Resolution #580-2025
Contract # 381-2025

CONTRACT DOCUMENTS AND SPECIFICATIONS

FOR

Merrick Trunk Sewer Improvements

Wastewater System Improvements
Division of Water Quality
Lexington Fayette Urban County Government

Remedial Measures Plan ID No. WH-7

LFUCG Bid No.100-2025

Date: October, 2025

PREPARED BY:

PRIME AE Group, Inc.
651 Perimeter Drive, Suite 300
Lexington, KY 40517
Engineer's Project No. 200126



Edition: Bid Set

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SECTION 00100

ADVERTISEMENT FOR BIDS

1.01 INVITATION

Sealed proposals for the following work will be received by the Lexington-Fayette Urban County Government (LFUCG) via Ion Wave (https://lexingtonky.ionwave.net) until 2:00 pm, local time, November 13, 2025 for furnishing all labor and/or materials and performing all work as set forth in the Contract Documents prepared by and for Lexington-Fayette Urban County Government, Division of Water Quality (OWNER). All forms and Contract Documents normally filled out and attached with bid submission shall be downloaded from Lynn Imaging's Planroom and may be viewed on Ion Wave. All notary requirements are waived for this solicitation. A copy of bid bond must be included with submission. Immediately following the scheduled closing time for reception of Bids, all proposals which have been submitted in accordance with the above will be opened electronically and a bid tab sheet will be posted on Ion Wave within approximately 30 mins.

LFUCG will only be accepting bids on-line through Ion Wave for this solicitation. Base bid and alternate totals (if required) should be provided on the appropriate line items tab on Ion Wave. Submissions without line item totals (if required) may be rejected and deemed non-responsive. THESE INSTRUCTIONS SUPERCEDE ALL OTHER BID SUBMISSION INSTRUCTIONS PROVIDED IN THIS PACKAGE. PLEASE SUBMIT ALL QUESTIONS VIA THE Q&A MODULE ON ION WAVE.

1.02 DESCRIPTION OF WORK

The project includes providing all construction supervision, labor, materials, tools, test equipment necessary for the **Merrick Trunk Sewer Improvements Project**; **(RMP WH-7)** that includes replacement of approximately 7200 linear feet of 30-inch sanitary sewer and appurtenance structures beginning on Greentree Road near Tates Creek Road and continuing through backyards along Willowood Road and then Tates Creek Road, crossing Tates Creek near Gainesway Drive, crossing the New Circle Road Ramp, then continuing across Tates Creek again and extending along Tates Creek Road to Dove Run Road and to Monta Vesta Road, ending at the City Park Property at the corner of Montavesta Road and Dove Run Road. The project also includes a 380 linear feet tunnel section of 48-inch casing pipe with 403 linear feet of 30-inch carrier pipe, a 192 linear feet tunnel section of 48-inch casing pipe with 217 linear fee of 30-inch carrier pipe, a 177 linear feet tunnel section of 48-inch casing pipe with 202 linear feet of 30-inch carrier pipe, a 238 linear feet tunnel section of 48-inch casing pipe with 263 linear feet of 30-inch carrier pipe, and a 304 linear feet tunnel section of 48-inch casing pipe with 329 linear feet of 30-inch carrier pipe. It also includes 4 creek crossings.

1.03 OBTAINING PLANS, SPECIFICATIONS, AND BID DOCUMENTS

Plans, Specifications, and Contract Documents shall be obtained from Lynn Imaging, 328 Old Vine Street, Lexington, KY 40507, (859) 255-1021 or (www.lynnimaging.com)

and click on planroom for a non-refundable price of reproduction for each full set of plans and documents. Bids must be submitted through LFUCG's Ion Wave.

1.04 METHOD OF RECEIVING BIDS

Bids will be received from Prime Contracting firms on a lump sum and line item unit price basis. Bids shall be submitted in the manner and subject to the conditions as set forth and described in the Information Available to Bidders and Bid Form.
Bids should be submitted online via Ion Wave.

1.05 METHOD OF AWARD

Determination of the successful Bid will be based on the lowest responsive and responsible Bidder whose qualifications indicate the award will be in the best interest of the OWNER and whose Bid/proposal complies with all the prescribed requirements. No Notice of Award will be given until the OWNER has concluded such investigation as deemed necessary to establish the responsibility, qualifications and financial ability of Bidders to do the work in accordance with the Contract Documents to the satisfaction of the OWNER within the time prescribed. The OWNER reserves the right to reject the Bid of any Bidder who does not pass such investigation to the OWNER's satisfaction. The OWNER reserves the right to reject the Bid of any Bidder that is deemed to be unbalanced of front loaded. In analyzing Bids, the OWNER may take into consideration alternate and unit prices, if requested by the Bid forms.

1.06 BID WITHDRAWAL

No Bidder may withdraw his Bid for a period of ninety (90) calendar days after the closing date for receipt of Bids. Errors and omissions will not be cause for withdrawal of Bid without forfeit of Bid Bond.

1.07 BID SECURITY

All Bids shall be accompanied by a Bid Bond of not less than five percent (5%) of the amount of the Bid executed by a Surety Company authorized to do business in the Commonwealth of Kentucky and countersigned by a licensed Kentucky Resident Agent, representing the Surety Company. Certified Check or Bid Bond shall be payable to Lexington-Fayette Urban County Government. Bid Bonds are not required for bids under $50,000. A cashier's check or irrevocable letter of credit is an acceptable form of bid security.

A scanned copy of the bid bond is acceptable and must be uploaded with the bid through Ion Wave.

1.08 SUBMISSION OF BIDS

Contractors shall submit their Bids via Ion Wave not later than 2:00 p.m. (local time) November 6, 2025. Bids will remain sealed until 2:00 p.m. (local time) November 6,

2025, the official Bid closure time. Bids received after the scheduled closing time for receipt of Bids will not be considered.

1.09 RIGHT TO REJECT

The OWNER reserves the right to reject any and all Bids and to waive all informalities and/or technicalities where the best interest of the OWNER may be served.

1.10 NOTIFICATION TO THE LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT FOR AFFIRMATIVE ACTION PLAN AND CURRENT WORKFORCE

The successful bidder must submit the following to the OWNER:

1. Affirmative Action Plan for his/her firm.
2. Current Workforce Analysis Form

Failure to submit this as required herein may result in disqualification of the Bidder from the award of the contract.

1.11 NOTICE CONCERNING MWDBE AND VETERAN GOALS

Notice of requirement for Affirmative Action to ensure Equal Employment Opportunities and Disadvantaged Business Enterprises (DBE) Contract participation. Disadvantaged Business Enterprises (DBE) consists of Minority-Owned Business Enterprises (MBE) and Woman-Owned Business Enterprises (WBE).

The OWNER has set a goal that not less than seventeen percent (17%) of the total value of this Contract be subcontracted to Disadvantaged Business Enterprises, with minimum subgoals of five percent (5%) for MBEs and a subgoal of twelve percent (12%) for WBEs, and set a goal that not less than three percent (3%) of the total value of this Contract be subcontracted to Veteran-Owned Small Businesses and/or Service-Disabled Veteran Owned Businesses. The goals for the utilization of Disadvantaged Business Enterprises and Veteran-Owned Small Businesses as subcontractors are recommended goals. Contractor(s) who fail to meet such goals will be expected to provide written explanations to the Director of the Division of Purchasing of efforts they have made to accomplish the recommended goal, and the extent to which they are successful in accomplishing the recommended goal will be a consideration in the procurement process. Depending on the funding source, other DBE goals may apply.

For assistance in locating Disadvantaged Business Enterprise and Veteran-Owned Small Businesses as Subcontractors contact:

Sherita Miller, Division of Central Purchasing
LFUCG
200 East Main Street, 3rd Floor, Room 338
Lexington, Kentucky 40507
859-258-3323
smiller@lexingtonky.gov

1.12 PRE-BID MEETING

A **mandatory** pre-Bid meeting will be held at **10:00 am local time, October 21, 2025** and will be a hybrid meeting. The in-person meeting will be held at the LFUCG DWQ building in the upstairs conference room at 125 Lisle Industrial Ave., Lexington, KY 40511. Prime contractors are REQUIRED to attend in person. Virtual attendance is allowed for sub-contractors only, and they may join via MS Teams using the link, call-in number, or QR Code below:

https://teams.microsoft.com/dl/launcher/launcher.html?url=%2F_%23%2Fl%2Fmeetup-join%2F19%3Ameeting_OGNhNGM2MWMtNmI3OS00NDZkLTg1NDctMDdiNzU4MTcyZDk5%40thread.v2%2F0%3Fcontext%3D%257b%2522Tid%2522%253a%2522083fc4d2-72ad-412b-ae7d-6b81b83916dd%2522%252c%2522Oid%2522%253a%2522fdade983-a266-44d5-9446-1570bdf80205%2522%257d%26anon%3Dtrue&type=meetup-join&deeplinkId=2e7d6f72-63f2-4073-9871-406b28c19fa0&directDl=true&msLaunch=true&enableMobilePage=true&suppressPrompt=true

For audio only, the call-in number and conference ID: 1 347-991-7874, 668477633#

1.13 CONSENT DECREE REQUIREMENTS

The work to be provided through this Bid will assist the OWNER in successfully implementing the Agreement (Contract) and complying with any requirements which are related to the CONSENT DECREE entered in a case styled *United States & Commonwealth of Kentucky v. Lexington-Fayette Urban County Government,* United States District Court for the Eastern District of Kentucky, Civil Action No. 5:06-cv-386-KSF (the "CONSENT DECREE"). The services provided through this Bid are hereinafter referred to as the Agreement (Contract). The primary goal of the Agreement (Contract) is to provide the owner with the technical support and/or construction services necessary to successfully meet the obligations and deadlines of the CONSENT DECREE.

The Bidder shall familiarize itself with and shall at all times comply with the CONSENT DECREE, and all federal, state and local laws, ordinances, and regulations that in any manner affect the Agreement (Contract). Time is of the essence in the performance of Agreement (Contract). Bidder is aware that the Owner is subject to penalties for non-compliance with the CONSENT DECREE deadlines.

If delays result solely by reason of acts of the Bidder, the Bidder shall be held liable for any financial penalties incurred by the Owner as a result of the delay, including but not limited to those assessed pursuant to the CONSENT DECREE. In the event the parties cannot mutually agree upon the cause(s) associated with the delays in completing project deliverables, the Bidder must immediately notify the Owner in the event of such delay, and provide the Owner a written action plan within five (5) business days on how it will attempt to resolve the delay.

In the event that Bidder's delay or other nonperformance of its obligations hereunder results in the imposition of penalties against the Owner pursuant to the CONSENT DECREE, or the Owner otherwise suffers damage as a result of such delay or nonperformance, Bidder shall be solely liable to Owner for any and all such damages, including any costs and attorney's fees.

An electronic version of the CONSENT DECREE is available on the LFUCG web page for review or to print a copy at no charge.

END OF SECTION

SECTION 00300

INFORMATION AVAILABLE TO BIDDERS

1.01 RECEIPT AND OPENING OF BIDS

A. The Lexington-Fayette Urban County Government (herein called the OWNER) invites Bids from firms on the project described in the Advertisement for Bids. The OWNER will receive Bids online through Ion Wave (https://lexingtonky.ionwave.net) at the time and in the manner set forth in the Advertisement for Bids, at which time the bids will be opened electronically. The OWNER may consider informal any Bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all Bids. Any Bid may be withdrawn prior to the scheduled time for the opening of Bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be considered. No Bidder may withdraw a Bid within ninety twenty (90) days after the actual time and date of the Bid opening, but OWNER may, in its sole discretion, release any Bid and return the Bid Security prior to that date.

B. The OWNER assumes no responsibility for Bids that are not submitted electronically as indicated above. Bids that are not submitted online by the stated time and date will be rejected.

1.02 PREPARATION OF BID

A. Each Bid must be submitted on the prescribed digital Bid Form within Ion Wave. All blank spaces for the Bid prices must be filled in or the bid will be considered incomplete. Each Bid must be submitted online via Ion Wave.

1.03 SUBCONTRACTS

A. The Bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this Contract must be acceptable to the OWNER. All proposed subcontractors must be identified on Bid Form. Prior to the award of Contract, the OWNER or the OWNER's representative will advise the Contractor of the acceptance and approval thereof or of any action necessary to be taken. Should any Subcontractor be rejected by the OWNER, the Contractor shall present a new name and/or firm to the OWNER at no change in the Contract Price.

1.04 QUALIFICATIONS OF BIDDER

A. The OWNER may make such investigations as the OWNER deems necessary to determine the ability of the Bidder to perform the Work, and the Bidder shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the OWNER that such Bidder is properly qualified to carry out the obligations of the Agreement (Contract) and to complete the Work contemplated therein. Conditional Bids will not be accepted.

B. In evaluating Bids, OWNER shall consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and alternatives and unit or lump

sum prices, as requested. OWNER may consider maintenance requirements, performance data, and disruption or damage to private property. The contract, if awarded, will be awarded to the lowest, qualified, responsible Bidder based upon OWNER's evaluation which indicates that the award will be in the best interest of OWNER and the general public.

C. In the event there is any question as to the Bidder's qualifications and ability to complete the work, a final determination will be made in accordance with a fair evaluation by the OWNER of the following listed elements.

1. If the OWNER requires filling out a detailed financial statement, the Bidder may provide its current certified financial statement(s) for the required time interval.

2. Corporate firms are required to be registered and in good standing with the requirements and provisions of the Office of the Secretary of State, Commonwealth of Kentucky.

3. Documents Required of Contractor - (1) A sworn statement signed by the President or owner of the Company regarding all current work in progress anywhere; (2) A document showing the percent of completion of each project and the total worth of each project; and (3) Documentation showing the percentage of the DBE employment levels on each project of the Bidder's current work force, and DBE participation levels for Subcontractors.

4. Optional OWNER Requirements - The OWNER, at its discretion, may require the Bidder/Contractor to provide: (1) A current detailed financial statement for a period including up to 3 prior years. (2) Financial security or insurance in amounts and kinds acceptable to the OWNER to meet the financial responsibility requirements for the Contractor to indemnify the OWNER. (3) Additional information and/or DBE work force data, as well as DBE participation data.

5. Each Bidder agrees to waive any claim it has or may have against the OWNER, the Architect/Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any Bid.

1.05 BID SECURITY

A. Each Bid must be accompanied by a Bid bond prepared on a Form of Bid Bond and attached thereto, duly executed by the Bidder as principal and having as surety thereon a surety company approved by the OWNER, in the amount of 5% of the Bid. Such Bid bond will be returned to the unsuccessful Bidder(s) only upon written request to the Director of Central Purchasing within seven (7) days of opening of Bids. Bid bond shall be made payable to the Lexington-Fayette Urban County Government. Bid security is not required for projects under $50,000.

B. Bonds shall be placed with an agent licensed in Kentucky with surety authorized to do business within the state. When the premium is paid for such coverage, the full commission payable shall be paid to such local agent who shall not divide such commission with any person other than a duly licensed resident local agent.

C. Electronic, scanned Bid bond(s) will be accepted and shall be uploaded to Ion Wave prior to close of bids.

1.06 LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

A. The successful Bidder, upon his failure or refusal to execute and deliver the Contract and bonds required within ten (10) days after he has received notice of the acceptance of his Bid, shall forfeit to the OWNER, as liquidated damages for such failure or refusal, the security deposited with his Bid.

1.07 TIME OF COMPLETION AND LIQUIDATED DAMAGES

A. Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" from the OWNER and to fully complete the Project within the time as specified in the Contract Documents. Bidder must agree also to pay liquidated damages for each consecutive calendar day thereafter as specified in the Contract Documents.

1.08 EXAMINATION OF CONTRACT DOCUMENTS AND SITE

A. It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site(s) to become familiar with local conditions that may affect cost, progress, performance or furnishing of the work, (c) consider Federal, State and Local laws and regulations that may affect cost, progress, performance or furnishing of the work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors or discrepancies in the Contract Documents.

B. Bidders should examine the requirements of the General Conditions for information pertaining to subsurface conditions, underground structures, underground facilities, and availability of lands, easements, and rights-of-way. The completeness of data, presented in the Contract Documents, pertaining to subsurface conditions, underground structures, and underground facilities for the purposes of bidding or construction is not assured. The Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (surface and subsurface) which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents. On request in advance, OWNER will provide access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations.

C. The submission of a Bid will constitute an incontrovertible representation by the Bidder that Bidder has complied with every requirement of this Article; that without exception the Bid is premised upon furnishing and performing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents; and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

1.09 ADDENDA AND INTERPRETATIONS

A. No interpretation of the meaning of the Contract Documents will be made to any Bidder orally. Every request for such interpretation should be submitted in writing via the Q&A module on Ion Wave. Addenda will be issued by the OWNER through Lynn Imaging's Planroom and posted to Ion Wave as needed. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications. Acknowledgement of the receipt of addenda must be included with all submitted Bids. Failure of any Bidder to receive any such addendum or interpretation shall not relieve such Bidder from any obligation under his Bid as submitted. All addenda so issued shall become part of the Contract Documents.

1.10 SECURITY FOR FAITHFUL PERFORMANCE

A. Simultaneously with the delivery of the executed Contracts, the Contractor shall furnish Performance, Payment, and Erosion and Sediment Control Bonds as security for the faithful performance of this Contract and for payment of all persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the OWNER and authorized to do business in the Commonwealth of Kentucky.

B. The Contractor shall furnish the Warranty Bond upon completion of the Work, prior to the OWNER's release of the final payment.

C. All bonds required by this Contract and laws of this State shall be placed with agents licensed in the State of Kentucky. When the premium is paid for such coverage's, the full commission shall be paid to such local agent who shall not divide such commission with any person other than a duly licensed resident local agent.

D. Contractor shall use standard Performance, Payment, Warranty, and Erosion and Sediment Control Bond forms such as documents provided with the Contract Documents or AIA form A312 (latest edition), for the Performance and Payment Bonds only.

E. The Performance Bond shall be in the amount of one hundred percent (100%) of the Agreement (Contract) amount. The Payment Bond shall be in the amount of one hundred percent (100%) of the Agreement (Contract) amount. The Warranty Bond shall be in the amount of five percent (5%) of the final construction cost amount (based on contractor's final pay request). The Erosion and Sediment Control Performance Bond shall be in the amount of one percent (1%) of the Agreement (Contract) amount.

1.11 POWER OF ATTORNEY

A. Attorney-in-fact who signs Bid bonds or Contract bonds must file with each bond a certified and effectively dated copy of their Power of Attorney.

1.12 TAXES AND WORKMEN'S COMPENSATION

A. The Contractor and subcontractor will be required to accept liability for payment of all payroll taxes, sales and use tax, and all other taxes or deductions required by local,

state or federal law, such as social security measured by wages. Each shall carry Workmen's Compensation Insurance to the full amounts as required by Statutes and shall include the cost of all foregoing items in the Bid. The Contractor will not otherwise be reimbursed or compensated for such tax payments. The Contractor is urged to ascertain at his own risk his actual tax liability in connection with the execution or performance of this Contract.

1.13 LAWS AND REGULATIONS

A. The Bidder's attention is directed to the fact that all applicable state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout, and they will be deemed to be included in the Contract, the same as though herein written out in full.

1.14 EROSION AND SEDIMENT CONTROL AND PERMITS

A. The Contractor and Subcontractors performing Work on projects on behalf of the OWNER shall also comply with all applicable federal, state, and local environmental regulations and all requirements and conditions set forth in specifications herein.

1.15 PREVAILING WAGE LAW AND MINIMUM HOURLY RATES

A. There are no Federal or State prevailing wage rates for this Project.

1.16 AFFIRMATIVE ACTION PLAN

A. The successful Bidder must submit with their bid the following items to the Urban County Government (see section 00410 – Bid Form):

1. Affirmative Action Plan of the firm
2. Current Work Force Analysis Form
3. Good Faith Effort Documentation to meet the MWDBE goals.
4. List of Disadvantaged Business Enterprise Subcontractors and the Dollar Value of each Subcontract

B. A Work Force Analysis on the prescribed form shall be submitted for each Contract. Failure to submit these items as required herein may result in disqualification of the Bidder from award of the Contract.

C. All submissions should be attached to the Bidder's bid submission on Ion Wave.

1.17 CONTRACT TIME

A. The number of calendar days within which the Work is to be substantially completed and ready for final payment (the Contract Time) is set forth in the Bid Form and the Agreement (Contract).

1.18 SUBSTITUTE OR "OR-EQUAL" ITEMS

A. The Contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or-equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by the Contractor if acceptable to the Engineer and OWNER, application for such acceptance will not be considered by the Engineer and OWNER until after the effective date of the Agreement (Contract). The procedure for submission of any such application by the Contractor and consideration by the Engineer and OWNER is set forth in the General Conditions.

1.19 EQUIPMENT MANUFACTURERS LIST

A. The Equipment Manufacturers identified in the Equipment Manufacturers List are the only equipment manufacturers/suppliers to be considered in the Bid. There are and will be no other equals considered during the bidding phase for these equipment items. The Contractor may select any of the listed manufacturers for each item and must circle the selected manufacturer for each item at the time of Bid submission.

B. The design was completed based upon the first listed manufacturer. The Contractor, at no cost to the OWNER, will be responsible for any changes to the structures, piping, electrical, instrumentation, or other to accommodate any required changes should a vendor other than the first listed be selected in the bid. This will include payment to the Engineer of Record for any required redesign.

1.20 SIGNING OF AGREEMENT (CONTRACT)

A. When OWNER gives a Notice of Award to the successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement (Contract) with all other written Contract Documents attached. Within ten days thereafter, Contractor shall sign and deliver the required number of counterparts of the Agreement (Contract) and attached documents to OWNER with the required Bonds, Certificate of Insurance, and Power of Attorney. The OWNER will deliver one fully signed counterpart to Contractor at such time as it has been signed by the Mayor.

1.21 ASSISTANCE TO BE OFFERED TO DISADVANTAGED BUSINESS ENTERPRISE (MWDBE) CONTRACTORS

A. Outreach for MWDBE(s)

The Lexington-Fayette Urban County Government (LFUCG) maintains a database of MWDBE contractors and organizations. When a LFUCG construction project is advertised for bidding, notices are sent to companies registered at https://lexingtonky.ionwave.net. The notices describe the project and indicate the deadline for submitting bids.

If you wish to be added to the LFUCG MWDBE contractor database, please contact:

Sherita Miller, Division of Central Purchasing

Lexington-Fayette Urban County Government
200 East Main Street, Room 338
Lexington, Kentucky 40507
859-258-3323
smiller@lexingtonky.gov

B. Bid Bond Assistance for MWDBE(s)

For those MWDBE contractors who wish to bid on LFUCG project, bid bond assistance is available. This bid bond assistance is in the form of a "Letter of Certification" which is accepted by the LFUCG's Division of Purchasing, in lieu of a bid bond. The "Letter of Certification" must be included in the bid package when it is submitted to the Division of Purchasing electronically. The "Letter of Certification" will reference the specific project for which the bid is being submitted, and the time and date on which the bid is due. Bid bond assistance must be requested from the Lexington-Fayette Urban County Government's Division of Central Purchasing.

C. Eligibility for Bid Bond Assistance for MWDBE(s)

In order to be eligible for any Bid bonding assistance, a MWDBE construction company must be owned or controlled at the level of 51% or more by a member or members of a minority group or females. Prior to receiving assistance, a statement providing evidence of ownership and control of the company by a member or members of a minority group or females must be signed by the Owner or corporate officer and by an attorney or accountant submitted to:

Sherita Miller, Division of Central Purchasing
Lexington-Fayette Urban County Government
200 East Main Street, Room 338
Lexington, Kentucky 40507
859-258-3323
smiller@lexingtonky.gov

D. MWDBE and Veteran Subcontractors

The LFUCG will, upon request, assist prime contractors in the procurement of eligible DBE and veteran subcontractors in an effort to achieve 17% minimum MWBE goal and to achieve 3% minimum veteran goal.

For a list of eligible subcontractors, please contact:

Sherita Miller, Division of Central Purchasing
Lexington-Fayette Urban County Government
200 East Main Street, Room 338
Lexington, Kentucky 40507
859-258-3323
smiller@lexingtonky.gov

1.22 MINORITY BUSINESS ENTERPRISE PROGRAM (MBEP) PARTICIPATION GOALS

A. GENERAL

1. The LFUCG request all potential contractors to make a concerted effort to include Certified Minority Business Enterprise (MBE), Certified Woman-Owned (WBE), Certified Disadvantaged (DBE) Business Enterprises, Certified Veteran-Owned Small Businesses (VOSB), and Certified Service-Disabled Veteran Owned Small Business (SDVOSB) as subcontractors or suppliers in their bids. The term "Certified" shall mean the business is appropriately certified, licensed, verified, or validated by an organization or entity recognized by the Division of Procurement as having the appropriate credentials to make a determination as to the status of the business.

2. Toward that end, the LFUCG has established seventeen percent (17%) of total procurement costs as a minimum Goal for participation of Certified Minority and Women Business Enterprise (MWBE) including minimum subgoals of five percent (5%) for MBE and a subgoal of twelve percent (12%) for WBE.

3. **It is therefore a request of each Bidder to include in its bid, the same goal (17%) for Certified MWBE participation and other subgoals and requirements as outlined in this section.**

4. The LFUCG has also established a three percent (3%) of total procurement costs as a minimum Goal for participation for Certified VOSB and/or Certified SDVOSB; and a goal of utilizing Certified DBE where applicable

5. **It is therefore a request of each Bidder to include in its bid, the same goal (3%) for Certified Veteran-Owned participation and other requirements as outlined in this section.**

B. PROCEDURES

1. Prime Contractors, minority and women business enterprises, veteran owned, small businesses, and service-disabled veteran owned small businesses must complete monthly contract compliance audits in the Diverse Business Management Compliance System, https://lexingtonky.diversitycompliance.com/

2. Replacement of a Minority-Owned, Woman-Owned or Veteran-Owned subcontractor or supplier listed in the original submittal must be requested in writing and must be accompanied by documentation of Good Faith Efforts to replace the subcontractor / supplier with another MWDBE Firm; this is subject to approval by the LFUCG. (See LFUCG MWDBE Substitution Form)

3. For assistance in identifying qualified, certified businesses to solicit for potential contracting opportunities, bidders may contact:

   a. Sherita Miller, smiller@lexingtonky.gov

4. The LFUCG will make every effort to notify interested MWDBE and Veteran-Owned subcontractors and suppliers of each Bid Package, including information on the scope of work, the pre-bid meeting time and location, the bid date, and all other pertinent information regarding the project.

C. DEFINITIONS

1. A Certified Minority-Owned Business Enterprise (MBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by an ethnic minority (i.e. Black American, Asian American, Hispanic American, Native American).

2. A Certified Woman-Owned Business Enterprise (WBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by a woman.

3. A Certified Disadvantaged Business Enterprise (DBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by a person(s) who is socially and economically disadvantaged as defined by 49CFR subpart 26.

4. A Certified Veteran-Owned Small Business (VOSB) is defined as a business which is certified as being at least 51% owned, managed and controlled by a veteran who served on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.

5. A Certified Service-Disabled Veteran Owned Small Business (SDVOSB) is defined as a business in which at least 51% is owned, managed and controlled by a disabled veteran who served on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.

6. The term "Certified" shall mean the business is appropriately certified, licensed, verified, or validated by an organization or entity recognized by the Division of Procurement as having the appropriate credentials to make a determination as to the status of the business.

7. Good Faith Efforts are efforts that, given all relevant circumstances, a bidder or proposer actively and aggressively seeking to meet the goals, can reasonably be expected to make. In evaluating good faith efforts made toward achieving the goals, whether the bidder or proposer has performed the efforts outlined in the Obligations of Bidder for Good Faith Efforts outlined in this document will be considered, along with any other relevant factors.

D. OBLIGATION OF BIDDER FOR GOOD FAITH EFFORTS

1. The bidder shall make a Good Faith Effort to achieve the Participation Goal for MWDBE and Veteran-Owned subcontractors/suppliers. The failure to meet the goal shall not necessarily be cause for disqualification of the bidder; however, bidders not meeting the goal are required to furnish with their bids written documentation of their Good Faith Efforts to do so.

2. Award of Contract shall be conditioned upon satisfaction of the requirements set forth herein.

3. The Form of Proposal includes a section entitled "MWDBE Participation Form". The applicable information must be completed and submitted as outlined below.

4. Failure to submit this information as requested may be cause for rejection of bid or delay in contract award.

E. DOCUMENTATION REQUIRED FOR GOOD FAITH EFFORTS

1. All Bidders are required to submit documentation of their good faith and outreach efforts to ensure all businesses, including small and disadvantaged businesses such as minority-, woman-, and veteran-owned businesses, have an equal opportunity to compete for and participate in the performance of any subcontracts resulting from this procurement. Examples of good faith and outreach efforts that satisfy this requirement to encourage the participation of, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs include:

   a. Advertised opportunities to participate in the contract in at least two (2) publications of general circulation media; trade and professional association publications; small and minority business or trade publications; and publications or trades targeting minority, women and disadvantaged businesses not less than fifteen (15) days prior to the deadline for submission of bids to allow DBEs, MBEs, WBE, VOSBs, and/or SDVOSBs to participate.

   b. Attended LFUCG Procurement Economic Inclusion Outreach event(s) within the past year to meet new small businesses, DBEs, MBEs, WBEs, VOSBs, and/or SDVOSBs to partner with on LFUCG contracts and procurements.

   c. Attended pre-bid/pre-proposal meetings that were scheduled by LFUCG to inform small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs of subcontracting opportunities.

   d. Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs.

   e. Requested a list of certified small, DBE, MBE, WBE, VOSB and/or SDVOSB subcontractors or suppliers from LFUCG and showed evidence of contacting the companies on the list(s).

   f. Contacted organizations that work with small, DBE, MBE, WBE, and VOSB companies for assistance in finding certified DBEs, MBEs, WBEs, VOSB and/or SDVOSBs to work on this project. Those contacted and their responses must be a part of the bidder's outreach efforts documentation.

g. Sent written notices, by certified mail, email, or facsimile, to qualified, certified small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs soliciting their participation in the contract not less than seven (7) days prior to the deadline for submission of bids to allow them to participate effectively.

h. Followed up initial solicitations by contacting small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs via tailored communications to determine their level of interest.

i. Provided the interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs with adequate and timely information about the plans, specifications, and requirements of the contract.

j. Selected portions of the work to be performed by small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs in order to increase the likelihood of subcontracting participation. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate small, DBE, MBE, WBE, VOSB and/or SDVOSB participation, even when the prime contractor may otherwise perform these work items with its own workforce.

k. Negotiated in good faith with interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs, not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection must be so noted in writing with a description as to why an agreement could not be reached.

l. Included documentation of quotations received from interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs that were not used due to uncompetitive pricing or were rejected as unacceptable and/or copies of responses from firms indicating that they would not be submitting a bid.

    1) Bidder has to submit sound reasons why the quotations were considered 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 small business', DBE's MBE's, WBE's, VOSB's and/or SDVOSB's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy the participation goals.

m. Made an effort to offer assistance to or refer interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal.

n. Made efforts to expand the search for small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs beyond the usual geographic boundaries.

o. Other – any other evidence that the bidder submits that may demonstrate that the bidder has made reasonable efforts to include small, DBE, MBE, WBE, VOSB and/or SDVOSB participation.

2. Bidder must document, with specificity, each of the efforts it made to include small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs as subcontractors in the procurement, including the date on which each effort was made, the medium through which each effort was made, and the outcome of each effort.

3. Outreach efforts demonstrated by the bidder will be evaluated on a pass/fail basis.

NOTE: FAILURE TO SUBMIT THE DOCUMENTATION REQUESTED IN THIS SECTION MAY BE CAUSE FOR REJECTION OF BID. BIDDERS MAY INCLUDE ANY OTHER DOCUMENTATION DEEMED RELEVANT TO THIS REQUIREMENT WHICH IS SUBJECT TO REVIEW BY THE MBE LIAISON. DOCUMENTATION OF GOOD FAITH AND OUTREACH EFFORTS MUST BE SUBMITTED WITH THE BID, REGARDLESS OF THE PROPOSED LEVEL OF SMALL, DBE, MBE, WBE, VOSB AND/OR SDVOSB PARTICIPATION IN THE PROCUREMENT. IF THE GOOD FAITH AND OUTREACH EFFORT DOCUMENTATION IS NOT SUBMITTED WITH THE BID RESPONSE, THE BID MAY BE REJECTED.

LEXINGTON

MINORITY BUSINESS ENTERPRISE PROGRAM

Sherita Miller, MPA, CPSD
Minority Business Enterprise Liaison
Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street
Lexington, KY 40507
smiller@lexingtonky.gov
859-258-3323

OUR MISSION: The mission of the Minority Business Enterprise Program (MBEP) is to facilitate the full participation of minority and women owned businesses in the procurement process and to promote economic inclusion as a business imperative essential to the long- term economic viability of Lexington-Fayette Urban County Government.

To that end the urban county council adopted and implemented Resolution 272-2024 – a Certified Minority and Women Business Enterprise seventeen percent (17%) minimum goal including minimum subgoals of five percent (5%) for Minority Business Enterprises (MBE) and a subgoal of twelve percent (12%) for Women Business Enterprises (WBE); a three (3%) minimum goal for Certified Veteran-Owned Small Businesses and/or Certified Service- Disabled Veteran Owned Businesses; and a goal of utilizing Disadvantaged Business Enterprises (DBE), where applicable, for government contracts.

The resolution states the following definitions shall be used for the purposes of reaching these goals:

Certified Disadvantaged Business Enterprise (DBE) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a person(s) who is socially and economically disadvantaged as define by 49 CFR subpart 26.*

Certified Minority Business Enterprise (MBE) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by an ethnic minority (i.e. Black American, Asian American, Hispanic American, Native American)*

Certified Women Business Enterprise (WBE) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a woman.*

Certified Veteran-Owned Small Business (VOSB) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a veteran who served on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.*

Certified Service -Disabled Veteran Owned Small Business (SDVOSB) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a disabled veteran who served*

on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.

The term "Certified" shall mean the business is appropriately certified, licensed, verified, or validated by an organization or entity recognized by the Division of Procurement as having the appropriate credentials to make a determination as to the status of the business.

The following certifications are recognized and accepted by the MBEP:

Kentucky Transportation Cabinet (KYTC), Disadvantaged Business Enterprise (DBE)
Kentucky Minority and Women Business Enterprise (MWBE)
Women's Business Enterprise National Council (WBENC)
National Women Business Owners Corporation (NWBOC)
National Minority Supplier Development Council (NMSDC)
Tri-State Minority Supplier Development Council (TSMSDC)
U.S. Small Business Administration Veteran Small Business Certification (VetCert)
Kentucky Service- Disabled Veteran Owned Small Business (SDVOSB)

To comply with Resolution 272-2024, prime contractors, minority and women business enterprises, veteran owned small businesses, and service-disabled veteran owned small businesses must complete monthly contract compliance audits in the Diverse Business Management Compliance system, https://lexingtonky.diversitycompliance.com/

A list of organizations that certify and/or maintain lists of certified businesses (i.e. DBE, MBE, WBE, VOSB and/or SDVOSB) is available upon request by emailing, Sherita Miller, smiller@lexingtonky.gov.



LEXINGTON

LFUCG MWDBE PARTICIPATION FORM

Bid/RFP/Quote Reference #_____

The MWDBE and/or veteran subcontractors listed have agreed to participate on this Bid/RFP/Quote. If any substitution is made or the total value of the work is changed prior to or after the job is in progress, it is understood that those substitutions must be submitted to the Division of Procurement for approval immediately. **Failure to submit a completed form may cause rejection of the bid.**

MWBE Company, Name, Address, Phone, Email	DBE/MBE WBE/VOSB/SDVOSB	Work to be Performed	Total Dollar Value of the Work	% Value of Total Contract
1.				
2.				
3.				
4.				

The undersigned company representative submits the above list of MDWBE and veteran firms to be used in accomplishing the work contained in this Bid/RFP/Quote. Any misrepresentation may result in the termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

_____ _____

Company **Company Representative**

_____ _____

Date **Title**

LEXINGTON

LFUCG MWDBE SUBSTITUTION FORM

Bid/RFP/Quote Reference #_____

The substituted MWDBE and/or veteran subcontractors listed below have agreed to participate on this Bid/RFP/Quote. These substitutions were made prior to or after the job was in progress. These substitutions were made for reasons stated below and are now being submitted to the Division of Procurement for approval. By the authorized signature of a representative of our company, we understand that this information will be entered into our file for this project. **Note: Form required if a subcontractor is being substituted on a contract.**

SUBSTITUTED DBE/MBE/WBE/VOSB Company Name, Address, Phone, Email	DBE/MBE/WBE/VOSB/SDVOSB Formally Contracted/ Name, Address, Phone, Email	Work to Be Performed	Reason for the Substitution	Total Dollar Value of the Work	% Value of Total Contract
1.					
2.					
3.					
4.					

The undersigned acknowledges that any misrepresentation may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Company _____ **Company Representative** _____

Date _____ **Title** _____

DOCUMENTATION REQUIRED FOR GOOD FAITH EFFORTS AND OUTREACH PLANS

As affirmed in Resolution Number 272-2024, the Urban County Council has adopted an annual aspirational goal of utilizing at least seventeen percent (17%) of public funds spend from certain discretionary agreements with certified Minority Business Enterprises (MBEs) and certified Woman Business Enterprises (WBEs); utilizing at least three percent (3%) of public funds from certain discretionary agreements with Certified Veteran-Owned Small Business and Certified Service-Disabled Veteran-Owned Small Businesses (VOSBs); and utilizing Disadvantaged Business Enterprises (DBEs) where applicable. Bidders should make every effort to achieve these goals.

Therefore, as an element of the responsiveness of the bid, all Bidders are required to submit documentation of their good faith and outreach efforts to ensure all businesses, including small and disadvantaged businesses such as minority-, woman-, and veteran-owned businesses, have an equal opportunity to compete for and participate in the performance of any subcontracts resulting from this procurement. Examples of good faith and outreach efforts that satisfy this requirement to encourage the participation of, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs include:

1. Advertised opportunities to participate in the contract in at least two (2) publications of general circulation media; trade and professional association publications; small and minority business or trade publications; and publications or trades targeting minority, women, and disadvantaged businesses not less than fifteen (15) days prior to the deadline for submission of bids to allow, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs to participate.

2. Attended LFUCG Procurement Economic Inclusion Outreach event(s) within the past year to meet new small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs to partner with on LFUCG contracts and procurements.

3. Attended pre-bid/pre-proposal meetings that were scheduled by LFUCG to inform small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs of subcontracting opportunities.

4. Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs.

5. Requested a list of certified small, DBE, MBE, WBE, VOSB and/or SDVOSB subcontractors or suppliers from LFUCG and showed evidence of contacting the companies on the list(s).

6. Contacted organizations that work with small, DBE, MBE, WBE, and VOSB companies for assistance in finding certified DBEs, MBEs, WBEs, VOSB and/or SDVOSBs to work on this project. Those contacted and their responses must be a part of the bidder's outreach efforts documentation.

7. Sent written notices, by certified mail, email, or facsimile, to qualified, certified small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs soliciting their participation in the contract not less than seven (7) days prior to the deadline for submission of bids to allow them to participate effectively.

8. Followed up initial solicitations by contacting small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs via tailored communications to determine their level of interest.

9. Provided the interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs with adequate and timely information about the plans, specifications, and requirements of the contract.

10. Selected portions of the work to be performed by small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs in order to increase the likelihood of subcontracting participation. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate small, DBE, MBE, WBE, VOSB and/or SDVOSB participation, even when the prime contractor may otherwise perform these work items with its own workforce.

11. Negotiated in good faith with interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs, not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection must be so noted in writing with a description as to why an agreement could not be reached.

12. Included documentation of quotations received from interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs that were not used due to uncompetitive pricing or were rejected as unacceptable and/or copies of responses from firms indicating that they would not be submitting a bid.

    a. Bidder has to submit sound reasons why the quotations were considered 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 small business', DBE's MBE's, WBE's, VOSB's and/or SDVOSB's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy the participation goals.

13. Made an effort to offer assistance to or refer interested small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal.

14. Made efforts to expand the search for small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs beyond the usual geographic boundaries.

15. Other – any other evidence that the bidder submits that may demonstrate that the bidder has made reasonable efforts to include small, DBE, MBE, WBE, VOSB and/or SDVOSB participation.

Bidder must document, with specificity, each of the efforts it made to include small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs as subcontractors in the procurement, including the date on which each effort was made, the medium through which each effort was made, and the outcome of each effort.

Note: Failure to submit the documentation requested in this section may be cause for rejection of bid. Bidders may include any other documentation deemed relevant to this requirement which is subject to review by the MBE Liaison. Documentation of Good Faith and Outreach Efforts must be submitted with the Bid, regardless of the proposed level of small, DBE, MBE, WBE, VOSB and/or SDVOSB participation in the procurement. If the Good Faith and Outreach Effort documentation is not submitted with the bid response, the bid may be rejected.

OUTREACH EFFORTS EVALUATION

Outreach efforts demonstrated by the bidder or respondent will be evaluated on a pass/fail basis.

ATTACHMENT A – SMALL AND DISADVANTAGED, MINORITY-, WOMEN-, AND VETERAN-OWNED BUSINESS OUTREACH PLAN

Proposer Name:		**Date:**	
Project Name:		**Project Number:**	
Contact Name:		**Telephone:**	
Email:			

The mission of the Minority Business Enterprise Program is to facilitate the full participation of disadvantaged businesses, minority-, women-, veteran-, and service-disabled veteran-owned businesses in the procurement process and to promote economic inclusion as a business imperative essential to the long -term economic viability of Lexington-Fayette Urban County Government.

To that end, small and disadvantaged businesses, including minority-, woman-, veteran-, and service-disabled veteran-owned businesses, must have an equal opportunity to be utilized in the performance of contracts with public funds spent from certain discretionary agreements. By submitting its offer, Bidder/Proposer certifies that it has taken, and if there are further opportunities will take, reasonable steps to ensure that small and disadvantaged businesses, including minority-, woman-, veteran-, and service-disabled veteran-owned businesses, are provided an equal opportunity to compete for and participate in the performance of any subcontracts resulting from this procurement.

The information submitted in response to this clause will not be considered in any scored evaluation. Failure to submit this form may cause the bid or proposal to be rejected.

Is the Bidder/ Proposer a certified firm? Yes ☐ No ☐

If yes, indicate all certification type(s):

DBE ☐ MBE ☐ WBE ☐ SBE ☐ VOSB/SDVOSB ☐

and supply a copy of the certificate and/or certification letter if not currently listed on the city's Minority Business Enterprise Program's (MBEP) certified list.

1. Include a list of firms that Bidder/ Proposer has had a contractual relationship with within the last two years that are minority-owned, woman-owned, veteran-owned or small businesses, regardless of their certification status.

Click or tap here to enter text.

2. Does Bidder/Proposer foresee any subcontracting opportunities for this procurement?

Yes ☐ No ☐

If no, please explain why in the field below. Do not complete the rest of this form and submit this first page with your bid and/or proposal. Click or tap here to enter text.

ATTACHMENT A – SMALL and DISADVANTAGED, MINORITY-, WOMEN-, and VETERAN-OWNED BUSINESS OUTREACH PLAN

If yes, please complete the following pages and submit all pages with your bid and/or proposal.

Describe the steps Bidder/Proposer took to solicit small and disadvantaged businesses, including MBEs, WBEs, VOSBs, and SDVOSBs, for subcontracting opportunities for this procurement.

3. Check the good faith and outreach efforts the Bidder/Proposer used to encourage the participation of small and disadvantaged businesses including, MBEs, WBEs, VOSBs and SDVOSBs:

- ☐ Bidder placed advertisements in search of prospective small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs for the solicitation.
- ☐ Bidder attended LFUCG Procurement Economic Inclusion Outreach event(s) within the past year.
- ☐ Bidder attended pre-bid and/or pre-proposal meetings for this solicitation.
- ☐ Bidder sponsored an Economic Inclusion Outreach event.
- ☐ Bidder requested a list of certified small, DBE, MBE, WBE, VOSB and/or SDVOSB subcontractors or suppliers from LFUCG.
- ☐ Bidder contacted organizations that work with small, DBE, MBE, WBE, VOSB and/or SDVOSB companies.
- ☐ Bidder sent written notices to certified small, DBE, MBE, WBE, VOSB and SDVOSB businesses.
- ☐ Bidder followed up to initial solicitations with interested small, DBE, MBE, WBE, VOSB and/or SDVOSB.
- ☐ Bidder provided small, DBE, MBE, WBE, VOSB and/or SDVOSB businesses interested in performing the solicited work with prompt access to the plans, specifications, scope of work, and requirements of the solicitation.
- ☐ Bidder made efforts to segment portions of the work to be performed by small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs, including dividing sub-bid/partnership opportunities into economically feasible units/parcels, to facilitate participation.
- ☐ Bidder negotiated in good faith with interested small, DBE, MBE, WBE, VOSB and/or SDVOSB businesses.

☐ Bidder provided adequate rationale for rejecting any small business', DBEs, MBEs, WBEs, VOSBs or SDVOSBs for lack of qualifications.

☐ Bidder offered assistance in obtaining bonding, insurance, financial, equipment, or other resources to small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs, in an effort to assist them in meeting project requirements.

☐ Bidder made efforts to expand the search for small businesses, DBEs MBEs, WBEs, VOSBs and/or SDVOSBs beyond the usual geographic boundaries.

☐ Bidder made other reasonable efforts to include small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs participation.

4. Bidder/Proposer must include documentation, including the date each effort was made, the medium through which each effort was made, and the outcome of each effort with this form, regardless of the level of small, DBE, MBE, WBE, VOSB and/or SDVOSB participation. Examples of required documentation include copies of email communications, copies of newspaper advertisements, or copies of quotations received from interested small businesses, DBEs, MBEs, WBEs, VOSBs or SDVOSBs.

Click or tap here to enter text.

For detailed information regarding outreach efforts that satisfy the MBE Program's requirements, please see "Documentation Required for Good Faith Efforts and Outreach Plans" page.

Note: The Bidder/Proposer must be willing to report the identity of each subcontractor and the value of each subcontract to MBEP if awarded a contract from this procurement.

Failure to submit the documentation requested may be cause for rejection of the bid. Bidders may include any other documentation deemed relevant to this requirement, which is subject to review by the MBE Liaison. Documentation of Good Faith and Outreach Efforts must be submitted with the bid, regardless of the proposed level of SBEs, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs participation in the procurement. If the Good Faith and Outreach Effort Form and associated documentation is not submitted with the bid response, the bid may be rejected.

The undersigned acknowledges that all information is accurate. Any misrepresentations may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and claims.

Company	**Company Representative**
Date	**Title**

1.25 OWNER PERMITS

A. Bidder shall refer to Section 00890 regarding permits that have been obtained by the OWNER.

1.26 GEOTECHNICAL DATA

A. Bidder shall refer to the Appendices regarding available geotechnical data for this Contract.

END OF SECTION

SECTION 00410

BID FORM

MERRICK TRUNK SEWER IMPROVEMENTS

Division of Water Quality
Lexington-Fayette Urban County Government

LFUCG Bid No. 100-2025

1.01 GENERAL

Place: Lexington, Kentucky Date: November 13 2025

The following Bid Form shall be followed exactly in submitting a Bid for this Work.

This Bid Form Submitted by Tribute Contracting, Inc.

2125 County Rd 1, South Point, OH 45680
(Name and Address of Bidder)

(Hereinafter called "Bidder"), organized and existing under the laws of the State of Ohio,

doing business as a corporation
"a corporation," "a partnership", or an "individual" as applicable

To: Lexington-Fayette Urban County Government
(Hereinafter called "Owner"
Office of the Director of Central Purchasing
200 East Main Street, Room 338
Lexington, KY 40507

The Bidder, in compliance with your Advertisement for Bids for the **Merrick Trunk Sewer Improvements**; Lexington, Kentucky, having examined the Contract Documents including the Plans and Specifications with related documents, having examined the site for proposed Work, and being familiar with all of the conditions and any and all addendums surrounding the construction of the proposed Project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the Project in accordance with the Contract Documents, within the time set forth therein, and at the unit prices stated hereinafter. These prices are to cover all expenses incurred in performing the Work required under the Contract Documents, of which this Bid is a part.

The Bidder hereby agrees to commence Work under this Contract on a date to be specified in a written "Notice to Proceed" of the Owner and to substantially complete the Project within **540**

days, consecutive calendar days. Bidder further agrees to pay liquidated damages, the sum of One Thousand Dollars and Zero Cents ($1,000.00) for each consecutive day thereafter.

The Bidder hereby acknowledges receipt of the following addenda:

Addendum No. 1 Date 10-15-25; Addendum No. 5 Date 11-06-25

Addendum No. 2 Date 10-24-25; Addendum No. ____ Date _____

Addendum No. 3 Date 10-31-25; Addendum No. ____ Date _____

Addendum No. 4 Date 11-05-25; Addendum No. ____ Date _____

Insert above the number and the date of any Addendum issued and received. If none has been issued and received, the word "NONE" should be inserted.

1.02 LEGAL STATUS OF BIDDER

A. *A corporation duly organized and doing business under the laws of the State of Ohio, for whom Todd Harrah, bearing the official title of President, whose signature is affixed to this Bid is duly authorized to execute contracts.

~~B. *A Partnership, all of the members of which, with addresses are: (Designate general partners as such)~~

_____

_____

_____

_____

_____

~~C. *An individual, whose signature is affixed to this Bid. (Print name)~~

_____

_____

* The Bidder shall fill out the appropriate form and strike out the other two.

1.03 BIDDERS AFFIDAVIT

Comes the Affiant, Todd Harrah, and after being first duly sworn, states under penalty of perjury as follows:

A. His/her name is Todd Harrah and he/she is the individual submitting the Bid or is the authorized representative of Tribute Contracting, Inc., the entity submitting the Bid (hereinafter referred to as "Bidder").

B. Bidder will pay all taxes and fees, which are owed to the Lexington-Fayette Urban County Government at the time the Bid is submitted, prior to award of the Agreement and will maintain a "current" status in regard to those taxes and fees during the life of the Agreement.

C. Bidder will obtain a Lexington-Fayette Urban County Government business license, if applicable, prior to award of the Agreement.

D. Bidder has authorized the Division of Central Purchasing to verify the above-mentioned information with the Division of Revenue and to disclose to the Urban County Council that taxes and/or fees are delinquent or that a business license has not been obtained.

E. Bidder has not knowingly violated any provision of the campaign finance laws of the Commonwealth of Kentucky within the past five (5) years and the award of an Agreement to the Bidder will not violate any provision of the campaign finance laws of the Commonwealth.

F. Bidder has not knowingly violated any provision of Chapter 25 of the Lexington-Fayette Urban County Government Code of Ordinances, known as the "Ethics Act."

G. Bidder acknowledges that "knowingly" for purposes of this Affidavit means, with respect to conduct or to circumstances described by a statute or ordinance defining an offense, that a person is aware or should have been aware that his/her conduct is of that nature or that the circumstance exists.

Further, Affiant sayeth naught.

Affiant Signature

STATE OF Kentucky

COUNTY OF Boyd

The foregoing instrument was subscribed, sworn to and acknowledged before me by Todd Harrah on this the 13th day of November, 2025

My commission expires: 10-2-29

NOTARY PUBLIC, STATE AT LARGE

JOHN M. PARSLEY
Notary Public - State At Large
KENTUCKY - Notary ID # KYNP35081
My Commission Expires 10/02/2029

1.04 BID SCHEDULE

A. The Bidder agrees to perform all the Work described in the Specifications and shown on the Plans for the following proposed lump sum and/or unit prices, if applicable, which shall include the furnishing of all labor, materials, supplies, equipment and/or vehicle usage, services, all items of cost, overhead, taxes (federal, state, local), and profit for the Contractor and any Subcontractor involved, within the time set forth herein. If unit prices are applicable, Bidder must make the extensions and additions showing the total amount of Bid. In all cases of discrepancies or math errors the amount written in for the unit price of an item shall govern.

B. If a discrepancy between the unit price and the item total exists, the unit price prevails except:

If the unit price is illegible, omitted, or the same as the item total, item total prevails and the unit price is the quotient of the item total and the quantity.

C. If the unit price and the item total are illegible or are omitted, the Bid may be determined nonresponsive. If a lump sum total price is illegible or is omitted, the Bid may be determined nonresponsive.

By submitting a Bid, the Bidder acknowledges that the trenchless constructability of all tunnels shown on the Contract Drawings have been vetted by the Bidder and that the Bidder's own design has been advanced to the extent necessary to establish, in the Bidder's own opinion, the ability to safely construct by means of tunneling methods.

D. A Preliminary Tunnel Plan shall be developed by the Bidder, concurrent with the development of the Bid, to document the Bidder's awareness and understanding of the quantity of, location of, and access to the portions of the Contract that are required to be built by trenchless means. The Preliminary Tunnel Plan is a conceptual plan establishing the capability to accomplish the tunnel construction required by Contract. Following award of the Contract, the Contractor shall modify the Preliminary Tunnel Plan as needed to develop the most efficient construction plan of operation in accordance with Contract Documents. Requirements for submittal of and content of the Preliminary Tunnel Plan shall be in accordance with this Section.

E. Apparent Low Bidder shall submit, no later than 48 hours after Bid Opening, a Preliminary Tunnel Work Plan as part of its Bid. The Preliminary Tunnel Work Plan shall consist of sketches, markups, and/or narrative explanations. Legible hand written notes on Bid Documents (e.g.: Bid Drawings) are acceptable. The Preliminary Tunnel Work Plan shall include the following:

1. **Indication of diameter, type, and material of initial tunnel support, casings, or jacking pipe for Pipe-17, Pipe 22, Pipe-24, Pipe-25 & Pipe 27.**

2. Indication of tunnel drive direction.

3. Indication of basic tunnel equipment type, size, make, and model anticipated such as tunnel boring machine size, microtunnel boring machine, pipe jacked shield, auger boring machine, or utility hand tunneling methods.

4. Indication of conceptual understanding of all shaft locations, size (e.g.: diameter, length and width), orientation, anticipated conceptual method of support, staging/storage, and means of site access for each tunnel shaft as required for the Bidder's specific means and methods.

5. Conceptual markup of plan, profile, or detail drawings of the following:

   a. groundwater removal process and safe discharge locations,

   b. spoil handling and storage,

   c. method of installation and blocking of carrier pipe, and

   d. annular space grouting.

F. Preliminary indication all areas where potential ground modification strategies are anticipated or will be further explored by the Bidder upon award of the Contract.

G. For a lump sum based bid, the item total is the bid amount the Owner uses for bid comparison.

H. For a unit price based bid, the sum of the item totals is the bid amount the Owner uses for bid comparison.

I. The Bidder must indicate the base bid pipe material by circling the selected pipe material at the time of the submission of the Bid.

J. The Bidder must indicate the tunnel method by circling the selected tunneling method on the Bid Schedule at the time of the submission of the Bid.

K. The Owner's decision on the bid amount is final.

BID SCHEDULE

Item	Description	Qty	Unit	Unit Price	Item Price
1	Mobilization	1	LS	85,000.00	85,000.00
2	Bonds and Insurance	1	LS	148,000.00	148,000.00
3	General Requirements	1	LS	940,000.00	940,000.00
4	Demobilization	1	LS	8,000.00	8,000.00
5	Erosion and Sediment Control and Conformance with SWPPP	1	LS	35,000.00	35,000.00
6	Clearing and Grubbing	1	LS	30,000.00	30,000.00
7	Tree Protection	1,000	LF	2.00	2,000.00
8	PVC (SDR 35) Gravity Sewer Lateral (Not in Pavement)	50	LF	260.00	13,000.00
9	Sanitary Sewer Cleanout with frame and cover	5	EA	1,200.00	6,000.00
10	Tee Fittings for Sewer Connections (Inserta Tee)	5	EA	400.00	2,000.00
11	30-Inch Gravity Sewer Pipe, 0'-6.0' Depth (DIP, PVC, FRPM, PP)	70	LF	366.00	25,260.00
12	30-Inch Gravity Sewer Pipe, 6.1' to 10.0' depth (DIP, PVC, FRPM, PP)	1606	LF	410.00	658,460.00
13	30-Inch Gravity Sewer Pipe, 10.1' to 15.0' depth (DIP, PVC, FRPM, PP)	2214	LF	477.00	1,056,078.00
14	30-Inch Gravity Sewer Pipe, 15.1' to 20.0' depth (DIP, PVC, FRPM, PP)	1200	LF	508.00	609,600.00
15	30-Inch Gravity Sewer Pipe, > 20.0' depth (DIP, PVC, FRPM, PP)	817	LF	640.00	522,880.00
16	• Pipe (17) Tunnel Line Segment, Beneath Tates Creed Road near downstream Station 25+65, 390± LF of 48-	1	LS	1,277,000.00	1,277,000.00

Item	Description	Qty	Unit	Unit Price	Item Price
	inch minimum casing size with a 30-inch carrier pipe. See Tunneling Method Table in the Project Specific Notes for additional information. Tunneling Method (Circle One) • Tunnel Boring Machine (TBM) • Guided Bore and Jack (GB&J) • Micotunneling Boring Machine (MTBM)				
17	• Pipe (21) Tunnel Line Segment, Beneath Kirklevington Drive near downstream Station 34+57, 191± LF of 48-inch minimum casing size with a 30-inch carrier pipe. See Tunneling Method Table in the Project Specific Notes for additional information. Tunneling Method (Circle One) • Tunnel Boring Machine (TBM) • Guided Bore and Jack (GB&J) • Micotunneling Boring Machine (MTBM)	1	LS	648,000.00	648,000.00
18	• Pipe (23) Tunnel Line Segment, Beneath New Circle Road Off Ramp near downstream Station 39+20, 175± LF of 48-inch minimum casing size with a 30-inch carrier pipe. See Tunneling Method Table in the Project Specific Notes for additional	1	LS	499,000.00	499,000.00

Item	Description	Qty	Unit	Unit Price	Item Price
	information. Tunneling Method (Circle One) • Tunnel Boring Machine (TBM) • Guided Bore and Jack (GB&J) • Micotunneling Boring Machine (MTBM)				
19	• Pipe (24) Tunnel Line Segment, Beneath New Circle Road near downstream Station 41+22, 238± LF of 48-inch minimum casing size with a 30-inch carrier pipe. See Tunneling Method Table in the Project Specific Notes for additional information. Tunneling Method (Circle One) • Tunnel Boring Machine (TBM) • Guided Bore and Jack (GB&J) • Micotunneling Boring Machine (MTBM)	1	LS	599,000.00	599,000.00
20	• Pipe (26) Tunnel Line Segment, Beneath Tates Creek Road near downstream Station 44+10, 300± LF of 48-inch minimum casing size with a 30-inch carrier pipe. See Tunneling Method Table in the Project Specific Notes for additional information. Tunneling Method (Circle One) • Tunnel Boring Machine (TBM)	1	LS	782,000.00	782,000.00

Item	Description	Qty	Unit	Unit Price	Item Price
	• Guided Bore and Jack (GB&J) • Micotunneling Boring Machine (MTBM)				
21	Manhole Abandonment	8	EA	1,000.00	8,000.00
22	Standard Manhole, 5-foot diameter (depth 0.0 TO 6.0 ft)	29	EA	8,220.00	238,380.00
23	Manhole Barrel Extension, 5-foot diameter	300	VF	300.00	90,000.00
24	Drop Manhole, 5-foot diameter (depth 0.0-6.0 ft)	3	EA	11,500.00	34,500.00
25	Drop Manhole, 5-foot diameter VF	30	VF	500.00	15,000.00
26	Drop Manhole, 6-foot diameter, 0' to 6.0' depth	3	EA	13,000.00	39,000.00
27	Drop Manhole, 6-foot diameter VF	40	VF	550.00	22,000.00
28	Standard Manhole, 8-foot diameter, 0' to 6.0' depth	2	EA	16,000.00	32,000.00
29	Manhole Barrel Extension, 8-foot diameter	25	VF	800.00	20,000.00
30	Drop Manhole, 8-foot diameter, 0' to 6.0' depth	2	EA	20,000.00	40,000.00
31	Manhole Barrel Extension, 8-foot diameter	30	VF	950.00	28,500.00
32	Manhole Anti-flotation collar	29	EA	1,200.00	34,800.00
33	Creek Crossing and Bank/Bed Restoration	4	EA	10,500.00	42,000.00
34	Connect Existing 8-inch Gravity Sewer to New Manhole	4	EA	800.00	3,200.00
35	Connect Existing 10-inch Gravity Sewer to New Manhole	3	EA	1,000.00	3,000.00
36	Connect Existing 12-inch Gravity Sewer to New Manhole	2	EA	1,200.00	2,400.00
37	Connect Existing 15-inch Gravity Sewer to New Manhole	1	EA	1,500.00	1,500.00
38	Connect Existing 18-inch Gravity Sewer to New Manhole	2	EA	2,500.00	5,000.00

Item	Description	Qty	Unit	Unit Price	Item Price
39	Cut and Cap Existing 8-inch Sewer	2	EA	800.00	1,600.00
40	Cut and Cap Existing 18-inch Sewer	6	EA	2,400.00	14,400.00
41	Pipe Abandonment, Safeload, 18-inch pipe	800	LF	50.00	40,000.00
42	Plug Pipe and manhole	7	EA	700.00	4,900.00
43	Video inspection of new sewer pipe	7500	LF	4.00	30,000.00
44	Asphalt Paving: Trench Construction, Street / Parking Lot / Driveway	2,800	SY	100.00	280,000.00
45	Concrete Paving: Private Parking Lots / Driveways / Aprons	200	SY	180.00	36,000.00
46	Temporary Roadway Striping (as directed by Engineer)	1	LF	3.00	3.00
47	Site Restoration, Method A	300	LF	34.00	10,200.00
48	Site Restoration, Method B	4,500	LF	5.00	22,500.00
49	Site Restoration, Method C	300	LF	7.00	2,100.00
50	Temporary Seeding (As Directed by Engineer)	1	SY	10.00	10.00
51	Concrete Curb and Gutter Removal and Replacement	1300	LF	55.00	71,500.00
52	Dense Graded Aggregate-DGA-As Directed By the Engineer	1	TON	30.00	30.00
53	No. 2 Crushed Stone, Extra As Directed by the Engineer	1	TON	30.00	30.00
54	Flowable (controlled Density) fill as directed by engineer	11	CY	160.00	1,760.00
55	Remove Asphalt sidewalk and Construct New Concrete Sidewalk (Tates Creek Road)	800	SY	90.00	72,000.00
56	Remove and Replace Concrete Sidewalk	700	SY	90.00	63,000.00
57	Sidewalk Ramps, Including Detectable Warnings	12	EA	3,000.00	36,000.00

Item	Description	Qty	Unit	Unit Price	Item Price
58	Chain Link Fence as Directed by Engineer	1	LF	60.00	60.00
59	Bypass Pumping and Setups	1	LS	95,000.00	95,000.00
60	Maintenance of Traffic	1	LS	140,000.00	140,000.00
61	Easement and Property Requirements (MOU Conditions)	1	LS	56,000.00	56,000.00
62	Miscellaneous Roadway Markings	1	LS	32,000.00	32,000.00
63	Construct Internal Sweep from inlet pipe invert to bench	3	EA	1,500.00	4,500.00
64	Replace retaining Wall-3545 Winding Court	1	LS	3,000.00	3,000.00
65	Tennis Court Reconstruction Allowance	1	LS	$100,000	100,000.00
66	LexTran Bus Shelter Replacement	1	LS	30,000.00	30,000.00
67	Third Party Professional Pre-Constrution Photographic Documentation Allowance	1	LS	$7,000	7,000.00
68	Landscaping Allowance-3504 Tates Creek Rd.	1	LS	$3,000	3,000.00
69	Allowance: Miscellaneous Site Improvements	1	LS	$1,000,000	1,000,000.00
TOTAL BID (Items 1 thru 69)					10,762,511.00

TOTAL BASE BID AMOUNT:

Ten Million Seven Hundred Sixty Two Thousand Five Hundred Eleven Dollars and Zero Cents **Dollars ($** 10,762,511.00 **)**

Respectfully Submitted,

FIRM: Tribute Contracting, Inc.

ADDRESS: 2125 County Rd 1

CITY/STATE/ZIP: South Point, OH 45680

DATE: 11-13-2025

BY: Todd Harrah
(must be original signature)

TITLE: Todd Harrah, President

PHONE: 740-451-1010 FAX: 740-894-3168
(area code, number & extension)

EMAIL ADDRESS: tharrah@tributecc.com

OFFICIAL ADDRESS AND PHONE:

2125 County Rd 1
South Point, OH 45680

(Seal if Bid is by Corporation)

Tribute Contracting, Inc. CORPORATE SEAL 2024 OHIO

By signing this form, you agree to all the terms and associated forms.

1.05 STATEMENT OF BIDDER'S QUALIFICATIONS

The following statement of the Bidder's qualifications is required to be filled in, executed, and submitted with the Bid:

A. Name of Bidder: Tribute Contracting, Inc.

B. Permanent Place of Business: 2125 County Rd 1, South Point, OH 45680

C. When Organized: 11-19-2024

D. Where Incorporated: State of Ohio

E. Financial Condition:

If specifically requested by the Owner, the apparent low Bidder is required to submit its latest three (3) years audited financial statements to the Owner's Division of Central Purchasing within seven (7) calendar days following the Bid opening.

F. In the event the Agreement is awarded to the undersigned, Performance, Payment, Erosion and Sediment Control, and Warranty bonds will be furnished by:

Philadelphia Indemnity Insurance Company (Surety)

Signed: Kimberly Mileo (Representative of Surety)

G. The following is a list of similar projects performed by the Bidder: (Attach separate sheet if necessary).

NAME	LOCATION	CONTRACT SUM
See attached		

H. The Bidder has now under contract and bonded the following projects:

NAME	LOCATION	CONTRACT SUM
See attached		

I. List Key Bidder Personnel who will work on this Project.

NAME	POSITION DESCRIPTION	NO. OF YEARS WITH BIDDER
Todd Harrah	Project Manager	11
Larry Davis	Superintendent	8
William Kirby	Foreman	6
Aimee Harrah	EEO/AA Officer	10

J. MWDBE Participation on current bonded projects under contract:

SUBCONTRACTORS (LIST)	PROJECT (SPECIFIC TYPE)	MWDBE	% of WORK
Geco Enterprises	Wolf Run G-Sewer	yes	9%
TruTest, LLC	Wolf Run F-Sewer	yes (WBE)	1%
Vision Engineering	Wolf Run F-Sewer	yes (MBE)	1%
Highway Safety	Pea Ridge Sewer	yes (WBE)	1%

(USE ADDITIONAL SHEETS IF NECESSARY)

K. We acknowledge that, if we are the apparent low Bidder, we may be required to submit to the Owner within seven (7) calendar days following the Bid Opening, a sworn statement regarding all office management and field management personnel. Additionally, if requested by the Owner, we will within seven (7) days following the request submit audited financial statements and loss history for insurance claims for the three (3) most recent years (or a lesser period if stipulated by the Owner)

1.06 LIST OF PROPOSED SUBCONTRACTORS

The following list of proposed subcontractors is required by the Owner to be executed, completed and submitted with the Bid Form. All subcontractors are subject to approval of the Lexington-Fayette Urban County Government. Failure to submit this list completely filled out may be cause for rejection of Bid.

BRANCH OF WORK** (List each major item)	SUBCONTRACTOR	MWDBE (yes/no)	% of WORK
1. Tunneling	Name: Capitol Tunneling, Inc.	NO	30%
	Address: 2216 Refugee Rd Columbus, OH 43207		
2. Testing	Name: TruTest, LLC	yes	1%
	Address: 8202 Cadence Place Louisville, KY 40222		
3. Layout	Name: Vision Engineering	yes	1%
	Address: 128 E Reynolds Rd Lexington, KY 40517		
4. material supplies	Name: Geco Enterprises	yes	5%
	Address: 1221 E 4th St London, KY 40743		
5. Paving	Name: C&R Asphalt, LLC	no	1%
	Address: 415 Rebmann Ln. Lexington, KY 40504		
6.	Name:		
	Address:		

** Such as: Grading, asphalt paving, concrete, seeding and protection, construction staking, etc.

1.07 AUTHENTICATION OF BID AND STATEMENT OF NON-COLLUSION AND NON-CONFLICT OF INTEREST

I hereby swear (or affirm) under the penalty for false swearing:

A. That I am the Bidder (if the Bidder is an individual), a partner of the Bidder (if the Bidder is a partnership), or an officer or employee of the Bidding corporation having authority to sign on its behalf (if the Bidder is a corporation);

B. That the attached Bid has been arrived at by the Bidder independently, and has been submitted without collusion with, and without any agreement, understanding or planned common course of action, with any other contractor, vendor of materials, supplies, equipment or services described in the Advertisement for Bid, designed to limit independent bidding or competition;

C. That the contents of the Bid or Bids have not been communicated by the Bidder or its employees or agents to any person not an employee or agent of the Bidder or its surety on any bond furnished, with the Bid or Bids, and will not be communicated to any such person, prior to the official opening of the Bid or Bids;

D. That the Bidder is legally entitled to enter into the contracts with the Lexington-Fayette Urban County Government, and is not in violation of any prohibited conflict of interest;

E. (Applicable to corporation only) That as a foreign corporation, we are registered with the Secretary of State, Commonwealth of Kentucky, and authorized to do business in the State__✓_____ or, that as a domestic corporation, we are in good standing with the Secretary of State, Commonwealth of Kentucky_____. [Check the statement applicable.]

F. This offer is for ninety (90) calendar days from the date this Bid is opened. In submitting the above, it is expressly agreed that, upon proper acceptance by the Lexington-Fayette Urban County Government of any or all items Bid above, an Agreement shall thereby be created with respect to the items accepted.

G. That I have fully informed myself regarding the accuracy of the statements made in this statement.

H. That I certify that Subcontractors have not and will not be awarded to any firm(s) that have been debarred from noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964 As Amended, Executive Order 11246 As Amended or any other Federal Law.

Tribute Contracting, Inc. 11-13-25 _____

Company Date Representative

1.08 STATEMENT OF EXPERIENCE

NAME OF INDIVIDUAL: Todd Harrah

POSITION/TITLE: Project Manager

STATEMENT OF EXPERIENCE: Over 30yrs exp. in underground utility construction

NAME OF INDIVIDUAL: Larry Davis

POSITION/TITLE: Superintendent

STATEMENT OF EXPERIENCE: over 30yrs exp in underground utility construction

NAME OF INDIVIDUAL: William Kirby

POSITION/TITLE: Foreman

STATEMENT OF EXPERIENCE: over 15yrs exp. in underground utility construction

NAME OF INDIVIDUAL: Aimee Harrah

POSITION/TITLE: EEO/AA officer

STATEMENT OF EXPERIENCE: 10 years exp. in EEO, AA and human resources

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

_____

* Include all officers, office management, Affirmative Action officials, and field management personnel. Attach separate sheets if necessary.

1.09 TUNNELING CONTRACTOR QUALIFICATIONS

Tunneling Company Name:	Capitol Tunneling Inc.
Kentucky Contractor's License Number:	Not Applicable to scope of work

A. This Tunneling Contractor Qualifications is required to be completed for each Tunneling Contractor and included with the Bidder's Bid for the Project. To be considered for award of the Contract, Bidder shall provide all information that is requested in Attachment A. If all information is not provided, the Bid will be deemed non-responsive.

Time (in years) that organization has been doing business under present name	54 Years
Name of designated Project Manager	E. Kyle Lucus
Name of designated Field Superintendent	Mark Pennington / Jim Stilson
Number of Regular Employees of the Organization	45

B. In addition to completing the above form, the Contractor shall provide, as attachments, the following items:

1. Resume of designated Project Manager. See attached
2. Resume of designated Field Superintendent. See attached
3. Company's existing work commitments. See attached

1.10 TUNNELING CONTRACTOR QUALIFICATIONS – EXPERIENCE

A. This Tunneling Contractor's Qualifications – Experience Information (Attachment B) is required to be completed and included with the Bidder's Bid for the Project. To be considered for award of the Contract, Tunneling Contractor shall demonstrate it has experience performing similar work on other projects.

B. For **each** tunnel installation method that the Bidder is intending to use on the Project, the Tunneling Contractor shall complete the Project Experience Summary Table(s) outlining experience that the Tunneling Contractor has utilizing that specific tunnel installation method. The table shall be populated with Projects that the Tunneling Contractor completed within the past 10 years. The experience qualifications requirements shall meet the minimum requirements set forth in the specific tunnel specification section.

C. If the Bidder wishes to include more information that what is specified in the summary table, it may be included as an attachment to the end of Attachment B.

PROJECT EXPERIENCE SUMMARY TABLE

	Project 1	Project 2	Project 3
Project Name			
Tunnel Installation Method(s)			
Year(s) Project Occurred			
Owner			
Owner's Phone Number			
Original & Final Contract Price			
Original & Final Contract Times (days)			
Carrier Pipe Material and Diameter			
Casing or Tunnel Lining Type and Diameter			
Carrier Pipe Grouted in Place (Y/N)			
Total Tunnel Length (feet) 2,000 LF (min.)			
Range of Tunnel Depth (feet)			
Rock Excavation Required (Y / N)			
Temporary or Permanent Shaft w/invert below groundwater table (Y / N)			

See Attached Spreadsheet

Lexington Fayette
Urban County Government
CONTRACTOR REGISTRATION

Be It Known That
CAPITOL TUNNELING INC
is hereby granted
Registration # 15022
as a
Specialty Contractor
in Lexington-Fayette County
Expiration Date: 12/31/2025

HERE IS YOUR WALLET CARD. YOU MAY CUT OUT AND SIGN THE BACK TO CARRYWITH YOU.

LEXINGTON-FAYETTE URBAN COUNTY
REGISTERED CONTRACTOR

CAPITOL TUNNELING INC
is registered as a
Specialty Contractor

Registration #
15022

Expiration Date
12/31/2025

E. Kyle Lucus

2216 Refugee Road
Columbus, Ohio 43207
(614) 444-0255 Phone
(614) 444-4094 Fax

Current Job Title:

- President / CEO

Construction Operations Education / Training:

- BSCE – University of Kentucky, May 1996
- E.I.T. Certification – April 20, 1996
- OSHA 10 Hour Certification
- OSHA 30 Hour Certification
- OSHA Subpart P-Excavation & Trench Competent Person Training
- Confined Space Trained
- CPR / First Aid Trained
- Licensed Blaster
- RWT
- FDOT Safety Compliant
- CDL Holder

Employment History:

- 1986 – 1994 : Laborer
- 1995 – 1996 : Project Labor Foreman
- 1996 – 1998 : Project Manager/Estimator
- 1998 – 2000: Vice President of Engineering
- 2000 – 2005: Vice President / CEO
- 2005 – Present: President / CEO

Current Responsibilities:

- Direct supervision of Project Superintendents, Labor Foreman, and Management personnel
- Responsible for procuring and maintaining manpower and equipment to complete work
- Responsible for pre-bid site investigations, producing accurate cost estimates, completing bid packages and submitting of bids
- Responsible for contract compliance, submittals, project engineering and design, correspondence with Owner/Engineer/Client
- Responsible for monitoring and updating Project schedules
- Responsible for compliance with regulatory agencies such as OSHA, Workmans' Compensation, Unemployment, EPA
- Responsible for enforcement of Company Policies and Procedures including but not limited to: Safety, EEO, Union Compliance and Environmental issues.
- Responsible for the day to day operations required to manage multiple working crews in a 17 state area

Mark Pennington

2216 Refugee Road
Columbus, Ohio 43207
(614) 444-0255 Phone
(614) 444-4094 Fax

Current Job Title:

- Project Superintendent

Construction Operations Education / Training:

- OSHA 30 Hour Certification
- SKED Training
- Confined Space Trained
- CPR / First Aid Trained
- Trenching & Excavation Training
- Licensed Blaster
- Dangerous Ordinance License
- RWT Training

Employment History:

- 1984 – 1990: Tunnel Laborer
- 1990 – 1991: Project Labor Foreman / Blaster
- 1991 – Present: Project Superintendent

Current Responsibilities:

- Direct supervision of all employees working on the project.
- Responsible for procuring and maintaining manpower and equipment to complete work.
- Responsible for installation of tunnels & bores as required by Project Plans and Specifications.
- Responsible for maintaining project schedules.
- Accurate calculations of material quantities and scheduling of timely deliveries.
- Responsible for enforcement of company policies and procedures including but not limited to Safety, EEO, Union Compliance, and Environmental issues.
- Responsible for maintaining accurate job records including daily reports, time keeping, safety inspections, equipment records, and job site safety meetings.

James Stilson

2216 Refugee Road
Columbus, Ohio 43207
(614) 444-0255 Phone
(614) 444-4094 Fax

Current Job Title:

- Project Superintendent

Construction Operations Education / Training:

- OSHA 10 Hour Certification
- OSHA 30 Hour Certification
- Confined Space Trained
- CPR / First Aid Trained
- RWT Training
- Trenching & Excavation Training
- Certified TBM Operator
- Member of Operating Engineers Local 18

Employment History:

- 2001 - 2009: Tunnel / Boring Laborer / Pipe layer
- 2009 – 2018: Project Foreman
- 2018 – Present: Project Superintendent

Current Responsibilities:

- Direct supervision of all employees working on the Project
- Responsible for communicating and enforcement of Company Safety Program
- Responsible for procuring and maintaining manpower and equipment to complete work
- Responsible for Installation of tunnels and casings as required by project plans and specifications.
- Responsible for maintaining project schedules.
- Specialty installations of ABM, PTGBM, SBU-A, SBU-M, and TBM installations
- Assist with development and training of employees on specialty equipment such as ABM, PTGBM, SBU-A, SBU-M, and TBM operations.
- Accurate Calculations of Material quantities and scheduling of timely deliveries.
- Responsible for enforcement of Company Policies and Procedures including but not limited to Safety, EEO, Union Compliance, and Environmental issues.
- Responsible for maintaining accurate job records including daily reports, time keeping, safety inspections, equipment records, and job site safety meetings.

2025 Capitol Tunneling Work Commitment Summary as of
11/12/2025 at9:26 AM

Project Number	Customer	Project Name	Location of Project	Owner	% Complete
20-B-145	Confidential	I-70 Reconstruction ODOT 21-0221	Zanesville (Muskingum County) OH	ODOT 210221	85%
23-C-129	Confidential	East Frankfort Interceptor Ph III	Frankfort, KY	City of Frankfort	92%
24-B-111	Confidential	Plainfield EF Lift Station	120 Columbia Rd, Plainfield, IN 46168	Town of Plainfield	65%
24-B-113	Confidential	Northwest Water Transmission Improvements	Boone County/Florence, KY	Boone - Kenton Water	90%
24-B-115	Confidential	New Circle Rd Sanitary Sewer Trunks A & B	Lexington, KY	LFUCG	75%
24-B-116	Confidential	Hebron Water Line bore	Hebron, Ohio	National Church Residences	40%
24-B-117	Confidential	ODOT 250040	Lucas County	ODOT	0%
24-B-118	Confidential	ODOT FRA-IR70-22.85	Franklin County, OH	ODOT	0%
24-B-120	Confidential	Del-Webb Northstar	Delaware County, OH	Romanilli & Hughes	0%
24-G-123	Confidential	Sellersburg Ivy Tech 2-grout	Sellersburg, IN	City of Sellersburg	0%
24-B-124	Confidential	Rickenbacker Building H Lot 10 Drainage	Commercial Point	Rickenbacker AFB	52%
24-B-125	Confidential	Carmenton Sewer	Columbus, OH	City of Columbus	0%
25-B-108	Confidential	John Glenn Ave. Water Main	Columbus, OH	City of Columbus	0%
25-C-109	Confidential	Culvert Rehabilitation	Atlanta, GA	CSX	5%
25-B-110	Confidential	Genoa Township Water Transmission	Genoa Township/Delaware County	Delco Water	0%
25-B-112	Confidential	Kenwood Hills Local Sewer	Hamilton County, OH	Cincinnati MSD	0%
25-B-113	Confidential	MiraLuna Sewer	Galena, OH	Romanilli & Hughes	0%
25-C-114	Confidential	LWC CHWTP Residuals Conveyance	Louisville, KY	LWC	0%

Guided Bore and Jack Project Experience Summary Table

	Project 1	Project 2	Project 3	Project 4	Project 5	Project 6
Project Name	KYTC Newtown Pike Extension Phase 2; ATS Construction; Lexington, Kentucky	LFUCG West Hickman Sewer; Tribute Contracting; Lexington, Kentucky	Southeastern Hills Trunck Sewer Improvements - Tribute Contracting, Lexington KY	LFUCG West Hickman Trunk Sewer D; Free Contracting; Lexington, Kentucky	Wolf Run Trunk B and C; Tribute Contracting; Lexington, Kentucky	Georgetown-Scott County South Sewer Extension Contracts 1 & 2; Howell Contractors; Georgetown, Kentucky
Tunnel Installalation Method(s)	GBJ w/SBU-M	GBJ w/SBU-A	GBJ w/SBU-A	GBJ w/SBU-M & SBU-A	GBJ w/SBU-A	GBJ w/SBU-A
Year(s) Project Occurred	2016	2017	2021	2018/2019	2019/2020	2022
Owner	KYTC Project 15126, LFUCG - Owner Vernon Azevedo (859) 425-2438	Lexington-Fayette Urban County Gov Vernon Azevedo (859) 425-2438	Lexington-Fayette Urban County Gov Fletcher Gabbard (859) 621-9833	Lexington-Fayette Urban County Gov	Lexington-Fayette Urban County Gov	The City of Georgetown
Owner's Number	(502) 564-4890	(859) 258-3323	(859) 744-5434	(859) 258-3323	(859) 258-3323	(502) 863-9800
Original and Final Contract Price	$399,280.00	$283,050.00	$392,981.00	$1,064,851.70	$256,740	$1,199,914.00
Original and Final Contract Times (days)	1/5/16 - 3/29/16	3/23/17 - 6/15/17	10/01/2021 - 12/30/2021	7/17/18- 6/11/19	8/27/19- 4/21/20	2/28/22-Current
Carrier Pipe Material and Diameter	42" Ductile Iron Pipe	60" HOBAS	24" PVC	54"/48" HOBAS	36" HOBAS	24"/18"/15"/12" PVC
Casing or Tunnel Lining Type and Diameter	60" Steel Casing	72" Steel Casing	42" Steel Casing	72"/60" Steel casing	54" Steel Casing	42"/36" Steel Casing
Carrier grouted (Y/N)(Ft)	Yes - 280'	Yes - 170'	Yes	Yes - 570'	No	Yes - 946'
Project Total Casing Length (Ft)	280	170	180	730	230	946
Range of Tunnel Depth	16'-60'	18'-27'	16-26'	10' to 30'	10' to 20'	10'-45'
Rock Excavation Required (Y/N)	Yes	Yes	Yes	Yes	Yes	Yes
Tempory or Permanent Shaft w/ invert below groundwater table (Y/N)	*Pit and Dewatering done by Main Contractor	*Pit and Dewatering done by Main Contractor	*Pit and Dewatering done by Main Contractor	*Pit and Dewatering done by Main Contractor	*Pit and Dewatering done by Main Contractor	*Pit and Dewatering done by Main Contractor

1.11 EQUAL OPPORTUNITY AGREEMENT

The Law

* Title VII of the Civil Rights Act of 1964 (amended 1972) states that it is unlawful for an employer to discriminate in employment because of race, color, religion, sex, age (40-70 years) or national origin.

* Executive Order No. 11246 on Nondiscrimination under Federal contract prohibits employment discrimination by contractor and subcontractor doing business with the Federal Government or recipients of Federal funds. This order was later amended by Executive Order No. 11375 to prohibit discrimination on the basis of sex.

* Section 503 of the Rehabilitation Act of 1973 States:

  The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap.

* Section 2012 of the Vietnam Era Veterans Readjustment Act of 1973 requires Affirmative Action on behalf of disabled veterans and veterans of the Vietnam Era by contractors having Federal Contracts.

* Section 206 (A) of Executive Order 12086, Consolidation of Contract Compliance Functions for Equal Employment Opportunity, states:

  The Secretary of Labor may investigate the employment practices of any Government contractor or sub-contractor to determine whether or not the contractual provisions specified in Section 202 of this order have been violated.

The Lexington-Fayette Urban County Government practices Equal Opportunity in recruiting, hiring and promoting. It is the Government's intent to affirmatively provide employment opportunities for those individuals who have previously not been allowed to enter into the mainstream of society. Because of its importance to the local Government, this policy carries the full endorsement of the Mayor, Commissioners, Directors, and all supervisory personnel. In following this commitment to Equal Employment Opportunity and because the Government is the benefactor of the Federal funds, it is both against the Urban County Government policy and illegal for the Government to let contracts to companies which knowingly or unknowingly practice discrimination in their employment practices. Violation of the above mentioned ordinances may cause an Agreement to be canceled and the contractor may be declared ineligible for future consideration.

Please sign this statement in the appropriate space acknowledging that you have read and understand the provisions contained herein. Return this document as part of your application packet.

Bidders

I/We agree to comply with the Civil Rights Laws listed above that govern employment rights of minorities, women, Vietnam veterans, handicapped, and aged persons.

[signature] Tribute Contracting, Inc.

Signature Name of Business

The Entity (regardless of whether construction Contractor, non-construction Contractor or supplier) agrees to provide equal opportunity in employment for all qualified persons, to prohibit discrimination in employment because of race, color, creed, national origin, sex or age, and to promote equal employment through a positive, continuing program from itself and each of its sub-contracting agents. This program of equal employment opportunity shall apply to every aspect of its employment policies and practices.

The Kentucky Equal Employment Opportunity Act of 1978 (KRS 45.560-45.640) requires that any county, city, town, school district, water district, hospital district, or other political subdivision of the state shall include in directly or indirectly publicly funded contracts for supplies, materials, services, or equipment hereinafter entered into the following provisions:

During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age or national origin;

(2) The contractor will state in all solicitations or advertisements for employees placed by or on behalf of the contractors that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age or national origin;

(3) The contractor will post notices in conspicuous places, available to employees and applicants for employment, setting forth the provisions of the non-discrimination clauses required by this section; and

(4) The contractor will send a notice to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding advising the labor union or workers' representative of the contractor's commitments under the nondiscrimination clauses.

The Act further provides:

KRS 45.610. Hiring minorities - Information required

(1) For the length of the contract, each contractor shall hire minorities from other sources within the drawing area, should the union with which he has collective bargaining agreements be unwilling to supply sufficient minorities to satisfy the agreed upon goals and timetable.

(2) Each contractor shall, for the length of the contract, furnish such information as required by KRS 45.560 to KRS 45.640 and by such rules, regulations and orders issued pursuant thereto and will permit access to all books and records pertaining to his employment practices and work sites by the contracting agency and the department for purposes of investigation to ascertain compliance with KRS 45.560 to 45.640 and such rules, regulations and orders issued pursuant thereto.

KRS 45.620. Action against contractor - Hiring of minority contractor or subcontractor

(1) If any contractor is found by the department to have engaged in an unlawful practice under this chapter during the course of performing under a contract or subcontract covered under KRS 45.560 to 45.640, the department shall so certify to the contracting

agency and such certification shall be binding upon the contracting agency unless it is reversed in the course of judicial review.

(2) *If the contractor is found to have committed an unlawful practice under KRS 45.560 to 45.640, the contracting agency may cancel or terminate the contract, conditioned upon a program for future compliance approved by the contracting agency and the department. The contracting agency may declare such a contractor ineligible to bid on further contracts with that agency until such time as the contractor complies in full with the requirements of KRS 45.560 to 45.640.*

(3) *The equal employment provisions of KRS 45.560 to 45.640 may be met in part by a contractor by subcontracting to a minority contractor or subcontractor. For the provisions of KRS 45.560 to 45.640, a minority contractor or subcontractor shall mean a business that is owned and controlled by one or more persons disadvantaged by racial or ethnic circumstances.*

KRS 45.630 Termination of existing employee not required, when

Any provision of KRS 45.560 to 45.640 notwithstanding, no contractor shall be required to terminate an existing employee upon proof that that employee was employed prior to the date of the contract.

KRS 45.640 Minimum skills

Nothing in KRS 45.560 to 45.640 shall require a contractor to hire anyone who fails to demonstrate the minimum skills required to perform a particular job.

In the case of an Agreement exceeding $250,000, the Contractor will be required within seven (7) days following the Bid Opening to furnish evidence that its work-force in Kentucky is representative of the available work-force in the area from which it draws employees, or to supply an Affirmative Action plan which will achieve such representation during the life of the Contract.

1.12 LFUCG MWDBE PARTICIPATION FORM

LEXINGTON

LFUCG Bid/RFP/Quote Reference No. 100-2025

The MWDBE and/or Veteran subcontractors listed have agreed to participate on this Bid/RFP/Quote. If any substitution is made or the total value of the Work is changed prior to or after the job is in progress, it is understood that those substitutions must be submitted to the Division of Procurement for approval immediately. **Failure to submit a completed form may cause rejection of the bid.**

MWBE Company, Name, Address, Phone, Email	DBE / MBE WBE / VOSB SDVOSB	Work to be Performed	Total Dollar Value of the Work	% Value of Total Contract
1. Vision Engineering 128 E Reynolds Rd Lexington, KY Jihad Hallany 859-233-3150	MBE	Layout	14,500.00	1%
2. TruTest, LLC Kristi Conrad 8202 Cadence Place Louisville, KY 502-552-5142	WBE	Testing	28,000.00	1%
3 Geco Enterprises, Inc. Linda Baker PO Box 463 London, KY 40743 mlbaker0622@gmail.com	MBE	material supplies	est. 409,010.00 (unit prices)	4-5%
4.				

The undersigned company representative submits the above list of MDWBE firms to be used in accomplishing the work contained in this Bid/RFP/Quote. Any misrepresentation may result in the termination of the Contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Tribute Contracting, Inc.
Company

Company Representative

11-13-25
Date

Todd Harrah, President
Title

LEXINGTON

1.13 LFUCG MWDBE SUBSTITUTION FORM

LFUCG Bid/RFP/Quote Reference No. 100-2025

The substituted MWDBE and/or Veteran subcontractors listed below have agreed to participate on this Bid/RFP/Quote. These substitutions were made prior to or after the job was in progress. These substitutions were made for reasons stated below and are now being submitted to the Division of Procurement for approval. By the authorized signature of a representative of our company, we understand that this information will be entered into our file for this project. **Note: Form required if a subcontractor is being substituted on a contract.**

SUBSTITUTED DBE/MBE/WBE/VOSB Company Name, Address, Phone, Email	DBE/MBE/WBE/ VOSB/SDVOSB Formally Contracted/ Name, Address, Phone, Email	Work to Be Performed	Reason for the Substitution	Total Dollar Value of the Work	% Value of Total Contract
TBD- will complete & submit if low bidder and any substitutions are made					

The undersigned acknowledges that any misrepresentation may result in termination of the Contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Tribute Contracting, Inc.
Company

Company Representative

11-13-25
Date

Todd Harrah, President
Title

1.14 ATTACHMENT A – SMALL AND DISADVANTAGED, MINORITY-, WOMEN-, AND VETERAN-OWNED BUSINESS OUTREACH PLAN

Proposer Name: Tribute Contracting, Inc. **Date:** 11-13-25

Project Name: Merrick Trunk Sewer **Project Number:** 100-2025

Contact Name: Aimee Harrah **Telephone:** 740-451-1010

Email: aharrah88@yahoo.com

The mission of the Minority Business Enterprise Program is to facilitate the full participation of disadvantaged businesses, minority-, women-, veteran-, and service-disabled veteran-owned businesses in the procurement process and to promote economic inclusion as a business imperative essential to the long -term economic viability of Lexington-Fayette Urban County Government.

To that end, small and disadvantaged businesses, including minority-, woman-, veteran-, and service-disabled veteran-owned businesses, must have an equal opportunity to be utilized in the performance of contracts with public funds spent from certain discretionary agreements. By submitting its offer, Bidder/Proposer certifies that it has taken, and if there are further opportunities will take, reasonable steps to ensure that small and disadvantaged businesses, including minority-, woman-, veteran-, and service-disabled veteran-owned businesses, are provided an equal opportunity to compete for and participate in the performance of any subcontracts resulting from this procurement.

The information submitted in response to this clause will not be considered in any scored evaluation. Failure to submit this form may cause the bid or proposal to be rejected.

Is the Bidder/ Proposer a certified firm? Yes ☐ No ☑

If yes, indicate all certification type(s):

DBE ☐ MBE ☐ WBE ☐ SBE ☐ VOSB/SDVOSB ☐

and supply a copy of the certificate and/or certification letter if not currently listed on the city's Minority Business Enterprise Program's (MBEP) certified list.

1. Include a list of firms that Bidder/ Proposer has had a contractual relationship with within the last two years that are minority-owned, woman-owned, veteran-owned or small businesses, regardless of their certification status. Vision Engineering, Total View, GECO Enterprises, TruTest, LLC, Highway Safety

Click or tap here to enter text.

2. Does Bidder/Proposer foresee any subcontracting opportunities for this procurement?

Yes ☑ No ☐

If no, please explain why in the field below. Do not complete the rest of this form and submit this first page with your bid and/or proposal. Click or tap here to enter text.

If yes, please complete the following pages and submit all pages with your bid and/or proposal.

Describe the steps Bidder/Proposer took to solicit small and disadvantaged businesses, including MBEs, WBEs, VOSBs, and SDVOSBs, for subcontracting opportunities for this procurement.

3. Check the good faith and outreach efforts the Bidder/Proposer used to encourage the participation of small and disadvantaged businesses including, MBEs, WBEs, VOSBs and SDVOSBs:

☑ Bidder placed advertisements in search of prospective small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs for the solicitation.

☑ Bidder attended LFUCG Procurement Economic Inclusion Outreach event(s) within the past year.

☑ Bidder attended pre-bid and/or pre-proposal meetings for this solicitation.

☐ Bidder sponsored an Economic Inclusion Outreach event.

☑ Bidder requested a list of certified small, DBE, MBE, WBE, VOSB and/or SDVOSB subcontractors or suppliers from LFUCG.

☑ Bidder contacted organizations that work with small, DBE, MBE, WBE, VOSB and/or SDVOSB companies.

☑ Bidder sent written notices to certified small, DBE, MBE, WBE, VOSB and SDVOSB businesses.

☑ Bidder followed up to initial solicitations with interested small, DBE, MBE, WBE, VOSB and/or SDVOSB.

☑ Bidder provided small, DBE, MBE, WBE, VOSB and/or SDVOSB businesses interested in performing the solicited work with prompt access to the plans, specifications, scope of work, and requirements of the solicitation.

☑ Bidder made efforts to segment portions of the work to be performed by small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs, including dividing sub-bid/partnership opportunities into economically feasible units/parcels, to facilitate participation.

☑ Bidder negotiated in good faith with interested small, DBE, MBE, WBE, VOSB and/or SDVOSB businesses.

☑ Bidder provided adequate rationale for rejecting any small business', DBEs, MBEs, WBEs, VOSBs or SDVOSBs for lack of qualifications. n/a

☑ Bidder offered assistance in obtaining bonding, insurance, financial, equipment, or other resources to small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs, in an effort to assist them in meeting project requirements.

☑ Bidder made efforts to expand the search for small businesses, DBEs MBEs, WBEs, VOSBs and/or SDVOSBs beyond the usual geographic boundaries.

☑ Bidder made other reasonable efforts to include small businesses, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs participation.

4. Bidder/Proposer must include documentation, including the date each effort was made, the medium through which each effort was made, and the outcome of each effort with this form, regardless of the level of small, DBE, MBE, WBE, VOSB and/or SDVOSB participation. Examples of required documentation include copies of email communications, copies of newspaper advertisements, or copies of quotations received from interested small businesses, DBEs, MBEs, WBEs, VOSBs or SDVOSBs. Verbal/Phone communication w/ Jihad Hallany/Vision Engineering for Layout, we will be using them.

Click or tap here to enter text. Verbal and e-mail w/ Geco Enterprises and we will be using them - See attached quote

For detailed information regarding outreach efforts that satisfy the MBE Program's requirements, please see "Documentation Required for Good Faith Efforts and Outreach Plans" page.

<u>Note</u>: The Bidder/Proposer must be willing to report the identity of each subcontractor and the value of each subcontract to MBEP if awarded a contract from this procurement.

Failure to submit the documentation requested may be cause for rejection of the bid. Bidders may include any other documentation deemed relevant to this requirement, which is subject to review by the MBE Liaison. Documentation of Good Faith and Outreach Efforts must be submitted with the bid, regardless of the proposed level of SBEs, DBEs, MBEs, WBEs, VOSBs and/or SDVOSBs participation in the procurement. If the Good Faith and Outreach Effort Form and associated documentation is not submitted with the bid response, the bid may be rejected.

The undersigned acknowledges that all information is accurate. Any misrepresentations may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and claims.

Tribute Contracting, Inc.

Company

11-13-25

Date

Company Representative

Todd Harrah, President

Title

1.15 EQUAL EMPLOYMENT OPPORTUNITY AFFIRMATIVE ACTION POLICY

It is the policy of Tribute Contracting, Inc.
(Name of Bidder)

to assure that all applicants for employment and all employees are treated on a fair and equitable basis without regard to their race, religion, sex, color, handicap, natural origin or age.

Such action shall include employment, promotion, demotion, recruitment or recruitment advertising, layoff or termination, rates of pay and other forms of compensation, and selection for training, whether apprenticeship and/or on-the-job-training.

Furthermore, this company agrees to make special recruitment efforts to hire the protected class whenever feasible. This company also agrees to adhere to all applicable federal, state, and local laws relating to Equal Employment Opportunity for all individuals.

Todd Harrah, President

1.16 WORKFORCE ANALYSIS FORM

Name of Organization: Tribute Contracting, Inc.

Categories	Total	White (not Hispanic or Latino)		Hispanic or Latino		Black or African-American (not Hispanic or Latino)		Native Hawaiian and other Pacific Islander (not Hispanic or Latino)		Asian (not Hispanic or Latino)		American Indian or Alaskan Native (not Hispanic or Latino)		Two or more races (not Hispanic or Latino)		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Administrators	2	2	0														
Professionals																	
Superintendents	3	3	0														
Supervisors																	
Foremen	14	14	0														
Technicians																	
Protective Service																	
Para-Professionals																	
Office/Clerical	6	4	2														
Skilled Craft	70	67	2			1											
Service/Maintenance																	
Total	95	90	4			1											

Prepared By: Aimee Harrah — Date 11/13/25

Aimee Harrah, HR

Todd Harrah, President

1.17 EVIDENCE OF INSURABILITY

LEXINGTON-FAYETTE UBAN COUNTY GOVERNMENT CONTRUCTION PROJECT

(Use separate form for each Agency or Brokerage agreeing to provide coverage)

Names Insured: Tribute Contracting, Inc.
Address: 2125 County Rd 1, South Point, OH 45680
Project to be insured: Merrick Trunk Sewer Improvements

In lieu of obtaining certificates of insurance at this time, the undersigned agrees to provide the above Named Insured with the minimum coverage listed below. These are outlined in the Insurance and Risk Management of Section 00600 - Bonds and Certifications, including all requirements, and conditions:

Article Items	Coverage	Minimum Limits and Policy Requirements	Limits Provided to Insured	Name of Insurer	A.M. Best's	
					Code	Rating
1.05.D.1	CGL	$1,000,000/per occ., $2,000,000/aggregate or $2,000,000 combined single limit Requirements (a) through (e)	1,000,000/occ 2,000,000/agg	Motorists	13331	A
1.05.D.1	Auto	Combined single $1,000,000/per occ. aggregate Requirements (a) through (c)	1,000,000 CSL	Motorists	13331	A
1.05.D.1	WC	$ Statutory	Statutory	Brickstreet	15726	A
1.05.D.1	Employer's Liability	$500,000	1,000,000	Brickstreet	15726	A

Section 00600 includes required provisions, statements regarding insurance requirements, and the undersigned agrees to abide by all provisions for the coverage's checked above unless stated otherwise when submitting

Assured Partners
Agency or Brokerage

1002 Third Avenue
Street Address

Huntington, WV
City

304-693-2838
Telephone Number

Brenda Kash
Name of Authorized Representative

Agent
Title

Brenda Kash
Authorized Signature

11-13-25
Date

NOTE: Authorized signatures may be the agent's if agent has placed insurance through an agency agreement with the insurer If insurance is brokered, authorized signature must be that of authorized representative of insurer

IMPORTANT: CONTRACT MAY NOT BE AWARDED IF A COMPLETED AND SIGNED COPY OF THIS FORM FOR ALL COVERAGES LISTED ABOVE IS NOT PROVIDED

1.18 DEBARRED FIRMS

PROJECT NAME: MERRICK TRUNK Wastewater System Improvements

LFUCG BID NO.: **100-2025**

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
LEXINGTON, KY

All prime Contractors shall certify that Subcontractors have not and will not be awarded to any firms that has been debarred for noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964 As Amended, Executive Order 11246 As Amended or any other Federal Law.

All Bidders shall complete the Debarment Certification in duplicate and submit both copies to the Owner with the Bid Form. The Owner (grantee) shall transmit one copy to the Lexington-Fayette Urban County Government, Division of Community Development within fourteen (14) days after Bid opening.

The undersigned hereby certifies that the firm of Tribute Contracting, Inc. has not and will not award a subcontract, in connection with any Agreement award to it as the result of this bid, to any firm that has been debarred for noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964, Executive Order 11246 As Amended or any Federal Law.

Tribute Contracting, Inc.
Name of Firm Submitting Bid

Signature of Authorized Official

Todd Harrah, President
Title

11-13-2025
Date

1.19 DEBARMENT CERTIFICATION

A. All Contractors/Subcontractors shall complete this certification.

B. The Contractor/Subcontractor certifies in accordance with Executive Order 12549 (Debarment and Suspension 2/18/86) that to the best of its knowledge and belief, that it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared negligible, or voluntarily excluded from covered transactions or contract by any Federal department or agency for noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964 As Amended, Executive Order 11246 As Amended or any other Federal Law.

   a. Have not within a three year period preceding this Bid 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;

   b. Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(a) of this certification; and

   c. Have not within a three (3) year period preceding this Bid has one or more public (Federal, State or local) transactions or contracts terminated for cause or default.

2. Where the Contractor is unable to certify to any of the statements in this certification, such prospective contractors shall attach an explanation to this certification form.

Firm Name: Tribute Contracting, Inc.

Project: Merrick Trunk Sewer Improvements

Printed Name: Todd Harrah

Title of Authorized Representative: President

Signature: Todd Harrah

Date: 11-13-2025

1.20 CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

A. The undersigned certifies, to the best of his or her knowledge and belief, that:

1. 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 an 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.

2. 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 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.

3. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

B. 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 Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty for not less than $10,000 and not more than $100,000 for each such failure.

Todd Harrah, President

Typed Name & Title of Authorized Representative

Signature of Authorized Representative

11-13-25

Date

_____I am unable to certify to the above statements. My explanation is attached.

1.21 BID BOND

Bond Number: 001

KNOW ALL MEN BY THESE PRESENTS, that we Tribute Contracting, Inc.

as principal (the "Principal") and Philadelphia Indemnity Insurance Company

hereinto called Surety, are held and firmly bound unto

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 East Main Street, Third Floor
Lexington, Kentucky 40507

as obligee (the "Obligee"), in the penal sum of (5%) Five percent of amount bid dollars for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for
Merrick Trunk Sewer Improvements

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal within the period specified therein, or, if no period be specified, within ninety (90) days after opening, and the Principal shall enter into a contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or contract documents, or in the event of the failure of the Principal to enter into such contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference in money not to exceed the penal sum hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void; otherwise to remain in full force and effect. In no event shall the liability hereunder exceed the penal sum thereof.

PROVIDED AND SUBJECT TO THE CONDITION PRECEDENT, that any claim by Obligee under this bond must be submitted in writing by registered mail, to the attention of the Surety Law Department at the address above, within 120 days of the date of this bond. Any suit under this bond must be instituted before the expiration of one (1) year from the date of this bond. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall apply.

Continued on next page.

DATED as of this 13th day of November, 20 25

WITNESS / ATTEST:

Principal (Secretary)

Principal

By: Steven D. Whaley (seal)

Todd Harrah, President
Name and Title

Tribute Contracting, Inc CORPORATE SEAL 2024 Ohio

1927

Tammy S Selbe

Surety (Secretary) Tammy S Selbe
Witness to Surety

Philadelphia Indemnity Insurance Company

Surety

By: Kimberly L. Miles (seal)

Kimberly L. Miles, Attorney-in-fact
Name and Title

Countersigned by a Licensed KY Resident Agent

Julie S Duke

PHILADELPHIA INDEMNITY INSURANCE COMPANY
One Bala Plaza, Suite 100
Bala Cynwyd, PA 19004-0950

Power of Attorney

KNOW ALL PERSONS BY THESE PRESENTS: That **PHILADELPHIA INDEMNITY INSURANCE COMPANY** (the Company), a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, does hereby constitute and appoint **Douglas P. Taylor, Andrew K. Teeter, Kimberly L. Miles, Tammy S. Selbe and Jessica J. Bentley of USI Insurance Services, LLC.** its true and lawful Attorney-in-fact with full authority to execute on its behalf bonds, undertakings, recognizances and other contracts of indemnity and writings obligatory in the nature thereof, issued in the course of its business and to bind the Company thereby, in an amount not to exceed **$75,000,000.**

This Power of Attorney is granted and is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of PHILADELPHIA INDEMNITY INSURANCE COMPANY on the 14th of November 2016.

RESOLVED: That the Board of Directors hereby authorizes the President or any Vice President of the Company: (1) Appoint Attorney(s) in Fact and authorize the Attorney(s) in Fact to execute on behalf of the Company bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof and to attach the seal of the Company thereto; and (2) to remove, at any time, any such Attorney-in-Fact and revoke the authority given. And be it

FURTHER RESOLVED: That the signatures of such officers and the seal of the Company may be affixed to any such Power of Attorney or certificate relating thereto by facsimile, and any such Power of Attorney so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached.

IN TESTIMONY WHEREOF, PHILADELPHIA INDEMNITY INSURANCE COMPANY HAS CAUSED THIS INSTRUMENT TO BE SIGNED AND ITS CORPORATE SEALTO BE AFFIXED BY ITS AUTHORIZED OFFICE THIS 5TH DAY OF OCTOBER 2024.

(Seal)

John Glomb, President & CEO
Philadelphia Indemnity Insurance Company

On this 5th day of October, 2024 before me came the individual who executed the preceding instrument, to me personally known, and being by me duly sworn said that he is the therein described and authorized officer of the **PHILADELPHIA INDEMNITY INSURANCE COMPANY**; that the seal affixed to said instrument is the Corporate seal of said Company; that the said Corporate Seal and his signature were duly affixed.

Commonwealth of Pennsylvania - Notary Seal
Vanessa Mckenzie, Notary Public
Delaware County
My commission expires November 3, 2028
Commission number 1366394
Member, Pennsylvania Association of Notaries

Notary Public: Vanessa McKenzie

residing at: Bala Cynwyd, PA

My commission expires: November 3, 2028

I, Edward Sayago, Corporate Secretary of PHILADELPHIA INDEMNITY INSURANCE COMPANY, do hereby certify that the foregoing resolution of the Board of Directors and the Power of Attorney issued pursuant thereto on the 5th day October 2024 are true and correct and are still in full force and effect. I do further certify that John Glomb, who executed the Power of Attorney as President, was on the date of execution of the attached Power of Attorney the duly elected President of PHILADELPHIA INDEMNITY INSURANCE COMPANY.

In Testimony Whereof I have subscribed my name and affixed the facsimile seal of each Company this 13th day of November 2025.

Edward Sayago, Corporate Secretary
PHILADELPHIA INDEMNITY INSURANCE COMPANY

POWER OF ATTORNEY

(Attach to Bid Bond)

END OF SECTION

Re: Merrick Trunk Sewer Improvements

Geco Enterprises

From: Linda Baker (mlbaker0622@gmail.com)

To: aharrah88@yahoo.com

Date: Wednesday, November 5, 2025 at 02:10 PM EST

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> Thanks,
> Aimee Harrah
> Tribute Contracting
>
> **Aimee Harrah**
> **2125 County Road 1**
> **South Point, OH 45680**
> **(740) 451-1010**

Geco Quote

GECO Enterprise, Inc.
MBE Certified Contractor & Material Supplier
P O Box 463
London, KY 40743-0463
Phone(606)864-7550, Fax(606)864-6390
Mobile(606)682-2210
Email: gigibacon@windstream.net

Gigi Bacon, President

QUOTE 2025-097

LFUCG - MERRICK TRUNK SEWER IMPROVEMENTS — NOVEMBER 5, 2025

We are pleased to quote the following prices for the above referenced project as a Certified MBE Material Supplier/ Subcontractor/Minority Business.

QTY	UM	DESCRIPTION	PRICE EA	EXT PRICE
		5. Erosion Control		
		Temp Silt Fence & Inlet Protection		
90	RL	36X60 LS125 Staked Silt Fence Black	$ 30.39	$ 2,734.65
144	EA	14X26 SAND BG WHIT	$ 0.21	$ 29.66
		- Type C - Avg. 12 Bags per Inlet		
		Construction Entrance		
1	RL	15X300 FT N080 NTPEP N/WOV 500 SY	$ 602.55	$ 602.55
80	FT	24 X 20 N12 PROLIN Soil Tight Solid HDPE Pipe	$ 20.97	$ 1,677.66
		Concrete Washout		
1	RL	20X100 FT 10 MIL POLY SHT CLR $145.00	$ 149.35	$ 149.35
		- Concrete Washout material. Needs approval.		
20	EA	14X26 SAND BG WHIT $0.20	$ 0.21	$ 4.12
		As Needed Material		
1	EA	9X12 FLTR SOCK	$ 14.34	$ 14.34
		- This filter sock also comes in 300' rolls if preferred.		
1	EA	2X2X36 H/WOOD STKS	$ 1.05	$ 1.05
1	EA	14X26 SAND BG WHIT	$ 0.21	$ 0.21
1	EA	8X112.5 CURLEX II GR/GR DW73 100 SY	$ 87.55	$ 87.55
1	BX	6X1X6 STAPLE 11GA 1000/BX	$ 27.81	$ 27.81
		- 1 Box/15 Rolls		
1	EA	Dandy Bag - Drop Inlet (Asphalt)	$ 66.95	$ 66.95
		- Price is subject to change. Casting number required before ordering.		
1	RL	MIRAFI FW700 WOV 6X300 200 SY	$ 364.62	$ 364.62
1	RL	FABRIC MIRAFI FW700 12 X 300	$ 708.64	$ 708.64
		7. Tree Protection		
10	RL	4X100 FT 7 LB SAFETY FENCE ORAN	$ 15.45	$ 154.50
100	EA	5 FT LD STL T POST UNPTD	$ 2.83	$ 283.25
1	PK	7-1/2 BLACK PROSELECT CABLE TIE / ZIP TIE / ZIPTIE 100 PACK	$ 6.44	$ 6.44
		- (1) Bag of 100 ties per 100' of Reinforced Silt Fence		
		8. PVC (SDR35) GRAVIY SEWER LATERAL		
56	FT	6 X 14 SDR35 PVC Gasket Joint Sewer Pipe	$ 4.30	$ 240.53
1	EA	2 X 1000 Underground Detectable Sewer Green	$ 30.90	$ 30.90
5	EA	6 PVC Sewer Gasket X Gasket 45 BEND	$ 28.19	$ 140.96
		8. San. Sewer Cleanout		
5	EA	6 PVC Sewer Gasket 2 WAY Cleanout Tee	$ 319.80	$ 1,599.02
35	FT	6 X 14 SDR35 PVC Gasket Joint Sewer Pipe	$ 4.30	$ 150.33
5	EA	6 PVC SWR HUB FEM CO ADPT SDR35	$ 31.48	$ 157.38
5	EA	6 PVC SWR RH THRD CO PLUG SDR35	$ 20.36	$ 101.82
5	EA	15 CI CO LID AND SEWER CVR	$ 77.25	$ 386.25
5	EA	6 Cast Iron PVC X 6 Cast Iron PVC Coupling	$ 14.36	$ 71.79
		16. Pipe 17 Tunnel Line		
390	C	48 X .688 Steel CASING Pipe	$ 43,090.16	$ 168,051.64

		Rolled & Welded Steel Casing Pipe Bev/Sq			
56	EA	36 x 48 SS Casing Spacer - Specs do NOT call for any end wraps or Link Seals. The ends will be closed off with brick & grout. Contractor responsible for this.	$ 272.31	$	15,249.44
		17. Pipe 21 Tunnel Line			
191	C	48 X .688 Steel CASING Pipe	$ 43,090.16	$	82,302.21
		Rolled & Welded Steel Casing Pipe Bev/Sq			
28	EA	36 x 48 SS Casing Spacer	$ 272.31	$	7,624.72
		18. Pipe 23 Tunnel Line			
175	C	48 X .688 Steel CASING Pipe	$ 43,090.16	$	75,407.78
		Rolled & Welded Steel Casing Pipe Bev/Sq			
25	EA	36 x 48 SS Casing Spacer - Specs do NOT call for any end wraps or Link Seals. The ends will be closed off with brick & grout. Contractor responsible for this.	$ 272.31	$	6,807.79
		19. Pipe 24 Tunnel Line			
238	C	48 X .688 Steel CASING Pipe	$ 43,090.16	$	102,554.59
		Rolled & Welded Steel Casing Pipe Bev/Sq			
34	EA	36 x 48 SS Casing Spacer - Specs do NOT call for any end wraps or Link Seals. The ends will be closed off with brick & grout. Contractor responsible for this.	$ 272.31	$	9,258.59
		20. PIPE 26 TUNNEL LINE			
300	C	48 X .688 Steel CASING Pipe	$ 43,090.16	$	129,270.49
		Rolled & Welded Steel Casing Pipe Bev/Sq			
43	EA	36 x 48 SS Casing Spacer - Specs do NOT call for any end wraps or Link Seals. The ends will be closed off with brick & grout. Contractor responsible for this.	$ 272.31	$	11,709.39
		22 - 30. Manhole Castings ONLY			
39	EA	1140 MH F/C CITY OF LEX SAN SWR	$ 391.40	$	15,264.60
		24. Drop Manhole, 5ft Dia.			
		External Drops			
2	EA	8 PVC Sewer Gasket X Gasket X Gasket Tee	$ 106.96	$	213.91
2	EA	8 PVC Sewer Gasket X Gasket 90 BEND	$ 88.90	$	177.80
14	FT	8 X 14 SDR35 PVC Gasket Joint Sewer Pipe	$ 4.30	$	60.13
4	EA	8 Kor-N-Seal Manhole BOOT Adapter 7.00-8.50	$ 106.32	$	425.27
1	EA	10 PVC Sewer Gasket X Gasket X Gasket Tee	$ 390.93	$	390.93
1	EA	10 PVC Sewer Gasket X Gasket 90 BEND	$ 299.04	$	299.04
14	FT	10 X 14 SDR35 PVC Gasket Joint Sewer Pipe	$ 12.13	$	169.87
2	EA	10 Manhole BOOT Adapter 9.50-11.25	$ 132.50	$	265.00
		Internal Sweep Drops			
1	EA	12 F/GLS DROP BOWL Drop Bowl – 24" Bowl, 12" outlet for 4' - 6' manhole- requires 6 3/8" x 1" anchor bolts	$ 592.36	$	592.36
14	FT	12 X 14 SDR35 PVC Gasket Joint Sewer Pipe	$ 17.45	$	244.27
1	EA	12 PVC Sewer Gasket X Gasket 45 BEND	$ 297.29	$	297.29
1	EA	12 PVC Sewer GXS 45 BEND	$ 288.29	$	288.29
2	EA	12 SS 304 ADJ CLMP BRKT F/SDR35 304 SS Pipe Bracket for 12" Pipe. Fits SDR 35 and10" Truss Pipe approximate range 12.34" - 12.66"	$ 134.38	$	268.77
10	EA	Concrete ANCR ASSY Anchor Assemblies: Each contains 1 304SS bolt, 1304SS washer and 1 tamp-in lead expansion anchor.	$ 3.03	$	30.28
1	EA	30in F/GLS DROP BOWL for 18in Sewer on 5ft-6ft MHs Drop Bowl – 30" Bowl, 18" outlet for 5' - 6' manhole- requires 6 3/8" x 1" anchor bolts	$ 801.44	$	801.44
14	FT	18 X 14 F679 PS46 PVC Gasket Joint Sewer Pipe	$ 27.17	$	380.40
1	EA	18 PVC Heavy Wall Sewer Gasket X Gasket 45 Elbow	$ 1,333.93	$	1,333.93
1	EA	18 PVC Heavy Wall Sewer GXS 45 Elbow	$ 1,099.27	$	1,099.27
12	EA	18 SS 304 ADJ CLMP BRKT F/ SDR35 304 SS Pipe Bracket for 18" Pipe. Fits SDR35 approximate range 18.55" - 18.90"	$ 229.43	$	458.87
10	EA	Concrete ANCR ASSY Anchor Assemblies: Each contains 1 304SS bolt, 1304SS washer and 1 tamp-in lead expansion anchor.	$ 3.03	$	30.28

		26. Drop Manhole, 6ft Dia.				
		External Drops				
2	EA	8 PVC Sewer Gasket X Gasket X Gasket Tee	$	106.96	$	213.91
2	EA	8 PVC Sewer Gasket X Gasket 90 BEND	$	88.90	$	177.80
14	FT	8 X 14 SDR35 PVC Gasket Joint Sewer Pipe	$	4.30	$	60.13
4	EA	8 Kor-N-Seal Manhole BOOT Adapter 7.00-8.50	$	106.32	$	425.27
		Internal Sweep Drops				
1	EA	30in F/GLS DROP BOWL for 18in Sewer on 5ft-6ft MHs Drop Bowl – 30" Bowl, 18" outlet for 5' - 6' manhole- requires 6 3/8" x 1" anchor bolts	$	801.44	$	801.44
14	FT	18 X 14 F679 PS46 PVC Gasket Joint Sewer Pipe	$	27.17	$	380.40
1	EA	18 PVC Heavy Wall Sewer Gasket X Gasket 45 Elbow	$	1,333.93	$	1,333.93
1	EA	18 PVC Heavy Wall Sewer GXS 45 Elbow	$	1,099.27	$	1,099.27
2	EA	18 SS 304 ADJ CLMP BRKT F/ SDR35 304 SS Pipe Bracket for 18" Pipe. Fits SDR35 approximate range 18.55" - 18.90"	$	229.43	$	458.87
10	EA	Concrete ANCR ASSY Anchor Assemblies: Each contains 1 304SS bolt, 1304SS washer and 1 tamp-in lead expansion anchor.	$	3.03	$	30.28
		30. Drop Manhole, 8ft Dia. (Internal Sweep)				
2	EA	30in F/GLS DROP BOWL for 18in Sewer on 7ft-8ft MHs Drop Bowl – 30" Bowl, 18" outlet for 7' - 8' manhole- requires 6 3/8" x 1" anchor bolts	$	820.52	$	1,641.04
14	FT	18 X 14 F679 PS46 PVC Gasket Joint Sewer Pipe	$	27.17	$	380.40
2	EA	18 PVC Heavy Wall Sewer Gasket X Gasket 45 Elbow	$	1,333.93	$	2,667.86
2	EA	18 PVC Heavy Wall Sewer GXS 45 Elbow	$	1,099.27	$	2,198.54
4	EA	18 SS 304 ADJ CLMP BRKT F/ SDR35 304 SS Pipe Bracket for 18" Pipe. Fits SDR35 approximate range 18.55" - 18.90"	$	229.43	$	917.73
20	EA	Concrete ANCR ASSY Anchor Assemblies: Each contains 1 304SS bolt, 1304SS washer and 1 tamp-in lead expansion anchor.	$	3.03	$	60.56
		34. Connect Ex. 8in to New Manhole (As Needed Material)				
1	EA	8 Cast Iron PVC X 8 Cast Iron PVC Coupling RC Series	$	83.89	$	83.89
14	FT	8 X 14 SDR35 PVC Gasket Joint Sewer Pipe	$	4.30	$	60.13
1	EA	8 Kor-N-Seal Manhole BOOT Adapter 7.00-8.50	$	106.32	$	106.32
		35. Connect Ex. 10in to New Manhole (As Needed Material)				
1	EA	10 Cast Iron PVC X 10 Cast Iron PVC Coupling RC Series	$	102.59	$	102.59
14	FT	10 X 14 SDR35 PVC Gasket Joint Sewer Pipe	$	12.13	$	169.87
1	EA	10 Manhole BOOT Adapter 9.50-11.25	$	132.50	$	132.50
		36. Connect Ex. 12in to New Manhole (As Needed Material)				
1	EA	12 Cast Iron PVC X 12 Cast Iron PVC Coupling RC Series	$	125.57	$	125.57
14	FT	12 X 14 SDR35 PVC Gasket Joint Sewer Pipe	$	17.45	$	244.27
1	EA	12 KOR N SEAL M/H CNTR 11.25-13.00	$	132.50	$	132.50
		37. Connect Ex. 15in to New Manhole (As Needed Material)				
1	EA	15 Cast Iron PVC X 15 Cast Iron PVC Coupling RC Series	$	214.57	$	214.57
14	FT	15X14 SDR35 PVC Gasket Joint Sewer Pipe	$	25.78	$	360.93
1	EA	15 KOR-N-SEAL Manhole Connector 14.0-15.5	$	173.31	$	173.31
		38. Connect Ex. 18in to New Manhole (As Needed Material)				
1	EA	18 Cast Iron PVC X 18 Cast Iron PVC Coupling RC Series	$	446.97	$	446.97
14	FT	18 X 14 F679 PS46 PVC Gasket Joint Sewer Pipe	$	27.17	$	380.40
1	EA	18 PIPE S206-24 KOR-N-SEAL BOOT 18-00-19.50	$	255.24	$	255.24
		39. Cut & Cap Ex. 8in Sewer				
2	EA	8 PVC Sewer Gasket Cap	$	45.36	$	90.72
		40. Cut & Cap Ex. 18in Sewer				
6	EA	18 PVC Sewer Gasket Cap	$	501.11	$	3,006.63
		As Needed Item				
1	EA	30 KOR N SEAL M/H CNTR	$	397.99	$	397.99
1	EA	30 Cast Iron PVC X 30 Cast Iron PVC Coupling RC	$	836.88	$	836.88
1	EA	72 F/GLS Utility Marker Sewer Green	$	20.86	$	20.86
1	EA	24 X 4 HDPE Manhole Adjustable RING	$	78.01	$	78.01
1	EA	24 X 2 HDPE Manhole Adjustable RING	$	40.08	$	40.08

1	EA	24 X SLOPE HDPE Manhole Adjustable Ring - 28-30 lbs per case / 40 cartons per skid - 1 Roll of Butyl will be able to seal approx. 2 adjustment rings.	$	41.30	$	41.30	
1	EA	1/2 X 21 FT ROLL BUTYL Seal (Box - 12 rolls per box)	$	144.61	$	144.61	
		OPTION A - PVC COLLECTION LINES					
		10. Tee Fittings for Sewer Connection					
5	EA	6 X 30 SDR35 X SDR35 INSERTA Tee - If a full SDR35 30x6 Tee is preferred, please use $3,960.00 ea.	$	150.51	$	752.57	
1	EA	RED 612 HOLE SAW 164MM	$	277.88	$	277.88	
		11-13. 30in Gravity Sewer 15ft Bury & Less					
3836	FT	30 X 14 F679 PS46 PVC Gasket Joint Sewer Pipe	$	78.73	$	302,020.56	
4	EA	2 X 1000 Underground Detectable Sewer Green	$	30.90	$	123.60	
				78.73		91,484.26	
		14. 30in Gravity Sewer 15ft - 20ft Bury					
1162	FT	30 X 14 F679 PS115 HW PVC Gasket Joint Sewer Pipe	$	105.19	$	122,235.31	
2	EA	2 X 1000 Underground Detectable Sewer Green	$	30.90	$	61.80	
		15. 30in Gravity Sewer 20ft Bury & Greater					
800	FT	30 C905 DR25 CL165 PVC Gasket Joint Green PIP	$	106.05	$	84,839.04	
1	EA	2 X 1000 Underground Detectable Sewer Green	$	30.90	$	30.90	
		16. Pipe 17 Tunnel Line					
420	FT	30 X 14 F679 PS46 PVC Gasket Joint Sewer Pipe	$	78.73	$	33,067.94	
		17. Pipe 21 Tunnel Line					
224	FT	30 X 14 F679 PS46 PVC Gasket Joint Sewer Pipe	$	78.73	$	17,636.24	
		18. Pipe 23 Tunnel Line					
210	FT	30 X 14 F679 PS46 PVC Gasket Joint Sewer Pipe	$	78.73	$	16,533.97	
		19. Pipe 24 Tunnel Line					
266	FT	30 X 14 F679 PS46 PVC Gasket Joint Sewer Pipe	$	78.73	$	20,943.03	
		20. Pipe 26 Tunnel Line					
336	FT	30 X 14 F679 PS46 PVC Gasket Joint Sewer Pipe	$	78.73	$	26,454.36	
		OPTION A - PVC COLLECTION LINES TOTAL					**$ 624,977.20**
		OPTION B - HP COLLECTION LINES					
		10. Tee Fittings for Sewer Connection					
5	EA	6 SDR35 X 30 HP INSERTA TEE	$	150.51	$	752.57	
1	EA	6 INSERTA HP HOLE SAW	$	486.30	$	486.30	
		11-15. 30in Gravity Sewer HP Pipe					
7200	FT	30 X 20 HP N12 TRW Sanitary Solid PP Pipe	$	78.73	$	566,879.04	
8	EA	2 X 1000 Underground Detectable Sewer Green	$	30.90	$	247.20	
		OPTION B - HP COLLECTION LINES					**$ 568,365.11**
		TOTAL QUOTE			**$**	**1,854,956.83**	

$409,009.95

THANK YOU AND GOOD LUCK:

DO YOU KNOW THAT BY USING GECO ENTERPRISES AS YOUR MATERIAL SUPPLIER YOU CAN SATISFY YOUR MINORITY PARTICIPATION GOALS!

MBE CERTIFIED AN EQUAL OPPORTUNITY EMPLOYER

Re: Merrick Trunk Sewer Improvements

From: Linda Baker (mlbaker0622@gmail.com)

To: aharrah88@yahoo.com

Date: Wednesday, November 5, 2025 at 02:10 PM EST

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> **Aimee Harrah**
> **2125 County Road 1**
> **South Point, OH 45680**
> **(740) 451-1010**

Merrick Trunk Sewer Improvements

Geco Enterprises

From: Aimee Harrah (aharrah88@yahoo.com)

To: mlbaker0622@gmail.com

Date: Wednesday, November 5, 2025 at 02:07 PM EST

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Aimee Harrah
Tribute Contracting

Aimee Harrah
2125 County Road 1
South Point, OH 45680
(740) 451-1010

TRIBUTE CONTRACTING & CONSULTANTS, INC.

Current Contracts on Hand:

1) **City of Kenova/Prichard Waterline Upgrade** – 80% Complete
   a. Install approx. 75,000 of 12 in waterline
   b. Owner: City of Kenova: 304-453-1631
   c. Contract Amount: $7,426,187.00
   d. Engineer: EL Robinson, Eric Coberly, 304-776-7473
   e. Anticipated Completion: March 2026

2) **Mason PSD Sand Hill Road Sewer Contract 2** – 30% Complete
   a. Install approx. 35,000LF of gravity and force main sewer
   b. Owner: Mason County PSD, 304-675-6399
   c. Contract Amount: $3,741,543.00
   d. Engineer: Cerrone Associates, Chad Miller, 304-232-5550
   e. Anticipated Completion: June 2026

3) **Mason PSD Sand Hill Road Sewer Contract 3** – 25% Complete
   a. Install approx. 52,000LF of gravity and force main sewer
   b. Owner: Mason County PSD, 304-675-6399
   c. Contract Amount: $6,423,528.00
   d. Engineer: Cerrone Associates, Chad Miller, 304-232-5550
   e. Anticipated Completion: August 2026

4) **Mason PSD Sand Hill Road Sewer Contract 4** – 33% Complete
   a. Install approx. 24,000LF of gravity and force main sewer
   b. Owner: Mason County PSD, 304-675-6399
   c. Contract Amount: $3,551,923.00
   d. Engineer: Cerrone Associates, Chad Miller, 304-232-5550
   e. Anticipated Completion: June 2026

5) **Greenbrier Co PSD 2 Sam Black Church Water Extension Phase II** – 65% Complete
   a. Install approx.. 28,500LF of water line
   b. Owner: Greenbrier County PSD #2, 304-438-9283
   c. Contract Amount: 2,440,840.00
   d. Engineer: Thrasher Group, Ryan Boustany, 304-343-7601
   e. Anticipated Completion: January 2026

6) **LFUCG Wolf Run Trunk G** – 25% Complete
   a. Install approx. 5,400LF of 18" and 21" Gravity Sewer
   b. Owner: LFUCG, LFUCG, Contact: Bob Peterson, 859-425-2438
   c. Contract Amount: $3,602,388.00
   d. Engineer: Strand Associates, Contact: Liz Dienst, 859-225-8500
   e. Anticipated Completion: April 2026

7) **East Bank Wastewater System Improvements Contract 1** – 40% Complete
   a. Install approx. 9,500LF of Gravity Sewer
   b. Owner: Town of East Bank, 304-595-1605
   c. Contract Amount: $5,159,715.00
   d. Engineer: Ghosh Engineers, Kennon Chambers, 304-343-5300
   e. Anticipated Completion: July 2026

8) **East Bank Wasterwater System Improvements Contract 2** – 15% Complete
   a. Install approx. 9,500LF of Gravity Sewer
   b. Owner: Town of East Bank, 304-595-1605
   c. Contract Amount: $4,814,989.00
   d. Engineer: Ghosh Engineers, Kennon Chambers, 304-343-5300
   e. Anticipated Completion: September 2026

9) **North Beckley PSD Contract 1 Sprague Lift Station & Force Main** – 20% Complete
   a. Install approx. 5,300 LF of Force Main and Pump Station Improvements
   b. Owner: North Beckley PSD, 304-253-2191
   c. Contract Amount: $5,224,100.00
   d. Engineer: EL Robinson, Bob Hazlewood, 304-252-7473
   e. Anticipated Completion: October 2026

10) Mingo Co PSD Sewer Rehab Contract 1 Chattaroy Area – Under Contract
   a. Install approx..
   b. Owner: Mingo County PSD, 304-253-2244
   c. Contract Amount: $2,489,701.50
   d. Engineer: The Thrasher Group, Jesse Alden, 304-343-7601
   e. Anticipated Completion: September 2026

TRIBUTE CONTRACTING & CONSULTANTS, LLC.
2125 County Rd 1, South Point, OH 45680

List of Projects Completed:

1) **Ben Creek Water Project** – Installation of 60,000LF of 10", 6" and 2" Waterline, Booster Station, Meter Settings, 2 – PRV, Valves and Hydrants.
   a. Contract Amount: $3,281,274.42
   b. Dates of Construction: 04/2015 – 01/2016
   c. Owner: Mingo County PSD, Contact: JB Heflin, 304-235-2244
   d. Engineer: E.L Robinson, Contact: Mark McGettigan, 304-776-7473

2) **Hinton, WV Sewer Project** – Installation of 1300LF of 8" Gravity Sewer Line, 7 Manholes, Laterals and Concrete Street Restoration.
   a. Contract Amount: $148,743.00
   b. Dates of Construction: 05/2015
   c. Owner: Hinton Sanitation Board, Contact: Cris Meadows, 304-466-3255
   d. Engineer: Thrasher Group, Contact: Ted Hamb, 800-273-6541

3) **Wilderness Water Project** – Installation of 1 Booster Station, 11,000LF of 8" and 6" Waterline, Water Meter Setting, Valves and Hydrants.
   a. Contract Amount: $874,506.00
   b. Dates of Construction: 08/2015 – 06/2016
   c. Owner: Wilderness PSD, Contact: Scott Rader, 304-872-5225
   d. Engineer: Stafford Consultants, Contact: Ed Shutt, 304-425-9555

4) **Beckley Sewer Project, Contract 11-1** – Installation of 23,000LF of 4"-18" Sewer Line and 110 Manholes
   a. Contract Amount: $3,238,775.00
   b. Dates of Construction: 11/2015 – 08/2016
   c. Owner: Beckley WV Sanitation Board, Contact: Jeremiah Johnson, 304-253-3526
   d. Engineer: Burgess & Niple, Contact: Tim Utt, 304-485-8573

5) **St. Mary's Sewer Project** – Installation of 2400 LF of 8" and 12" Gravity Sewer Line, 1600 LF of 12"-18" Storm Sewer Line, 3300LF of 4" Gas Line, 20 Manholes and Drop Inlets
   a. Contract Amount: $981,400
   b. Dates of Construction: 01/2016 – 08/2016
   c. Owner: WV Dept. of Corrections, Contact: Phillip Farley, 304-558-2036 Ext 53463
   d. Engineer: S&S Engineering, Contact: Jessie O. Parker Jr., 304-342-7168

6) **Webb Tank Project** – Installation of a Retaining Wall Behind Existing Water Tank
   a. Contract Amount: $113,726.00
   b. Dates of Construction: 04/2016 – 06-2016
   c. Owner: Crum WV PSD, Contact: Jessie Allen, 304-393-3162
   d. Engineer: E.L. Robinson, Contact: Mark McGettigan, 304-776-7473

7) **Fairborn Raw Water Project** – Installation of 9600' 18" DIP Raw Waterline, 5-18" Butterfly Valves with Vaults, Chlorine Injection Vaults and Restoration.
   a. Contract Amount: $1,885,506.00
   b. Dates of Construction: 05/2016 – 01/2017
   c. Owner: Fairborn Ohio PSD, Contact: Karen Hawkins, 937-754-3097
   d. Engineer: AECOM Columbus, OH, Contact: Brian Benedict, 614-600-5812

8) **Ironton Storm/Sanitary Sewer Separation Project** – Installation of 12", 18" & 24" Storm Sewer Line, 8" Sanitary Sewer Line, Catch Basins, Manholes, Asphalt Repair, Concrete Sidewalks, Curbs, Curb Ramps & Concrete Alley Construction.
   a. Contract Amount: $774,088.00
   b. Dates of Construction: 07/2016 – 04/2017
   c. Owner: City of Ironton, Contact: Katrina Keith, 740-532-3833
   d. Engineer: E.L Robinson, Contact: Michael Williams, PE, 740-532-2411

9) **Ironton Brick Street Repair Project** – 4,700 SQFT of Brick Roadway Surface Rehab with Concrete Base
   a. Contract Amount: $79,800.00
   b. Dates of Construction: 05/2017 – 05/2017
   c. Owner: City of Ironton, Contact: Katrina Keith, 740-532-3833
   d. Engineer: E.L Robinson, Contact: Michael Williams, PE, 740-532-2411

10) **Malden Contract No. 2- Sewer Project** – Force Main Improvements, Install 11,000LF of 12-18" Force Main
   a. Contract Amount: $1,281,060.00
   b. Dates of Construction: October 2016-August 2017
   c. Owner: Malden PSD, Charleston, WV; Contact: Chet Adkins, 304-925-6997
   d. Engineer: Thrasher Group; Contact: Jesse Alden, 304-343-7601

11) **Malden Contract No. 4- Sewer Project** – Install Effluent Discharge Line, 3,300LF of 30" PVC Gravity Discharge Line
   a. Contract Amount: $773,965.00
   b. Dates of Construction: October 2016-July 2017
   c. Owner: Malden PSD, Charleston, WV; Contact: Chet Adkins, 304-925-6997
   d. Engineer: Thrasher Group; Contact: Jesse Alden, 304-343-7601

12) **UK Trunk A Sanitary Sewer Project** – Install 2200LF 42" Sanitary Sewer & 400LF 36" CIPP Lining, 26 Manholes and Concrete and Asphalt Road Restoration
    a. Contract Amount: $2,767,032.00
    b. Dates of Construction: 09/2016 – 09/2017
    c. Owner: LFUCG, Lexington, KY; Contact: Vernon Azevedo, 859-425-2438
    d. Engineer: MSE of Kentucky; Contact: Glen Ross, 859-223-5694

13) **Ironton Floodwall Pump Station #6 Outfall Relining** – Install 400 LF of 48" Slip lining and Installation of One Sluice Gate Vault
    a. Contract Amount: $671,036.00
    b. Dates of Construction: 07/2017 – 09/2017
    c. Owner: City of Ironton, Contact: Katrina Keith, 740-532-3833
    d. Engineer: E.L Robinson, Contact: Michael Williams, PE, 740-532-2411

14) **Arthur Plat Water Project** – Install 12,000LF of 8" DIP Waterline, 304 Water Services
    a. Owner: Montgomery County, Ohio Board of Commissioners, Contact: Ed Schlaack, 937-781-2632
    b. Dates of Construction: 08/2017 – 06/2018
    c. Contract Amount: $1,674.968.00
    d. Engineer: Northwest Consultants, Inc., Contact: Tom Lyons, 937-291-9092

15) **Hampton Manor Sanitary Sewer Improvements Project** – Install 3500LF of 24" Gravity Sewer Line and 38 Manholes
    a. Owner: WMU, Contact: Eddie Hightower, 859-744-5434
    b. Dates of Construction: 06/2017 – 05/2018
    c. Contract Amount: $1,250,700.00
    d. Engineer: Palmer Engineering Inc, Contact: Stephanie Blain 859-714-1218

16) **W16-4 NW Regional to E Regional System Interconnection** – Install 5,100LF of 20" DIP Water Main
    a. Owner: Greene County, Ohio, Contact: Randy Gilbert, 937-562-7499
    b. Dates of Construction: 12/2017 – 04/2018
    c. Contract Amount: $1,220,906.48
    d. Engineer: Greene County, Contact: Randy Gilbert, 937-562-7499

17) **West Hickman B&C- Sewer Project** – Install 7,300LF of 48-60" Gravity Sewer and Manholes
    a. Owner: LFUCG, Lexington, KY; Contact: Vernon Azevedo, 859-425-2438
    b. Dates of Construction: 04/2017 – 06/2018
    c. Contract Amount: $5,890,949.00
    d. Engineer: Vision Engineering, Contact: Jihad Hallany, 859-559-0516

18) **City of Ashland 29th St. Storm Water Separation Project** – Install 6,875 LF of 15"-48" Diameter Storm Line and Manholes
   a. Owner: City of Ashland, Contact: Ryan Eastwood PE, 606-327-2008
   b. Dates of Construction: 04/2017 – 09/2018
   c. Contract Amount: $2,941,565.00
   d. Engineer: HDR Engineering Inc, Contact: 859-223-3755

19) **Greenbrier PSD – Sewer Extension Phase A, Contract 2 Houfnagle Rd** – Install 9,000LF of 8" and 6" Gravity Sewer and Manholes
   a. Owner: Greenbrier PSD #1, Contact: Lisa Bennett, 304-645-6632
   b. Dates of Construction: 03/2018 – 10/2018
   c. Contract Amount: $1,449,174.00
   d. Engineer: Criss Haynes, PE, 304-667-9507

20) **Danese PSD AML Water Project Contract #1** – Install 62,000LF of 6" and 4" Water Line
   a. Owner: Danese, WV PSD, Contact: Cynthia Jones: 304-438-6686
   b. Dates of Construction: 01/2018 – 12/2018
   c. Contract Amount: $2,250,991.00
   d. Engineer: E.L Robinson, Contact: Ray Tilly, 304-252-7473

21) **Danese PSD AML Water Project Contract #3** – Install 20,000LF of 2-6" Water Line
   a. Owner: Danese, WV PSD, Contact: Cynthia Jones: 304-438-6686
   b. Dates of Construction: 02/2018 – 12/2018
   c. Contract Amount: $719,316.00
   d. Engineer: E.L Robinson, Contact: Ray Tilly, 304-252-7473

22) **Island Creek Sanitary Sewer Extension Project** – Install 6,500LF of 16" DIP Gravity Sewer Line, 8,400LC of 8" Gravity Sewer and 105 Manholes
   a. Owner: Logan, WV PSD, Contact: William Baisden, 304-946-2641
   b. Dates of Construction: 01/2018 – 12/2018
   c. Contract Amount: $4,675,776.00
   d. Engineer: E.L Robinson, Contact: Rick Roberts, 304-776-7473

23) **Maysville Sewer Line Extension Project** – Install 16,000LF of 8" Force Main, 9,200LF of 6&8" Gravity Sewer, 1 Lift Station
   a. Owner: City of Maysville, KY, Contact: David Cartmell, 606-564-9419
   b. Dates of Construction: 03/2018 – 10/2018
   c. Contract Amount: $1,494,192.00
   d. Engineer: Tetra Tech, Inc., Contact: Herbert LeMaster, 859-223-8000

24) **Williamsdale Sanitary Sewer Expansion Project** – Install 3,300LF of 8-15" SDR 35&26 Pipe and 21 Manholes
   a. Owner: Butler County Ohio, Contact: Wayne Beyerline, 513- 867-5744
   b. Dates of Construction: 06/2018 – 12/2018
   c. Contract Amount: $1,102,261.00
   d. Engineer: Same as Owner

25) **South Point Clarifier Rehabilitation Project** – Installation of 4 clarifiers for the Village of South Point Sewer Plant
    a. Owner: Village of South Point; Contact: Russ McDonald, 740-377-2304
    b. Dates of Construction: 01/2018 – 12/2018
    c. Contract Amount: $721,394.00
    d. Engineer: E.L Robinson, Contact: Michael Williams, PE, 740-532-2411

26) **Glenns Creek Interceptor** – Dig & Replace 8,300LF of 24-36" Sanitary Sewer
    a. Owner: City of Frankfort, KY, Contact: Elizabeth Coyle, 502-875-2448
    b. Dates of Construction: 07/2018 – 06/2019
    c. Contract Amount: $2,282,242.00
    d. Engineer: Hazen & Sawyer, Contact: Kurt Zehnder, 859-317-1424

27) **Summit Rd to Cable Rd Water Line Improvements** – Install 18,000LF of 12" & 8" PVC Waterline
    a. Owner: SWLCWSD, Contact: Lee Conkel, 740-927-0410
    b. Dates of Construction: 08/2018 – 06/2019
    c. Contract Amount: $1,517,771.00
    d. Engineer: Same as Owner

28) **Hebron Area Sanitary Sewer Improvements Project** – Install 7,000LF of 16" PVC Force Main, 12MH's and 2,500LF of 30" Dig and Replace Gravity Sewer
    a. Owner: Sanitation District #1, Contact: Mike Glowacki, 859-547-1646
    b. Dates of Construction: 05/2018 – 06/2019
    c. Contract Amount: $2,472,397.00
    d. Engineer: GRW Engineers, Contact: Spencer Stork, 859-223-3999

29) **Town Branch Commons Sanitary Sewer Project** – Installation of 4,800LF of 12-24" PVC Sanitary Sewer Line
    a. Owner: LFUCG Lexington, KY, Contact: Bob Peterson, 859-425-2255
    b. Dates of Construction: 07/2018 – 07/2019
    c. Contract Amount: $6,412,416.00
    d. Engineer: Strand Associates, Contact: Mike Davis, 859-225-8500

30) **Sam Black Church Waterline Extension Contract 1** – Installation of 7,500LF of 2-8" Water Line
    a. Owner: Greenbrier PSD #2, Contact: Kevin Williams, 304-667-1749
    b. Dates of Construction: 09/2018 – 09/2019
    c. Contract Amount: $3,500,331.00
    d. Engineer: Thrasher Group, Contact: Thomas Morgan, 304-624-4108

31) **Big Harts Phase 3 Waterline Extension Project** – Installation of 29,000 LF of 2-8" Water Line
    a. Owner: Logan, WV PSD, Contact: William Baisden, 304-946-2641
    b. Dates of Construction: 09/2019 – 08/2019
    c. Contract Amount: $1,705,644.00
    d. Engineer: E.L Robinson, Contact: Rick Roberts, 304-776-7473

32) **AQUA Ohio, Lawrence County Group 2 Water Improvements** – Installation of 2,400LF of 6 & 8" Water Line with 53 services
    a. Owner: AQUA Ohio, Contact: Richard Dunham, 440-725-2390
    b. Dates of Construction: 07/2019 – 09/2019
    c. Contract Amount: $438,000.00
    d. Engineer: Same as Owner

33) **Burlington Sewer Force Main Upgrade** – Installation of 4,500LF of 24" Ductile Iron Force Main
    a. Owner: Sanitation District #1, Contact: Mike Glowacki, 859-547-1646
    b. Dates of Construction: 04/2019 – 09/2019
    c. Contract Amount: $1,433,560.00
    d. Engineer: HDR Engineering Inc, Contact: 859-223-3755

34) **Union PSD Rocky Fork Sanitary Sewer Extension Contract 1** – Installation of 25,000LF of Gravity Sewer and 3 Pump Stations
    a. Owner: Union, WV PSD, Contact: Earl Burks, 304-776-3131
    b. Dates of Construction: 12/2018 – 01/2020
    c. Contract Amount: $4,105,000.00
    d. Engineer: Thrasher Group, Contact: Jesse Alden, 304-343-7601

35) **Union PSD 40th St Sanitary Sewer Extension Contract 2** – Installation of 3,500LF of 6" and 8" Gravity Sewer
    a. Owner: Union, WV PSD, Contact: Earl Burks, 304-776-3131
    b. Dates of Construction: 12/2018 – 01/2020
    c. Contract Amount: $691,150.00
    d. Engineer: Thrasher Group, Contact: Jesse Alden, 304-343-7601

36) **Union PSD Koontz Drive Lift Station Contract 3** – Installation of 1,400LF of 6" Force Main and Lift Station
    a. Owner: Union, WV PSD, Contact: Earl Burks, 304-776-3131
    b. Dates of Construction: 12/2018 – 01/2020
    c. Contract Amount: $446,720.00
    d. Engineer: Thrasher Group, Contact: Jesse Alden, 304-343-7601

37) **New Richmond Water Line** – Installation of 7,000LF of 8", 7,500LF of 6" & 4,400LF of 2" Water Line
   a. Owner: Ravenscliff-McGraws PSD; Contact: 304-682-0211
   b. Dates of Construction: 05/2019 – 01/2020
   c. Contract Amount: $1,599,088.00
   d. Engineer: Thrasher Group, Contact: Michael Stone, 304-431-7800

38) **Big Harts Phase 4 Waterline Extension Project** – Installation of 41,000LF of 2-8" Waterline
   a. Owner: Logan, WV PSD, Contact: William Baisden, 304-946-2641
   b. Dates of Construction: 04/2019 – 01/2020
   c. Contract Amount: $2,548,744.50
   d. Engineer: E.L Robinson, Contact: Rick Roberts, 304-776-7473

39) **Cox Road and Oliver Road 12" Water Main Replacement** – Installation of 7,500LF of 12" Ductile Iron Water Main
   a. Owner: Northern KY Water District, Contact: Steve Broering, 859-426-2728
   b. Dates of Construction: 03/2019 – 04/2020
   c. Contract Amount: $940,926.60
   d. Engineer: Same as Owner

40) **National Pike Little Farms Water Main Replacement Phase 1** – Installation of 18,000LF of 6 & 8" Water Main, 335 Services
   a. Owner: Franklin County Commissioners, Contact: Ryan Stowe, 614-374-5897
   b. Dates of Construction: 10/2019 – 07/2020
   c. Contract Amount: $5,056,620.32
   d. Engineer: CCI, Contact: Roger Jacobson, 614-485-0670

41) **Park Pointe Force Main Bypass Project** – Directional Drill Installation of 280LF of 14: HDPE & Two Tie-ins
   a. Owner: Huntington Sanitary Board, Contact: Wes Leek, 304-696-4437
   b. Dates of Construction: August 2020
   c. Contract Amount: $102,000.00
   d. Engineer: Potesta & Associates, Contact: Pat Taylor, 304-342-1400

42) **5th Ave Outfall Inline Check Valve Project** – Install Inline Check Valve Into 60" Concrete CSO Outfall Pipe
   a. Owner: Huntington Sanitary Board, Contact: Wes Leek, 304-696-4437
   b. Dates of Construction: August 2020
   c. Contract Amount: $71,200.00
   d. Engineer: Potesta & Associates, Contact: Pat Taylor, 304-342-1400

43) **Wolf Run Trunk B&C Sewer Project** – Installation of 4,700LF 42-36" Sanitary Sewer
   a. Owner: LFUCG, Contact: Bob Peterson, 859-425-2438
   b. Dates of Construction: 04/2019 – 10/2020
   c. Contract Amount: $6,253,480.00

d. Engineer: Kenvirons, Contact: Phil Meador, 502-695-4357

44) Shady Spring Pluto/Fire Trail Rd Sewer Extension Contract 1 – Installation of 25,000LF of 6-8" Gravity Sewer & Pump Stations

a. Owner: Shady Spring PSD, Contact: Jerry Smith, 304-255-1565
b. Dates of Construction: 04/2019 – 11/2020
c. Contract Amount: $4,418,670.77
d. Engineer: Cardno, Contact: Myron Amick, 304-809-0606

45) Shady Spring Pluto/Fire Trail Rd Sewer Extension Contract 2 – Installation 18,000LF of 2-4" Force Main, 64 Grinders and a Pump Station

a. Owner: Shady Spring PSD, Contact: Jerry Smith, 304-255-1565
b. Dates of Construction: 04/2019 – 11/2020
c. Contract Amount: $2,449,416.82
d. Engineer: Cardno, Contact: Myron Amick, 304-809-0606

46) Giatto-Weyanoke Waterline Extension Contract 3 – Installation of 16,000LF of 8" and 2,300LF of 2" Waterline

a. Owner: Lashmeet PSD, Contact: Robin McGraw, 304-682-0211
b. Dates of Construction: 03/2020 – 12/2020
c. Contract Amount: $1,560,431.80
d. Engineer: Thompson & Litton, Contact: Stacy Fowler, 304-425-9555

47) West Dunbar Sanitary Sewer Improvements Contract 1 – Installation of 15,000LF of 6-10" Gravity Sewer & 94 MH's

a. Owner: West Dunbar PSD, Contact: Dr. John Fuller, 304-766-0220
b. Dates of Construction: 01/2020 – 03/2021
c. Contract Amount: $5,545,159.69
d. Engineer: Gosh Engineers, Contact: Kennon Chambers, 304-343-5300

48) Ashland Simpson Road Water Line Replacement – Installation of 3,300LF of 16" DR Water Line Replacement

a. Owner: City of Ashland, Contact: Steve Cole, 606-385-3332
b. Dates of Construction: 08/2020 – 04/2021
c. Contract Amount: $665,498.00
d. Engineer: Same as Owner

49) Huntington 8th & 10th St Pump Stations – Installation of Two Stormwater Pump Stations & 800LF of 16" Force Main

a. Owner: Huntington Sanitary Board, Contact: Wes Leek, 304-696-4437
b. Dates of Construction: 06/2020—06/2021
c. Contract Amount: $1,099,410.00
d. Engineer: Potesta & Associates, Contact: Pat Taylor, 304-342-1400

50) **CSB Woodward Branch Sanitary Sewer Improvements Phase I** – Installation of 15,000 LF of 6-18" Gravity Sewer, 109 MHs, 156 House Service Cleanouts, Etc
   a. Owner: Charleston Sanitary Board, Contact: Tim Haapala, 304-348-1084
   b. Dates of Construction: 05/2020—07/2021
   c. Contract Amount: $5,144,375.00
   d. Engineer: Burgess & Niple, Contact: Craig Richards, 304-485-8541

51) **US 27/AA Highway Sanitary Sewer Improvements Riley Road** – Installation of 6,900LF of 15-21" Gravity Sewer, 11 MH's, 11 MH Modifications, 1 Bore and Jack
   a. Owner: SD1, Contact: Spencer Stork, 859-578-6894
   b. Dates of Construction: 01/2021—05/2021
   c. Contract Amount: $1,527,015.52
   d. Engineer: AECOM, Contact: Brian Shmude, 614-600-5990

52) **Elkhorn Creek Water Project Phase II Contract 1** – Installation of 70,000LF of 2-10" Water Line
   a. Owner: McDowell Co PSD, Contact: Mavis Brewster, 304-297-2622
   b. Dates of Construction: 01/2021 – 01/2022
   c. Contract Amount: $5,106,715.00
   d. Engineer: E.L Robinson, Contact: Ray Tilly, 304-252-7473

53) **Lexington Woods Booster Station Contract 1-2020** – Installation of a booster station and 300LF of 16" Water Line
   a. Owner: SWLCWSD, Contact: Chris Gilcher, 740-927-4100
   b. Dates of Construction: 04/2021 –11/2021
   c. Contract Amount: $979,394.00
   d. Engineer: Strand Associates, Contact: Patrick Karnes, 614-835-0460

54) **CSB Danner Hollow Sanitary Sewer Improvements** – Installation of 5,000LF of 6-12" Gravity Sewer and 52 MH's
   a. Owner: Charleston Sanitary Board, Contact: Tim Haapala, 304-348-1084
   b. Dates of Construction: April 2021 – October 2021
   c. Contract Amount: $2,279,384
   d. Engineer: Burgess & Niple, Contact: Craig Richards, 304-485-8541

55) **LEDC- Industrial Corridor Pump Station Force Main** – Installation of 31,000LF of 8" Force Main, 5,650LF of 12" Gravity Sewer, 26 MHs and 1 Lift Station
   a. Owner: LEDC: Jeremy Clay, 740-377-4550
   b. Dates of Construction: 04/2021 – 12/2021
   c. Contract Amount: $4,050,297.00
   d. Engineer: Strand Associates: Contact Nina Durek, 614-835-0460

56) James E Sauls Dr. Water Line Project – Installation of 8,500LF of 18" Water Line

a. Owner: Clermont County, Contact Matt Sanders, 513-732-8882
b. Dates of Construction: 09/2021 – 12/2021
c. Contract Amount: $1,261,166.00
d. Engineer: Clermont County, Contact Matt Sanders, 513-732-8882

57) Village of South Point- Waterline Improvements Project Phase 1 – Install 7,000LF of 2-8" PVC Waterline and approx. 80 House Services, 2 RR Bores

a. Owner: Village of South Point: Russ McDonald, 740-377-2304
b. Dates of Construction: 07/2021 / 12/2021
c. Contract Amount: $916,247.00
d. Engineer: IBI Group: Jack Christy 614-818-4900

58) Culloden Wastewater System Improvements Contract #1 – Install 7,500LF of 6-15" Gravity Sewer, 1 Pump Station

a. Owner: Culloden PSD, Contact: Nathan Johnson 304-416-0576
b. Dates of Construction: 02/2020 – 06/2022
c. Contract Amount: $1,483,136.00
d. Engineer: Chapman Technical, Contact: Matt Tanner, 304-727-5501

59) Center PSD Pineville Existing Collection System Replacement – Dig & Replace 5,280LF of 8-15" Gravity Sewer

a. Owner: Center PSD, Contact: Bryan Alred, 304-558-2981
b. Dates of Construction: 01/2021—05/2022
c. Contract Amount: $2,146,150.00
d. Engineer: Thompson & Litton, Contact: Stacy Fowler, 304-425-9555

60) LFUCG Wolf Run Trunk D&E Sewer Project – Install 7,500LF of 8-36" Gravity Sewer, Trunk Sewer Replacement, 52 MH's

a. Owner: LFUCG, Contact: Bob Peterson, 859-425-2438
b. Dates of Construction: 04/2021 – 07/2022
c. Contract Amount: $3,021,087.00
d. Engineer: GRW Inc., Contact: Mike Jacobs, 859-489-5319

61) LFUCG- Southeastern Hills Trunk Sewer Improvements – Install 2500LF 18-24" Gravity Sewer, 2035LF 18" Pipe Bursting, 1 Bore, 32MHs

a. Owner: LFUCG, Contact: Bob Peterson, 859-425-2438
b. Dates of Construction: 08/2021 – 09/2022
c. Contract Amount: $3,582,778.00
d. Engineer: Strand Associates, Contact: Mike Davis, 859-225-850

62) **CSB Woodward Branch Sanitary Sewer Improvements Phase II** – 15,000LF of 6-10" Gravity Sewer and 150 MH's
   a. Owner: Charleston Sanitary Board, Contact: Tim Haapala, 304-348-1084
   b. Dates of Construction: 11/2021 – 08/2022
   c. Contract Amount: $4,687,974.00
   d. Engineer: Burgess & Niple, Contact: Craig Richards, 304-485-8541

63) **Village of Middleport Water System Improvements** – Install approx. 15,000LF of 4-10" Water Line, Service Meters
   a. Owner: Village of Middleport, Joe Woodall, 740 992-6424
   b. Dates of Construction: 09/2021 – 06/2022
   c. Contract Amount: $3,479,434.00
   d. Engineer: Choice One Engineering, Brian Schmidt, 419.305.2551

64) **City of Pennsboro Water System Improvements Project** – Install approx. 23,000LF of 2-8" Water Line, 200 Service Settings, Water Storage Tank Rehabilitation
   a. Owner: City of Pennsboro, Robert Riggs, 304-659-2377
   b. Dates of Construction: 10/2021 – 08/2022
   c. Contract Amount: $3,019,633.00
   d. Engineer: Thrasher Group, Steve Haynes, 304-624-4108

65) **Village of South Point- Waterline Improvements Project Phase 2** – Install 12,500LF of 8" PVC Waterline and approx. 150 House Services
   a. Owner: Village of South Point: Russ McDonald, 740-377-2304
   b. Dates of Construction: 02/2022 – 09/2022
   c. Contract Amount: $1,442,523.50
   d. Engineer: IBI Group: Jack Christy 614-818-4900

66) **Lewisburg Contract 8A Raw Water Line** – Install approx. 12,000LF of 24" DI Water Line
   a. Owner: City of Lewisburg, Beverly White
   b. Dates of Construction: 09/2022 – 03/2023
   c. Contract Amount: $4,369,818.60
   d. Engineer: Chapman Technical Group, Michael Stone, 304-727-5501

67) **Yeager Airport/ Eagle Mountain Road Sewer Extension** – Install approx. 3,000 of 8" gravity sewer, 15 MHs
   a. Owner: WV Airport Authority, Kevin Price, 304-344-8033
   b. Dates of Construction: 01/2023- 03/2023
   c. Contract Amount: $580,000.00
   d. Engineer: TranSystems Engineering, Melissa Defibaugh, 304-481-6136

68) **Beckley City Avenue Sanitary & Storm Rehab** – Install approx. 2,600LF of 4-12" PVC & DI Sanitary and approx. 1,000LF of 6-12" PVC Storm Sewer
   a. Owner: Beckley Sanitary Board, John Peplowski, 304-256-1760
   b. Dates of Construction: 04/2022 – 06/2023
   c. Contract Amount: $788,491.00
   d. Engineer: Thrasher Group, Joe Boggs, 304-431-7800

69) **Mingo Beech Creek Waterline Extension** – Install approx. 73,000LF of 2-8" Water line & 1 Booster Pump Station
   a. Owner: Mingo PSD, JB Heflin, 304-235-2244
   b. Dates of Construction: 05/2022 – 06/2023
   c. Contract Amount: $3,930,712.40
   d. Engineer: EL Robinson, Mark McGettigan, 304-776-7473

70) **Newtonsville Collection System Part B** – Install approx. 16,000LF of 8" Sanitary Sewer, 4,000LF Service Line, 1 Pump Station
   a. Owner: Clermont County Commissioners, 513-732-7300
   b. Dates of Construction: 08/2022 – 08/2023
   c. Contract Amount: $6,009,146.00
   d. Engineer: Jacobs Engineering, 513-595-7500

71) **Town of Ceredo- 6th Street Sanitary Sewer Improvements** – Install approx. 750LF of 8" PVC SDR35 Gravity Sanitary Sewer
   a. Owner: Town of Ceredo, Paul Billups, 304-453-1041
   b. Dates of Construction: 05/2023 – 05/2023
   c. Contract Amount: $170,430.00
   d. Engineer: Potesta & Associates, Terry Moran, 304-342-1400

72) **Milton Sanitary Sewer Rehab & Lift Station Contract #2** – Install approx. 7500LF of 12 & 15" Gravity Sewer, 3 Bores, 1 Lift Station
   a. Owner: Milton Utility Commission, Tom Canterbury, 304-743-3422
   b. Dates of Construction: 06/2022 – 12/2023
   c. Contract Amount: $5,063,645.00
   d. Engineer: Thrasher Group, Eric Sherrard, 304-343-7601

73) **Parkersburg Large Diameter Water Main Replacement** – Install Approx 28,600LF of 12" Water Main, 4,400LF of 6-8", 1 Booster Station
   a. Owner: Parkersburg Utility Board, Eric Bennett, 304-424-8535
   b. Dates of Construction: 06/2022 – 11/2023
   c. Contract Amount: $8,400,184.00
   d. Engineer: Burgess & Niple, Contact: Tim Utt, 304-485-8573

74) **Richwood- Hinkle Mountain & Little Laurel Water Extension** – Install approx. 8,500LF of 6-8" Water Line
    a. Owner: City of Richwood, 304-846-2596
    b. Dates of Construction: 10/2022 – 01/2024
    c. Contract Amount: $5,157,136.00
    d. Engineer: Thompson & Litton, Matt Peters, 304-425-9555

75) **City of Wellston Infrastructure Improvements Storm & Sanitary** – Install approx. 7,200LF of 6-36" Gravity Sewer
    a. Owner: City of Wellston, Anthony Brenner, 740-384-2720
    b. Dates of Construction: 06/2023 – 12/2023
    c. Contract Amount: $4,113,437.79
    d. Engineer: DLZ Ohio, Gary Silcott, 740-380-2828

76) **Milton Sanitary Sewer Rehab Contract #3** – Install approx. 8,000LF of 4 & 6" Force Main, 3,500LF of 8" Gravity Sewer, 2 New Pump Station and Rehab 3 Pump Stations
    a. Owner: Milton Utility Commission, Tom Canterbury, 304-743-3422
    b. Dates of Construction: 09/2022 – 02/2024
    c. Contract Amount: $3,203,225.00
    d. Engineer: Thrasher Group, Eric Sherrard, 304-343-7601

77) **CSB Bradford Street Spot Repair** – Install 5 Gravity Sewer Spot Repairs and 1 Manhole
    a. Owner: Charleston Sanitary Board, Contact: Tim Haapala, 304-348-1084
    b. Dates of Construction: 04/2024 – 05/2024
    c. Contract Amount: $837,000.00
    d. Engineer: Burgess & Niple, Contact: Matt Newlon, 304-485-8541

78) **Lavalette PSD Water Improvements Project** – Install approx. 27,750LF of 8" Water Line
    a. Owner: Lavalette PSD, Richard Smith, 304-525-3771
    b. Dates of Construction: 09/2023 – 05/2024
    c. Contract Amount: $2,711,406.00
    d. Engineer: EL Robinson, Shawn Kelley, 304-776-7473

79) **Greenbrier PSD #1 Rolling Hills Sewer Extension Project Contract 1** – Install approx. 15,000LF of 6-8" Gravity Sewer
    a. Owner: Greenbrier PSD #1, Lisa Bennett, 304-645-6632
    b. Dates of Construction: 04/2023 – 06/2024
    c. Contract Amount: $4,151,931.00
    d. Engineer: Criss Haynes, PE, 304-667-9507

80) **CSB Rolling Hills Sanitary Sewer Improvements** – Install approx. 3,100LF 6-8" Gravity Sewer, CIPP of 1,500LF 6-12" Sanitary Sewer, 19 Manholes, Rehab of 11 Existing MH's
    a. Owner: Charleston Sanitary Board, Contact: Tim Haapala, 304-348-1084
    b. Dates of Construction: 11/2023 – 05/2024
    c. Contract Amount: $1,523,903.00
    d. Engineer: Burgess & Niple, Contact: Matt Newlon, 304-485-8541

Tribute Contracting, Inc.

Authority To Sign

Date: 12/02/2024

Tribute Contracting, Inc located at 2125 County Road 1, South Point, OH 45680 does hereby certify that Todd Harrah as President, Tom Enyart as Vice President, Steven Doug Whaley as Secretary and Charles Crimmel as Treasurer has the authority to execute and/or sign all documents on behalf of Tribute Contracting, Inc for any and all bids, bidding documents and associated contract documents.

By affixing his signature Todd Harrah as President, Tom Enyart as Vice President, Steven Doug Whaley as Secretary and Charles Crimmel as Treasurer has unequivocal authority to bind Tribute Contracting, Inc to any and all contractual obligations and arrangements.

Todd Harrah, President

Tom Enyart, Vice President

Steven Doug Whaley, Secretary

Charles Crimmel, Treasurer

PARP

1410264
Michael G. Adams
KY Secretary of State
Received and Filed
7/8/2025 2:35:28 PM
Fee receipt: $15.00

Commonwealth of Kentucky
Michael G. Adams, Secretary of St

Michael G. Adams
Secretary of State
P. O. Box 1150
Frankfort, KY 40602-1150
(502) 564-3490
http://www.sos.ky.gov

Annual Report
Online Filing
For the Year 2025

ARP

Company:	Tribute Contracting Inc.
Company ID:	1410264
State of origin:	Ohio
Formation date:	11/19/2024 12:00:00 AM
Date filed:	7/8/2025 2:32:18 PM
Fee:	$15.00

Principal Office

2125 County Road 1
South Point, OH 45680

Registered Agent Name/Address

Dinsmore Agent Co.
100 West Main St, STE 900
Lexington, KY 40507

Current Officers

President	Todd Harrah	2125 County Road 1, South Point, OH 45680
Vice President	Tommy Enyart	2125 County Road 1, South Point, OH 45680
Officer	Charles Crimmel	2125 County Road 1, South Point, OH 45680

County:	FAYETTE
Business size:	Medium
Business type:	Construction Special Trade Contractors

Signatures

Signature	Aimee Harrah
Title	Executive Administrator

Commonwealth of Kentucky
Michael G. Adams, Secretary of St

P601

1410264
Michael G. Adams
KY Secretary of State
Received and Filed
7/8/2025 2:32:18 PM
Fee receipt: $10.00

Michael G. Adams
Secretary of State
P. O. Box 718
Frankfort, KY 40602-0718
(502) 564-3490
http://www.sos.ky.gov

Statement of Change of Principal Office Address

POC

Pursuant to the provisions of KRS 14A.5-010, the undersigned hereby applies to change the principal office on behalf of

Tribute Contracting Inc.

and for that purpose submits the following statements:

1. Address of current principal office

75 W 3rd Avenue

Huntington, WV 25701

2. Principal office is hereby changed to:

2125 County Road 1
South Point, OH 45680

3. Authorized Signature of Entity

Aimee Harrah, Executive Administrator
Signature and Title

Aimee Harrah, Executive Administrator
Type or print name and title

7/8/2025
Date

SECTION 00510

NOTICE OF AWARD

CONTRACTOR: Tribute Contracting, Inc.
2125 County Road 1
South Point, OH 45680

OWNER: Lexington-Fayette Urban County Government
Division of Water Quality
Lexington, Kentucky

PROJECT: **MERRICK TRUNK SEWER IMPROVEMENTS**
Lexington-Fayette Urban County Government

LFUCG Bid No. **100-2025**

You are hereby notified that the Owner has considered the Bid submitted by you for the above-described project in response to its Advertisement for Bids dated November 6, 2025

It appears that it is to the best interest of said Owner to accept your Bid in the amount of Ten Million Seven Hundred Sixty Two Thousand Five Hundred Eleven dollars ($10,762,511.00), and you are hereby notified that your Bid has been accepted for

Merrick Trunk Sewer Improvements
LFUCG Bid No. **100-2025**

The Contractor is required by these Contract Documents to execute and deliver the formal Agreement (Contract) with the undersigned Owner and to furnish the required Contractor's Performance, Payment, Warranty, and Erosion and Sediment Control Bonds within fifteen (15) days from the date of the delivery of this Notice.

If you fail to execute said Agreement (Contract) and to furnish said Bonds within fifteen (15) days from the date of delivery of this Notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your Bid as abandoned and to award the Work covered by your Bid to another, or to re-advertise the Work or otherwise dispose thereof as the Owner may deem appropriate.

Dated this 5th day of December, 2025.

Lexington-Fayette Urban County Government
By: _____
Title: Remedial Measures Program Manager

NOTICE OF ACCEPTANCE

Receipt of the above Notice of Award is hereby acknowledged this 8th day of December, 2025

By: _____
Title: Todd Harrah, President

END OF SECTION

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SECTION 00520

AGREEMENT (CONTRACT)

THIS AGREEMENT, made on the 20th day of January, 20_____, by and between Lexington Fayette Urban County Government, acting herein called "OWNER" and **Tribute Contracting, Inc.** doing business as a **Corporation** located in the City of **South Point**, County of **Lawrence**, State of **Ohio**, hereinafter called "CONTRACTOR".

WITNESSETH: That the CONTRACTOR and the OWNER in consideration of **Ten Million Seven Hundred Sixty Two Thousand Five hundred Eleven dollars ($10,762,511.00)** quoted in the BID by the CONTRACTOR, dated **November 13, 2025**, hereby agree to commence and complete the construction described as follows:

1.01 SCOPE OF WORK

A. The CONTRACTOR shall furnish all the materials, supplies, machinery, equipment, tools, supervision, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the BID, the Contract Documents, and the Specifications prepared by the Engineer for the

Merrick Trunk Sewer Improvements
LFUCG Bid No. 100-2025

1.02 TIME OF COMPLETION

A. The time period estimated and authorized by the OWNER for Substantial Completion of Work by the AGREEMENT, in full, is hereby fixed as 540 **consecutive calendar days**. The time shall begin ten (10) calendar days after CONTRACTOR is issued the Notice to Proceed.

1.03 ISSUANCE OF NOTICE TO PROCEED

A. Notice to Proceed for Work will be issued in whole or in part of the Work as determined by the OWNER pending the availability of funds. The order of construction will be as determined by the Engineer after consultation with the CONTRACTOR and the OWNER.

1.04 AGREEMENT (CONTRACT) AMOUNT

A. The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the AGREEMENT as quoted in the BID, subject to any additions and deductions, as provided therein.

1.05 PROGRESS PAYMENTS

A. The OWNER shall make payments on account of the AGREEMENT in accordance with the General Conditions, as recommended by the Engineer and authorized by the OWNER, less the aggregate of previous payments.

1.06 ACCEPTANCE AND FINAL PAYMENT

A. Final payment shall be due within ninety (90) days after Final Completion of the Work, provided the Work is deemed "Final Completion" and fully accepted by the OWNER.

B. Before issuance of final certificate, the CONTRACTOR shall submit evidence satisfactory to the Engineer that all payrolls, material bills, and other indebtedness connected with the AGREEMENT (CONTRACT) has been paid.

C. If, after the Work has been substantially completed, full completion thereof is materially delayed through no fault of the CONTRACTOR, and the ENGINEER so certifies, the OWNER shall upon certificate of the ENGINEER, and without terminating the AGREEMENT (CONTRACT), make payment of the balance due for that portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

1.07 EXTRA WORK

A. The OWNER, without invalidating the AGREEMENT (CONTRACT) may order extra work or make changes by altering, adding to or deducting from the Work, the AGREEMENT (CONTRACT) amount being adjusted accordingly. All such work shall be executed and paid for in accordance with the General Conditions.

1.08 LIQUIDATED DAMAGES

A. If the CONTRACTOR shall fail or refuse to complete the Work within the AGREEMENT (CONTRACT) Time, or extension of time granted by the OWNER, then the CONTRACTOR agrees as a partial consideration for the awarding of this AGREEMENT (CONTRACT) that the OWNER may retain the compensation otherwise to be paid to the CONTRACTOR the amount of one thousand dollars **($ 1000)** per consecutive calendar day that the CONTRACTOR shall be in default after the Final Completion time stipulated in the Contract Documents. The said amount is fixed and agreed upon by and between the CONTRACTOR and the OWNER because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the OWNER would in such event sustain.

1.09 CONSENT DECREE REQUIREMENTS

A. The OWNER, the United States Environmental Protection Agency, and the Commonwealth of Kentucky have entered into a Consent Decree in a case styled *United States, et al. v. Lexington-Fayette Urban County Government,* United States District Court for the Eastern District of Kentucky, Case No. 5:06-CV-00386 ("CONSENT DECREE"), that requires OWNER to complete numerous projects related to its sanitary sewer system and stormwater management program within specific periods of time.

B. **Time is of the essence in the performance of this Agreement (CONTRACT).** CONTRACTOR is aware that the OWNER is subject to penalties for non-compliance

with the CONSENT DECREE deadlines. The CONTRACTOR shall be specifically liable and responsible for payment of any and all penalties, fines, or fees assessed against or incurred by the OWNER as a result of any delay in, or non-performance of, any of the CONTRACTOR's obligations or responsibilities under this AGREEMENT (CONTRACT), or for any other damages suffered by OWNER as a result of such delay or non-performance. This shall specifically include, but shall not be limited to, any penalty, fine, fee, or assessment against the OWNER by the U.S. Department of Justice, U.S. Environmental Protection Agency, and/or the Kentucky Energy and Environment Cabinet related to the CONSENT DECREE.

C. The provisions of the Contract Documents and the various rates of compensation for CONTRACTOR's services provided for elsewhere in this AGREEMENT (CONTRACT) have been agreed to in anticipation of the orderly and continuous progress of the AGREEMENT (CONTRACT) through completion.

D. If delays result by reason of acts of the OWNER or approving agencies, which are beyond the control of the CONTRACTOR, an extension of time for such delay will be considered. If delays occur, the CONTRACTOR shall immediately notify the OWNER and within five (5) business days from the date of the delay apply in writing to the OWNER for an extension of time for such reasonable period as may be mutually agreed upon between the parties, and if approved, the AGREEMENT (CONTRACT) schedule shall be revised to reflect the extension. Such extension of time to the completion date shall in no way be construed to operate as a waiver on the part of the OWNER of any of its rights in the AGREEMENT (CONTRACT). In the event the parties cannot agree upon an extension of time, the Dispute shall be addressed in the manner outlined hereinafter under this Article.

   In the event that the overall delay resulting from the above-described causes is sufficient to prevent complete performance of the AGREEMENT (CONTRACT) within six (6) months of the time specified herein, the fees to be paid to CONTRACTOR shall be subject to adjustment as agreed upon by the parties.

E. If delays result solely by reason of acts of the CONTRACTOR, the CONTRACTOR shall be held liable for any financial penalties incurred by the OWNER as a result of the delay, including but not limited to those assessed pursuant to the CONSENT DECREE. Disputes as outlined hereinafter in this Article shall apply in the event the parties cannot mutually agree upon the cause(s) associated with delays in completing project deliverables. The CONTRACTOR must immediately notify the OWNER in the event of such delay, and provide the OWNER a written action plan within five (5) business days on how it will attempt to resolve the delay.

F. DISPUTES

   1. Except as otherwise provided in this AGREEMENT (CONTRACT), any dispute hereunder may be resolved by agreement of the OWNER's Agent (Charles H. Martin, P.E., Director of Water Quality) and the CONTRACTOR. In the absence of such an agreement, the dispute shall be submitted to the OWNER's

Commissioner, Department of Public Works and Environmental Quality, whose decision shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, capricious, arbitrary, or so grossly erroneous as necessarily to imply bad faith. Pending a final decision of a dispute hereunder the CONTRACTOR shall proceed diligently with the performance of the AGREEMENT (CONTRACT) in accordance with the direction of the OWNER.

1.10 RIGHT TO REVIEW, AUDIT, AND INSPECT

A. The CONTRACTOR shall provide to the OWNER or its duly authorized representative(s), at any time during the course of the contract and up to five (5) years thereafter, access to any books, documents, papers, emails, and/or other records or communications which are directly pertinent to this specific contract for the purpose of making audit, examination, excerpts, and transcriptions.

1.11 CONTRACT DOCUMENTS

A. In general, the Advertisement for Bids, Information Available to Bidders, the Bid, the General Conditions, Performance, Payment, Erosion and Sediment Control and Warranty Bonds, AGREEMENT (CONTRACT), Supplementary Conditions, Supplemental General Conditions for SRF, Technical Specifications, any and all Addenda, and Plan Drawings form the AGREEMENT (CONTRACT) and they are fully a part of the AGREEMENT (CONTRACT) as if hereto attached or herein repeated.

A full listing of the Contract Documents consist of the following:

Specifications:	Per Table of Contents
Drawings (Plans):	Per Table of Contents

IN WITNESSETH WHEREOF, the parties hereto have executed this AGREEMENT (CONTRACT) as of the date and year above written.

(Seal)

Lexington-Fayette Urban County Government
Lexington, Kentucky
(Owner)

ATTEST:

MacKenzie Stack
Clerk of Urban County Council

By: Linda Gorton
(Signature of Mayor)

Linda Gorton, Mayor
(Name/Title)

(Seal)

Tribute Contracting, Inc.
(Contractor)

(Secretary)*

By:
(Contractor's Signature)

Aimee Hauah
(Witness)

Todd Harrah, President
(Name/Title)

2125 County Rd 1
(Address)

South Point, OH 45680

*IMPORTANT: Strike out any non-applicable terms:

Secretary of the OWNER should attest. If the CONTRACTOR is corporation, Secretary should attest. Give proper title of each person-executing AGREEMENT (CONTRACT).

END OF SECTION

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SECTION 00550

NOTICE TO PROCEED

CONTRACTOR: Tribute Contracting, Inc.
2125 County Road 1
South Point, OH 45680

OWNER: Lexington-Fayette Urban County Government
Lexington, Kentucky

PROJECT: Merrick Trunk Sewer Improvements
Lexington-Fayette Urban County Government
Lexington, Kentucky

LFUCG Bid No. 100-2025

Agreement (Contract) Amount: Ten Million Seven Hundred Sixty-Two Thousand Five Hundred Eleven dollars ($10,762,511.00)

This Notice to Proceed is issued on _____, 2026; therefore, Contractor is hereby notified to commence Work on the referenced Project on or before _____, 2026 **(commencement date shall be ten (10) days after issuance date)** and to substantially complete Work within 540 CONSECUTIVE CALENDAR DAYS thereafter. The Agreement (Contract) completion date is therefore _____, 2026.

The Agreement (Contract) provides for assessment of the sum of One Thousand dollars ($1,000) as liquidated damages for each consecutive calendar day after the above established Agreement (Contract) completion date that the Work remains incomplete.

Lexington-Fayette Urban County Government

By: _____

Title: RMP Manager

Date: _____

END OF SECTION

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SECTION 00600
BONDS AND CERTIFICATES

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Bond Number: PB02597100684

1.01 PERFORMANCE BOND

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that

Tribute Contracting, Inc.
(Name of CONTRACTOR)

2125 County Road 1
(Address of CONTRACTOR)

a Corporation, hereinafter
(Corporation, Partnership, or Individual)

called Principal, and Philadelphia Indemnity Insurance Company
(Name of Surety)

One Bala Plaza, Suite 100, Bala Cynwyd, PA 19004
(Address of Surety)

hereinto called Surety, are held and firmly bound unto

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 East Main Street, Third Floor
Lexington, Kentucky 40507

Obligee, hereinafter called "OWNER" in the penal sum of: Ten Million Seven Hundred Sixty-Two Thousand Five Hundred Eleven Dollars and no/100s dollars ($ 10,762,511.00), for the payment of whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into an Agreement (Contract) with OWNER for the Merrick Trunk Sewer Improvements, LFUCG Bid No. 100-2025 in accordance with Contract Documents prepared by Prime AE Group, Inc. and dated December 5th, 20 25, which Agreement (Contract) is by reference made a part hereof, and is hereinafter referred to as the Agreement (Contract).

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly and faithfully perform said Agreement (Contract), then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the OWNER.

Whenever, Principal shall be, and declared by OWNER to be in default under the Agreement (Contract), the OWNER having performed OWNER'S obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

A. Complete the Agreement (Contract) in accordance with its terms and conditions or

B. Obtain a Bid or Bids for completing the Agreement (Contract) in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or if the OWNER elects, upon determination by the OWNER and Surety jointly of the lowest responsible bidder, arrange for an Agreement (Contract) between such bidder and OWNER, and make available as Work progresses (even though there may be a default or a succession of defaults under the Agreement (Contract) or Agreements (Contracts) of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Agreement (Contract) Amount; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "Balance of the Agreement (Contract) Amount", as used in this paragraph shall mean the total amount payable by OWNER to Principal under the Agreement (Contract) and any amendments thereto, less the amount properly paid by OWNER to Principal.

Any suit under this bond must be instituted before the expiration of one (1) year from the date on which final payment under the Contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the OWNER named herein or the heirs, executors, administrators or successors of OWNER.

IN WITNESS WHEREOF, this instrument is executed in Six (6) (number) counterparts, each one of which shall be deemed an original, this the 15th day of December, 20 25.

ATTEST:

(Principal) Secretary
Steven D. Whaley, Secretary

Tribute Contracting, Inc.
Principal

By: Todd Harrah, President
2125 County Road 1
Address
South Point, OH 45680

Witness as to Principal
2125 County Road 1
Address
South Point, OH 45680

Philadelphia Indemnity Insurance Company
Surety

By: Attorney-in-Fact
300 Kanawha Blvd E, Suite 310
Address
Charleston WV 25301

ATTEST:

(Surety) Secretary
Jessica J. Bentley

(SEAL)

Witness to Surety
300 Kanawha Blvd E, Suite 310
Address
Charleston, WV 25301

Title: Attorney-in-fact
Surety
By: Kimberly L. Miles

Countersigned by a LIcensed KY Resident Agent
Julie S. Duke

Title: Tammy S. Selbe, Witness to Surety

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Agreement (Contract).

PHILADELPHIA INDEMNITY INSURANCE COMPANY
One Bala Plaza, Suite 100
Bala Cynwyd, PA 19004-0950

Power of Attorney

KNOW ALL PERSONS BY THESE PRESENTS: That **PHILADELPHIA INDEMNITY INSURANCE COMPANY** (the Company), a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, does hereby constitute and appoint **Douglas P. Taylor, Andrew K. Teeter, Kimberly L. Miles, Tammy S. Selbe and Jessica J. Bentley of USI Insurance Services, LLC.** its true and lawful Attorney-in-fact with full authority to execute on its behalf bonds, undertakings, recognizances and other contracts of indemnity and writings obligatory in the nature thereof, issued in the course of its business and to bind the Company thereby, in an amount not to exceed **$75,000,000.**

This Power of Attorney is granted and is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of PHILADELPHIA INDEMNITY INSURANCE COMPANY on the 14th of November 2016.

RESOLVED: That the Board of Directors hereby authorizes the President or any Vice President of the Company: (1) Appoint Attorney(s) in Fact and authorize the Attorney(s) in Fact to execute on behalf of the Company bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof and to attach the seal of the Company thereto; and (2) to remove, at any time, any such Attorney-in-Fact and revoke the authority given. And, be it

FURTHER RESOLVED: That the signatures of such officers and the seal of the Company may be affixed to any such Power of Attorney or certificate relating thereto by facsimile, and any such Power of Attorney so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached.

IN TESTIMONY WHEREOF, PHILADELPHIA INDEMNITY INSURANCE COMPANY HAS CAUSED THIS INSTRUMENT TO BE SIGNED AND ITS CORPORATE SEALTO BE AFFIXED BY ITS AUTHORIZED OFFICE THIS 5TH DAY OF OCTOBER 2024.

(Seal)

John Glomb, President & CEO
Philadelphia Indemnity Insurance Company

On this 5th day of October, 2024 before me came the individual who executed the preceding instrument, to me personally known, and being by me duly sworn said that he is the therein described and authorized officer of the **PHILADELPHIA INDEMNITY INSURANCE COMPANY**; that the seal affixed to said instrument is the Corporate seal of said Company; that the said Corporate Seal and his signature were duly affixed.

Commonwealth of Pennsylvania - Notary Seal
Vanessa Mckenzie, Notary Public
Delaware County
My commission expires November 3, 2028
Commission number 1366394
Member, Pennsylvania Association of Notaries

Notary Public: Vanessa McKenzie

residing at: Bala Cynwyd, PA

My commission expires: November 3, 2028

I, Edward Sayago, Corporate Secretary of PHILADELPHIA INDEMNITY INSURANCE COMPANY, do hereby certify that the foregoing resolution of the Board of Directors and the Power of Attorney issued pursuant thereto on the 5th day October 2024 are true and correct and are still in full force and effect. I do further certify that John Glomb, who executed the Power of Attorney as President, was on the date of execution of the attached Power of Attorney the duly elected President of PHILADELPHIA INDEMNITY INSURANCE COMPANY.

In Testimony Whereof I have subscribed my name and affixed the facsimile seal of each Company this 15th day of December, 2025.

Edward Sayago, Corporate Secretary
PHILADELPHIA INDEMNITY INSURANCE COMPANY

Bond Number: PB02597100684

1.02 PAYMENT BOND

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that

Tribute Contracting, Inc.
(Name of CONTRACTOR)

2125 County Road 1, South Point, OH 45680
(Address of CONTRACTOR)

a Corporation, hereinafter
(Corporation, Partnership, or Individual)

called Principal, and Philadelphia Indemnity Insurance Company
(Name of Surety)

One Bala Plaza, Suite 100, Bala Cynwyd, PA 19004
(Address of Surety)

hereinto called Surety, are held and firmly bound unto

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 East Main Street, Third Floor
Lexington, Kentucky 40507

Obligee, hereinafter called "OWNER" in the penal sum of: Ten Million Seven Hundred Sixty-Two Thousand Five Hundred Eleven Dollars and no/100s dollars ($10,762,511.00),

for the payment of whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into an Agreement (Contract) with OWNER for the Merrick Trunk Sewer Improvements, LFUCG Bid No. 100-2025 in accordance with Contract Documents prepared by Prime AE Group, Inc. and dated December 5th, 20 25, which Agreement (Contract) is by reference made a part hereof, and is hereinafter referred to as the Agreement (Contract).

NOW, THEREFORE THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly make payment to all claimants as hereinafter defined for all labor and material used or reasonably required for use in the performance of the Agreement (Contract), then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

A. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor material, or both, used or reasonably required for use in the performance of the Agreement (Contract), labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Agreement (Contract).

B. The above named Principal and Surety hereby jointly and severally agree with the OWNER that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant and have execution thereon. The OWNER shall not be liable for the payment of any costs or expenses of any such suit.

C. No suit or action shall be commenced hereunder by any claimant:

1. Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: The Principal, the OWNER, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the Work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the Work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, OWNER, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.

2. After the expiration of one (1) year following the date on which Principal ceased Work on said Agreement (Contract), it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

3. Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.

D. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against aid improvement, whether or not claim for the amount of such lien be presented under and against this bond.

IN WITNESS WHEREOF, this instrument is executed in Six (6) (number) counterparts, each one of which shall be deemed an original, this the 15th day of December, 2025.

ATTEST:

Tribue Contracting, Inc.
Principal

(Principal) Secretary
Steven D. Whaley, Secretary

By: Todd Harrah, President
2125 County Road 1
Address
South Point, OH 45680

Witness as to Principal
2125 County Road 1
Address
South Point, OH 45680

Philadelphia Indemnity Insurance Company
Surety

ATTEST:

By: Attorney-in-Fact
300 Kanawha Blvd E, Suite 310
Address
Charleston, WV 25301

(Surety) Secretary
Jessica J. Bentley

(SEAL)

Witness to Surety
300 Kanawha Blvd E, Suite 310
Address
Charleston, WV 25301

Title: Attorney-in-fact
Surety
By: Kimberly L. Miles

Title: Tammy S. Selbe, Witness to Surety

Countersigned by a Licensed KY Resident Agent
Julie S. Duke

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Agreement (Contract).

PHILADELPHIA INDEMNITY INSURANCE COMPANY
One Bala Plaza, Suite 100
Bala Cynwyd, PA 19004-0950

Power of Attorney

KNOW ALL PERSONS BY THESE PRESENTS: That **PHILADELPHIA INDEMNITY INSURANCE COMPANY** (the Company), a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, does hereby constitute and appoint **Douglas P. Taylor, Andrew K. Teeter, Kimberly L. Miles, Tammy S. Selbe and Jessica J. Bentley of USI Insurance Services, LLC.** its true and lawful Attorney-in-fact with full authority to execute on its behalf bonds, undertakings, recognizances and other contracts of indemnity and writings obligatory in the nature thereof, issued in the course of its business and to bind the Company thereby, in an amount not to exceed **$75,000,000.**

This Power of Attorney is granted and is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of PHILADELPHIA INDEMNITY INSURANCE COMPANY on the 14th of November 2016.

RESOLVED: That the Board of Directors hereby authorizes the President or any Vice President of the Company: (1) Appoint Attorney(s) in Fact and authorize the Attorney(s) in Fact to execute on behalf of the Company bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof and to attach the seal of the Company thereto; and (2) to remove, at any time, any such Attorney-in-Fact and revoke the authority given. And, be it

FURTHER RESOLVED: That the signatures of such officers and the seal of the Company may be affixed to any such Power of Attorney or certificate relating thereto by facsimile, and any such Power of Attorney so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached.

IN TESTIMONY WHEREOF, PHILADELPHIA INDEMNITY INSURANCE COMPANY HAS CAUSED THIS INSTRUMENT TO BE SIGNED AND ITS CORPORATE SEALTO BE AFFIXED BY ITS AUTHORIZED OFFICE THIS 5TH DAY OF OCTOBER 2024.

(Seal)

John Glomb, President & CEO
Philadelphia Indemnity Insurance Company

On this 5th day of October, 2024 before me came the individual who executed the preceding instrument, to me personally known, and being by me duly sworn said that he is the therein described and authorized officer of the **PHILADELPHIA INDEMNITY INSURANCE COMPANY**; that the seal affixed to said instrument is the Corporate seal of said Company; that the said Corporate Seal and his signature were duly affixed.

Notary Public: Vanessa McKenzie

Commonwealth of Pennsylvania - Notary Seal
Vanessa Mckenzie, Notary Public
Delaware County
My commission expires November 3, 2028
Commission number 1366394
Member, Pennsylvania Association of Notaries

residing at: Bala Cynwyd, PA

My commission expires: November 3, 2028

I, Edward Sayago, Corporate Secretary of PHILADELPHIA INDEMNITY INSURANCE COMPANY, do hereby certify that the foregoing resolution of the Board of Directors and the Power of Attorney issued pursuant thereto on the 5th day October 2024 are true and correct and are still in full force and effect. I do further certify that John Glomb, who executed the Power of Attorney as President, was on the date of execution of the attached Power of Attorney the duly elected President of PHILADELPHIA INDEMNITY INSURANCE COMPANY.

In Testimony Whereof I have subscribed my name and affixed the facsimile seal of each Company this 15th day of December, 2025.

Edward Sayago, Corporate Secretary
PHILADELPHIA INDEMNITY INSURANCE COMPANY

Bond Number: PB02597100684X

1.03 EROSION AND SEDIMENT CONTROL PERFORMANCE BOND

EROSION AND SEDIMENT CONTROL PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that

Tribute Contracting, Inc.
(Name of CONTRACTOR)

2125 County Road 1, South Point, OH 45680
(Address of CONTRACTOR)

a Corporation, hereinafter
(Corporation, Partnership, or Individual)

called Principal, and Philadelphia Indemnity Insurance Company
(Name of Surety)

One Bala Plaza, Suite 100, Bala Cynwyd, PA 19004
(Address of Surety)

hereinto called Surety, are held and firmly bound unto

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 East Main Street, Third Floor
Lexington, Kentucky 40507

Obligee, hereinafter called "OWNER" in the penal sum of: One Hundred Seven Thousand Six Hundred Twenty-Five Dollars and 11/100s dollars ($ 107,625.11), for the payment of whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into an Agreement (Contract) with OWNER for the **Merrick Trunk Sewer Improvements**, LFUCG Bid No. 100-2025 in accordance with Contract Documents prepared by Prime AE Group, Inc. and dated December 5th, , 20 25, which Agreement (Contract) is by reference made a part hereof, and is hereinafter referred to as the Agreement (Contract).

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly and faithfully perform said Agreement (Contract), then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the OWNER.

Whenever, Principal shall be, and declared by OWNER to be in default under the Agreement (Contract), the OWNER having performed OWNER's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

A. Complete the installation, maintenance, and removal of the soil erosion and sediment controls and final stabilization of the site in accordance with the Agreement (Contract),

the LFUCG Land Disturbance Permit, Chapter 16 Article X Division 5 of the LFUCG Code of Ordinances, and the KPDES General Permit for Stormwater Discharges Associated with Construction Activities (KYR 10).

B. Obtain a Bid or Bids for completing the installation, maintenance, and removal of the soil erosion and sediment controls and final stabilization of the site in accordance with the Agreement's (Contract's) terms and conditions, and upon determination by Surety of the lowest responsible bidder, or if the OWNER elects, upon determination by the OWNER and Surety jointly of the lowest responsible bidder, arrange for an Agreement (Contract) between such bidder and OWNER, and make available as Work progresses (even though there may be a default or a succession of defaults under the Agreement (Contract) or Agreements (Contracts) of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Agreement (Contract) Amount; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the Agreement (Contract) Amount", as used in this paragraph shall mean the total amount payable by OWNER to Principal under the Agreement (Contract) and any amendments hereto, less the amount properly paid by OWNER to Principal.

Any suit under this bond must be instituted before the expiration one (1) year from the date on which final payment under the Agreement (Contract) falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the OWNER named herein or the heirs, executors, administrators or successors of OWNER.

IN WITNESS WHEREOF, this instrument is executed in Six (6) (number) counterparts, each one of which shall be deemed an original, this the 15th day of December, 2025.

ATTEST:

Tribute Contracting, Inc.
Principal

(Principal) Secretary
Steven D. Whaley, Secretary

By: Todd Harrah, President
2125 County Road 1
Address
South Point, OH 45680

Witness as to Principal
2125 County Road 1
Address
South Point, OH 45680

Philadelphia Indemnity Insurance Company
Surety

ATTEST:

By: Attorney-in-Fact
300 Kanawha Blvd E, Suite 310
Address
Charleston, WV 25301

(Surety) Secretary
Jessica J. Bentley

(SEAL)

Witness to Surety
300 Kanawha Blvd E, Suite 310
Address
Charleston, WV 25301

Title: Attorney-in-fact
Surety
By: Kimberly L. Miles

Countersigned by a Licensed KY Resident Agent
Julie S. Duke

Title: Tammy S. Selbe, Witness to Surety

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Agreement (Contract).

PHILADELPHIA INDEMNITY INSURANCE COMPANY
One Bala Plaza, Suite 100
Bala Cynwyd, PA 19004-0950

Power of Attorney

KNOW ALL PERSONS BY THESE PRESENTS: That **PHILADELPHIA INDEMNITY INSURANCE COMPANY** (the Company), a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, does hereby constitute and appoint **Douglas P. Taylor, Andrew K. Teeter, Kimberly L. Miles, Tammy S. Selbe and Jessica J. Bentley of USI Insurance Services, LLC.** its true and lawful Attorney-in-fact with full authority to execute on its behalf bonds, undertakings, recognizances and other contracts of indemnity and writings obligatory in the nature thereof, issued in the course of its business and to bind the Company thereby, in an amount not to exceed **$75,000,000.**

This Power of Attorney is granted and is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of PHILADELPHIA INDEMNITY INSURANCE COMPANY on the 14th of November 2016.

RESOLVED: That the Board of Directors hereby authorizes the President or any Vice President of the Company: (1) Appoint Attorney(s) in Fact and authorize the Attorney(s) in Fact to execute on behalf of the Company bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof and to attach the seal of the Company thereto; and (2) to remove, at any time, any such Attorney-in-Fact and revoke the authority given. And, be it

FURTHER RESOLVED: That the signatures of such officers and the seal of the Company may be affixed to any such Power of Attorney or certificate relating thereto by facsimile, and any such Power of Attorney so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached.

IN TESTIMONY WHEREOF, PHILADELPHIA INDEMNITY INSURANCE COMPANY HAS CAUSED THIS INSTRUMENT TO BE SIGNED AND ITS CORPORATE SEALTO BE AFFIXED BY ITS AUTHORIZED OFFICE THIS 5TH DAY OF OCTOBER 2024.

(Seal)

John Glomb, President & CEO
Philadelphia Indemnity Insurance Company

On this 5th day of October, 2024 before me came the individual who executed the preceding instrument, to me personally known, and being by me duly sworn said that he is the therein described and authorized officer of the **PHILADELPHIA INDEMNITY INSURANCE COMPANY**; that the seal affixed to said instrument is the Corporate seal of said Company; that the said Corporate Seal and his signature were duly affixed.

Commonwealth of Pennsylvania - Notary Seal
Vanessa Mckenzie, Notary Public
Delaware County
My commission expires November 3, 2028
Commission number 1366394
Member, Pennsylvania Association of Notaries

Notary Public: Vanessa McKenzie

residing at: Bala Cynwyd, PA

My commission expires: November 3, 2028

I, Edward Sayago, Corporate Secretary of PHILADELPHIA INDEMNITY INSURANCE COMPANY, do hereby certify that the foregoing resolution of the Board of Directors and the Power of Attorney issued pursuant thereto on the 5th day October 2024 are true and correct and are still in full force and effect. I do further certify that John Glomb, who executed the Power of Attorney as President, was on the date of execution of the attached Power of Attorney the duly elected President of PHILADELPHIA INDEMNITY INSURANCE COMPANY.

In Testimony Whereof I have subscribed my name and affixed the facsimile seal of each Company this 15th day of December, 2025.

Edward Sayago, Corporate Secretary
PHILADELPHIA INDEMNITY INSURANCE COMPANY

1.04 WARRANTY BOND

WARRANTY BOND

KNOW ALL MEN BY THESE PRESENTS, that

_____
(Name of CONTRACTOR)

_____
(Address of CONTRACTOR)

a _____, hereinafter
(Corporation, Partnership, or Individual)

called Principal, and _____
(Name of Surety)

_____
(Address of Surety)

hereinto called Surety, are held and firmly bound unto

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 East Main Street, Third Floor
Lexington, Kentucky 40507

Obligee, hereinafter called "OWNER" in the penal sum of:_____

_____dollars ($_____),

for the payment of whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents. The warranty bond shall be in the amount of five percent (5%) of the final construction cost amount (based on contractor's final pay request).

WHEREAS, Principal by written agreement is entering into an Agreement (Contract) with OWNER for the **Merrick Trunk Sewer Improvements**, LFUCG Bid No. 100-2025 in accordance with Contract Documents prepared by _____ and dated _____, 20___, which Agreement (Contract) is by reference made a part hereof, and is hereinafter referred to as the Agreement (Contract).

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION IS SUCH that, if the Principal shall well and faithfully do and perform the required maintenance and shall indemnify and save harmless the OWNER against all claims, loss or damage, and expenses of reconstruction or additional work required to restore the Project to its acceptable condition within a period of one (1) year from the date of acceptance by OWNER of the Project, then this obligation shall be void; otherwise, it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the OWNER.

Any suit under this bond must be instituted before the expiration of one (1) year from the date on which final payment under the Contract falls due.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the OWNER named herein or the heirs, executors, administrators, successors, or assigns of the OWNER.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of
(number)

which shall be deemed an original, this the _____ day of _____, 20_____.

ATTEST:

_____
Principal

_____
(Principal) Secretary

By: _____

_____
Address

_____

_____
Witness as to Principal

_____
Address

_____ _____
Surety

ATTEST: By: _____
Attorney-in-Fact

_____ _____
(Surety) Secretary Address

_____

(SEAL)

_____ Title:_____
Witness to Surety Surety

_____ By: _____
Address

_____

Title: _____

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Agreement (Contract).

POWER OF ATTORNEY

(to be inserted)

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1.05 RISK MANAGEMENT PROVISIONS INSURANCE AND INDEMNIFICATION

A. DEFINITIONS

The Contractor understands and agrees that the Risk Management Provisions of this Agreement (Contract) define the responsibilities of the Contractor to the Owner.

As used in these Risk Management Provisions, the terms "Contractor" and "Owner" shall be defined as follows:

1. "Contractor" means the contractor and its employees, agents, servants, owners, principals, licensees, assigns and subcontractors of any tier.

2. "Owner" means the Lexington-Fayette Urban County Government and its elected and appointed officials, employees, agents, boards, consultants, assigns, volunteers and successors in interest.

B. INDEMNIFICATION AND HOLD HARMLESS PROVISION

1. It is understood and agreed by the parties that Contractor hereby assumes the entire responsibility and liability for any and all damages to persons or property caused by or resulting from or arising out of any act or omission on the part of Contractor under or in connection with this agreement and/or the provision of goods or services and the performance or failure to perform any work required thereby.

2. Contractor shall indemnify, save, hold harmless and defend the Owner from and against all liability, damages, and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest, defense costs and reasonable attorney's fees that are in any way incidental to or connected with, or that arise or are alleged to have arisen, directly or indirectly, from or by Contractor's performance or breach of the agreement and/or the provision of goods or services provided that: (a) it is attributable to personal injury, bodily injury, sickness, or death, or to injury to or destruction of property (including the loss of use resulting therefrom), or to or from the negligent acts, errors or omissions or willful misconduct of the Contractor; and (b) not caused solely by the active negligence or willful misconduct of the Owner.

3. In the event the Owner is alleged to be liable based upon the above, Contractor shall defend such allegations and shall bear all costs, fees and expenses of such defense, including but not limited to, all reasonable attorneys' fees and expenses, court costs, and expert witness fees and expenses, using attorneys approved in writing by the Owner, which approval shall not be unreasonably withheld.

4. These provisions shall in no way be limited by any financial responsibility or insurance requirements, and shall survive the termination of this Agreement (Contract).

5. The Work and services performed hereunder involve a Consent Decree as further explained in of Section 00100, provision 1.13 of these specifications. The provisions of that provision are incorporated herein by reference as if expressly stated.

6. Owner is a political subdivision of the Commonwealth of Kentucky. Contractor acknowledges and agrees that the Owner is unable to provide indemnity or otherwise save, hold harmless, or defend the Contractor in any manner.

C. FINANCIAL RESPONSIBILITY

1. The Contractor understands and agrees that it shall, prior to final acceptance of its Bid and the commencement of any Work, demonstrate the ability to assure compliance with the Indemnity Agreement and other provisions of this Agreement (Contract).

D. INSURANCE REQUIREMENTS

Bidders' attention is directed to the following insurance requirements, as Bidders must confer with their respective insurance agents, brokers, or carriers to determine in advance of Bid submission the availability of the insurance coverage's and endorsements required herein. If an apparent low Bidder fails to comply strictly with the insurance requirements below, that Bidder shall be disqualified from the award of the Agreement (Contract), at the Owner's discretion.

1. Required Insurance Coverage

Contractor shall procure and maintain for the duration of this Agreement (Contract) the following or equivalent insurance policies at no less than the limits shown below and cause its subcontractors to maintain similar insurance with limits acceptable to Owner in order to protect Owner against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by Contractor. The cost of such insurance shall be included in any Bid.

Coverage	**Limits**
General Liability (Insurance Services Office Form CG 00 01)	$1 million per occurrence $2 million aggregate, or $2 million combined single limit
Commercial Automobile Liability (Insurance Services Office Form CA 0001)	Combined single, $1 million per occurrence
Worker's Compensation	Statutory
Employer's Liability	$500,000

The policies above shall contain the following conditions:

a. All Certificates of Insurance forms used by the insurance carrier shall be properly filed and approved by the Department of Insurance for the Commonwealth of Kentucky (DOI). Owner shall be named as additional insured in the General Liability Policy and Commercial Automobile Liability Policy using the Kentucky DOI approved forms.

b. The General Liability Policy shall be primary to any insurance or self-insurance retained by Owner.

c. The General Liability Policy shall include a Products and Completed Operations endorsement or Premises and Operations Liability endorsement unless it is deemed not to apply by Owner.

d. The General Liability Policy shall include an Explosion-Collapse Underground (XCU) endorsement.

e. The General Liability Policy shall include a Pollution Liability and/or Environmental Casualty endorsement unless it is deemed not to apply by Owner.

f. Owner shall be provided at least thirty (30) days advance written notice via certified mail, return receipt requested, in the event any of the required policies are canceled or non-renewed.

g. Said coverage shall be written by insurers acceptable to Owner and shall be in a form acceptable to Owner. Insurance placed with insurers with a rating classification of no less than Excellent (A or A-) and a financial size category of no less than VIII, as defined by the most current Best's Key Rating Guide shall be deemed automatically acceptable.

h. Owner requests that the Bidder obtain an Umbrella Liability endorsement to the CGL policy for a limit of liability of $ 5,000,000 and that this CGL policy endorsement be renewed for one (1) year after completion of this project.

2. Renewals

a. After insurance has been approved by Owner, evidence of renewal of an expiring policy must be submitted to Owner, and may be submitted on a manually signed renewal endorsement form. If the policy or carrier has changed, however, new evidence of coverage must be submitted in accordance with these Insurance Requirements.

3. Deductibles and Self-Insured Programs

IF CONTRACTOR INTENDS TO SUBMIT SELF-INSURANCE PLAN, IT MUST BE FORWARDED TO LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DIVISION OF RISK MANAGEMENT, 200 EAST MAIN STREET,

LEXINGTON, KENTUCKY 40507 NO LATER THAN A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO BID OPENING DATE. Self-insurance programs, deductibles, and self-insured retentions in insurance policies are subject to separate approval by Lexington-Fayette Urban County Government's Division of Risk Management, upon review of evidence of Contractor's financial capacity to respond to claims. Any such programs or retentions must provide Owner with at last the same protection from liability and defense of suits as would be afforded by first-dollar insurance coverage. If Contractor satisfies any portion of the insurance requirements through deductibles, self-insurance programs, or self-insured retentions, Contractor agrees to provide Lexington-Fayette Urban County Government, Division of Risk Management, the following data prior to the final acceptance of Bid and the commencement of work:

a. Contractor's latest audited financial statement, including auditor's notes.

b. Any records of any self-insured trust fund plan or policy and related accounting statement.

c. Actuarial funding reports or retained losses.

d. Risk Management Manual or a description of self-insurance and risk management program.

e. A claim loss run summary for the previous five (5) years.

f. Self-Insured Associations will be considered.

4. Safety and Loss Control

   a. Contractor shall comply with all applicable federal, state, and local safety standards related to the performance of its works or services under this Agreement and take necessary action to protect the life, health and safety and property of all of its personnel on the job site, the public, and the Owner.

5. Verification of Coverage

6. Prior to award of bid, Contractor agrees to furnish Owner with all applicable Certificates of Insurance signed by a person authorized by the insurer to bind coverage on its behalf. If requested, Contractor shall provide Owner copies of all insurance policies, including all endorsements.

7. Right to Review, Audit and Inspect

8. Contractor understands and agrees that Owner may review, audit and inspect any and all of Contractor's records and operations to insure compliance with these Insurance Requirements.

9. Contractor understands and agrees that the failure to comply with any of these insurance, safety, or loss control provisions shall constitute default under this

Agreement (Contract). Contractor also agrees that Owner may elect at its option any single remedy or penalty or any combination of remedies and penalties, as available, including but not limited to purchasing insurance and charging Contractor for any such insurance premiums purchased, or suspending or terminating this Agreement (Contract).

1.06 CERTIFICATE OF LIABILITY INSURANCE

(Insert Contractor's Certificate)

END OF SECTION

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 11/20/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
AssuredPartners of West Virginia, LLC
P O Box 2627
Huntington WV 25726

CONTACT NAME: Brenda Kash
PHONE (A/C, No, Ext): (304) 736-2222 **FAX (A/C, No):** (304) 302-3401
E-MAIL ADDRESS: brenda.kash@assuredpartners.com

INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A :	Motorists Insurance	13331
INSURER B :	Travelers Property Casualty Company of America	25674
INSURER C :	Brickstreet Mutual Insurance	12372
INSURER D :		
INSURER E :		
INSURER F :		

INSURED
Tribute Contracting & Consultants LLC
Tribute Contracting & Consultants Inc.
2125 County Road 1
South Point OH 45680

COVERAGES **CERTIFICATE NUMBER:** CL259915992 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	[X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [ ] PRO-JECT [ ] LOC [ ] OTHER:	Y		5003122348	09/08/2025	09/08/2026	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG Ohio Employers Liability	$ 1,000,000 $ 500,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 2,000,000 $ 1,000,000
A	AUTOMOBILE LIABILITY [X] ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS [ ] HIRED AUTOS ONLY [ ] NON-OWNED AUTOS ONLY	Y		5003122348	09/08/2025	09/08/2026	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Medical payments	$ 1,000,000 $ $ $ $ 5,000
B	[X] UMBRELLA LIAB [X] OCCUR [ ] EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $			EX-A1023669-25-NF	09/08/2025	09/08/2026	EACH OCCURRENCE AGGREGATE 	$ 5,000,000 $ 5,000,000 $
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N [Y] If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		WCB1038247	09/08/2025	09/08/2026	[X] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
A	Rented/Leased Equipment Installation Floater			5003122348	09/08/2025	09/08/2026	Rented/Leased Eqpt Installation Floater	$500,000 $1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Certificate holder and Prime AE Group are named additional insured with respect to the Merrick Trunk Sewer Improvements

CERTIFICATE HOLDER
LFUCG
200 East Main Street,3rd Floor
Lexington KY 40507

CANCELLATION
SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE
Brenda Kash

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SECTION 00700
GENERAL CONDITIONS

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This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

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These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*—The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

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12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*—See Paragraph 11.01 for definition.

17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*—The individual or entity named as such in the Agreement.

20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*—Sections of Division 1 of the Specifications.

22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.

23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

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27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*—Polychlorinated biphenyls.

31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.

37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

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40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.

46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.

47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.

48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

49. *Unit Price Work*—Work to be paid for on the basis of unit prices.

50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

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51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents; or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

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c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the

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Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete

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and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of

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the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work*: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work*: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation , (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

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B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

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ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

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4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

   a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

   b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

   a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

   b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and

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contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all such information and data;

b. locating all Underground Facilities shown or indicated in the Contract Documents;

c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the

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consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

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C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

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H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also

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meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.

E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

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a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

6. include completed operations coverage:

a. Such insurance shall remain in effect for two years after final payment.

b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

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5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;

2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors,

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members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:

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1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's

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interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

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B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

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2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and

3) it has a proven record of performance and availability of responsive service.

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,

b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

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c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services; and

4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be

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required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner,

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Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

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6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought

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by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

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B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are

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required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

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d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any

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disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the

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extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

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D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

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1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.

C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and

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tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

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9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

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9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

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D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

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B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

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B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part;

2. approve the Claim; or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing

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in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

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c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

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3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances:*

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

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11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

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3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

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12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and

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testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

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B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract

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Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's

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recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

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14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

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3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

    a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

    b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

    a. to supervise, direct, or control the Work, or

    b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

    c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

    d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

    e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

    a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

    b. the Contract Price has been reduced by Change Orders;

    c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

    d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

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C. *Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

   a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

   b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

   c. there are other items entitling Owner to a set-off against the amount recommended; or

   d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

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B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

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3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;

   b. consent of the surety, if any, to final payment;

   c. a list of all Claims against Owner that Contractor believes are unsettled; and

   d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid

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or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees

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specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's repeated disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and

3. complete the Work as Owner may deem expedient.

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C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

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B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or

2. agrees with the other party to submit the Claim to another dispute resolution process; or

3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

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ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SECTION 00800

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC C-700) (2007 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

1.01.A.12 Replace in its entirety with the following:

"12. Contract Documents – The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), Contractor's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and Engineer's written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or Hardcopies of the items listed in this paragraph are Contract Documents. Files in electronic format of text, data, graphics, and the like that may be furnished by Owner to Contractor are not Contract Documents".

1.01.A.44 First sentence, change: "in the opinion of the Engineer", to "in the opinion of Engineer and Owner".

1.02 Terminology

Delete 1.02.E and replace with the following:

1.02.E The words "furnish", "furnish and install", "install", and "provide" or words with similar meaning shall be interpreted, unless otherwise specifically stated, to mean "furnish and install complete in place and ready for service".

Add the following:

1.02.G The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract (EJCDC C-700, (2007 Edition) have the meanings assigned to them in the General Conditions.

ARTICLE 2 – PRELIMINARY MATTERS

Add the following:

2.00 Execution of Agreement

2.00.A At least six (6) counterparts of the Agreement will be executed and delivered by the Contractor to the OWNER within fifteen (15) days of the Notice of Award and receipt of the Contract Documents by the Contractor for execution; and OWNER will execute and deliver one counterpart to Contractor within ten (10) days of receipt of the executed Agreement from Contractor.

2.01 Delivery of Bonds and Evidence of Insurance

2.01.B Replace "Before any Work at the Site is started, Contractor and Owner shall each deliver to the other" with "When Contractor delivers the executed counterparts of the Agreement to the Owner, Contractor shall deliver to the Owner", and replace "and Owner respectively are" with "is".

2.02 Copies of Documents

2.02A Revise as follows:

Owner shall furnish to Contractor up to ~~ten~~ three printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed:

2.03.A Delete in its entirety and substitute the following:

2.03.A The Contract Time will commence to run on the day indicated in the Notice to Proceed; but in no event will the Contract Time commence to run later than the ninetieth day after the day of Bid opening or the thirtieth day after the effective date of the Agreement. By mutual consent of the parties to the Contract, these time limits may be changed.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING AND REUSE

3.01 Intent

Add the following:

3.01.D It is the intent of the Specification and Contract Documents to obtain an operable Project. Equipment, components, systems, etc., therein shall be made operable by the Contractor.

3.01.E The Contract Drawings may be supplemented from time to time with additional Drawings by the Engineer as may be required to illustrate the work or, as the work progresses, with additional Drawings, by the Contractor, subject to the approval of the Engineer. Supplementary Drawings, when issued by the Engineer or by the Contractor, after approval by the Engineer, shall be furnished

in sufficient quantity to all those who, in the opinion of the Engineer, are affected by such Drawings.

3.03 Reporting and Resolving Discrepancies

Add the following:

3.03.B.2 In resolving such conflicts, errors and discrepancies, the Contract Documents shall be given precedence in the following order:

a. Agreement
b. Field and Change Orders
c. Addenda
d. Special Conditions
e. Instruction to Bidders
f. General Conditions
g. Project Specifications and Drawings
h. LFUCG standard specifications and standard details

Figure dimensions on drawings shall govern over scale dimensions and detailed Drawings shall govern over general Drawings.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS.

4.02 Subsurface and Physical Conditions

4.02.A Delete: "the Supplementary Conditions", and substitute "Section 00320 – Geotechnical Data".

4.02.B Second sentence, delete: "Supplementary Conditions" and substitute "Specifications and Contract Drawings".

4.04 Underground Facilities

Add the following:

4.04.B.3 The Owner, Engineer, and Engineer's Consultants shall not be liable to Contractor for any claims, costs, losses or damages incurred or sustained by Contractor on or in connection with any other project or anticipated project.

4.06 Hazardous Environmental Condition at Site

4.06.A First sentence, delete "Supplementary Conditions" and substitute "Section 00300 – Information Available To Bidders."

4.06.B Second sentence, delete "Supplementary Conditions: and substitute "Specifications and Contract Drawings."

4.06.G First sentence, insert "Kentucky" between "by" and "Laws".

Add the following at the end of this section: "The parties understand and acknowledge that no Kentucky case, statute, or Constitutional provision authorizes a local government to indemnify a contractor and that this contract provision may be unenforceable.

ARTICLE 5 – BONDS AND INSURANCE

Delete Article 5 in its entirety and substitute the following:

5.01 Performance and Payment Bonds

5.01A Concurrent with execution of the Agreement and within fifteen (15) days of the Notice of Award, the successful Contractor shall procure, execute and deliver to the OWNER and maintain, at his own cost and expense, the following bonds in the forms attached, of a surety company approved by the State of Kentucky as a Surety:

5.01.B Performance Bond – in an amount not less than 100% of the total amount payable to the Contractor by the terms of the Contract as security for the faithful performance of the work. Bond must be valid until one (1) year after the date of issuance of the Certificate of Substantial Completion.

5.01.C Payment Bond – in an amount not less than 100% of the total amount payable to the Contractor by the terms of the Contract as security for the payment of all persons performing labor and furnishing material in connection with the work. Bond must be valid until one (1) year after date of issuance of the Certificate of Substantial Completion.

5.01.D All Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

5.01.E If the Surety on any Bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business in the State of Kentucky is revoked, the Contractor shall within five (5) days thereafter substitute another Bond or Surety, both of which shall be acceptable to the OWNER.

5.02 Insurance Requirements

See Section 00600 – Bonds and Certificates for Insurance Requirements.

5.03 Contractor's Liability Insurance

See Section 00600 – Bonds and Certificates for Insurance Requirements.

5.04 Indemnification Agreement

See Section 00600 – Bonds and Certificates for Indemnification.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.06 Concerning Subcontractors, Suppliers and Others

6.06.B First sentence, delete: "If the Supplementary Conditions", and substitute "The Bid Form". The seventh line, delete "Supplementary Conditions", and substitute "Bid Form".

6.06.G Delete in its entirety and substitute the following:

6.06.G All work performed for Contractor by a Subcontractor shall be pursuant to an appropriate agreement between the Contractor and Subcontractor. The Subcontractor shall not commence work until Contractor has obtained all insurance as required by Paragraphs 5.02 through 5.03 inclusive.

6.07 Patent Fees and Royalties

6.07 Delete 6.07.A, 6.07.B, and 6.07.C in their entirety and substitute the following:

6.07.A Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work of any invention, design, process, products or device which is the subject of patent rights or copyrights held by others. Contractor shall indemnify and hold harmless OWNER and Engineer, and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses, including attorney's fees, arising out of any infringement of patent rights or copyrights incident to the use in the performance of the Work or furnished by him in fulfillment of the requirements of this Contract. In the event of any claim or action by law on account of such patents or fees, it is agreed that the OWNER may retain out of the monies which are, or which may become due the Contractor under this Contract, a sum of money sufficient to protect itself against loss, and to retain the same until said claims are paid or are satisfactorily adjusted.

6.08 Permits

6.08.A Third sentence of paragraph delete, "or if there are no Bids.....to the Work.", and substitute "and the Contractor shall pay all charges of utility owners for connections to the Work."

6.09 Laws and Regulations

6.09.B Delete 6.09B in its entirety and substitute the following:

6.09.B If Contractor observes that the Specifications or Drawings are at variance with any Laws or Regulations, he shall give Engineer prompt written notice thereof. If Contractor performs any Work knowing it to be contrary to such Laws or Regulations, and without such notice to Engineer, he shall bear all costs arising therefrom. The Contractor shall, at all times, observe and comply with and shall cause all his agents and employees and all his Subcontractors to observe and comply with all such existing Laws or Regulations, and shall protect and indemnify the OWNER and the Engineer and the municipalities in which work is being performed, and their officers and agents against any claim, civil penalty, fine or liability arising from or based on the violation of any such Law or Regulation, whether by himself or his employees or any of his Subcontractors.

6.13 Safety and Protection

6.13.B First sentence, after "CONTRACTOR" add the following:

", subject to provisions 6.09.B,"

6.19 Contractor's General Warranty and Guarantee

6.19.A After the first sentence of Section 6.19.A add the following:
"All materials or equipment delivered to the site shall be accompanied by certificates, signed by an authorized officer of the supplier, and notarized guaranteeing that the materials or equipment conform to specification requirements, Such certificates shall be immediately turned over to the Engineer. Materials or equipment delivered to the site without such certificates will be subject to rejection. The warranty and guarantee period shall be for a period of one (1) year, or such longer period as may be prescribed by Law, from the date of Substantial Completion."

6.20 Indemnification

6.20.A First sentence, after "...claims, costs" add the following:

", civil penalties, fines,"

6.20.C Add the following:

6.30.C.3 Nothing in the Contract Documents shall create or give to third parties any claim or right of action against the Contractor, the OWNER or the Engineer beyond such as may legally exist irrespective of the Contract.

ARTICLE 7 – OTHER WORK AT THE SITE

7.02 Coordination

Delete in its entirety.

7.03 Legal Relationships

7.03.B Delete "Owner and".

7.03.C Delete "Owner and".

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.02 Replacement of Engineer

8.02.A Delete in its entirety.

8.06 Insurance

8.06.A Delete in its entirety.

8.11 Evidence of Financial Arrangements

8.11.A Delete in its entirety.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 OWNER'S Representative

9.01.A Delete in its entirety and substitute the following:

9.01.A Engineer will be the OWNER'S representative during the construction period, and his instructions shall be carried into effect promptly and efficiently.

9.03 Project Representative

Add the following:

9.03.B The Resident Project Representative will serve as the Engineer's liaison with the Contractor, working principally through the Contractor's resident superintendent to assist him in understanding the intent of the Contract Documents.

9.03.C The Resident Project Representative shall conduct on-site observations of the work in progress to confirm that the work is proceeding in accordance with the Contract Documents. He will verify that tests, equipment and systems start-ups and operating maintenance instructions are conducted as required by the Contract Documents. He will have the authority to disapprove or reject defective work in accordance with Article 13.

9.09 Limitations on Engineer's Authority and Responsibilities

Add the following:

9.09.F Except upon written instructions of the Engineer, the Resident Project Representative:

1. Shall not authorize any deviation from the Contract Documents or approve any substitute materials or equipment.

2. Shall not exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Shall not undertake any of the responsibilities of Contractor, Subcontractors, or Contractor's superintendent, or expedite the Work.

4. Shall not advise on or issue directions relative to any aspect of the means, methods, techniques, sequences or procedures of construction unless such is specifically called for in the Contract.

5. Shall not advise on or issue directions as to safety precautions and programs in connection with the Work.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES, UNIT PRICE WORK

11.01 Cost of the Work

11.01.A Last sentence, following "...in Paragraph 11.01.B," insert the following:

"or claims for extra cost shall be considered based on an escalation of labor costs throughout the period of the Contract,"

11.01.A.2 Add the following at the end of the paragraph:

"No claims for extra cost shall be considered based on an escalation of material costs throughout the period of the Contract."

11.01.A.3 Delete second sentence "If required...be acceptable."

11.01.A.4 Delete in its entirety.

11.01.A.5.a Delete in its entirety.

11.01.A.5.c Add the following before last sentence of paragraph:

"These rates shall include all fuel, lubricants, insurance, etc. Equipment rental charges shall not exceed the prorated monthly rental rates listed in the current edition of the 'Compilation of Rental Rates for Construction Equipment' as published by the Associated Equipment Distributors. Charges per hour shall be determined by dividing the monthly rates by 176."

11.01.A.5.f Delete in its entirety.

11.01.A.5.g Delete in its entirety.

11.01.A.5.h Delete in its entirety.

11.03 Unit Price of Work:

11.03.D.1 Delete "materially and significantly", and insert "by more than plus or minus twenty percent (20%)".

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 Change of Contract Price

12.01.A Add the following after the last sentence:

Section 01025 shall be given precedence over section 00700 regarding changes in contract price.

12.03 Delays

12.03.B Delete in its entirety and substitute the following:

12.03.B Delays beyond the control of the Contractor, as provided in paragraph 12.03.A, shall not entitle the Contractor to obtain additional project overhead costs unless such delays extend the Project as described below:

1. beyond the original Contract Times,

2. beyond the Contract Times for which the overhead costs have been previously approved, or

3. beyond Contract Times that are extended as a result of delays described in 12.03.C.

For the purpose of this paragraph, overhead costs shall be the supplemental costs defined in 11.01.A.5, paragraphs a, b, c, g, h and i. The Contractor's bid shall include all overhead costs as necessary to be on the Project for the original Contract Times.

12.03.C Add the following after the last sentence:

If the Contractor and the Owner cannot agree upon an equitable adjustment in the Contract Times, delays described in this Paragraph 12.03.C shall be determined as follows:

1. Contractor shall obtain weather history for the most recent five (5) years (minimum) preceding the Bid date. Weather history shall be obtained from the National Oceanic & Atmospheric Administration (NOAA) or other source approved by the Engineer. Historical weather shall be based on data from the weather reporting station closest to the project site.

2. For delays to be considered that are associated with an abnormal amount of rain, the Contractor shall use the weather history to calculate an average number of days that rainfall exceeded 0.1-inches for the period (month, quarter, year, etc.) in question. The average value calculated shall be rounded up to the next full day. A time extension may be considered equal to the number of days, above the calculated average, that the period in question experienced rainfall in excess of 0.1-inches. A Contract Time extension will not be considered for rain amounts less than 0.1-inches.

3. For daily rain amounts in excess of 1-inch, a time extension of one day beyond the number of days calculated as described above may be considered.

4. For delays associated with other abnormal weather events, the weather history shall be used to calculate an average number of days for the type of weather considered to be the cause of a delay. (Calculation of the average number of days shall be as described above.) Where the Contractor can demonstrate that the abnormal weather event has impaired his ability to

perform work, beyond the day of the abnormal event, to perform site maintenance as necessary to restore the site to a workable condition may be considered.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.03 Tests and Inspections

13.03.B Delete in its entirety and substitute the following:

13.03.B Contractor shall employ and pay for inspections and testing services specifically noted as such in the Contract.

13.03.C Delete in its entirety and substitute the following:

13.03.C If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to be specifically inspected, tested, or approved by some public body, Contractor shall assume full responsibility therefore, pay all costs in connection therewith and furnish Engineer the required certificates of inspection, testing or approval.

Add the following:

13.03.G The OWNER reserves the right to independently perform at its own expense, laboratory tests on random samples of material or performance tests on equipment delivered to the site. These tests if made will be conducted in accordance with the appropriate referenced standards or Specification requirements. The entire shipment represented by a given sample, samples or piece of equipment may be rejected based on the failure of samples or pieces of equipment to meet specified test requirements. All rejected materials or equipment shall be removed from the site, whether stored or installed in the Work, and the required replacement shall be made, all at no additional cost to the OWNER.

13.05 OWNER May Stop the Work:

13.05A First sentence, after "…conform to the Contract Documents", insert "or if the Work interferes with the operation of the existing facility".

13.06 Correction or Removal of Defective Work

Add the following:

13.06.C At any time during the progress of the Work and up to the date of final acceptance, the Engineer shall have the right to reject any work which does not conform to the requirements of the Contract Documents, even though such work has been previously inspected and paid for. Any omissions or failure on the part of the Engineer to disapprove or reject any Work or materials at the time of inspection shall not be construed as an acceptance of any defective work or materials.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 Schedule of Values

Add the following:

14.01.B The Contractor shall submit for the Engineer's approval, a complete breakdown of all Lump Sum Items in the Proposal. This breakdown, modified as directed by the Engineer, will be used as a basis for preparing estimates and establishing progress payments.

14.02 Progress Payments

14.02.A.3 Delete in its entirety and replace with the following:

14.02.A.3 Progress payment request shall include the percentage of the total amount of the Contract which has been completed from initiation of construction of the Project to and including the last day of the preceding month, or other mutually agreed upon day of the month accompanied by such data and supporting evidence as OWNER or Engineer may require.

Add the following:

14.02.A.4 Forms to be used shall be prepared by the Contractor and submitted to the Engineer for approval.

14.02.A.5 At the option of the OWNER, partial payment up to the estimated value, less retainage, may be allowed for any materials and equipment not incorporated in the Work, pursuant to the following conditions:

a. Equipment or materials stored on the site shall be properly stored, protected and maintained.

b. For any partial payment, the Contractor shall submit, with his monthly progress payment from each material or equipment manufacturer, bills or invoices indicating actual material cost.

c. Contractor shall submit evidence that he has paid for materials or equipment stored and for which the Engineer has authorized partial payment and previous progress payments, prior to submission to the next monthly payment request. (See example letter at the end of this Section 00800).

14.02.A.6 The OWNER will retain ten percent (10%) of the amount of each such estimate until the monetary value of the Work completed under the Contract, including any amendment thereto, equals fifty percent (50%) of the total monetary value of the Contract. After fifty percent (50%) of the monetary value of Work is completed under the Contract, including any amendment thereto, as evidenced by approved Partial Payment Requests exclusive of stored materials, and in the opinion of the OWNER, satisfactory progress is being made, the OWNER may adjust future partial payment so that five percent (5%) of the amount of the Contract, including any amendment thereof, is retained.

14.02.A.7 If the OWNER determines it is appropriate to reduce retainage, the method used for such adjustment shall be to fix retainage at five percent (5%) of the amount of the Contract, including any amendment thereto,(when the work is 50% complete) and to pay all subsequent Partial Payment Requests to the full approved amount. The intent of such an adjustment is to gradually reduce retainage to five percent (5%) of the amount of the Contract, including any amendment thereto, when the Work is one hundred percent (100%) complete.

14.02.A.8 The OWNER may reinstate up to ten percent (10%) retainage if it is determined that the Contractor is not making satisfactory progress or there is other specific cause for retainage.

14.02.B.1 Review of Applications:

First sentence delete "10 days", insert "30 days".

14.02.C.1 Payment Becomes Due:

First sentence delete "Ten days" and insert "Thirty Days".

14.02.D.3 Delete in its entirety.

14.04 Substantial Completion

14.04 Delete paragraphs A, B, C, and D in their entirety and substitute the following:

14.04.A Contractor may, in writing to OWNER and Engineer, certify that the entire Project is substantially complete and request that Engineer issue a certificate of Substantial Completion. Within a reasonable time thereafter, OWNER, Contractor and Engineer shall inspect the Project to determine the status of completion. If Engineer and OWNER do not consider the Project substantially complete, Engineer will notify Contractor in writing giving his reasons, therefore. If Engineer and OWNER consider the Project substantially complete, Engineer will prepare and deliver to OWNER a tentative certificate of Substantial Completion and the responsibilities between OWNER and Contractor for maintenance, heat and utilities. There shall be attached to the certificate a tentative list of items to be completed or corrected before Final Completion, and the certificate shall fix the time within which such items shall be completed or corrected, said time to be within Contract Time. No warranties associated with the Project shall start until issuance of the certificate of Substantial Completion.

14.04.B In accordance with KRS 371.410, Substantial Completion is the point at which, as certified in writing by OWNER, a project is at the level of completion, in strict compliance with the contract, where:

1. Necessary approval by public regulatory authorities has been given.
2. The Owner has received all required warranties and documentation; and
3. The Owner may enjoy beneficial use or occupancy and may use, operate, and maintain the project in all respects, for its intended purpose.

14.05 Partial Utilization

14.05.A Delete in its entirety and substitute the following:

14.05.A Partial Utilization is also referred to as "Beneficial Occupancy" and "In Service Date". Partial Utilization (Beneficial Occupancy) will occur before Substantial Completion of entire Project. Prior to Substantial Completion of the entire Project, OWNER may request Contractor to permit them to use a specified part of the Project which they believe they may use without significant interference with construction of the other parts of the Project. Prior to requesting Beneficial Occupancy all testing shall be complete and passed, all training shall be complete, and that part of the Project shall be operational for its functional design. If Contractor agrees, Contractor shall certify to OWNER and Engineer that said part of the Project has achieved Beneficial Occupancy and request the Engineer to issue a memorandum declaring Beneficial Occupancy for that part of the Project. Within a reasonable time thereafter, OWNER, Contractor, and Engineer shall inspect that part of the Project to determine its status of completion. If Engineer and OWNER do not consider that it has achieved Beneficial Occupancy, Engineer will notify Contractor in writing giving his reasons therefor. If Engineer and OWNER consider that part of the Project to have reached Beneficial Occupancy, Engineer will execute and deliver to OWNER and Contractor a memorandum to that effect, fixing the date of Beneficial Occupancy and the responsibility between OWNER and Contractor for maintenance, heat, and utilities, as it pertains to that part of the Project.

14.05.B Equipment Warranties will not begin until after successful start-up, training, and acceptance by Owner for Substantial Completion of the entire Project. Any manufacturer's request to initiate warranty period earlier than Owner's acceptance will not be valid.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 Owner May Suspend Work

Add the following:

15.01.B Should the OWNER suspend Work due to repeated unsafe Work conducted by the Contractor, which is confirmed by subsequent inspection by OSHA, the Contractor shall not be allowed any adjustment in Contract Price or extension of Contract Time attributed to the delay.

15.02 Owner May Terminate for Cause

15.02.A.2 Add the following to the end of first sentence after "jurisdiction":

"(including those governing employee safety)"

15.02D Delete in its entirety.

Add the following:

15.05 Assignment of Contract

15.05 Contractor shall not assign, transfer, convey or otherwise dispose of the Contract, or of his legal right, title, or interest in or to the same or to any part thereof, without the prior written consent of the OWNER. Contractor shall not assign by power of attorney or otherwise any monies due him and payable under this Contract without the prior written consent of the OWNER. Such consent, if given, will in no way relieve the Contractor from any of the obligations of this Contract. OWNER shall not be bound to abide by or observe the requirements of any such assignment.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 Methods and Procedures

16.01.A Replace the first sentence with the following:

"If required by applicable laws and regulations, and not specifically excluded elsewhere, either OWNER or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding."

ARTICLE 17 – MISCELLANEOUS

17.01 Giving Notice

Add the following:

17.01.B No oral statement of any person whomsoever shall in any manner or degree modify or otherwise affect the terms of this Contract. Any notice to the Contractor, form OWNER and Engineer, relative to any part of this Contract shall be in writing.

Add the following:

17.07 Claims for Injury or Damage

17.07.A Should OWNER or Contractor suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 17.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

17.08 Non-Discrimination in Employment

17.08.A The Contractor shall comply with the following requirements prohibiting discrimination:

17.08.A.1 That no person (as defined in KRS 344.010) shall Bid on Lexington-Fayette Urban County Government Construction projects or bid to furnish materials or supplies to the Lexington-Fayette Urban County Government, if, within six months prior to the time of opening of Bids, said person shall have been found, by declamatory

judgment action in Fayette Circuit Court, to be presently engaging in an unlawful practice, as hereinafter defined. Such declamatory judgment action may be brought by an aggrieved individual or upon an allegation that an effort at conciliation pursuant to KRS 344.200 has been attempted and failed, by the Lexington-Fayette County Human Rights Commission.

17.08.A.2 That it is an unlawful practice for any employer:

a. to fail or refuse to hire, or to discharge any individual or otherwise to discriminate against an individual, with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, sex, age, or national origin; or

b. to 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 sex, race, color, religion, age, or national origin.

17.08.A.3 That it is unlawful practice for an employer, labor organization, or joint-labor management committee controlling apprenticeship or other training or retraining, including on-the-job training programs to discriminate against an individual because of his race, color, religion, sex, age, or national origin in admission to, or employment in, any program established to provide apprenticeship or other training.

17.08.A.4 That a copy of the LFUCG Ordinance shall be available for viewing at the Lexington-Fayette Urban County Government offices.

17.09 Temporary Street Closing or Blockage

17.09.A The Contractor will notify the Engineer, Owner, and LFUCG Division of Traffic Engineering at least 72 hours prior to making any temporary street closing or blockage. This will permit orderly notification to all concerned public agencies.

17.10 Percentage of Work Performed by Prime Contractor

17.10.A The Contractor shall perform on site, and with its own organization, Work equivalent to at least fifty percent (50%) of the total amount of Work to be performed under the Contract. This percentage may be reduced by a supplemental agreement to this Contract if, during performing the Work, the Contractor requests a reduction, and the Engineer determines that the reduction would be to the advantage of the OWNER.

17.11 Clean-Up

17.11.A Clean-up shall progress, to the greatest degree practicable, throughout the course of the Work. The Work will not be considered as completed, and final payment will not be made, until the right-of-way and all ground occupied or affected by the Contractor in connection with the Work has been cleared of all rubbish, equipment, excess materials, temporary structures, and weeds. Rubbish and all waste materials of whatever nature shall be disposed of, off the project site, in an

acceptable manner. All property, both public and private, which has been damaged in the prosecution of the Work, shall be restored in an acceptable manner. All areas shall be draining, and all drainage-ways shall be left unobstructed, and in such a condition that drift will not collect, or scour be induced.

17.12 General

17.12.A The duties and obligations imposed by the Contract Documents and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon Contractor, and all of the rights and remedies available to OWNER and Engineer, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply. All representations, warranties and guarantees made in the Contract Documents will survive final payment and termination or completion of the Agreement.

17.13 Debris Disposal

17.13.A For all LFUCG projects any fill, trash, construction demolition debris, yard waste, dirt or debris of any kind that is removed from the project site must be disposed of in accordance with local, state, and federal regulations. The disposal site or facility must be approved in advance by the LFUCG and disposal documentation is required. The Contractor will be responsible for payment of any fines associated with improper disposal of material removed from the project site.

17.14 Maintenance of Traffic

17.14.A Traffic shall be maintained on state and LFUCG highways and streets at all times during construction. For all work that impacts traffic, the Contractor shall obtain a traffic permit at least two (2) working days in advance from the Division of Traffic Engineering

(859) 258-3489.

17.14.B It shall be the Contractor's responsibility to notify LFUCG Police Department's Safety Officer (859) 258-3600 prior to performing any construction work, which might interfere with traffic or compromise the public safety.

Add the following:

ARTICLE 18 – LIQUIDATED DAMAGES FOR FAILURE TO COMPLETE WORK ON TIME

18.01 Liquidated Damages

18.01.A If the Contractor shall fail to complete the Work within the Contract Time, or extension of time granted by the OWNER in accordance with Article 12, then the Contractor will pay to the OWNER the amount for liquidated damages as specified

in the Contract for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.

(Reference Section 00800, Article 14.02.A.5.c)

*****PUT ON CONTRACTOR'S LETTERHEAD*****

DATE: _____

TO: OWNER: _____

ADDRESS: _____

_____

_____

RE: Project Title: _____
Lexington Fayette Urban County Government
Lexington, Kentucky
LFUCG Bid No.: _____

We hereby certify that the labor and materials listed on this request for payment have been used in the construction of this work, or that all materials included in this request for payment and not yet incorporated into the construction are now on the site or stored at an approved location with proper insurance to protect these stored materials; and that all lawful charges for labor, materials etc., covered by previous Certificates of Payment have been paid and that all other lawful charges on which this request for payment is based have been paid for in full or will be paid for in full from the funds received in payment of this request within ten (10) calendar days from receipt of this partial payment from the OWNER.

CONTRACTOR: _____

BY: _____

TIME: _____

State of: _____

County of: _____

Sworn to and subscribed before me this _____day of _____,

20____.

_____

Notary Public (Seal)

My Commission Expires:

END OF SECTION

SECTION 00890

PERMITS

1. KDOW Stream Construction Permit
2. Water Quality Certification
3. USACE Nationwide Permit
4. KYTC Encroachment Permit
5. KDOW Sewer Line Construction Permit

END OF SECTION

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Andy Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-2150
Fax: 502-564-4245

Rebecca W. Goodman
SECRETARY

Anthony R. Hatton
COMMISSIONER

STREAM CONSTRUCTION PERMIT
For Construction In Or Along A Stream

Issued to: **LFUCG - Division of Water**
Address: **125 Lisle Industrial Ave**
Lexington, KY 40511
Permit No.: **36137**

Permit effective date: **June 27, 2025**
Permit expires on: **June 27, 2026**

Agency Interest: **2295**
Activity ID: **APE20250016**

In accordance with KRS 151.250 and KRS 151.260, the Energy and Environment Cabinet approves the application dated **June 26, 2025** for **Replacement of approximately 190 feet of existing sanitary sewer line at four different locations using open cut method, as shown in the submitted plans and specifications, in the floodplain of West Hickman Creek, with general coordinates 37.985146,-84.486563, in Jessamine County**

There shall be no deviation from the plans and specifications submitted and hereby approved unless the proposed change shall first have been submitted to and approved in writing by the Cabinet. This approval is subject to the attached limitations. **Please read these limitations carefully!** If you are unable to adhere to these limitations for any reason, please contact this office prior to construction.

This permit is valid from the standpoint of stream obstruction only. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies. Specifically if the project involves work in a stream, such as bank stabilization, dredging, relocation, or in designated wetlands, a 401 Water Quality Certification from the Division of Water will be required.

This permit is nontransferable and all construction must be completed by the expiration date noted above. Year by year extensions may be requested subject to the requirements of 401KAR 4:060 Section 3 (5) (a) and (b) by submitting the attached Final Development Report, Permit Extension, Modification or Termination Form **prior** to your current permit expiration date. When your project is completed, you are required to notify the Division by submitting the same form and any required documents per your permit. The form may be emailed to: DOWFloodplain@ky.gov.

Any violation of the Water Resources Act of 1966 as amended is subject to penalties as set forth in KRS 151.990.

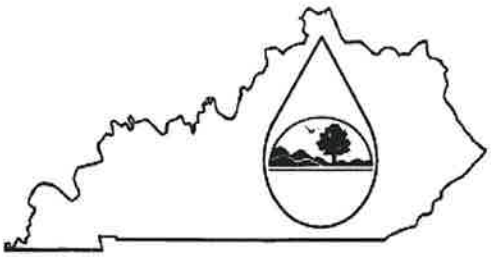
If you have any questions concerning this letter or other floodplain management requirements, please contact the Division of Water's Floodplain Management Section at (502) 564-3410 or by email at DOWFloodplain@ky.gov.

Sincerely,

David Ray Coe

David Coe, P.E., Supervisor
Floodplain Management Section
Water Resources Branch, Division of Water

Frankfort Regional Office
Robert Peterson, PE, LFUCG
Jeremy L Jackson, agent, Jackson Group
Katie Beard, PE, Engineer
Doug Burton - Lexington-Fayette Urban County Government Floodplain Coordinator



Commonwealth of Kentucky
Energy and Environment Cabinet
Division of Water

Final Development Report, Permit Extension, Modification or Termination Form

Name/Corporation Name: **LFUCG - Division of Water**

Email Address: _____

Agency Interest #: **2295**

Permit #: **36137**

SELECT THE APPROPRIATE PERMITTING ACTION REQUIRED BELOW

FINAL DEVELOPMENT REPORT FORM
Submit within 90 days after completion of construction

☐ All work on this project has been completed according to the plans and specifications as permitted by the Division of Water.

- ☒ Photographs of completed development (required)
- ☐ As Built drawings, if required by permit conditions
- ☐ Elevation Certificate, if required by permit conditions
- ☐ Floodproofing Certificate, if required by permit conditions
- ☐ Fill Compaction Tests, if required by permit conditions

PERMIT EXTENSION REQUEST FORM
Submit at least 30 days prior to permit expiration

☐ Permit Extension is requested, the project plans have not changed

- ☐ Construction began on (date) _____
- ☐ Construction has not started, will begin on (date) _____

PERMIT TERMINATION FORM

☐ The permitted project was not started and will not be completed

PERMIT MODIFICATION FORM

Provide detailed description of changes to the project on the following page, include maps and drawings as required.

Signature (Required): _____

Email this completed form to DOWFloodplain@ky.gov
or mail to DOW Floodplain Management, 300 Sower Blvd, Frankfort KY 40601

Modification Notes, permit Number: 36137

Email this completed form to DOWFloodplain@ky.gov
or mail to DOW Floodplain Management, 300 Sower Blvd, Frankfort KY 40601

Stream Construction Permit

Lexington West Hickman WWTP

Facility Requirements

Permit Number: 36137

Activity ID No.:APE20250016

STRC0000000025 (AI: 2295 - LFUCG) Replacement of approximately 190 feet of existing sanitary sewer line at four different locations using open cut method, as shown in the submitted plans and specifications, in the floodplain of West Hickman Creek, with general coordinates 37.985146,-84.486563, in Jessamine County:

Submittal/Action Requirements:

Condition No.	Condition
S-1	The Permittee or project engineer shall submit final construction report within 90 days after completion of construction. The Permittee or project engineer shall certify in writing that the project was completed in accordance with the approved plans and specifications. A Final Construction Report Form is enclosed. [401 KAR 4:060 Section 3(6)]

Narrative Requirements:

Condition No.	Condition
T-1	The Permittee, LFUCG - Division of Water, is responsible for compliance with the following permit conditions and all Federal, State and Local regulations applicable to this project. [KRS 151.250]
T-2	The issuance of this permit by the cabinet does not convey any property rights of any kind or any exclusive privilege. [KRS 151.250 & 401 KAR 4:060]
T-3	This permit is issued from the standpoint of stream obstruction only and does not constitute certification of any other aspect of the proposed construction. The Permittee is liable for any damage resulting from the construction, operation, or maintenance of this project. This permit was issued under the provisions of KRS Chapter 151.250 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the Permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies. [KRS 151.250]
T-4	A copy of this permit shall be available at the construction site. [KRS 151.250]. [KRS 151.250]
T-5	Any work performed by or for the Permittee that does not fully conform to the submitted application or drawings and the limitations set forth in this 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. [KRS 151.280]
T-6	Any design changes or amendments to the approved plans shall be submitted to the Division of Water and approved in writing prior to implementation. [KRS 151.250]

STRC0000000025 (AI: 2295 - LFUCG) Replacement of approximately 190 feet of existing sanitary sewer line at four different locations using open cut method, as shown in the submitted plans and specifications, in the floodplain of West Hickman Creek, with general coordinates 37.985146,-84.486563, in Jessamine County:

Narrative Requirements:

Condition No.	Condition
T-7	Since your community participates in the National Flood Insurance Program, a local floodplain permit shall be obtained prior to beginning of construction. Upon completion of construction the Permittee shall contact the local permitting agency for final approval of the construction for compliance with the requirements of the local floodplain ordinance. [401 KAR 4:060 Section 9(c)]
T-8	Erosion prevention measures, sediment control measures, and other site management practices shall be designed, installed, and maintained in an effective operating condition to prevent migration of sediment off site. [KRS 224.70-110]
T-9	To avoid secondary adverse impacts, all materials used shall be stable and inert, free from pollutants and floatable objects, and shall meet all appropriate engineering standards. (Inert here means materials that are not chemically reactive and that will not rot or decompose, such as soil, rock, broken concrete or similar materials.). [401 KAR 4:060 Section 7]
T-10	All debris and excess material shall be removed for disposal outside of the base floodplain. [401 KAR 4:060]
T-11	Upon completion of construction all disturbed areas shall be seeded and mulched or otherwise stabilized to prevent erosion. [401 KAR 4:060]
T-12	The entry of mobile equipment into the stream channel shall be limited as much as reasonably possible to minimize degradation of the waters of the Commonwealth. [401 KAR 4:060]
T-13	Construction other than as authorized by this permit shall require written approval from the Division of Water. [401 KAR 4:060]
T-14	The existing stream flow shall be maintained at all times during construction using standard flow diversion or pump around methods. Cofferdams or other structures placed in the stream shall be removed immediately if adverse flooding conditions result or if a flooding event is imminent. [401 KAR 4:060 Section 4]

STRC0000000025 (AI: 2295 - LFUCG) Replacement of approximately 190 feet of existing sanitary sewer line at four different locations using open cut method, as shown in the submitted plans and specifications, in the floodplain of West Hickman Creek, with general coordinates 37.985146,-84.486563, in Jessamine County:

Narrative Requirements:

Condition No.	Condition
T-15	The Sub-fluvial crossing shall meet the following criteria whichever is applicable: (1) During the construction of the crossing, no material may be placed in the stream or in the flood plain of the stream to form construction pads, coffer dams, access roads, etc., unless prior approval has been obtained from the cabinet. (2) The trench shall be backfilled as closely as possible to the original contour. All excess material from construction of the trench shall be disposed of outside of the flood plain unless the Permittee has received prior approval from the cabinet to fill within the flood plain. (3) For subfluvial crossings of erodible channels, there shall be at least thirty (30) inches clear to the top of the pipe or conduit at all points. (4) For subfluvial crossings of nonerodible channels, there shall be at least six (6) inches of clear cover above the top of the pipe or conduit at all points, and the pipe or conduit shall be encased on all sides by at least six (6) inches of concrete. (5) The weight of a pipe and its contents during normal operating conditions at all points shall exceed that of an equal volume of water, or the Permittee shall provide the division with sufficient information to show that the pipe and joints have sufficient strength. [401 KAR 4:050 Section 2]
T-16	The Permittee shall obtain a Water Quality Certification or a determination that none is required through the Division of Water, Water Quality Section prior to commencement of construction. Contact the Water Quality Certification Supervisor at 401WQC@ky.gov or (502) 564-3410. [KRS 224.16-050 & Clean Water Act Section 401]

Andy Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-2150
Fax: 502-564-4245

Rebecca W. Goodman
SECRETARY

Anthony R. Hatton
COMMISSIONER

September 30, 2025

Robert Peterson
Lexington-Fayette Urban County Government
125 Lisle Industrial Road
Suite 108
Lexington, KY 40511

Re: §401 Water Quality Certification
Lexington West Hickman WWTP
AI No.: 2295; Activity ID: APE20250015
WQC No: WQC2025-098-1
USACE ID No.: LRL-2021-00937
West Hickman Creek
Fayette County, Kentucky

Dear Mr. Peterson:

Pursuant to Section 401 of the Clean Water Act (CWA) and 40 CFR 121.7(c), the Commonwealth of Kentucky certifies it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 303, 304, 306, and 307 of the CWA, will not be violated by the above referenced project provided that the U.S. Army Corps of Engineers authorizes the activity under a federal license or permit, and the attached conditions are met.

Other permits from the Division of Water may be required for this activity. Activities within a floodplain may require a Permit to Construct Across or Along a Stream; contact the Floodplain Management Section (502-564-3410). Projects that disturb one acre or more of land or is part of a larger common plan of development or sale that will ultimately disturb one acre or more of land require a Kentucky Pollution Discharge Elimination System (KPDES) Stormwater Permit; contact the Surface Water Permits Branch (502-564-3410 or SWPBSupport@ky.gov). A Groundwater Protection Plan is required if activities listed in Section 2(2) of 401 KAR 5:037 are conducted. A Water Withdrawal Application is required for activities proposing raw water withdrawals of 10,000 gallons per day or more; contact the Watershed Management Branch (502-564-3410).

All future correspondence on this project must reference AI No. **2295**. **The attached document is your official Water Quality Certification; please read it carefully**. Please contact Bryan Killian by phone at 502-782-4695 or email at bryan.killian@ky.gov if you have any questions.

Sincerely,

Samantha Vogeler

Samantha Vogeler, Supervisor
Water Quality Certification Section
Kentucky Division of Water

SV:BK
Attachment

cc: USACE: Louisville CELRL.Door.To.The.Corps@usace.army.mil
Jeremy Jackson, Jackson Group: (via email: jjackson@jacksongroupco.com)
Katie Beard, Prime: (via email: katie.beard@primeeng.com)
Josh Lillpop, USFWS: Frankfort (via email: kentuckyes@fws.gov)
Andrea Drayer, Kentucky River Basin Coordinator (via email: andrea.drayer@uky.edu)
Zachary Campbell, Frankfort Regional Office (via email: zachary.campbell@ky.gov)

Water Quality Certification
Lexington West Hickman WWTP
Facility Requirements
Permit Number: WQC2025-098-1
Activity ID No.:APE20250015

ACTV0000000025 (AI 2295 - Lexington West Hickman WWTP) Sanitary Sewer Upgrade:

Submittal/Action Requirements:

Condition No.	Condition
S-1	Lexington-Fayette Urban County Government (LFUCG) shall notify the Water Quality Certification Project Manager or Supervisor of the scheduled start of construction activities at least two weeks before the start of construction. This condition is necessary for the Division of Water to be informed of the ongoing activity for the purposes of site visits to ensure implementation of Kentucky Regulatory Statutes and Administrative Regulations; the Division will monitor the environment, minimize impact to aquatic resources, protect the use and designation of resources, allow more effective and efficient control practices, identify changes and conditions in ecological systems as a result of activities, and to warn of emergency conditions. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]
S-2	LFUCG shall notify the Water Quality Certification Project Manager or Supervisor of substantial completion of construction no later than two weeks post-construction. This condition is necessary for the Division of Water to be informed of the ongoing activity for the purposes of site visits to ensure implementation of Kentucky Regulatory Statutes and Administrative Regulations; the Division will monitor the environment, minimize impact to aquatic resources, protect the use and designation of resources, allow more effective and efficient control practices, identify changes and conditions in ecological systems as a result of activities, and to warn of emergency conditions. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]
S-3	LFUCG shall submit as-built drawings within 90 days after substantial completion of construction to the Water Quality Certification Section Project Manager or Supervisor. This condition is necessary to monitor the aquatic resources, minimize impact to aquatic resources, protect the use and designation of resources, allow more effective and efficient control practices, identify changes and conditions in ecological systems as a result of activities, and to warn of emergency conditions. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]

ACTV0000000025 (AI 2295 - Lexington West Hickman WWTP) Sanitary Sewer Upgrade:

Narrative Requirements:

Condition No.	Condition
T-1	The work approved by this certification shall be limited to 37.985156, -84.486583: - Installation of a new sewer line in Lexington near Tates Creek Rd - Four crossings across West Hickman Creek and one crossing across an Unnamed Intermittent Tributary of West Hickman Creek - Sewer pipe (18" and 24" diameter) installed using an open trench method - 285 linear feet of temporary impacts to perennial streams for trenching - 44 linear feet of temporary impacts to intermittent streams for trenching This condition is necessary to confirm activities approved by this certification. [401 KAR 10:030 Section 1, 401 KAR 9:010 Section 1(a)(2), KRS 224.10-100, KRS 224.70-110]
T-2	All work performed under this certification shall adhere to the design and specifications set forth in the following document(s): - Application for Permit to Construct Across or Along a Stream and/or Water Quality Certification received on 6/23/2025 - Pre-file Meeting Request received on 6/23/2025 - Certification Request received on 9/29/2025 - WQCApplicationAmended1209 signed.pdf - ATTACHMENTS bookmarked.pdf - 5C____ 200126 Sanitary_Merrick-plans and BMPS.pdf - xmit email _LRL-2021-00937.msg - NOD_1_Merrick_Trunk_Line_AI_2295.pdf - 2295_Two_Week_Notice_Letter_31July2025.pdf - Two_Week_Notice_Email_Merrick_Trunk_Line_AI_2295.pdf - RE_NOD_1_Merrick_Trunk_Line_AI_2295.pdf - Merrick_Trunk_Line_Map Series_1-7.pdf This condition is necessary to confirm activities approved by this certification. [401 KAR 10:030 Section 1, 401 KAR 9:010 Section 1(a)(2), KRS 224.10-100, KRS 224.70-110]
T-3	LFUCG is responsible for preventing degradation of waters of the Commonwealth from soil erosion. An erosion and sediment control plan must be designed, implemented, and maintained in effective operating condition at all times during construction. This condition is necessary to prevent and minimize objectionable deposits and pollution and protect the use of the stream. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]

ACTV0000000025 (AI 2295 - Lexington West Hickman WWTP) Sanitary Sewer Upgrade:

Narrative Requirements:

Condition No.	Condition
T-4	No in-stream operations or activities shall be conducted during fish spawning season (April 1 through June 30), due to the potential impacts of increased sediment load and associated water quality and designated aquatic habitat impacts. This condition is necessary to monitor the aquatic resources, minimize impact to aquatic resources, protect the use and designation of resources, allow more effective and efficient control practices, identify changes and conditions in ecological systems as a result of activities, and to warn of emergency conditions. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 4(1)(c,h), KRS 224.10-100, KRS 224.70-110]
T-5	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 where such instream work is unavoidable, then it shall be performed in such a manner and duration as to minimize re-suspension of sediments and disturbance to the channel, banks, or riparian vegetation. This condition is necessary to prevent and minimize objectionable deposits and pollution and protect the use of the stream. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]
T-6	Erosion and sediment 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. This condition is necessary to prevent and minimize objectionable deposits and pollution and protect the use of the stream. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]
T-7	Remove all sediment and erosion control measures after re-vegetation has become well-established. This condition is necessary to prevent and minimize objectionable deposits and pollution and protect the use of the stream. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]
T-8	Any fill or riprap shall be of a composition that shall not cause violations of water quality standards by adversely affecting the biological, chemical, or physical properties of waters of the Commonwealth. If riprap is used, it shall be of a weight and size that bank stress or slump conditions shall not occur. This condition is necessary to prevent and minimize objectionable deposits and pollution and protect the use of the stream. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]
T-9	Sediment and erosion control measures (e.g., check-dams, silt fencing, or hay bales) 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, placement shall not be conducted in such a manner that may cause instability of streams that are adjacent to, upstream, or downstream of the structures. All sediment and erosion control measures shall be removed and the natural grade restored prior to withdrawal from the site. This condition is necessary to prevent and minimize objectionable deposits and pollution and protect the use of the stream. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]
T-10	Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse. This condition is necessary to prevent water pollution as prohibited by statute. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]

ACTV0000000025 (AI 2295 - Lexington West Hickman WWTP) Sanitary Sewer Upgrade:

Narrative Requirements:

Condition No.	Condition
T-11	To the maximum extent practicable, all in-stream work under this certification shall be performed during low flow. This condition is necessary to prevent and minimize objectionable deposits and pollution and protect the use of the stream. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]
T-12	Removal of existing riparian vegetation shall be restricted to the minimum necessary for project construction. This condition is necessary to minimize negative effects to the environment, protect the use of the stream, and protect aquatic resources. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]
T-13	Should stream pollution, 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 800/564-2380. This condition is necessary to monitor the aquatic resources, minimize impact to aquatic resources, protect the use and designation of resources, allow more effective and efficient control practices, identify changes and conditions in ecological systems as a result of activities, and to warn of emergency conditions. [401 KAR 10:030 Section 1, 401 KAR 10:031 Section 2(1)(a), KRS 224.10-100, KRS 224.70-110]
T-14	This Water Quality Certification expires on September 30, 2030. This condition is necessary for the issuance of the certification. [KRS 224.10-100, KRS 224.16-050(2), KRS 224.70-110]
T-15	Other permits from the Division of Water may be required for this activity. If this activity occurs within a floodplain, a Permit to Construct Across or Along a Stream may be required. Please contact the Floodplain Management Section Supervisor (502-564-3410) for more information prior to construction. If the project will disturb one acre or more of land, or is part of a larger common plan of development or sale that will ultimately disturb one acre or more of land, a Kentucky Pollution Discharge Elimination System (KPDES) Stormwater Permit shall be required. Please contact the Surface Water Permits Branch (502-564-3410 or SWPBSupport@ky.gov) for more information. A Groundwater Protection Plan is required if any of the activities listed in Section 2(2) of 401 KAR 5:037 are conducted. A Water Withdrawal Application is required for any activities proposing raw water withdrawals of 10,000 gallons per day or more. For technical assistance contact the Watershed Management Branch at 502-564-3410 or visit eec.ky.gov. This condition is necessary for confirm authorized impacts, the appropriate responsible party, monitor the aquatic resources, minimize impact to aquatic resources, protect the use and designation of resources, allow more effective and efficient control practices, identify changes and conditions in ecological systems as a result of activities, and to warn of emergency conditions. [KRS 224.10-100, KRS 224.16-050(2), KRS 224.70-110]

ACTV0000000025 (AI 2295 - Lexington West Hickman WWTP) Sanitary Sewer Upgrade:

Narrative Requirements:

Condition No.	Condition
T-16	If there is a transfer or conveyance of the project site during the issued WQC term for the approved activity, LFUCG shall submit written notice to the Water Quality Certification Section Project Manager or Supervisor of the transfer or conveyance of the project site or any part of the project site at least 60 days prior to the transfer or conveyance of the project site. The notification shall include the WQC number; the Agency Interest (AI) No.; the name, mailing address, email address, and telephone number of the current owner; the name, mailing address, email address, and telephone number of the prospective transferee; the proposed effective date of transfer/conveyance; and a copy of the documentation evidencing the transfer/conveyance. Failure to comply with this condition does not negate the validity or enforceability of this certification. This condition is necessary for confirm authorized impacts, the appropriate responsible party, monitor the aquatic resources, minimize impact to aquatic resources, protect the use and designation of resources, allow more effective and efficient control practices, identify changes and conditions in ecological systems as a result of activities, and to warn of emergency conditions. [401 KAR 10:030 Section 1, 401 KAR 9:010 Section 1(a)(2), KRS 224.10-100, KRS 224.70-110]

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING JR PL
LOUISVILLE, KY 40202

October 23, 2025

Regulatory Division
South Branch
ID No. LRL-2021-00937

Mr. Robert Peterson
Lexington-Fayette Urban County Government
(LFUCG)
125 Lisle Industrial Avenue
Lexington, Kentucky 40511

Dear Mr. Peterson:

This is in response to your request for authorization to temporarily impact 44 linear feet of an intermittent UT and 285 linear feet of perennial West Hickman Creek for the open trench installation of 18" and 24" sanitary sewer lines as part of the Lexington West Hickman Merrick Trunk Line Project. The proposed project would be located along Tates Creek in Lexington, Fayette County, Kentucky (Latitude: 37.985156°N, Longitude: -84.486583°W). The information supplied by your agent, Stantec Consulting Services, Inc., was reviewed to determine whether a Department of the Army (DA) permit will be required under the provisions of Section 404 of the Clean Water Act.

Your project includes a discharge of dredged or fill material into waters of the United States associated with the construction, maintenance, repair, and removal of utility lines for water and other substances. The project is authorized under the provisions of 33 CFR 330 Nationwide Permit (NWP) No. 58, Utility Line Activities for Water and Other Substances, as published in the Federal Register January 13, 2021. Under the provisions of this authorization, you must comply with the enclosed Terms and General Conditions for NWP No. 58, and the following Special Condition(s):

> The Permittee shall comply with all conditions of the Section 401 Water Quality Certification No. 2025-098-1, dated September 30, 2025, issued by the Kentucky Division of Water, which are incorporated herein by reference.

This verification is valid until the NWP is modified, reissued, or revoked. NWP No. 58 will be modified, reissued, or revoked on March 14, 2026. It is incumbent upon LFUCG to remain informed of changes to the NWPs. If you commence or are under contract to commence this activity before the date that the relevant NWP is modified or revoked, you will have 12 months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this NWP. The enclosed Compliance Certification 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. Please note that we also perform periodic inspections to ensure compliance with our permit conditions and applicable Federal laws. A copy of this letter will be forwarded to your agent and to the KDOW.

If you have any questions, please contact us by writing to the District Regulatory Office at the above address, ATTN: CELRL-RDS, or contact me directly at (606) 784-9709 or

Crystal.D.Byrd@usace.army.mil. Any correspondence on this matter should refer to our ID Number LRL-2021-00937.

Sincerely,

Crystal Byrd

Crystal Byrd
Project Manager, South Branch
Regulatory Division

Enclosures

COORDINATING AGENCY

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2021 Nationwide Permit Summary

US Army Corps of Engineers
Louisville District ®

Issued: **March 15, 2021**
Expires: **March 14, 2026**

No. 58. Utility Line Activities for Water and Other Substances

(NWP Final Rule, 86 FR 2744)

Activities required for the construction, maintenance, repair, and removal of utility lines for water and other substances, excluding oil, natural gas, products derived from oil or natural gas, and electricity. Oil or natural gas pipeline activities or electric utility line and telecommunications activities may be authorized by NWPs 12 or 57, respectively. This NWP also authorizes associated utility line facilities in waters of the United States, provided the activity does not result in the loss of greater than 1/2-acre of waters of the United States for each single and complete project.

Utility lines: This NWP authorizes discharges of dredged or fill material into waters of the United States and structures or work in navigable waters for crossings of those waters associated with the construction, maintenance, or repair of utility lines for water and other substances, including outfall and intake structures. There must be no change in pre-construction contours of waters of the United States. A "utility line" is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose that is not oil, natural gas, or petrochemicals. Examples of activities authorized by this NWP include utility lines that convey water, sewage, stormwater, wastewater, brine, irrigation water, and industrial products that are not petrochemicals. The term "utility line" does not include activities that drain a water of the United States, such as drainage tile or french drains, but it does apply to pipes conveying drainage from another area.

Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect). Any exposed slopes and stream banks must be stabilized immediately upon completion of the utility line crossing of each waterbody.

Utility line substations: This NWP authorizes the construction, maintenance, or expansion of substation facilities associated with a utility line in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not result in the loss of greater than 1/2-acre of waters of the United States. This NWP does not authorize discharges of dredged or fill material into non-tidal wetlands adjacent to tidal waters of the United States to construct, maintain, or expand substation facilities.

Foundations for above-ground utility lines: This NWP authorizes the construction or maintenance of foundations for above-ground utility lines in all waters of the United States, provided the foundations are the minimum size necessary.

Access roads: This NWP authorizes the construction of access roads for the construction and maintenance of utility lines, including utility line substations, in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges of dredged or fill material into non-tidal wetlands adjacent to tidal waters for access roads. Access roads must be the minimum width necessary (see Note 2, below). Access roads must be constructed so that the length of the road minimizes any adverse effects on waters of the United States and must be as near as possible to pre-construction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above pre-construction contours and elevations in waters of the United States must be properly bridged or culverted to maintain surface flows.

This NWP may authorize utility lines in or affecting navigable waters of the United States even if there is no associated discharge of dredged or fill material (see 33 CFR part 322). Overhead utility lines constructed over section 10 waters and utility lines that are routed in or under section 10 waters without a discharge of dredged or fill material require a section 10 permit.

This NWP authorizes, to the extent that Department of the Army authorization is required, temporary structures, fills, and work necessary for the remediation of inadvertent returns of drilling fluids to waters of the United States through sub-soil fissures or fractures that might occur during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines. These remediation activities must be done as soon as practicable, to restore the affected waterbody. District engineers may add special conditions to this NWP to require a remediation plan for addressing inadvertent returns of drilling fluids to waters of the United States during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the utility line 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 of dredged or fill material, 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 construction, 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.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) a section 10 permit is required; or (2) the discharge will result in the loss of greater than 1/10-acre of waters of the United States. (See general condition 32.) (Authorities: Sections 10 and 404)

Note 1: Where the utility line is constructed, installed, or maintained in navigable waters of the United States (i.e., section 10 waters) within the coastal United States, the Great Lakes, and United States territories, a copy of the NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), for charting the utility line to protect navigation.

Note 2: For utility line activities crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Utility line activities must comply with 33 CFR 330.6(d).

Note 3: Access roads used for both construction and maintenance may be authorized, provided they meet the terms and conditions of this NWP. Access roads used solely for construction of the utility line must be removed upon completion of the work, in accordance with the requirements for temporary fills.

Note 4: Pipes or pipelines used to transport gaseous, liquid, liquescent, or slurry substances over navigable waters of the United States are considered to be bridges, not utility lines, and may require a permit from the U.S. Coast Guard pursuant to the General Bridge Act of 1946. However, any discharges of dredged or fill material into waters of the United States associated with such pipelines will require a section 404 permit (see NWP 15).

Note 5: This NWP authorizes utility line maintenance and repair activities that do not qualify for the Clean Water Act section 404(f) exemption for maintenance of currently serviceable fills or fill structures.

Note 6: For activities that require pre-construction notification, the PCN must include 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 crossings that require Department of the Army authorization but do not require pre-construction notification (see paragraph (b)(4) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, "District Engineer's Decision." The district engineer may require mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see general condition 23).

Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his or her 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. If a bottomless culvert cannot be used, then the crossing should be designed

and constructed to minimize adverse effects to aquatic life movements.

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 Structures and Fills. Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued. 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 NWP 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. Permittees 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 or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed

for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify designated critical habitat or critical habitat proposed for such designation. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or critical habitat has been completed. See 50 CFR 402.02 for the definition of "effects of the action" for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding "activities that are reasonably certain to occur" and "consequences caused by the proposed action."

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). 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 to the district engineer if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat or critical habitat proposed for such designation, 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 species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation), the pre-construction notification must include the name(s) of the endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or that utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. For activities where the non-Federal applicant has identified listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) 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 that the proposed activity will have "no effect" on listed species (or species proposed for listing or designated critical habitat (or critical habitat proposed for such designation), or until ESA section 7 consultation or conference has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation or conference with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.

(e) Authorization of an activity by an 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 FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) 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 coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA 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 pre-construction notification 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 FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.nmfs.noaa.gov/pr/species/esa/ respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring that an action authorized by an NWP complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are

necessary or appropriate to reduce adverse effects 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) No activity is authorized under any NWP which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places 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 (see 33 CFR 330.4(g)(1)). 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 NWP 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 commensurate with potential impacts, which may include background research, consultation, oral history interviews, sample field investigation, and/or 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 effects 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, or adverse effect.

(d) Where the non-Federal applicant has identified historic properties on which the proposed NWP activity might have the potential to cause effects and has so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. 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 permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine

monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, 52, 57 and 58 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after she or he determines 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 environmental effects of the proposed activity are no more than minimal, and provides an activity-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 only minimal adverse environmental effects.

(d) Compensatory mitigation at a minimum one-for-one ratio will be required for all losses of stream bed that exceed 3/100-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 environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. This compensatory mitigation requirement may be satisfied through the restoration or enhancement of riparian areas next to streams in accordance with paragraph (e) of this general condition. For losses of stream bed of 3/100-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 only 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. If restoring riparian areas involves planting vegetation, only native species should be planted. 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 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 environment 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 NWPs, 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.

(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)). If permittee-responsible mitigation is the proposed option, and the proposed compensatory mitigation site is located on land in which another federal agency holds an easement, the district engineer will coordinate with that federal agency to determine if proposed compensatory mitigation project is compatible with the terms of the easement.

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan needs to address only the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

(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 (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity 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 no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or 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 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 or federal, 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. (a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401, a CWA section 401 water quality certification for the proposed discharge must be obtained or waived (see 33 CFR 330.4(c)). If the permittee cannot comply with all of the conditions of a water quality certification previously issued by certifying authority for the issuance of the NWP, then the permittee must obtain a water quality certification or waiver for the proposed discharge in order for the activity to be authorized by an NWP.

(b) If the NWP activity requires pre-construction notification and the certifying authority has not previously certified compliance of an NWP with CWA section 401, the proposed discharge is not authorized by an NWP until water quality certification is obtained or waived. If the certifying authority issues a water quality certification for the proposed discharge, the permittee must submit a copy of the certification to the district engineer. The discharge is not authorized by an NWP until the district engineer has notified the permittee that the water quality certification requirement has been satisfied by the issuance of a water quality certification or a waiver.

(c) The district engineer or certifying authority 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)). If the permittee cannot comply with all of the conditions of

a coastal zone management consistency concurrence previously issued by the state, then the permittee must obtain an individual coastal zone management consistency concurrence or presumption of concurrence in order for the activity to be authorized by an NWP. The district engineer or a state may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its CWA 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 authorized, subject to the following restrictions:

(a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot 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.

(b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a commercial development is constructed under NWP 39, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the commercial development under NWP 39 cannot exceed 1/2-acre, and the total acreage loss of waters of United States due to the NWP 39 and 46 activities cannot exceed 1 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 activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity 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 review by, or 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 and/or review is not authorized by an NWP until the appropriate Corps office issues the section 408 permission or completes its review to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification. (a) *Timing*. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the

information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, 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. 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 NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) (i) 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 the 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 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.

(ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by an NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project, and does not change those non-PCN NWP activities into NWP PCNs.

(iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity 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 and intermittent 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 or 3/100-acre of stream bed 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 species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat (or critical habitat proposed for such designation), the PCN must include the name(s) of those endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or utilize

the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. For NWP activities that require 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. For NWP activities that require pre-construction notification, 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 NWP activity that requires permission from, or review by, 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, or review by, the Corps office having jurisdiction over that USACE project.

(c) *Form of Pre-Construction Notification*: The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. 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 activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) 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 (iii) 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 in tidal waters or the ordinary high water mark in the Great Lakes.

(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 that 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 pre-construction notifications to expedite agency coordination.

2021 District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the single and complete crossings of waters of the United States that require PCNs to determine whether they

individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings of waters of the United States authorized by an NWP. If an applicant requests a waiver of an applicable limit, as provided for in NWPs 13, 36, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by an NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters. The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure that the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) that the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

2021 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).

2021 Nationwide Permit Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term "discharge" means any discharge of dredged or fill material into waters of the United States.

Ecological reference: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An ecological reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. The loss of stream bed includes the acres of stream bed that are permanently adversely affected by filling or excavation because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters or wetlands for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

Navigable waters: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Perennial stream: A perennial stream has surface water flowing continuously year-round during a typical year.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands next to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term "single and complete project" is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of "independent utility"). Single and complete non-linear projects may not be "piecemealed" to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the

purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized jurisdictional stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

Tribal lands: Any lands title to which is either: 1) held in trust by the United States for the benefit of any Indian tribe or individual; or 2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

Tribal rights: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a "water of the United States." If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)).

2021 KENTUCKY REGIONAL GENERAL CONDITIONS

These regional conditions are in addition to, but do not supersede, the requirements in the Federal Register (See volume 86, date January 13, 2021, pp 2867-2874 for the text of Section C, General Conditions).

Notifications for all Nationwide Permits (NWPs) shall be in accordance with General Condition No. 32.

1. For activities that would result in a loss of Outstanding State or National Resource Waters (OSNRWs), Exceptional Waters (EWs), Coldwater Aquatic Habitat Waters (CAHs) and waters with Designated Critical Habitat (DCH) under the Endangered Species Act for the NWPs listed below, a Pre-Construction Notification (PCN) will be required to the Corps. The Corps will coordinate with the appropriate resource agencies (see attached list) on these NWPs for impacts to these waters.

   NWP 3 (Maintenance)
   NWP 4 (Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities)
   NWP 5 (Scientific Measurement Devices)
   NWP 6 (Survey Activities)
   NWP 12 (Oil or Natural Gas Pipeline Activities)
   NWP 13 (Bank Stabilization)
   NWP 14 (Linear Transportation Projects)
   NWP 15 (U.S. Coast Guard Approved Bridges)
   NWP 16 (Return Water from Upland Contained Disposal Areas)
   NWP 17 (Hydropower Projects)
   NWP 18 (Minor Discharges)
   NWP 19 (Minor Dredging)
   NWP 20 (Response Operations for Oil or Hazardous Substances)
   NWP 22 (Removal of Vessels)
   NWP 23 (Approved Categorical Exclusions)
   NWP 25 (Structural Discharges)
   NWP 30 (Moist Soil Management for Wildlife)
   NWP 32 (Completed Enforcement Actions)
   NWP 33 (Temporary Construction, Access, and Dewatering)
   NWP 36 (Boat Ramps)
   NWP 41 (Reshaping Existing Drainage Ditches)
   NWP 51 (Land-Based Renewable Energy Generation Facilities)
   NWP 57 (Electric Utility Line and Telecommunications Activities)
   NWP 58 (Utility Line Activities for Water and Other Substances)

2. In addition to the notification and agency coordination requirements in the NWPs, for impacts greater than 0.25 acres in all "waters of the U.S." for the NWPs listed below, a PCN will be required to the Corps. The Corps will coordinate with the appropriate resource agencies (see attached list) on these NWPs:

NWP 3 (Maintenance)
NWP 14 (Linear Transportation Projects)

3. Nationwide Permit No. 14 – Linear Transportation Projects.

(a) New road alignments or realignments are limited to a permanent loss of 500 linear feet of intermittent or perennial stream length or the stream bed acreages listed in the table below at each crossing. Road crossings with permanent losses greater than 500 linear feet of intermittent or perennial stream or the stream bed acreages listed in the table below associated with new alignments or realignments will be evaluated as an individual permit (i.e., a Letter of Permission or Standard Permit).

Table of Acreages at Varying Stream Widths for 500 Linear Feet of Impact	
Stream Width (Feet)	Acres of Stream at Varying Widths for 500 Linear Feet of Stream
1	0.011
2	0.023
3	0.034
4	0.046
5	0.057
6	0.069
7	0.080
8	0.092
9	0.103
10	0.115

(b) In addition to the notification requirements contained in NWP 14, the permittee must submit a PCN to the district engineer prior to commencing the activity for the permanent loss of greater than 300 linear feet of stream bed or the stream bed acreages listed in the table below. (See General Condition 32 and the definition of "loss of waters of the United States" in the Nationwide Permits for further information.)

Table of Acreages at Varying Stream Widths for 300 Linear Feet of Impact	
Stream Width (Feet)	Acres of Stream at Varying Widths for 300 Linear Feet of Stream
1	0.007
2	0.014
3	0.021
4	0.028
5	0.034
6	0.041
7	0.048
8	0.055
9	0.062
10	0.069

4. Notification in accordance with General Condition 32 is required to the Corps for all activities located in the following Section 10 waterways, to include the portion of their tributaries below the Ordinary High Water Mark or navigation pool, or otherwise subject to inundation, by the Section 10 waterway:

- Mississippi River
- Ohio River
- Licking River
- Kentucky River
- Salt River
- Green River
- Cumberland River
- Tennessee River
- Big Sandy River (from mouth to Louisa, KY)

5. All applications and requests should be submitted electronically. To submit applications or other requests electronically, all documents should be saved as a PDF document, and then submitted as an attachment in an email to the following email address:

CELRL.Door.To.The.Corps@usace.army.mil

Your email should include the following:
a) Subject Line with the name of the applicant, type of request, and location (County and State). Example: RE: Doe, John, DA Permit Application, Jefferson County, KY
b) Brief description of the request and contact information (phone number, mailing address, and email address) for the applicant and/or their agent.

c) Project Location: Address and Latitude/Longitude in decimal degrees (e.g. 42.927883, -88.362576).

All forms that require signature must be digitally signed or signed manually, scanned and then sent electronically.

Electronic documents must have sufficient resolution to show project details. In order to have the highest quality documents, the original digital documents should be converted to PDF rather than providing scanned copies of original documents.

The electronic application and attached documents must not exceed 10 megabytes (10MB).

6. For all activities, the applicant shall review the U.S. Fish and Wildlife Service's IPaC website: http://ecos.fws.gov/ipac to determine if the activity might affect threatened and/or endangered species or designated critical habitat. If federally-listed species or designated critical habitat are identified, a PCN in accordance with General Condition 18 and 32 would be triggered and the official species list generated from the IPaC website must be submitted with the PCN.

Further information:

Outstanding State or National Resource Water (OSNRWs), Exceptional Waters (EWs), and Coldwater Aquatic Habitat Waters (CAHs) are waters designated by the Commonwealth of Kentucky, Natural Resources and Environmental Protection Cabinet. The list can be found at the following link: http://eppcapp.ky.gov/spwaters/

Designated Critical Habitat (DCH) under the Endangered Species Act is determined within the Commonwealth of Kentucky by the U.S. Fish and Wildlife Service. The current list of Kentucky's Threatened, Endangered, and Federal Candidate Species can be found at the following link: http://www.fws.gov/frankfort/EndangeredSpecies.html

Information on Pre-Construction Notification (PCN) can be found at NWP General Condition No. 32 in the Federal Register (See volume 86, date January 13, 2021, pp 2867-2874 for the text of Section C, General Conditions).

COORDINATING RESOURCE AGENCIES

Chief, Wetlands Regulatory Section
U.S. Environmental Protection Agency
Region IV
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303

Supervisor
U.S. Fish & Wildlife Service
JC Watts Federal Building, Room 265
330 West Broadway
Frankfort, Kentucky 40601

Supervisor
401 Water Quality Certification
Kentucky Division of Water
300 Sower Boulevard, 3rd Floor
Frankfort, KY 40601

Commissioner
Department of Fish and Wildlife Resources
#1 Sportsman's Lane
Frankfort, KY 40601

Executive Director and State Historic Preservation Officer
Kentucky Heritage Council
410 High Street
Frankfort, KY 40601

Katie Beard

From: Baker, Robert A (KYTC-D07) <RobertA.Baker@ky.gov>
Sent: Thursday, October 2, 2025 8:09 AM
To: Katie Beard
Subject: RE: Merrick Trunk Encroachment Permit extension

Katie,

We do not have documentation for the extension. An email is all we send. I am ok with the extension of the permit for 1 year. Thanks.

Thanks,
Robert A. Baker, P.E.

KYTC, District 7 Permit Engineer
800 Newtown Court
Lexington, KY 40511

Office: (859) 246-2355
Email: RobertA.Baker@ky.gov

From: Katie Beard <katie.beard@primeeng.com>
Sent: Thursday, October 2, 2025 7:22 AM
To: Baker, Robert A (KYTC-D07) <RobertA.Baker@ky.gov>
Subject: RE: Merrick Trunk Encroachment Permit extension

Do you have any documentation of the permit extension that I can put in our bid documents?

Thanks,

Katie Beard, PE
Senior Project Manager

PRIME AE
Trust Is Built.

Phone # (Direct) – 859-305-8433
Phone # (Mobile) – 502-330-3125
1.833.723.4768 (Toll-Free)
katie.beard@primeeng.com

651 Perimeter Drive, Suite 300
Lexington, KY 40517
www.primeeng.com

From: Baker, Robert A (KYTC-D07) <RobertA.Baker@ky.gov>
Sent: Tuesday, September 23, 2025 10:51 AM

APPROVED

KENTUCKY TRANSPORTATION CABINET
Department of Highways
PERMITS BRANCH

TC 99-1A
Rev. 10/2020

7-14-2022

APPLICATION FOR ENCROACHMENT PERMIT

KYTC KEPT #: 07-2022-00116

SECTION 1: APPLICANT CONTACT INFORMATION

APPLICANT LFUCG DWQ	**ADDRESS** 125 Lisle Industrial		
EMAIL	**CITY** Lexington	**STATE** KY	**ZIP** 40511
CONTACT NAME 1 Robert Peterson	**EMAIL** rpeterson@lexingtonky.gov	**PHONE #** 859-425-2400 **CELL #**	
CONTACT NAME 2 *(if applicable)*	**EMAIL**	**PHONE #** **CELL #**	

SECTION 2: PROPOSED WORK LOCATION

ADDRESS Tates Creek Rd (KY 1974) near KY 4	**CITY** Lexington KY 1974 9.118-9.455		**STATE** Kentucky	**ZIP** 40517
COUNTY Fayette	**ROUTE #** ~~KY 1974/KY 4~~	**MILE POINT** ~~9.1x9.4/17.8~~	**LONGITUDE** (*X*) 84°29'40"W	**LATITUDE** (*Y*) 37°59'14"N

ADDITIONAL LOCATION INFORMATION:
Crossing Tates Creek Road/KY 1974, ~ 9.1 Mile Point & crossing KY 4 (off & on Ramp) ~ 9.4 M.P., including KY 4 ~ 17.8

FOR KYTC USE ONLY

PERMIT TYPE: ☒ Air Right ☐ Entrance ☒ Utilities ☐ Vegetation Removal ☐ Other: _____

ACCESS: ☐ Full ☐ Partial ☒ by Permit **LOCATION:** ☐ Left ☐ Right ☒ Crossing

SECTION 3: GENERAL DESCRIPTION OF WORK

Installation of 24" sanitary sewer trunk main, including steel casing pipe. The casing pipe will be installed by tunneling, @ four locations. Construction method "Jack & Bore" will be utitlized to tunnel underneath Tates Creek Rd./KY 1974 ~ Mile Point 9.1, New Circle Rd./KY 4 off & on ramp ~ Mile Point 9.4, & including New Circle Rd./KY 4 ~ Mile Point 17.8. See attached plans for more details.

THE UNDERSIGNED APPLICANT(s), being duly authorized representative(s) or owner(s), DO AGREE TO ALL ORIGINAL UNEDITED TERMS AND CONDITIONS ON THE TC 99-1A, pages 1-4.

Robert C Peterson — **SIGNATURE**

3/14/2022 — **DATE**

This is not a permit unless and until the applicant(s) receives an approved TC 99-1B from KYTC. This application shall become void if not approved by the cancellation date. The cancellation date shall be a minimum of one year from the date the applicant submits their application.

APPLICATION FOR ENCROACHMENT PERMIT

TERMS AND CONDITIONS

1. The permit, including this application and all related and accompanying documents and drawings making up the permit, remains in effect and is binding upon the Applicant/Permittee, its successors and assigns, as long as the encroachment(s) exists and also until the permittee is finally relieved by the Department of Highways from all its obligations.

2. Applicant shall meet all requirements of the Clean Water Act if the project will disturb one acre or more, the applicant shall obtain a KPDES KYR10 Permit from the Kentucky Division of Water. All disturbed areas shall meet the requirements of the Department of Highway's Standard Specifications, Sections 212 and 213, as amended.

3. **INDEMNITY:**
   - **A.** PERFORMANCE BOND: The permittee shall provide to the Department a performance bond according to the Permits Manual, Section PE-203 as a guarantee of conformance with the Department's Encroachment Permit requirements.
   - **B.** PAYMENT BOND: At the discretion of the department, a payment bond shall be required of the permittee to ensure payment of liquidated damages assessed to the permittee.
   - **C.** LIABILITY INSURANCE: Liability insurance shall be required of the permittee (in an amount approved by the department) to cover all liabilities associated with the encroachment.
   - **D.** It shall be the responsibility of the permittee, its successors and assigns, to maintain all indemnities in full force and effect until the permittee is authorized to release the indemnity by the Department.

4. A copy of this application and all related documents making up the approved permit shall be given to the applicant and shall be made readily available for review at the work site at all times.

5. Perpetual maintenance of the encroachment is the responsibility of the permittee, its successors and assigns, with the approval of the Department as required, unless otherwise stated.

6. Permittee, its successors and assigns, shall comply with and agree to be bound by the requirements and terms of (a) this application and all related documents making up the approved permit, (b) by the Department's Permits Manual, and (c) by the Manual on Uniform Traffic Control Devices, both manuals as revised to and in effect on the date of issuance of the permit, all of which documents are made a part thereof by this reference. Compliance by the permittee, its successors and assigns, with subsequent revisions to applicable provisions of either manual or other policy of the Department may be made a condition of allowing the encroachment to persist under the permit.

7. Permittee agrees that this and any encroachment may be ordered removed by the Department at any time, and for any reason, upon thirty days written notice to the last known address of the applicant or to the address at the location of the encroachment. The permittee agrees that the cost of removing and of restoring the associated right-of-way is the responsibility of the permittee, its successors and assigns.

8. Permittee, its successors and assigns, agree that if the Department determines that motor vehicular safety deficiencies develop as a result of the installation or use of the encroachment, the permittee, its successors and assigns, shall provide and bear the expenses to adjust, relocate, or reconstruct the facilities, add signs, auxiliary lanes, or other corrective measures reasonably deemed necessary by the Department within a reasonable time after receipt of a written notice of such deficiency. The period within which such adjustments, relocations, additions, modifications, or other corrective measures must be completed will be specified in the notice.

9. Where traffic signals are required as a condition of granting the requested permit or are thereafter required to correct motor vehicular safety deficiencies, as determined by the Department, the costs for signal equipment and installation(s) shall be borne by the permittee, its successors and assigns and the Department in its reasonable discretion and only in accordance with the Department's current policy set forth in the Traffic Operations Manual and Permits Manual. Any modifications to the permittee's entrance necessary to accommodate signalization (including necessary easement(s) on private property) shall be the responsibility of the permittee, its successors and assigns, at no expense to the Department.

APPLICATION FOR ENCROACHMENT PERMIT

10. The requested encroachment shall not infringe on the frontage rights of an abutting owner without their written consent as hereinafter described. Each abutting owner shall express their consent, which shall be binding on their successors and assigns, by the submission of a notarized statement as follows, "I (we), _____, hereby consent to the granting of the permit requested by the applicant along Route _____, which permit does affect frontage rights along my (our) adjacent real property." By signature(s) _____, subscribed and sworn by _____, on this date _____.

11. The permit, if approved, is subject to the agreement that it shall not interfere with any similar rights or permit(s) previously granted to any other party, except as otherwise provided by law.

12. Permittee shall include documentation which describes the facilities to be constructed. Permittee, its successors and assigns, agree as a condition of the granting of the permit to construct and maintain any and all permitted facilities or other encroachments in strict accordance with the submitted and approved permit documentation and the policies and procedures of the Department. Permittee, its successors and assigns, shall not use facilities authorized herein in any manner contrary to that prescribed by the approved permit. Only normal usage as contemplated by the parties and by this application and routine maintenance are authorized by the permit.

13. Permittee, its successors and assigns, at all times from the date permitted work is commenced until such time as all permitted facilities or other encroachments are removed from the right-of-way and the right-of-way restored, **shall defend, protect, indemnify and save harmless** the Department from any and all liability claims and demands arising out of the work, encroachment, maintenance, or other undertaking by the permittee, its successors and assigns, related or undertaken pursuant to the granted permit, due to any claimed act or omission by the permittee, its servants, agents, employees, or contractors. This provision shall not inure to the benefit of any third party nor operate to enlarge any liability of the Department beyond that existing at common law or otherwise if this right to indemnity did not exist.

14. Upon a violation of any provision of the permit, or otherwise in its reasonable discretion, the Department may require additional action by the permittee, its successors and assigns, up to and including the removal of the encroachment and restoration of the right-of-way. In the event additional actions required by the Department under the permit are not undertaken as ordered and within a reasonable time, the Department may in its discretion cause those or other additional corrective actions to be undertaken and the Department shall recover the reasonable costs of those corrective actions from the permittee, its successors and assigns.

15. Permittee, its successors and assigns, shall use the encroachment premises in compliance with all requirements of federal law and regulation, including those imposed pursuant to Title VI of the Civil Right Act of 1964 (42 U.S.C. § 2000d et seq.) and the related regulations of the U.S. Department of Transportation in Title 49 C.F.R. Part 21, all as amended.

16. Permittee, its successors and assigns, agree that if the Department determines it is necessary for the facilities or other encroachment authorized by the permit to be removed, relocated or reconstructed in connection with the reconstruction, relocation or improvement of a highway, the Department may revoke permission for the encroachment to remain under the permit and may order its removal, relocation or reconstruction by the permittee, its successors and assigns, at the expense of the permittee, except where the Department is required by law to pay any or all of those costs.

APPLICATION FOR ENCROACHMENT PERMIT

17. Permittee agrees that the authorized permit is personal to the permittee and shall remain in effect until such time as (a) the permittee's rights to the adjoining real property to have benefitted from the requested encroachment have been relinquished, (b) until all permit obligations have been assumed by appropriate successors and assigns, and (c) unless and until a written release from permit obligations has been granted by the Department. The permit and its requirements shall also bind the real property to have benefitted from the requested encroachment to the extent permitted by law. The permit and the related encroachment become the responsibility of the successors and assigns of the permittee and the successors and assigns of each property owner benefitting from the encroachment, or the encroachment may not otherwise permissibly continue to be maintained on the right-of-way. (Does not apply to utility encroachments serving the general public.)

18. If work authorized by the permit is within a highway construction project in the construction phase, it shall be the responsibility of the permittee to make personal contact with the Department's Engineer on the project in order to coordinate all permitted work with the Department's prime contractor on the project.

19. This permit is not intended to, nor shall it, affect, alter or alleviate any requirement imposed upon the permittee, its successors and assigns, by any other agency.

20. Permittee, its successors and assigns, agree to contain and maintain all dirt, mud, and other debris emanating from the encroachment away from the surrounding right-of-way and the travel way of the highway hereafter and at all times that its obligations under the permit remain in effect.

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

22. The undersigned Utility acknowledges ownership and control of the facilities proposed to be installed, modified, or extended by the Applicant/Permittee and agrees to be bound by the requirements and terms of this application and all related documents making up the approved permit, by the Department's Permits Guidance Manual, and by all applicable regulations and statutes in effect on the date of issuance of the permit. This information and application is certified correct to the best knowledge and belief of the undersigned Utility.

LFUCG Sanitary Sewer
UTILITY

Robert Peterson
NAME (Utility Representative)

Remedial Measures Project Manager
TITLE (Utility Representative)

SIGNATURE (Utility Representative)

3/14/2022
DATE

Kentucky 811 Know what's below. Call before you dig.

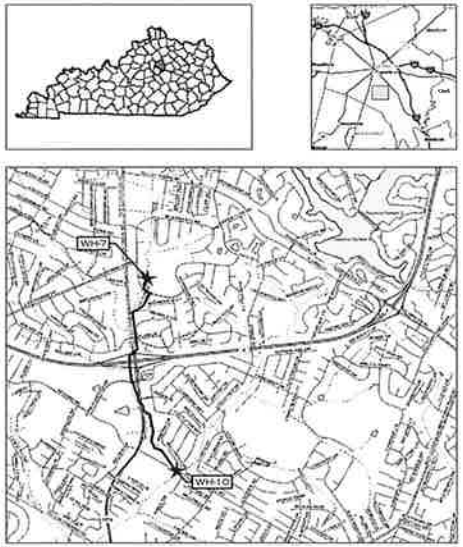
To Submit a Locate Request
24 Hours a Day, Seven Days a Week:
Call 811 or 800-752-6007

NOT FOR CONSTRUCTION

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
MERRICK TRUNK SEWER IMPROVEMENTS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH- 7
LFUCG BID NO. XX-2022

VICINITY MAP

LEXINGTON, KY



OWNER

LEXINGTON

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
DIVISION OF WATER QUALITY
125 LISLE INDUSTRIAL
LEXINGTON, KY 40511
PHONE (859) 425-2255
WWW.LEXINGTONKY.GOV

PRIME AE®

651 PERIMETER DRIVE SUITE 310
LEXINGTON, KY 40517
PHONE (859) 368-0145
WWW.PRIMEENG.COM

SHEET INDEX

SHEET NUMBER	SHEET NAME
COV	COVER SHEET
C-01-C-02	RMP GENERAL NOTES
SI1	PROJECT MAP
CE11 - CE17	PROPOSED SANITARY SEWER PLAN & PROFILE
CC1 - CC2	CC - CREEK CROSSING
SD1 - SD6	RMP STANDARD DETAILS

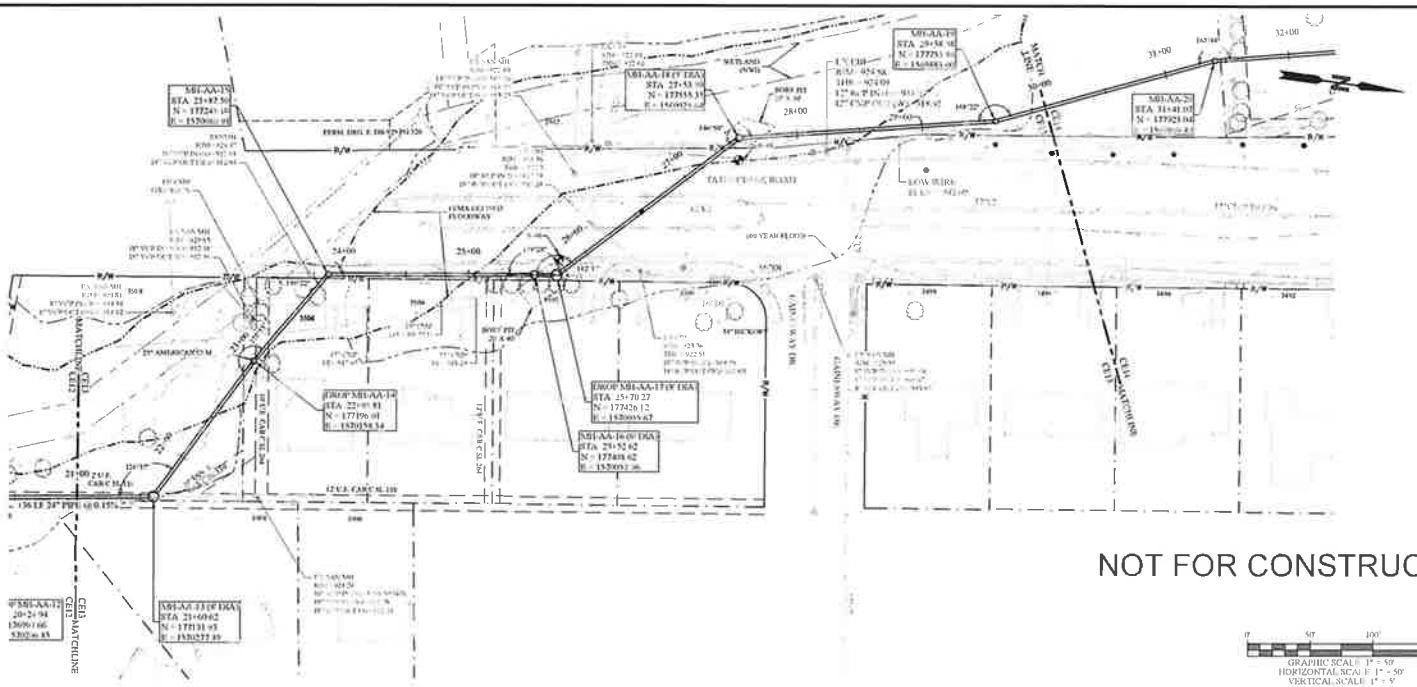
REVISION/SUBMITTAL LOG

NO.	DATE	REVISION/SUBMITTAL
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2	02/25/2022	KYTC ENCROACHMENT PERMIT

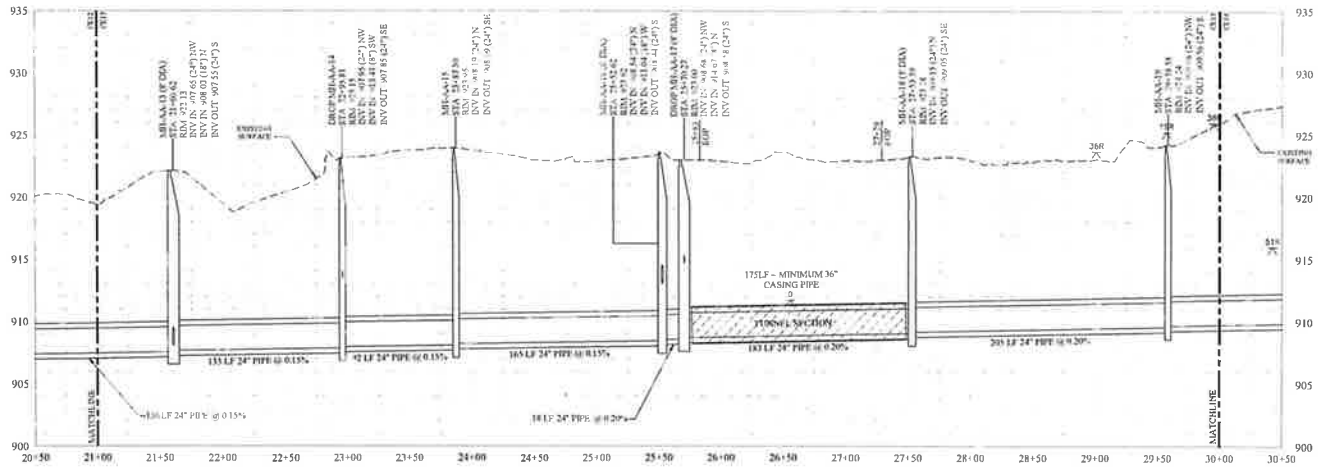
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02/25/2022

SHEET NO.
COV

200126 MERRICK TRUNK SEWER IMPROVEMENTS - WH-7



Line "AA"



PRIME AE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
DIVISION OF WATER QUALITY
SEWER IMPROVEMENTS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WM-7
LFUCG BID NO. XX-2022

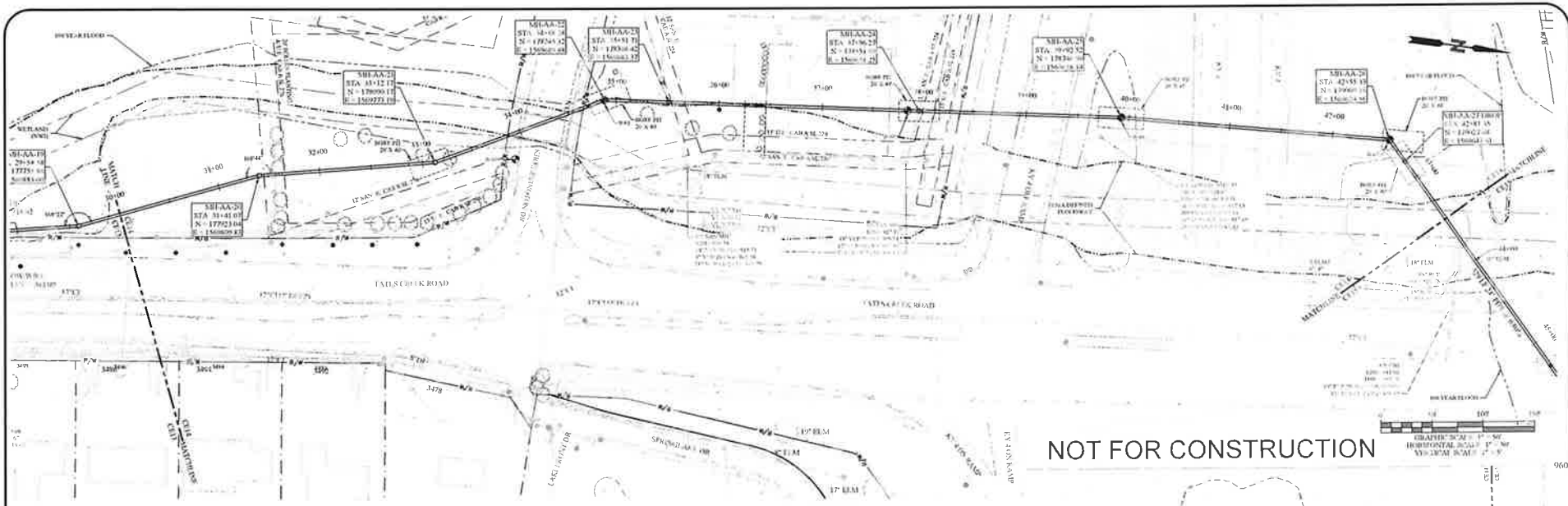
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DATE: FEBRUARY 2022
DRAWN BY: KWH
CHECKED BY:

DESCRIPTION OF REVISION

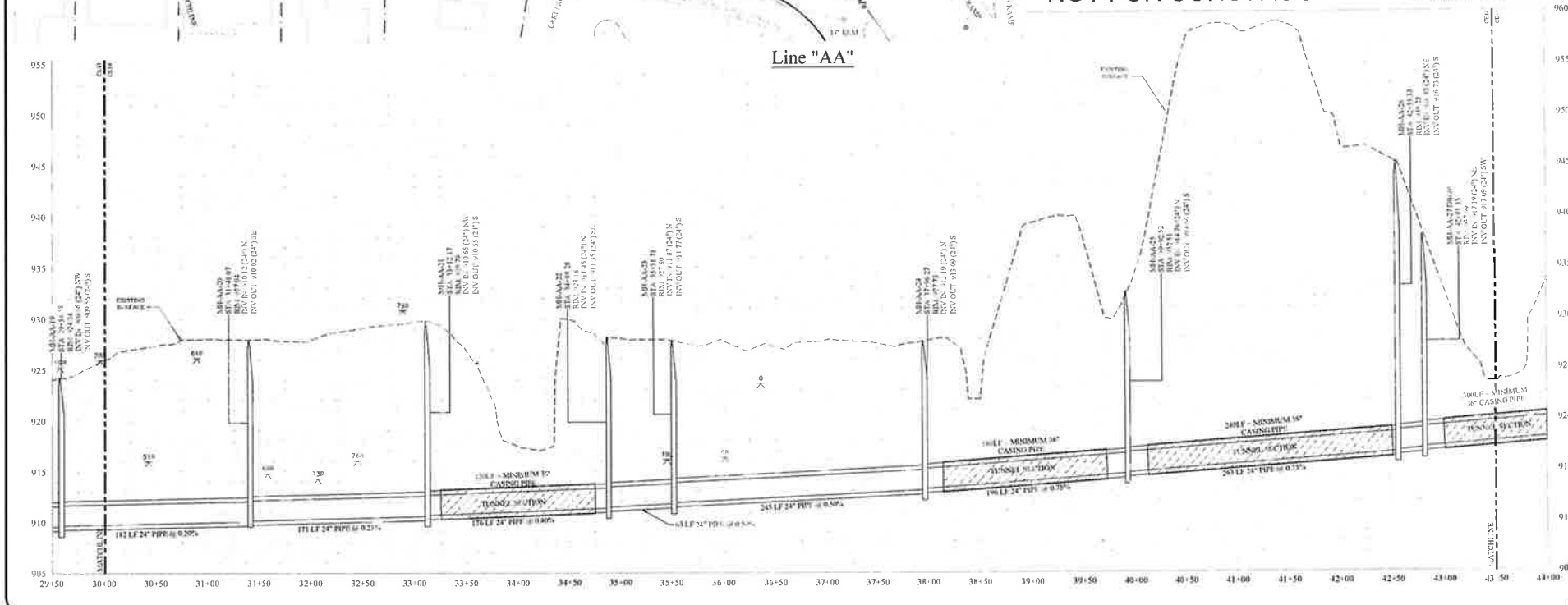
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PROPOSED SANITARY SEWER PLAN & PROFILE

SHEET NO.: CE13



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PRIME AE

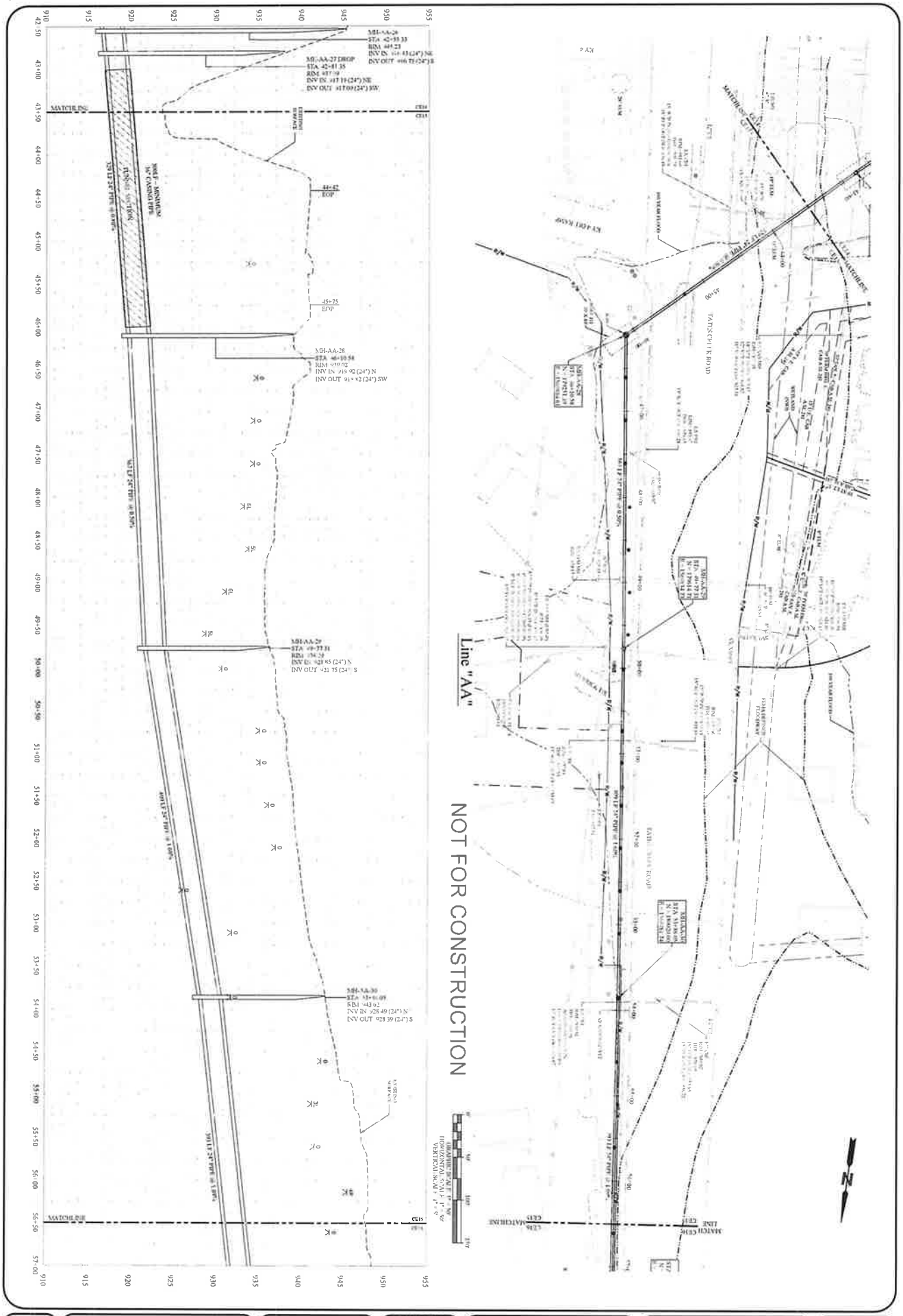
LEXINGTON FAYETTE URBAN COUNTY GOVERNMENT
MEMPHIS TRUNK
SEWER IMPROVEMENTS
DIVISION OF WATER QUALITY
REMEDIAL MEASURE PLAN NO. WW47
LFUCG BID NO. XX-2022

PROJECT NO.: 200126
DATE: FEBRUARY 2022
DRAWN BY: KWH
CHECKED BY:

DESCRIPTION OF REVISION

PROPOSED SANITARY SEWER
PLAN & PROFILE

SHEET NO.
CE14



CE 15

PROPOSED SANITARY SEWER
PLAN & PROFILE

DESCRIPTION OF REVISION

PROJECT NO.:
200126
DATE:
FEBRUARY 2022
DRAWN BY:
KWH
CHECKED BY:

LEXINGTON-FAYETTE URAN COUNTY GOVERNMENT
MERRICK TRUNK
SEWER IMPROVEMENTS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH-7
LFUCG BID NO. XX-2022

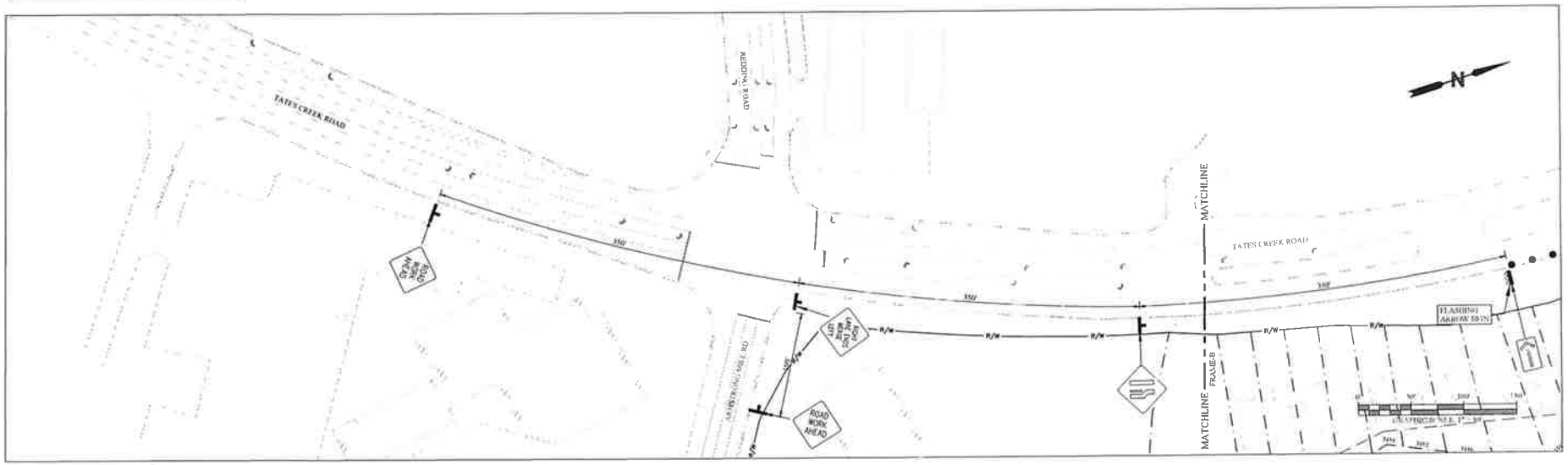
PRIME AE®

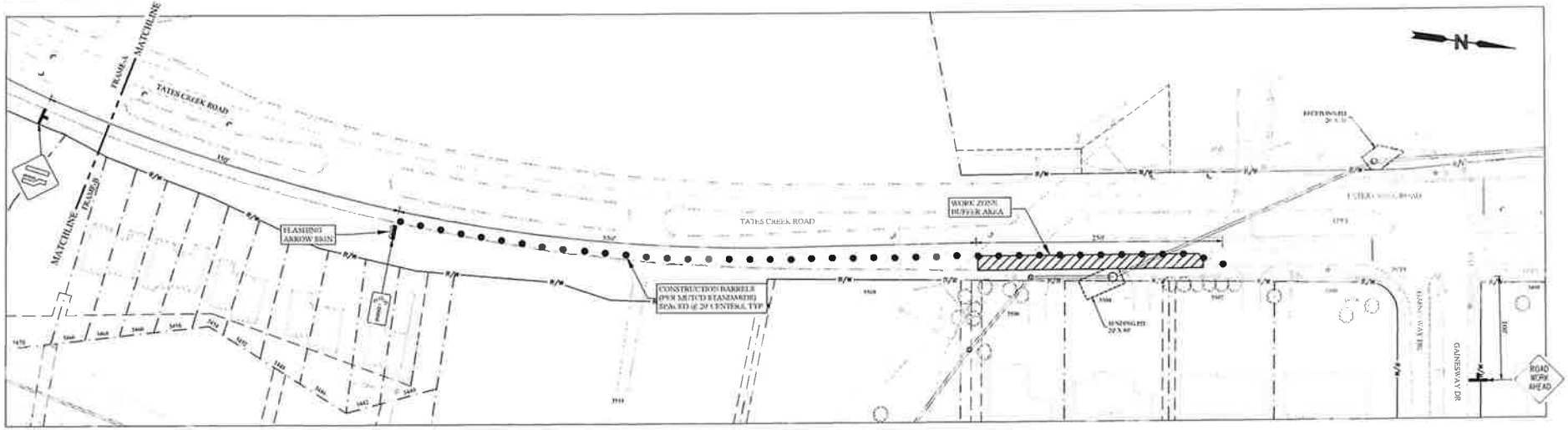
SEAL

MOT LEGEND

SINGLE LANE CLOSURE PER MUTCD

NOT FOR CONSTRUCTION





PRIME AE

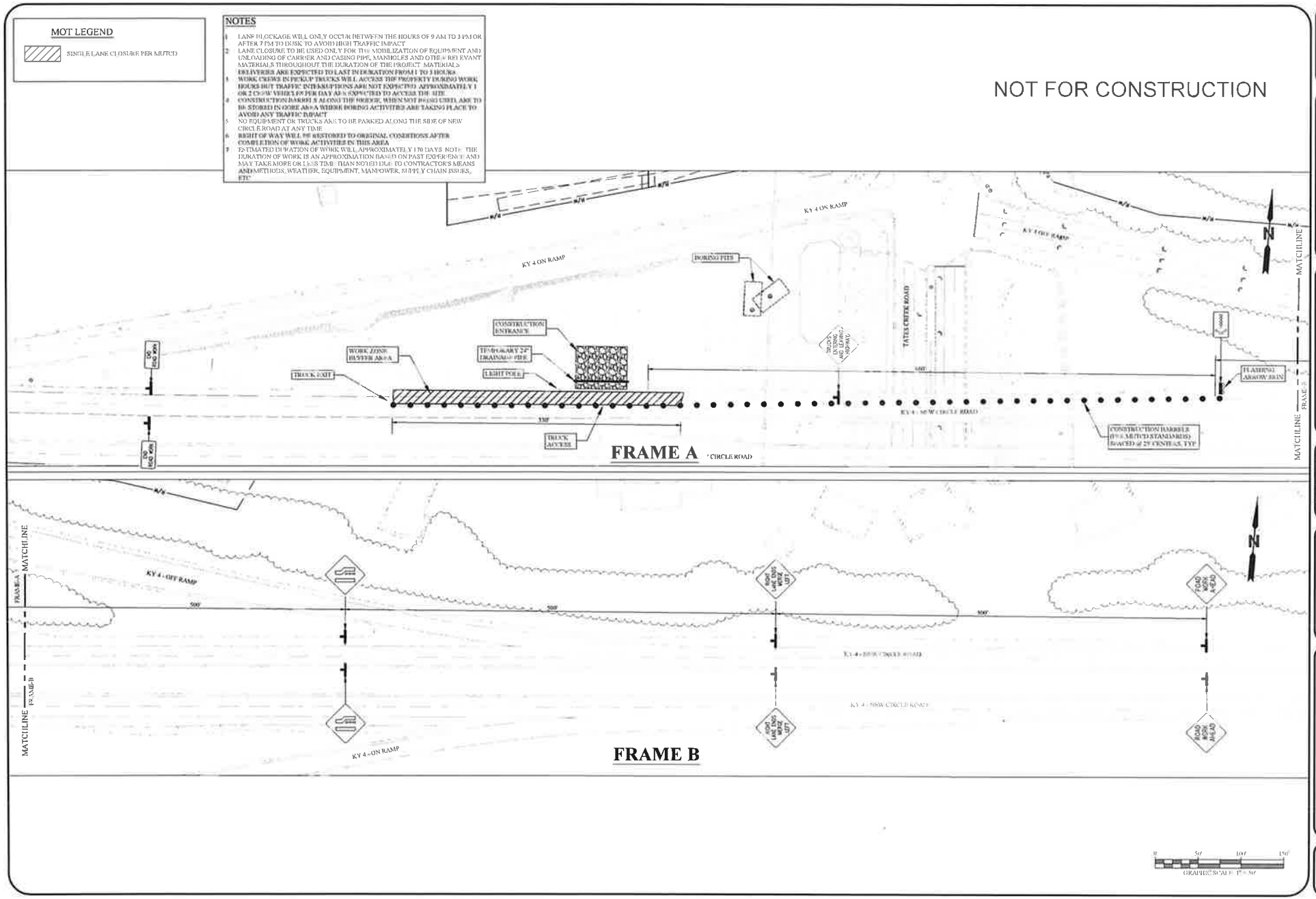
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
MERRICK TRUNK
SEWER IMPROVEMENTS
DIVISION OF WATER QUALITY
REMEDIAL MEASURE PROJECTS WH47
LFUCG BID NO. XX-2022

PROJECT NO.: 20012a
DATE: JULY 2022
DRAWN BY: KVH
CHECKED BY:

DESCRIPTION OF REVISION

MAINTENANCE OF TRAFFIC

SHEET NO.
MT 1



FRAME A ' CIRCLE ROAD

FRAME B

PRIME AE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH-7
LFUCG BID NO. XX-2022

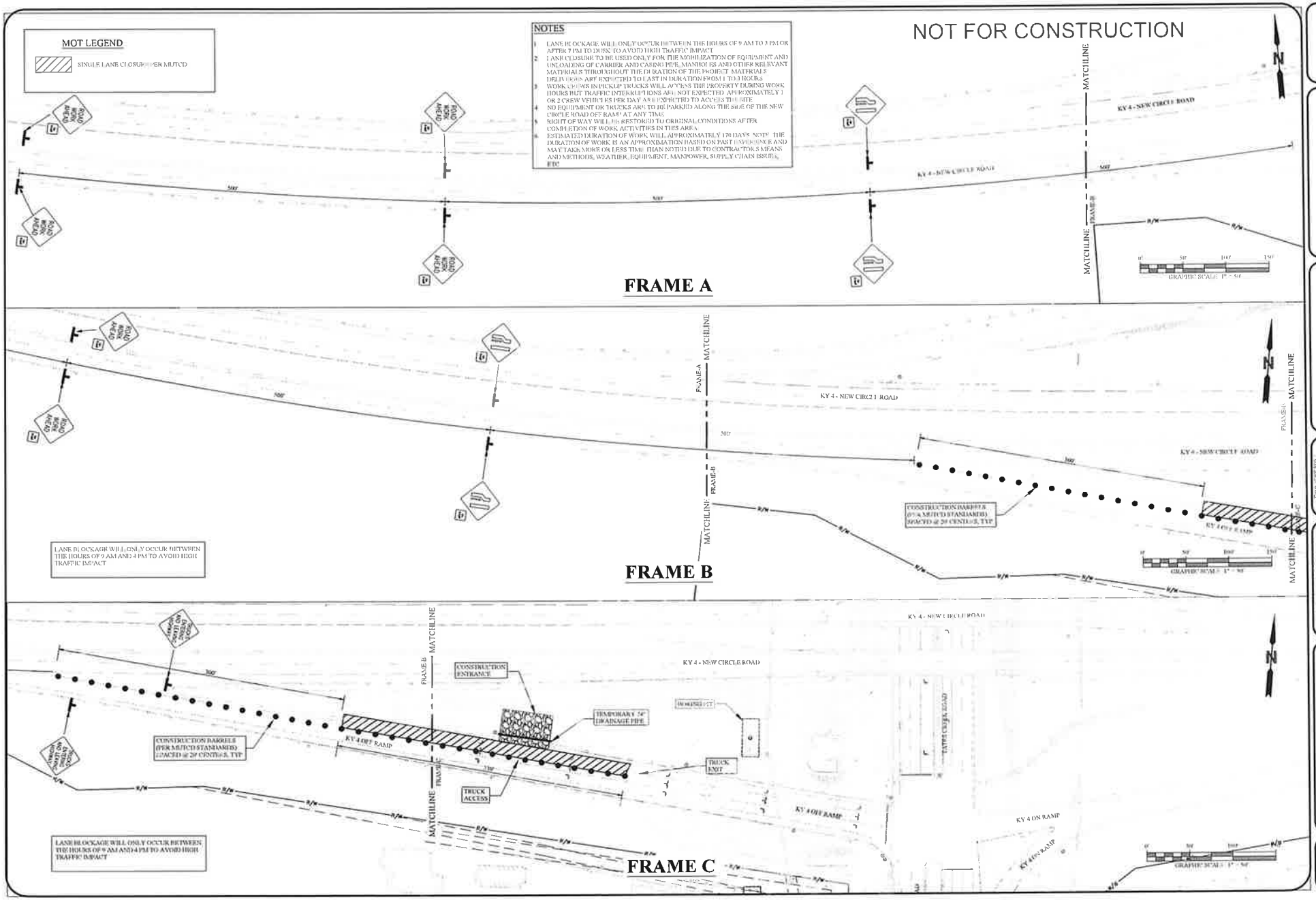
PROJECT NO.: 200126
DATE: JULY 2022
DRAWN BY: KWH
CHECKED BY:

DESCRIPTION OF REVISION

MAINTENANCE OF TRAFFIC

SHEET NO.: MT4

NOT FOR CONSTRUCTION



FRAME A

FRAME B

FRAME C

PRIME AE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
MERRICK TRUNK
SEWER IMPROVEMENTS
DIVISION OF WATER QUALITY
REMOVAL OF SANITARY SEWER CSO WH-7
LFUCG Bid No. XX-2022

PROJECT NO.: 200126
DATE: JULY 2022
DRAWN BY: KWH
CHECKED BY:

DESCRIPTION OF REVISION

MAINTENANCE OF TRAFFIC

SHEET NO.
MT5

KENTUCKY TRANSPORTATION CABINET
Department of Highways
DIVISION OF MAINTENANCE - PERMITS BRANCH

TYPICAL HIGHWAY BORE DETAIL
- FOR NON-FULLY CONTROLLED HIGHWAYS -

KYTC KEPT #: _____

SECTION 1: HIGHWAY INFORMATION

COUNTY	ROUTE	MILE POINT	PAVEMENT WIDTH

SECTION 2: UTILITY INFORMATION

UTILITY TYPE	PIPE TYPE	DIAMETER

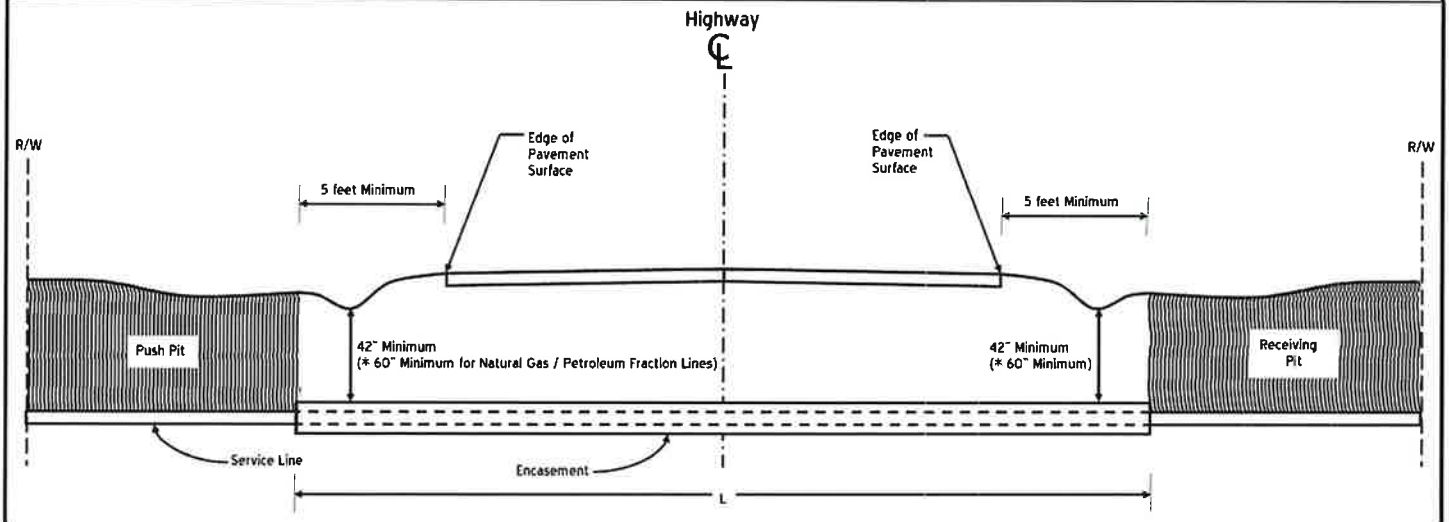
SECTION 3: ENCASEMENT INFORMATION

ENCASEMENT TYPE	DIAMETER

SECTION 4: BORE INFORMATION

BORE TYPE	LENGTH (L)	DIAMETER

SECTION 5: DETAIL FOR NON-FULLY CONTROLLED HIGHWAYS



SECTION 6: GENERAL NOTES

- Push Pit and Receiving Pit shall be backfilled and thoroughly compacted.
- All ditch lines are to remain open at all times and restored to original condition.
- Shape, Seed and Straw all disturbed areas immediately after completing the work.
- Provide traffic control as required to insured the safety of the traveling public in accordance with the current edition of the *Manual on Uniform Traffic Control Devices*.
- The minimum depth for underground utilities is **42"** under roadways, ramps, and ditch lines, except for natural gas and petroleum fraction lines which shall have a minimum of **60"** cover.
- See KYTC Permits Manual for all requirements and specifications.

ENCROACHMENT PERMIT GENERAL NOTES & SPECIFICATIONS

Permit No. ROAD BORE

I. SAFETY

A. General Provisions

☒ All signs and control of traffic shall be in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition, Part VI, and safety requirements shall comply with the Permits Manual.

☒ All work necessary in shoulder or ditch line areas of a state highway shall be scheduled to be promptly completed so that hazards adjacent to the traveled way are kept to an absolute minimum.

☒ No more than one (1) traveled-lane shall be blocked or obstructed during normal working hours. All signs and flaggers during lane closure shall conform to the Manual on Uniform Traffic Control Devices.

☒ When necessary to block one (1) traveled-lane of a state highway, the normal working hours shall be as directed by the Department. No lanes shall be blocked or obstructed during adverse weather conditions (rain, snow, fog, etc.) without specific permission from the Department. Working hours shall be between 9:00 a.m. and 3:30 p.m.

☒ The traveled-way and shoulders shall be kept clear of mud and other construction debris at all times during construction of the permitted facility.

☒ No nonconstruction equipment or vehicles or office trailers shall be allowed on the right of way during working hours.

☒ The right of way shall be left free and clear of equipment, material, and vehicles during non-working hours.

B. Explosives

☒ No explosive devices or explosive material shall be used within state right of way without proper license and approval of the Kentucky Department of Mines and Minerals, Explosive Division.

C. Other Safety Requirements

☒ All workers within right-of-way shall wear high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107-2004 publication entitled "American National Standard for Safety Apparel and Headwear"

II. UTILITIES - *Applies to Fully Controlled Access Highways ONLY

☐ *All work necessary within the right of way shall be performed behind a temporary fence erected prior to a boring operation.

☐ *The temporary woven wire fence shall be removed immediately upon completion of work on the right of way, and the control of access immediately restored to original condition, in accordance with applicable Kentucky Department of Highways Standard Drawings.

☐ *All vents, valves, manholes, etc., shall be located outside of the right-of-way.

☐ *Encasement pipe shall extend from right-of-way line to right-of-way line and shall be one continuous run of pipe. The encasement pipe shall be welded at all joints.

☒ The boring pit and tail ditch shall extend past the existing toe of slope or bottom of ditch line and shall be a minimum of 42 inches deep.

Permit No. ROAD BORE

II. UTILITIES (Continued)

☒ Encasement pipe pipe shall conform to current standards for highway crossings in accordance with the Permits Manual.

☒ Parallel lines shall be constructed between back slope of ditch line and right-of-way line and shall have a minimum of 30-inch cover above top of pipe or conduit.

☐ All pavement cuts shall be restored per Kentucky Transportation Cabinet form TC 99-13.

☐ Aerial crossing of this utility line shall have a minimum clearance of _____ feet from the high point of the roadway to the low point of the line (calculated at the coefficient for expansion of 120 degrees Fahrenheit).

☒ The 30-foot clear zone requirement shall be met to the extent possible in accordance with the Permits Manual.

☐ Special requirements.

III. GENERAL

A. OSHA

☒ Kentucky Occupational Safety and Health Standards for the construction industry, which has the effect of law, states in part (Page 52, 1926.651, Specific Excavation Requirements) "Prior to opening an excavation, effort shall be made to determine whether underground installations (sewer, telephone, water fuel, electric lines, etc.) will be encountered, and if so, where such underground installations are located. When the excavation approaches the estimated location of such an installation, the exact location shall be determined, and when it is uncovered proper supports shall be provided for the existing installation. Utility companies shall be contacted and advised of proposed work prior to the start of actual excavation."

B. Archaeological

☒ Whenever materials of an archaeological nature are discovered during the course of construction work or maintenance operations, contact shall be made immediately with the Division of Environmental Analysis, which maintains an archaeologist on staff, or with the Office of the State Archaeologist located at the University of Kentucky. Following this consultation, further action shall be decided on a case by case basis by the State Highway Engineer or the Transportation Planning Engineer or their designated representative.

C. Utilities in the Work Areas

☒ The permittee shall be responsible for any damage to existing utilities, and any utility modifications or relocations within state right of way necessary, as determined by the Department or by the owner of the utility, shall be at the expense of the permittee and subject to the approval of the Department.

☒ All existing manholes and valve boxes shall be adjusted to be flush with finished grade.

D. Environmental

☒ If the activity to which this permit relates disturbs one acre or more of land, you must obtain a KPDES (KYR10) permit.

Websites:

http://www.waterky.gov/permitting/wastewaterpermitting/KPDES.htm

Inspectors for KPDES KYR10 at www.KEPSC.org

Permit No. ROAD BORE

IV. RIGHT OF WAY RESTORATION

☒ All disturbed portions of the right of way shall be restored to grass as per Kentucky Department of Highways Standard Specifications for Road and Bridge Construction (latest edition). A satisfactory turf, as determined by the Department, shall be established by the permittee prior to release of indemnity. Sodding or seeding shall be as follows:

Lawn or High Maintenance Situation	70% Lawn Fescue (e.g., variety - Falcon) 30% Bluegrass or 70% Lawn Rye (e.g., variety - Derby) 30% Bluegrass
Right of Way Lawn Maintenance Situation	70% KY 31 Fescue 30% Perennial Rye Grass or 100% KY Fescue

☐ Two tons of clean straw mulch per acre of seeding.

☒ Prior to seeding, the ground shall be prepared in accordance with Kentucky Department of Highways Standard Specifications for Road and Bridge Construction (latest edition).

☒ Substitutes for sod such as artificial turf, rocked mulch, or paved areas may be acceptable if they are aesthetically pleasing.

☒ All ditch-flow lines and all ditch-side slopes shall be sodded.

☒ Existing concrete right of way markers shall not be disturbed, but if damaged in any way, they shall be entirely replaced by the permittee, with new concrete markers to match the original markers, in accordance with Kentucky Department of Highways Standard Drawings. Markers that are entirely removed shall be re-established in the proper locations by the permittee and to the satisfaction of the Department.

☐ Other right of way restoration requirements are as follows:

V. DRAINAGE

☒ All pipe shall be laid in a straight alignment, to proper grades, and with all materials and methods of installation including bedding and joint seating in accordance with Department Standard Specifications for Road and Bridge Construction (latest edition). Pipe shall not be covered until inspected by the Department and express permission obtained to make backfill.

☒ All gutter lines at the base of new curbs shall be on continuous grades, and pockets of water along with curbs or in entrance areas or other paved areas within the right of way shall not be acceptable.

☒ All drainage structures and appurtenances (manholes, catch basins, curbing, inlet basins, etc.) shall conform to Department specifications and shall be constructed in accordance with the Department Standard Drawings. Type required:

_____

_____

NOTICE TO PERMITTEE

THE PERMITTEE AGREES THAT ALL WORK WITHIN THE EXISTING RIGHT OF WAY SHALL BE DONE IN ACCORDANCE WITH THE PLANS AS APPROVED AND PERMITTED BY AN ENCROACHMENT PERMIT. ANY CHANGES OR VARIANCES MADE AT THE TIME OF CONSTRUCTION WITHOUT WRITTEN APPROVAL FROM THE DEPARTMENT OF HIGHWAYS SHALL BE REMOVED BY THE PERMITTEE AT NO EXPENSE TO THE DEPARTMENT OF HIGHWAYS AND SHALL BE REDONE BY THE PERMITTEE TO CONFORM WITH THE APPROVED PLANS.

Kentucky Transportation Cabinet
Department of Highways
Division of Maintenance
Permits Branch

ENCROACHMENT PERMIT

KYTC KEPT #: 07-2022-00116

Permittee: LFUGC DWC

Permit Type / Subtype: Utilities / Sewer

Work Completion Date: 1/1/2023

INDEMNITIES		
Type	**Amount Required**	**Tracking Number**
Performance Bond	$0.00	
Cash / Check	$0.00	
Self-Insured	$20,000.00	0009633
Payment Bond	$0.00	
Liability Insurance	$0.00	

This permit has been: **APPROVED** [X] **DENIED** [ ]

Daniel Kucela	D7 Engineering Support - TEBM	7/12/2022
SIGNATURE	**TITLE**	**DATE**

The TC 99-1(B), including the application TC-99 1(A) and all related and accompanying documents and drawings make up the permit. It is not a permit unless both the TC 99-1(A) and TC 99-1(B) are both present.

LOCATION(S)			
Description	**County - Route**	**Latitude**	**Longitude**
	Fayette - KY 1974	37.986789	-84.494137

Kentucky 811. Know what's below. Call before you dig

To Submit a Locate Request
24 Hours a Day, Seven Days a Week:
Call 811 or 800-752-6007

Andy Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-2150
Fax: 502-564-4245

Rebecca W. Goodman
SECRETARY

Anthony R. Hatton
COMMISSIONER

July 14, 2025

Robert Peterson
125 Lisle Industrial Ave
Lexington, KY 40511

Re: Merrick Trunk Sewer Improvements
Jessamine County, Kentucky
Lexington West Hickman WWTP
Activity ID #: 2295, APE20250011
Receiving Treatment Plant KPDES #: KY0021504

Dear Mr. Peterson:

We have reviewed the plans and specifications for the above referenced project. The plans include the construction of approximately 7193 linear feet of 30 inch PVC sanitary sewer line. This is to advise that plans and specifications for the above referenced project are APPROVED with respect to sanitary features of design, as of this date with the requirements contained in the attached construction permit.

If we can be of any further assistance or should you wish to discuss this correspondence, please do not hesitate to contact Henry Kwok at (502) 782 - 4170.

Sincerely,

KM

Ken Melton, P.E.
Supervisor, Clean Water Engineering Section
Signed by: Ken Melton
Water Infrastructure Branch
Division of Water

KM / HK
Enclosures
c: Fayette County Health Department
Prime AE Group Inc
Division of Plumbing
Lexington

Sewer Line Construction
Lexington West Hickman WWTP
Facility Requirements

Activity ID No.:APE20250011

GACT0000000195 (Merrick Truck Sewer Improvements) 7193 linear feet of 30 inch PVC sanitary sewer line:

Submittal/Action Requirements:

Condition No.	Condition
S-1	When this project is completed, the applicant shall: submit written certification: Due 30 calendar days after Completion of Construction to the Division of Water that the facilities have been constructed and tested in accordance with the approved plans and specifications and the approval conditions. Such certification shall be signed by a registered professional engineer. Failure to certify may result in penalty assessment and/or future approvals being withheld. [401 KAR 5:005 Section 24(2)]

Narrative Requirements:

Condition No.	Condition
T-1	The plans and specifications submitted for the project are approved by the Department of Environmental Protection as to sanitary features, subject to the requirements contained within the permit. [401 KAR 5:005 Section 24(3)]
T-2	Authority to construct these sewers is hereby granted. This approval is issued under the provisions of KRS Chapter 224.10-100 (19) regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any permits or licenses required by this cabinet and other state, federal, and local agencies. [401 KAR 5:005 Section 24(3)(c)2]
T-3	A permit to construct a facility shall be effective and valid for twenty-four (24) months upon issuance unless otherwise conditioned. If construction has not commenced within twenty-four (24) months following a permit's issuance, a new permit shall be obtained before construction may begin. [401 KAR 5:005 Section 24(1)]
T-4	The permit is issued to the applicant, and the permittee shall remain the responsible party for compliance with all applicable statutes and administrative regulations until a notarized applicable change in ownership certification is submitted and the transfer of ownership is acknowledged by the cabinet. [401 KAR 5:005 Section 28(1)]
T-5	The issuance of a permit by the cabinet does not convey any property rights of any kind or any exclusive privilege. [401 KAR 5:005 Section 24(5)]
T-6	There shall be no deviations from the plans and specifications submitted with the application or the conditions specified, unless authorized in writing by the cabinet. [401 KAR 5:005 Section 24(3)(b)1]

GACT0000000195 (Merrick Truck Sewer Improvements) 7193 linear feet of 30 inch PVC sanitary sewer line:

Narrative Requirements:

Condition No.	Condition
T-7	For subfluvial pipe crossings, a floodplain construction permit will not be required pursuant to KRS 151.250, if the following requirements of 401 KAR 4:050 Section 2 are met: 1) During the construction of the crossing, no material may be placed in the stream or in the flood plain of the stream to form construction pads, coffer dams, access roads, etc., unless prior approval has been obtained from the cabinet. 2) The trench shall be backfilled as closely as possible to the original contour. All excess material from construction of the trench shall be disposed of outside of the flood plain, unless the applicant has received prior approval from the cabinet to fill within the flood plain. 3) For subfluvial crossings of erodible channels, there shall be at least thirty (30) inches of clear cover above the top of the pipe or conduit at all points. 4) For subfluvial crossings of nonerodible channels, there shall be at least six (6) inches of clear cover above the top of the pipe or conduit at all points, and the pipe or conduit shall be encased on all sides by at least six (6) inches of concrete. 5) The weight of a pipe and its contents during normal operating conditions at all points must exceed that of an equal volume of water, or the applicant must provide the division with sufficient information to show that the pipe and joints have sufficient strength. Contact the Floodplain Management Section of the Surface Water Permits Branch at (502) 564-3410 with any question on these requirements. [KRS 151.250 & 401 KAR 4:060]
T-8	If any portion of the sewer project will be constructed in or along a stream or wetland, contact the Water Quality Certification Section, located within the Water Quality Branch, at 502-564-3410, to determine if a 401 certification will be required. [KRS 224.16-050]
T-9	Facilities shall be designed and constructed in accordance with the "Recommended Standards for Wastewater Facilities" of the Great Lakes-Upper Mississippi River Board of State Public Health and Environmental Managers, commonly referred to as "Ten States' Standards", 2014 edition. [401 KAR 5:005 Section 7(1)(a)]
T-10	Gravity sewer lines and force mains shall be designed and constructed to give mean velocities, when flowing full, of not less than two (2) feet per second. Velocity calculations shall incorporate roughness coefficients pursuant to 401 KAR 5:005 Section 8(8). [401 KAR 5:005 Section 8(8)]
T-11	Sewer line pipe material, joints, fittings, and installation shall conform to the latest ASTM specifications. [Ten States (WW) 33.7-33.9]
T-12	Gravity sewer lines and force mains shall have a minimum of thirty (30) inches of cover or provide comparable protection. [401 KAR 5:005 Section 8(9)]

GACT0000000195 (Merrick Truck Sewer Improvements) 7193 linear feet of 30 inch PVC sanitary sewer line:

Narrative Requirements:

Condition No.	Condition
T-13	Sewer lines crossing water mains shall be laid to provide a vertical distance of eighteen (18) inches between the outside of the water main and the outside of the sewer line. This shall be the case where the water main is either above or below the sewer line. The crossing shall be arranged so that the sewer line joints are equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer line to prevent damage to the water main. [Ten States (WW) 38.32]
T-14	Sewer lines shall be laid at least ten (10) feet horizontally from any existing or proposed water main. The distance shall be measured from edge to edge. [Ten States (WW) 38.31]
T-15	If gravity sewer lines and force mains are to be constructed in fill areas, the fill areas shall be compacted to ninety-five (95) percent density as determined by the Standard Proctor Density test or to a minimum of ninety (90) percent density as determined by the Modified Proctor Density test prior to the installation of the sewer lines. [401 KAR 5:005 Section 8(10)]
T-16	The integrity of a new gravity sewer line shall be verified by either the infiltration-exfiltration or low pressure air testing method, and a deflection test shall be performed, if using flexible pipe. The deflection test shall be performed after the final backfill has been in place for at least thirty (30) days with no pipe exceeding a deflection of five (5) percent. Additionally, each new manhole shall be tested for water tightness. [401 KAR 5:005 Section 8(6)(a)]
T-17	The entrance of groundwater into or loss of waste from a new gravity sewer line shall be limited to two-hundred (200) gpd per inch of diameter per mile of the gravity sewer line. This limitation includes manholes, gravity sewer lines, and appurtenances. [401 KAR 5:005 Section 8(5)]

SECTION 00910
ADDENDA

(Insert Addenda as they are issued.)

END OF SECTION

MAYOR LINDA GORTON

LEXINGTON

TODD SLATIN
DIRECTOR
CENTRAL PURCHASING

ADDENDUM No. 1

Bid Number: **#100-2025**

Date: October 15, 2025

Subject: Merrick Trunk Sewer
Remedial Measures Plan ID No. WH-7

Address inquiries to:
Q&A Module on Ion Wave

Brian Marcum
brianm@lexingtonky.gov
(859) 258-3325

TO ALL PROSPECTIVE SUBMITTERS:

Please be advised of the following modifications to the above referenced Bid:

1. SPECIFICATIONS

A. Replace Section 00100, Paragraph 1.12 with the following text: A **mandatory** pre-bid meeting will be held at **10:00 a.m. local time October 21, 2025**, and will be a hybrid meeting. The in-person meeting will be held at the LFUCG DWQ building in the upstairs conference room at 125 Lisle Industrial Avenue Lexington, KY 40511. Prime contractors are REQUIRED to attend in person. Virtual attendance is allowed for sub-contractors only, and they may join via MS Teams using the link, call-in number, or QR Code below:

https://teams.microsoft.com/l/meetup-join/19%3ameeting_OGNhNGM2MWMtNmI3OS00NDZkLTg1NDctMDdiNzU4MTcyZDk5%40thread.v2/0?context=%7b%22Tid%22%3a%22083fc4d2-72ad-412b-ae7d-6b81b83916dd%22%2c%22Oid%22%3a%22fdade983-a266-44d5-9446-1570bdf80205%22%7d

For audio only, the call-in number and conference ID: 1 347-991-7874, 668477633#

MAYOR LINDA GORTON

LEXINGTON

TODD SLATIN
DIRECTOR
CENTRAL PURCHASING

	Questions	Answers
1.	Regarding specification section 02532, 2.03 Fiberglass Reinforced Polymer Mortar Pipe, would Future Pipe Industries (FPI) be approved as an acceptable manufacturer?	If the FRPM pipe meets the requirements of Specification Section 02532 Paragraph 2.03, it will be acceptable.
2.	Could Vylon pipe be added to the list of approved pipe materials?	No, Vylon pipe will not be an accepted product for this project.

Todd Slatin

Todd Slatin, Director
Division of Central
Purchasing

All other terms and conditions of the Bid and specifications are unchanged.
This letter should be signed, attached to and become a part of your Bid.

COMPANY NAME: Tribute Contracting & Consultants, LLC

ADDRESS: 2125 County Rd 1, South Point, OH 45680

SIGNATURE OF BIDDER: Todd Slatin

MAYOR LINDA GORTON

LEXINGTON

TODD SLATIN
DIRECTOR
CENTRAL PURCHASING

ADDENDUM No. 2

Bid Number: **#100-2025**

Date: October 24, 2025

Subject: Merrick Trunk Sewer Wastewater System Improvements
Remedial Measures Plan ID No. WH-7

Address inquiries to:

Q&A Module on Ion Wave
Brian Marcum
brianm@lexingtonky.gov
(859) 258-3325

TO ALL PROSPECTIVE SUBMITTERS:

Please be advised of the following clarifications to the above referenced Bid:

	Questions	Answers
1.	Request to accept Superlit as an approved manufacturer for FRP pipes.	If the FRPM pipe meets the requirements of Specification Section 02532 Paragraph 2.03, it will be acceptable.
2.	Please remove approved manufacturers for FRP pipes from specifications.	Revise section 02532. See Specifications Section below.

1. CLARIFICATIONS

A. Meeting minutes from the Pre-Bid Meeting are attached.

2. DRAWINGS

A. MT-1 to MT-7

Replace with attached revised sheets.

Note 1: Lane blockage will only occur between the hours of 9 am to 3 pm or after 7 pm until **6 am** to avoid high traffic impact. Contractor to avoid working multiple crews directly on Tates Creek Rd. at one time.

MAYOR LINDA GORTON

LEXINGTON

TODD SLATIN
DIRECTOR
CENTRAL PURCHASING

3. SPECIFICATIONS

A. Section 00410- Bid Form

Replace Pages 00410-6 through 00410-12 with the attached revised Bid Schedule.

- Item 66- Tennis Court Reconstruction- added allowance value
- Correct Item numbers on the bid form.

B. Section 00890- Permits

- Add attached Stream Construction Permit

C. Section 01210- Allowances

- Add paragraph 1.01.C.4.
  Tennis Court Reconstruction Allowance (Item 66) - $100,000 has been established for Tennis Court Reconstruction at 3051 Kirklevington Drive.

D. Section 02374a- Permitting, Inspection, and Enforcement Procedures for Erosion and Sediment Control on DWQ Capital Construction Projects

- Add attached October 2025 revision

E. Section 02532 – Seweage Collection Lines

- Revise paragraph 2.03.C.4. "Acceptable Manufacturer: HOBAS Pipe USA or Flowtite **or Approved Equal.**"

Todd Slatin, Director
Division of Central Purchasing

All other terms and conditions of the Bid and specifications are unchanged.
This letter should be signed, attached to and become a part of your Bid.

COMPANY NAME: Tribute Contracting, Inc.

ADDRESS: 2125 County Rd 1, South Point, OH 45680

SIGNATURE OF BIDDER: _____

MAYOR LINDA GORTON

LEXINGTON

TODD SLATIN
DIRECTOR
CENTRAL PURCHASING

ADDENDUM No. 3

Bid Number: **#100-2025**

Date: October 31, 2025

Subject: Merrick Trunk Sewer Wastewater System Improvements
Remedial Measures Plan ID No. WH-7

Address inquiries to:

Q&A Module on Ion Wave
Brian Marcum
brianm@lexingtonky.gov
(859) 258-3325

TO ALL PROSPECTIVE SUBMITTERS:

Please be advised of the following clarifications to the above referenced Bid:

	Questions	Answers
1.	Spec Sheet 02222-1 Part 1.01F states, "Contractor shall design and include in their Bid the furnishing of all labor, equipment, materials, and suppliers necessary for ground stabilization by jet grouting, compaction grouting, void filling, soil mixing, slurry walls or other ground modification technologies to meet project objectives specified herein." Can the location of this requirement within the plans please be identified?	As stated in the specification, the location shall be as warranted in the experience of the Contractor. This specification will be used in the event the contractor determines it necessary for ground stabilization.
2.	Does the miscellaneous site improvements allowance include all restoration items (fence, landscape, etc.) behind the houses along Willowood Road, Winding Drive, and Winding Circle?	No, restoration is incidental to the contract. The "Miscellaneous Site Improvements" allowance is intended for use for unforeseen conditions that may arise and will be directed by the Owner/Engineer.

3.	For the retaining wall located at 3545 Winding Drive, does the retaining wall need to be replaced as is, or does it need to go back as a concrete retaining wall? Can details be provided?	The retaining wall shall be replaced to match existing materials and construction.
4.	Will the owner or contractor be responsible for payment of inspections and testing services? There are multiple references throughout the specifications which contradict each other. Please confirm.	The owner is responsible for payment of structural concrete testing (if applicable) and resident project representation (RPR) inspections. Testing of concrete pavement or trench cap is not required. All other testing and inspection services required for the work installed by the contractor is the responsibility of the contractor.
5.	The miscellaneous site improvements are labeled as a "defined allowance" on spec sheet 01210-1. On sheet 01210-2 section 1.6B states that for a defined allowance, the contractor's labor, installation, overhead and profit, and similar costs related to the equipment ordered under allowance shall be included as part of the Contract Sum and not part of the allowance. What should the contractor figure for these costs in their bid? Or will the contractor's labor, installation, overhead and profit, and similar costs be paid for under the miscellaneous site improvements allowance item? Should this allowance be labeled as an undefined allowance instead?	"Miscellaneous Site Improvements" shall be used as directed by the owner/engineer and is an undefined allowance.
6.	Spec Sheet 01010-3 section 1.07 mentions "all costs incurred by the Owner for any additional engineering shall be borne by the Contractor." What is this rate for additional hours over 40 hours?	The rates vary based on type of work and hours of work. Decisions to charge for additional RPR time shall be on a case-by-case basis. The rate is typically approximately $100 per hour.
7.	Is this project tax exempt?	Yes, in accordance with Kentucky state law, materials which are part of a permanent installation, such as pipe, manholes, etc. are tax exempt.

MAYOR LINDA GORTON

LEXINGTON

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DIRECTOR
CENTRAL PURCHASING

8.	Who is the manufacturer of the LexTran bus shelter?	Tolar Manufacturing. Tolar Model 26072-00 - 10' Signature Empire Flat Roof Non-Advertising Transit Shelter featuring: all aluminum construction; 10' x 5' nominal roof dripline; fully welded, flat angled shed roof structure with custom Sunset aluminum extrusion beam with gasketed glazing channels; 1/8" aluminum roof panels secured by gasketed pressure ribs; 3/8" clear tempered glass panels in the rear and full end walls, secured by 2-piece glass rail mullions and gasketed glazing channels; custom Sunset aluminum extrusion support posts with gasketed glazing channels and internally telescoping adjustable leveling shoes; decorative spun aluminum escutcheon shoe covers; stainless steel anchors; installation hardware and instructions; all parts finished in super durable baked powder coat color as selected from TCI standard RAL color deck.
9.	For the pipe pay items per depths, is this quantity measured as the deepest point for a single run of pipe? Or is it strictly measured as the depth which a pipe is laid? For example, could a single run of pipe with varying depths be paid for under multiple bid items?	The pipe depth is strictly measured as the depth of pipe laid based on the invert of the pipe. A single run of pipe with varying depths can be paid for under multiple bid items.

1. CLARIFICATIONS

2. DRAWINGS

A. CE-1 to CE-7
Replace sheets with the attached revised sheets.
Updated to add corrected pipe depth to the profiles.

B. CN-3
Replace sheet with the attached revised sheet.
Added MOU conditions for 3504 Tates Creek Road.

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3. SPECIFICATIONS

A. Section 01210- Allowances
- Revise paragraph 1.01.C.1. to omit "defined allowance."

The allowance is for unforeseen conditions that may arise and may be used at the direction of the Owner/Engineer.

B. Specification Section 01025- Measurement and Payment
- Section 2.48- Allowance: Landscaping – 3504 Tates Creek Road
  - add "The allowance covers 6 native trees"

C. Section 00410- Bid Form
Replace Pages 00410-6 through 00410-12 with the attached revised Bid Schedule.
- Item 68: Revise allowance amount to $3000
- Correct quantities for 30" Gravity Sewer Pipe (Items 11-15)

D. Section 00890- Permits
- Add attached Nationwide Permit No. 58 Approval

Todd Slatin

Todd Slatin, Director
Division of Central Purchasing

All other terms and conditions of the Bid and specifications are unchanged.
This letter should be signed, attached to and become a part of your Bid.

COMPANY NAME: Tribute Contracting, Inc.

ADDRESS: 2125 County Rd 1, South Point, OH 45680

SIGNATURE OF BIDDER: Todd Slatin

MAYOR LINDA GORTON

LEXINGTON

TODD SLATIN
DIRECTOR
CENTRAL PURCHASING

ADDENDUM No. 4

Bid Number: **#100-2025**

Date: November 5, 2025

Subject: Merrick Trunk Sewer Wastewater System Improvements
Remedial Measures Plan ID No. WH-7

Address inquiries to:

Q&A Module on Ion Wave
Brian Marcum
brianm@lexingtonky.gov
(859) 258-3325

TO ALL PROSPECTIVE SUBMITTERS:

Please be advised of the following clarifications to the above referenced Bid:

1. CLARIFICATIONS

A. Bid Date and time
Revise the Bid Date to **11/13/2025** at 2:00 PM ET

B. There are further clarifications required for this bid which will be issued on November 6th in Addendum #5.

2. DRAWINGS

None at this time

3. SPECIFICATIONS

None at this time

Todd Slatin, Director
Division of Central Purchasing

MAYOR LINDA GORTON

LEXINGTON

TODD SLATIN
DIRECTOR
CENTRAL PURCHASING

All other terms and conditions of the Bid and specifications are unchanged.
This letter should be signed, attached to and become a part of your Bid.

COMPANY NAME: Tribute Contracting, Inc.

ADDRESS: 2125 County Rd 1, South Point, OH 45680

SIGNATURE OF BIDDER: Todd Slatin

MAYOR LINDA GORTON

LEXINGTON

TODD SLATIN
DIRECTOR
CENTRAL PURCHASING

ADDENDUM No. 5

Bid Number: **#100-2025**

Date: November 6, 2025

Subject: Merrick Trunk Sewer Wastewater System Improvements
Remedial Measures Plan ID No. WH-7

Address inquiries to:

Q&A Module on Ion Wave
Brian Marcum
brianm@lexingtonky.gov
(859) 258-3325

TO ALL PROSPECTIVE SUBMITTERS:

Please be advised of the following clarifications to the above referenced Bid:

1. CLARIFICATIONS

A. **Note 1, on the Maintenance of Traffic plans applies to all areas EXCEPT the open cut section of Tates Creek Road on MT 2 and MT 3, and the closure on Dove Run Road as shown on MT 7. These sections will be a 24/7 closure with 7 am to 6 pm work hours. All lanes of all roads shall be open during UK football game weekends. Access to businesses and Merrick Place shall be maintained at all times.** The revised note reads as follows: Lane blockage will only occur between the hours of 9 am to 3 pm to avoid high traffic impact. Contractor to avoid setting up more than one lane blockage directly on Tates Creek Rd. at the same time. **This note will apply to all the other lane blockages as shown on the Maintenance of Traffic plans.**

B. Refer to revised pipe depth graphics on revised sheets CE1-CE7. The pipe bid items will be paid in accordance with Specification Section 01025- Measurement and Payment- Paragraph 2.11 Gravity Sewer Pipe. Specifically, the following describes the quantity: "The quantity of sewer to be for shall be the actual length of installed in trench and into boot of manhole."

C. The contractor shall provide a unit price per linear foot for Item 43- Video inspection of new sewer pipe. The contractor will be paid in accordance with Specification 01025- Measurement and Payment. Quantity on the bid form is intended to allow for slight variation in installed and video documented quantity due to unforeseen conditions.

D. Flowable fill is not required on the open cut section of Tates Creek Road, as this section,

inside New Circle Road, is maintained by the City, not KYTC. See detail 201-1 on sheet SD-1.

2. DRAWINGS

A. CE-1 to CE-7
Replace sheets with the attached revised sheets.
Updated to add corrected pipe depth ranges to the profiles.
Updated to add the pipe lengths to the profiles.

3. SPECIFICATIONS

A. Section 02222- Excavation for Tunnel Shafts
OMIT Paragraph 1.01.F:

Where warranted in the experience of the Contractor or where identified on the Drawings, ground modification shall be provided as part of the appropriate preparation for tunneling activities to reduce risk of surface settlement and heaving, protect nearby structures and utilities, and successfully install the piping system within line and grade tolerances. Contractor shall design and include in their Bid the furnishing of all labor, equipment, materials, and supplies necessary for ground stabilization by jet grouting, compaction grouting, void filling, soil mixing, slurry walls or other ground modification technologies to meet project objectives specified herein.

B. Section 01010- Summary of Work
Replace Paragraph 1.07. A. with the following:

The normal time of work for this Contract is limited to 40 hours per week and shall generally be between the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday. The Contractor may work beyond these hours or on weekends with written approval from the Owner. **Hours worked by the Engineer or Resident Project Representative (RPR), outside these specified times, will be paid by the Owner if the work is at the request of the Owner, or an approved request of the contractor, or approved night work in addition to a day shift, or unforeseen conditions are encountered. If the Contractor, through negligence, mismanagement, etc., causes additional engineering or RPR hours, the Contractor shall be responsible for the associated additional engineering or RPR costs.**

C. Section 00410- Bid Form
Replace Pages 00410-6 through 00410-12 with the attached revised Bid Schedule.

Items 13-15: Pipe quantities updated to include pipe lengths beyond the casing pipe quantities for the tunnel sections.

MAYOR LINDA GORTON

LEXINGTON

TODD SLATIN
DIRECTOR
CENTRAL PURCHASING

Todd Slatin

Todd Slatin, Director
Division of Central Purchasing

All other terms and conditions of the Bid and specifications are unchanged.
This letter should be signed, attached to and become a part of your Bid.

COMPANY NAME: Tribute Contracting, Inc.

ADDRESS: 2125 County Rd 1, South Point, OH 45680

SIGNATURE OF BIDDER: Todd Slatin

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SECTION 01010
SUMMARY OF WORK

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. The Work to be done under this Contract and in accordance with these Specifications consists of furnishing all equipment, supervision, labor, skill, material and all other items necessary for the construction of the Merrick Trunk Sewer Improvements

B. The Contractor shall perform all work required for such construction in accordance with the Contract Documents and subject to the terms and conditions of the Contract, complete and ready for use.

C. The principal features of the Work to be performed under this Contract includes, but is not limited to:

1. Installation of gravity sanitary sewers and/or force mains, reinforced concrete manholes, and appurtenances.

2. Connections to existing sanitary sewers and service laterals, as necessary.

3. Maintenance of existing sanitary sewer flows during construction

D. The foregoing description(s) shall not be construed as a complete description of all work required.

1.02 CONTRACT DOCUMENTS

A. Work to be done is shown on the set of Drawings entitled: **Merrick Trunk Sewer Improvements**. The numbers and titles of all Drawings appear on the index sheet of the Drawings. All drawings so enumerated shall be considered an integral part of the Contract Documents as defined herein.

1.03 GENERAL ARRANGEMENT

A. Drawings indicate the extent and general arrangement of the work. If any departures from the Drawings are deemed necessary by the Contractor to accommodate the materials and equipment he proposes to furnish, details of such departures and reasons therefore shall be submitted as soon as practicable to the Engineer for approval. No such departures shall be made without the prior written approval of the Engineer. Approved changes shall be made without additional cost to the Owner for this work or related work under other Contracts of the Project.

1.04 CONSTRUCTION PERMITS, EASEMENTS AND ENCROACHMENTS

A. The Owner shall obtain or cause to be obtained all permanent and temporary construction easements as shown on the Drawings or required for completion of the Work. The Contractor shall verify that these easements have been obtained and shall comply with the conditions set forth in each easement.

B. The Contractor shall obtain, keep current and pay all fees for any necessary construction permits from those authorities, agencies, or municipalities having jurisdiction over land areas, utilities, or structures which are located within the Contract limits and which will be occupied, encountered, used, or temporarily interrupted by the Contractor's operations unless otherwise stated. Record copies of all permits shall be furnished to the Engineer.

C. When construction permits are accompanied by regulations or requirements issued by a particular authority, agency or municipality, it shall be the Contractor's responsibility to familiarize himself and comply with such regulations or requirements as they apply to his operations on this Project.

1.05 ADDITIONAL ENGINEERING SERVICES

A. In the event that the Engineer is required to provide additional engineering services as a result of substitution of materials or equipment by the Contractor which are not "or equal", or changes by the Contractor in dimension, weight, power requirements, etc., of the equipment and accessories furnished, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor for the convenience of the Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the Owner.

B. In the event that the Engineer is required to provide additional engineering services as a result of Contractor's errors, omissions, or failure to conform to the requirements of the Contract Documents, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the Owner.

1.06 ADDITIONAL OWNER'S EXPENSES

A. In the event the Work of this Contract is not completed within the time set forth in the Contract or within the time to which such completion may have been extended in accordance with the Contract Documents, the additional engineering or inspection charges incurred by the Owner may be charged to the Contractor and deducted from the monies due him. Extra work or supplemental Contract work added to the original Contract, as well as extenuating circumstances beyond the control of the Contractor, will be given due consideration by the Owner before assessing engineering and inspection charges against the Contractor.

B. Unless otherwise specifically permitted, the normal time of work under this Contract is limited to 40 hours per week, Monday through Friday. Work beyond these hours will result in additional expense to the Owner. Any expenses and/or damages, including the cost of the Engineer's on site personnel, arising from the Contractor's operations beyond the hours and days specified above shall be borne by the Contractor.

C. Charges assessed to the Contractor for additional engineering and inspection costs will be determined based on actual hours charged to the job by the Engineer. Daily rates will depend on the number and classifications of employees involved, but in no case shall such charges exceed $500 per day for field personnel based on an eight hour workday. Additional charges will apply if multiple personnel are needed or if engineering time is required as part of the work outside the contract times.

D. Charges for additional Owner's expenses shall be in addition to any liquidated damages assessed in accordance with the Contract.

1.07 TIME OF WORK

A. The normal time of work for this Contract is limited to 40 hours per week and shall generally be between the hours of **7:00 a.m. and 6:00 p.m., Monday through Friday**. The Contractor may work beyond these hours or on weekends with written approval from the Owner. Hours worked by the Engineer or Resident Project Representative (RPR), outside these specified times, will be paid by the Owner if the work is at the request of the Owner, or an approved request of the contractor, or approved night work in addition to a day shift, or unforeseen conditions are encountered. If the Contractor, through negligence, mismanagement, etc., causes additional engineering or RPR hours, the Contractor shall be responsible for the associated additional engineering or RPR costs.

B. If it shall become imperative to perform work outside of the normal working hours the Owner and Engineer shall be informed a reasonable time in advance of the beginning of such work. Temporary lighting and all other necessary facilities for performing and inspecting the work shall be provided and maintained by the Contractor.

1.08 SURVEYS AND LAYOUT

A. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings or as directed by the Engineer. Elevations of existing ground and appurtenances are believed to be reasonably correct but are not guaranteed to be absolute and therefore are presented only as an approximation. Any error or apparent discrepancy in the data shown or omissions of data required for accurately accomplishing the stake out survey shall be referred immediately to the Engineer for interpretation or correction.

B. All survey work for construction control purposes shall be made by the Contractor at his expense. The Contractor shall provide a Licensed Surveyor as Chief of Party,

competently qualified survey party, all necessary instruments, stakes, and other material to perform the work.

C. Contractor shall establish all baselines for the location of the principal component parts of the work together with a suitable number of benchmarks adjacent to the work. Based upon the information provided by the Contract Drawings, the Contractor shall develop and make all detail surveys necessary for construction, including stakes for all working points, lines and elevations.

D. Contractor shall have the responsibility to carefully preserve the bench marks, reference points and stakes, and in the case of destruction thereof by the Contractor or resulting from his negligence, the Contractor shall be charged with the expense and damage resulting therefrom and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points and stakes.

E. Existing or new control points, property markers and monuments that will be or are destroyed during the normal causes of construction shall be reestablished by the Contractor and all reference ties recorded therefore shall be furnished to the Engineer. All computations necessary to establish the exact position of the work shall be made and preserved by the Contractor.

F. The Engineer may check all or any portion of the work and the Contractor shall afford all necessary assistance to the Engineer in carrying out such checks. Any necessary corrections to the work shall be immediately made by the Contractor. Such checking by the Engineer shall not relieve the Contractor of any responsibilities for the accuracy or completeness of his work.

G. At completion of the work, the Contractor shall furnish Record Drawings indicating the final layout of all constructed piping and manholes and finished grades constructed or changed as part of this work.

1.09 FIRE PROTECTION

A. Contractor shall take all necessary precautions to prevent fires at or adjacent to the work and shall provide adequate facilities for extinguishing fires which do occur. Burning shall not be permitted on site.

B. When fire or explosion hazards are created in the vicinity of the work as a result of the locations of fuel tanks or similar hazardous utilities or devices, the Contractor shall immediately alert the local Fire Marshal, the Engineer, and the Owner of such tank or device. The Contractor shall exercise all safety precautions and shall comply with all instructions issued by the Fire Marshal and shall cooperate with the Owner of the tank or device to prevent the occurrence of fire or explosion.

1.10 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, or reactant of other classification, must show approval of either the EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with all applicable rules and regulations.

1.11 FIRST AID FACILITIES AND ACCIDENTS

A. First Aid Facilities

1. The Contractor shall provide at the site such equipment and facilities as are necessary to supply first aid to any of his personnel who may be injured in connection with the work.

B. Accidents

1. The Contractor shall promptly report, in writing, to the Engineer and Owner all accidents whatsoever out of, or in connection with, the performance of the work, whether on or adjacent to the site, which cause death, personal injury or property damage, giving full details and statements of witnesses.

2. If death, serious injuries, or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Owner and the Engineer.

3. If any claim is made by anyone against the Contractor or a Subcontractor on account of any accidents, the Contractor shall promptly report the facts, in writing, to the Engineer and Owner, giving full details of the claim.

1.12 ULTIMATE DISPOSITION OF CLAIMS BY ONE CONTRACTOR ARISING FROM ALLEGED DAMAGE BY ANOTHER CONTRACTOR

A. During the progress of the Work, other Contractors may be engaged in performing other work or may be awarded other Contracts for additional work on this project. In that event, the Contractor shall coordinate the work to be done hereunder with the work of such other Contractors and the Contractor shall fully cooperate with such other Contractors and carefully fit its own work to that provided under other Contracts as may be directed by the Engineer. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other Contractor.

B. If the Engineer shall determine that the Contractor is failing to coordinate his work with the work of the other Contractors as the Engineer directed, then the Owner shall have the right to withhold any payments otherwise due hereunder until the Contractor completely complies with the Engineer's directions.

C. If the Contractor notifies the Engineer in writing that another Contractor is failing to coordinate his work with the work of this Contract as directed, the Engineer will promptly

investigate the charge. If the Engineer finds it to be true, he will promptly issue such directions to the other Contractor with respect thereto as the situation may require. The Owner, the Engineer, nor any of their agents shall not, however, be liable for any damages suffered by the Contractor by reason of the other Contractor's failure to promptly comply with the directions so issued by the Engineer, or by reason of another Contractor's default in performance, it being understood that the Owner does not guarantee the responsibility or continued efficiency of any Contractor.

D. The Contractor shall indemnify and hold the Owner and the Engineer harmless from any and all claims of judgments for damages and from costs and expenses to which the Owner may be subjected or which it may suffer or incur by reason of the Contractor's failure to promptly comply with the Engineer's directions.

E. Should the Contractor sustain any damage through any act or omission of any other Contractor having a Contract with the Owner for the performance of work upon the site or of work which may be necessary to be performed for the proper execution of the work to be performed hereunder, or through any act or omission of a Subcontractor of such Contract, the Contractor shall have no claim against the Owner or the Engineer for such damage, but shall have a right to recover such damage from the other Contractor under the provision similar to the following provisions which have been or will be inserted in the Contracts with such other Contractors.

F. Should any other Contractor having or who shall hereafter have a Contract with the Owner for the performance of work upon the site sustain any damage through any act or omission of the Contractor hereunder or through any act or omission of any Subcontractor of the Contractor, the Contractor agrees to reimburse such other Contractor for all such damages and to defend at his own expense any suit based upon such claim and if any judgment or claims against the Owner shall be allowed, the Contractor shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith and shall indemnify and hold the Owner harmless from all such claims.

G. The Owner's right to indemnification hereunder shall in no way be diminished, waived or discharged, by its recourse to assessment of liquidated damages as provided in the Contract, or by the exercise of any other remedy provided for by Contract Documents or by law.

1.13 BLASTING AND EXPLOSIVES

A. No blasting is allowed.

1.14 LIMITS OF WORK AREA

A. The Contractor shall confine his construction operations within the Contract limits shown on the Drawings and/or property lines and/or fence lines. Storage of equipment and materials, or erection and use of sheds outside of the Contract limits, if such areas are the property of the Owner, shall be used only with the Owner's approval. Such storage

or temporary structures, even within the Contract's limits, shall not be placed on properties designated as easements or rights-of-way unless specifically permitted elsewhere in the Contract Documents.

B. The Contractor shall secure, insure, maintain, rent/lease, and restore staging area.

C. The Contractor shall provide Engineer and Owner copy of agreement with landowner of staging areas.

1.15 WEATHER CONDITIONS

A. The Contractor shall take necessary precautions (in the event of impending storms) to protect all work, materials, or equipment from damage or deterioration due to floods, driving rain, or wind, and snow storms. The Owner reserves the right, through the opinion of the Engineer, to order that additional protection measures over and beyond those proposed by the Contractor, be taken to safeguard all components of the Project. The Contractor shall not claim any compensation for such precautionary measures so ordered, nor claim any compensation from the Owner for damage to the work from weather elements.

1.16 PERIODIC CLEANUP: BASIC SITE RESTORATION

A. During construction, the Contractor shall regularly remove from the site of the work all accumulated debris and surplus materials of any kind which result from his operations. Unused equipment and tools shall be stored at the Contractor's staging area for the Project.

B. As the work involves installation of sewers, drains, manholes, underground structures, or other disturbance of existing features in or across streets, rights-of-way, easements, or private property, the Contractor shall (as the work progresses) promptly backfill, compact, grade, and otherwise restore the disturbed area to the basic condition which will permit resumption of pedestrian or vehicular traffic and any other critical activity or functions consistent with the original use of the land. The requirements for temporary paving of streets, walks, and driveways are specified elsewhere. Unsightly mounds of earth, large stones, boulders, and debris shall be removed so that the site presents a neat appearance.

C. The Contractor shall perform the cleanup work on a regular basis and as frequently as ordered by the Engineer. Basic site restoration in a particular area shall be accomplished immediately following the installation or completion of the required facilities in that area. Furthermore, such work shall also be accomplished, when ordered by the Engineer, if partially completed facilities must remain incomplete for some time period due to unforeseen circumstances.

D. Upon failure of the Contractor to perform periodic cleanup and basic restoration of the site to the Engineer's satisfaction, the Owner may, upon five (5) days prior written notice to the Contractor, without prejudice to any other rights or remedies of the Owner, cause

such work for which the Contractor is responsible to be accomplished to the extent deemed necessary by the Engineer, and all costs resulting therefrom shall be charged to the Contractor and deducted from the amounts of money that may be due him.

1.17 USE OF FACILITIES BEFORE COMPLETION

A. The Owner reserves the right to enter the site and use any portion of the constructed facilities before final completion of the whole work to be done under this Contract. However, only those portions of the facilities which have been completed to the Engineer's satisfaction, as evidenced by his issuing a Certificate of Substantial Completion covering that part of the work, shall be placed in service.

B. It shall be the Owner's responsibility to prevent premature connections to or use of any portion of the installed facilities by private or public parties, persons or groups of persons, before the Engineer issues his Certificate of Substantial Completion covering that portion of the work to be placed in service.

C. Consistent with the approved progress schedule, the Contractor shall cooperate with the Owner, his agents, and the Engineer to accelerate completion of those facilities, or portions thereof, which have been designated for early use by the Owner.

1.18 CONSTRUCTION VIDEO

A. The Contractor shall video the entire project site prior to the start of construction. See Specification Section 01323 – Third Pary Professional Pre-Construction Photographic Documentation for full scope of work.

PART 2 – PART 2 – PRODUCT (NOT USED)

PART 3 – PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 – PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall furnish all necessary labor, machinery, tools, apparatus, equipment, materials, equipment, service, other necessary supplies and perform all work including all excavation and backfilling (without additional compensation, except where specifically set out in these specifications) at the contract unit prices bid for the work described in Part 2 of this Section.

1.02 PROGRESS AND PAYMENTS SCHEDULES

A. Within fifteen (15) days after the date of formal execution of the Agreement (Contract), the Contractor shall prepare and submit to the Engineer, for approval, a construction schedule of the Critical Path Method (CPM) type which depicts the Contractor's plan for completing the contract requirements and show work placement in dollars versus contract time. The Contractor's construction schedule must be approved by the Engineer before any payments shall be made on this contract.

B. Within fifteen (15) days after the date of formal execution of the Agreement (Contract), the Contractor shall prepare and submit to the Engineer, for approval, a periodic estimate which depicts the Contractor's cost for completing the contract requirements and show by major unit of the project work, the Contractor's dollar value for the material and the labor (two separate amounts) to be used as a basis for the periodic payments. The Contractor's periodic estimate must be approved by the Engineer before any payments shall be made on this contract.

C. The Engineer's decision as to sufficiency and completeness of the Contractor's construction schedule and periodic estimate shall be final.

D. The Contractor must make current, to the satisfaction of the Engineer, the construction schedule and periodic estimate each time the Contractor requests a payment on this contract.

E. The Contractor's construction schedule and periodic estimate must be maintained at the construction site available for inspection and shall be revised to incorporate approved change orders as they occur.

F. When the Contractor requests a payment on this contract, it must be on the approved periodic estimate and be current. Further, the current periodic estimate and construction schedule (both updated and revised) shall be submitted for review and approval by the Engineer before monthly payments shall be made by the Owner. The Contractor shall submit as stored materials for pay purposes provided proper documentation is provided.

1. Documentation for stored materials includes at a minimum, an approved Shop Drawing, materials to be on site, etc. See Specification Section 00800-14.02.A.5 for additional information.

G. Refer to Section 00800, Articles 14.02.A.6-8 for retainage requirements.

1.03 CLAIMS FOR EXTRA WORK

A. If the Contractor claims that any instructions by Drawings or otherwise involve extra cost, the Contractor shall give the Engineer written notice of said claim within seven (7) days after the receipt of such instructions, and in any event before proceeding to execute the work, stating clearly and in detail the basis of its claim or claims. No such claim shall be valid unless so made.

B. Claims for additional compensation for extra work, due to alleged errors in spot elevations, contour lines, or benchmarks, shall not be recognized unless accompanied by certified survey data, made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted, or would result, in handling more material, or performing more work than would reasonably be estimated from the Drawings and topographical maps issued.

C. Any discrepancies which may be discovered between actual conditions and those represented by the topographical maps and Drawings shall at once be reported to the Engineer, and work shall not proceed, except at the Contractor's risk, until written instructions have been received by the Contractor from the Engineer.

D. If, on the basis of the available evidence, the Engineer determines that an adjustment of the Contract Price or time is justifiable, the procedure shall then be as provided herein for "Changes in the Work".

E. By execution of this Contract, the Contractor warrants that it has visited the site of the proposed work and fully acquainted himself with the conditions there existing relating to construction and labor, and that it fully understands the facilities, difficulties, and restrictions attending the execution of the work under this Contract. The Contractor further warrants that it has thoroughly examined and is familiar with the Drawings, Specifications and all other documents comprising the Contract. The Contractor further warrants that by execution of this Contract its failure when it was bidding on this Contract to receive or examine any form, instrument or document, or to visit the site and acquaint himself with conditions there existing, in no way relieves the Contractor from any obligation under the Contract, and the Contractor agrees that the Owner shall be justified in rejecting any claim based on facts regarding which it should have been on notice as a result thereof.

1.04 DETERMINATION OF THE VALUE OF EXTRA (ADDITIONAL) OR OMITTED WORK

A. The value of extra (additional) or omitted work shall be determined in one or more of the following ways:

1. On the basis of the actual cost of all the items of labor (including on-the-job supervision), materials, and use of equipment, plus a maximum 15 percent for added work or a minimum 15 percent for deleted work which shall cover the Contractor's general supervision, overhead and profit.

    a. Labor may include on-site supervision, on-site project management, in addition to field personal associated with the work.

    b. In case of subcontracts, the 15 percent (maximum for added work and minimum for deleted work) is interpreted to mean the subcontractor's supervision, overhead and profit, and an additional 5 percent (maximum for added work and minimum for deleted work) may then be added to such costs to cover the General Contractor's supervision, overhead and profit.

    c. The cost of labor shall include required insurance, taxes and fringe benefits.

    d. Equipment costs shall be based on current rental rates in Lexington, KY.

2. By estimate and acceptance in a lump sum.

3. By unit prices named in the Contract or subsequently agreed upon.

B. Provided, however, that the cost or estimated cost of all extra (additional) work shall be determined in advance of authorization by the Engineer and approved by the Owner.

C. All extra (additional) work shall be executed under the conditions of the original Contract. Any claim for extension of time shall be adjusted according to the proportionate increase or decrease in the final total cost of the work unless negotiated on another basis.

D. Except for over-runs in contract unit price items, no extra (additional) work shall be done except upon a written Change Order from the Engineer, and no claim on the part of the Contractor for pay for extra (additional) work shall be recognized unless so ordered in writing by the Engineer.

PART 2 – PRODUCTS

2.01 MOBILIZATION

A. Payment for the Contractor's mobilization shall be made at the Contract lump sum price and shall include all costs incurred for moving equipment onto the project area, staging, security fencing, and any pertinent costs related thereto, for the duration of the contract term. Mobilization unit price shall not exceed two percent (2%) of the total Bid Amount.

2.02 BONDS AND INSURANCE

A. Payment for bonds and insurance shall be made at the Contract lump sum price and shall include the costs of all bonds provided under the Contract, and the premiums for insurance required under the Contract, for the duration of the contract term. Unit price shall be based on actual invoices and payment shall be made upon receipt of invoices attached to a monthly progress payment request.

2.03 GENERAL REQUIREMENTS

A. Payment for general requirements shall be made at the Contract lump sum price and shall include field supervision and support staff, office supervision and support staff, costs associated with maintaining the field operation, and other items required by the general requirements and conditions of the Contract. Payment for General Requirements shall be made on an equal distribution across the Contract term on a monthly basis.

2.04 DEMOBILIZATION

A. Payment for the Contractor's demobilization upon completion of the project shall be made at the Contract lump sum price and shall include all costs incurred for removing equipment and materials from the project area and any pertinent costs related thereto, for the duration of the Contract term. Demobilization unit price shall not exceed one percent (1%) of the total Bid Amount.

2.05 EROSION AND SEDIMENT CONTROL AND CONFORMANCE WITH SWPPP

A. Payment is for furnishing, installing, maintaining and removing erosion and sediment control devices. This is to be paid at the contract lump sum price, complete in place, which shall include compensation for materials, placing, cleaning, and maintaining the sediment and erosion control devices throughout the construction period and removal of the of the sediment and erosion control devices once vegetation is established. Payment shall be distributed as follows: 25% when all ESC measures are in place and operating correctly; 50% equally distributed across the Contract term; and 25% for the removal of the ESC measures and final stabilization/restoration.

2.06 CLEARING AND GRUBBING

A. Payment for clearing and grubbing shall be made at the Contract lump sum price and shall include all costs incurred for clearing, grubbing, scalping, removing trees and stumps and removing all vegetation and construction debris from the limits shown on the plans, except such objects that are to remain or are to be removed according to other items of work.

2.07 TREE PROTECTION

A. Payment for tree protection shall be paid for at the Contract unit price, per linear foot of fencing. Unit price shall include furnishing, installation, maintenance and removal of 4' tall orange plastic fencing attached to metal "tee" posts, securely driven into the ground. The Tree Protection unit price shall also include attaching tree protection signage (12"x 18" aluminum sign, provided by LFUCG DWQ) to the Tee posts at 25'+/- intervals. Zip ties or tie wire may be used. Signage shall be returned to LFUCG DWQ at the conclusion of the project. Maintenance of the fence shall cover repairs to fence, posts or signs, and grass and weed cutting, as required, for the duration of the project.

B. Coordination with LFUCG Division of Environmental Services, so they may cut tree roots, *prior to construction traffic/excavation* under or near significant trees shall be included. The Division of Environmental Services shall be notified 2 weeks before their services are required. The Contractor will not be allowed to proceed with their work if the roots have not been properly cut by DES. Failure to notify DES, 2 weeks prior to work in the area, shall not be grounds for additional contract time.

C. Tree protection fencing shall be installed at the direction of the Engineer and shall be placed a minimum of 3 weeks before any construction traffic occurs under or near significant trees.

2.08 6-INCH PVC (SDR 35) GRAVITY SEWER LATERAL (NOT IN PAVEMENT)

A. Payment is for furnishing and installing gravity sewer laterals at the contract unit price per linear foot. This is to be paid at the contract unit price, complete in place, which shall include compensation for pipe, reducers, spool pieces, fittings (excluding items included in cleanout pay item), materials, hauling, excavation (including rock excavation), shoring, sheeting, removal of existing lateral, bedding, backfilling, cleanup, restoration, testing, and all other items necessary for a complete installation.

2.09 INSTALL CLEANOUT

A. Payment is for furnishing and installing a Cleanout at the contract unit price each, based on the line size as indicated on the Bid Schedule. This is to be paid at the contract unit price, complete in place, which shall include compensation for cleanout casting, two-way cleanout tee, spool piece of pipe between cleanout casting and two-way cleanout tee, Strongback Fernco adapter, connection to existing lateral, concrete collar, materials,

hauling, excavation (including rock excavation), shoring, sheeting, bedding, backfilling, cleanup, testing, and all other items necessary for a complete installation.

2.10 TEE FITTINGS FOR GRAVITY SEWER LATERAL CONNECTION (NON-DUCTILE IRON OR INSERTA TEE)

A. Payment is for furnishing and installing Tee Fittings for Gravity Sewers (non-ductile iron or Inserta Tee) at the contract unit price per each, based on the line size as indicated on the Bid Schedule. This is to be paid at the contract unit price, complete in place, which shall include compensation for materials, hauling, excavation (including rock excavation), shoring, sheeting, bedding, backfilling, cleanup, testing, and all other items necessary for a complete installation.

2.11 GRAVITY SEWER PIPE

A. Payment is for furnishing and installing Gravity Sewer Pipe at the contract unit price per linear foot, based on the line size and burial depth as indicated on the Bid Schedule. Depth of burial is measured from existing ground surface to invert of sewer pipe and paid for accordingly. The quantity of sewer to be paid for shall be the actual length of installed in trench and into boot of manhole. Fittings and tees are paid for separately under a different pay item and not included in the length of pipe. Gravity sewer pipe is to be paid at the contract unit price, complete in place, which shall include compensation for pipe, materials, hauling, clearing and grubbing, excavation (including rock excavation), dewatering, shoring, sheeting, removal of existing pipe, bedding, backfilling, cleanup, restoration (excluding permanent seeding), testing, and all other items necessary for a complete installation. Pipe will have the same material specification between manholes.

2.12 TUNNEL INSTALLATION

A. Payment is for furnishing and installing a tunnel at the contract unit price per lump sum, based on the line size as indicated on the Tunneling Method Table listed in the Project Specific Notes (PSN). This is to be paid at the contract unit price per lump sum, complete in place, which shall include: compensation for tunneling (as selected method), grade control monitoring/surveying, tunnel lining, grout (if required and incidental to the contract), carrier pipe(s), casing spacers, materials, hauling, excavation (including rock excavation) of shafts/pits, shoring, sheeting, stabilization of other utilities, dewatering, backfilling, temporary electricity and water, couplings, concrete brick and mortar end seals, grout ports, testing, cleanup, costs for bonds and insurance, and all other items necessary for a complete tunnel installation as shown on the Construction Plans, Specifications and Tunneling Method Table.

Payments for tunnel progress shall be as follows:

1. Mobilization / Demobilization – LS (5% of total - maximum)

2. Furnish and Install Tunnel and Lining – LF (60% of total - maximum)

3. Shafts/Pits/Support Work – LS (10% of total)

4. Furnish and Install Carrier Pipe(s) – LF (20% of total - maximum)

5. Testing of Carrier Pipe(s) – LS (5% of total)

2.13 MANHOLE ABANDONMENT

A. Payment is for Manhole Abandonment at the contract unit price each. This is to be paid at the contract unit price, complete in place, which shall include compensation for excavation (including rock excavation), demolition, disposal, concrete, crushed stone fill, backfilling, cleanup, restoration, and all other items necessary for a complete installation.

2.14 STANDARD MANHOLE

A. Payment is for furnishing and installing a Manhole, based on the size and depth range (0' to 6.0') as indicated on the Bid Schedule. This is to be paid at the contract unit price each, complete in place, which shall include compensation for the manhole casting, cementitious crystalline admixture (see Specification Section 02608 for required admixtures), boots, steps, gaskets, exterior joint wraps with stainless steel bands, crushed stone, SS frame anchors, diaphragms, frame and cover, grout, materials, removal of existing manhole, hauling, excavation (including rock excavation), dewatering, bedding, backfilling, testing, cleanup, and all other items necessary for a complete installation on new or existing sewer lines.

2.15 MANHOLE VERTICAL FOOT (VF)

Payment is for furnishing and installing additional vertical depth (6.1' and greater) to standard and/or drop manholes, based on the size as indicated on the Bid Schedule. This is to be paid at the contract unit price per vertical foot (VF) for standard and drop manholes, complete in place cementitious crystalline admixture (see Specification Section 02608 for required admixtures), boots, steps, gaskets, exterior joint wraps with stainless steel bands, crushed stone, SS frame anchors, diaphragms, frame and cover, grout, materials, removal of existing manhole, hauling, excavation (including rock excavation) bedding, backfilling, testing, cleanup, and all other items necessary for a complete installation on new or existing sewer lines.

2.16 DROP MANHOLE

Payment is for furnishing and installing a Manhole Drop Connection, based on the size and depth range (0' to 6.0' depth) as indicated on the Bid Schedule. This is to be paid at the contract unit price each, complete in place, which shall include compensation for concrete casting, concrete encasement, reinforcement, piping/fittings cast into manhole concrete, Xypex or Conshield admixture, materials, assembly, installation, testing (including the drop connection), and all other items necessary for a complete installation on new or existing sewer lines.

2.17 MANHOLE ACCESSORIES FOR LOCATION WITHIN 100-YEAR FLOODPLAIN

A. Payment is for furnishing and installing a concrete anti-flotation collar cast into the manhole. This is to be paid at the contract unit price each, complete in place, which shall include compensation for concrete collar cast onto the manhole, materials, installation, and all other items necessary for a complete installation.

2.18 CREEK CROSSING AND BANK/BED RESTORATION

A. Payment is for furnishing, installing and maintaining each creek crossing and restoring the stream bank and bed. This is to be paid at the lump sum contract price, complete in place, which shall include compensation for excavation (including rock excavation), concrete, materials, bedding, backfilling, cleanup, restoration, seeding, plantings, and all other items necessary for a complete installation on new or existing sewer lines.

2.19 RECONNECT EXISTING GRAVITY SEWER OR SERVICE LATERAL TO NEW MANHOLE

A. Payment is for furnishing and installing a new manhole connection to an existing gravity sewer or service lateral based on the size as indicated on the bid schedule. This is to be paid at the contract unit price each, complete in place, which shall include compensation for gasket, Fernco Strongback coupling, full length of pipe, grout, materials, furnishing, excavation (including rock excavation), bedding, backfilling, cleanup, coring, and all other items necessary for a complete installation.

2.20 CUT AND CAP EXISTING SEWER

A. Payment is for cutting and capping existing sewer, based on the size as indicated on the Bid Schedule. This is to be paid at the contract unit price each, complete in place, which shall include compensation for concrete, cutting pipe, materials, equipment, excavation (including rock excavation), backfilling, cleanup, restoration, and all other items necessary for a complete capping.

2.21 PIPE ABANDONMENT, SAFELOAD

A. Payment is for abandoning an existing sewer by safe loading, at the contract unit price per linear foot based on the size as indicated on the Bid Schedule. This is to be paid at the contract unit price, complete in place, which shall include compensation for concrete, safe load plan, pumps, grout, cutting pipe, materials, traffic control, equipment, excavation (including rock excavation), backfilling, cleanup, restoration, and all other items necessary for a complete installation.

2.22 PIPE ABANDONMENT, PLUG

A. Payment is for abandoning an existing sewer using a plug, based on the size as indicated on the Bid Schedule. This is to be paid at the contract unit price each, complete in place, which shall include compensation for concrete, cutting pipe,

materials, equipment, excavation (including rock excavation), backfilling, cleanup, restoration, and all other items necessary for a complete installation.

2.23 PLUG MANHOLE INLET

A. Payment is for installing plug on spool section of pipe entering manhole, based on the size as indicated on the Bid Schedule. This is to be paid at the contract unit price each, complete in place, which shall include compensation for concrete, grout, cutting pipe, materials, equipment, excavation (including rock excavation), backfilling, cleanup, restoration, and all other items necessary for a complete capping.

2.24 VIDEO INSPECTION OF NEW SEWER PIPE

A. Payment for video inspection shall be made at the contract price per linear foot, including dewatering of pipe, bypass pumping, maintenance of traffic, hydraulic jet cleaning, disposal of debris, furnishing all labor, materials, tools, equipment, and incidentals, and doing all the work involved to perform sewer video inspections, including delivery of DVDs and/or digital files (flash drive, etc.) and written logs of the sewer videos to the Owner for review and acceptance.

2.25 ASPHALT PAVING: TRENCH CONSTRUCTION, STREET / PARKING LOT / DRIVEWAY

A. Payment for asphalt paving relating to trench construction in streets, parking lots, and driveways shall be paid for at the Contract unit price per square yard, which shall include placement of aggregate, concrete bridge, compaction, asphalt, removal of existing surface, placement of asphalt, taper of new pavement into existing pavement, and all appurtenances necessary for a complete installation.

2.26 CONCRETE PAVING: PRIVATE PARKING LOTS/DRIVEWAYS/APRONS

A. Payment for concrete paving relating to private parking lots, driveways, and aprons shall be paid for at the Contract unit price per square yard, which shall include placement of aggregate, compaction, concrete, removal of existing surface, placement of concrete, proper grading, taper of new surface into existing surface, and all appurtenances necessary for a complete installation.

2.27 ROADWAY STRIPING

A. Payment for roadway striping shall be paid for at the Contract unit price per linear foot of striping placed, which shall include materials, placement of striping, all maintenance of traffic, including flaggers, arrow board, message board, etc., and all appurtenances and manpower necessary for a complete installation.

2.28 SITE RESTORATION, METHOD A

A. Payment for site restoration method A (as defined in the General Notes), shall be paid for at the Contract unit price per linear foot, which shall include sod, fertilizer, lime,

placement, watering and maintenance throughout the duration of the contract, and all appurtenances necessary for a complete installation.

2.29 SITE RESTORATION, METHOD B

A. Payment for site restoration, method B (as defined in the General Notes), shall be paid for at the Contract unit price per linear foot, which shall include seed, fertilizer, lime, straw, placement, watering and maintenance throughout the duration of the contract, and all appurtenances necessary for a complete installation.

2.30 SITE RESTORATION, METHOD C

A. Payment for site restoration, method C (as defined in the General Notes), shall be paid for at the Contract unit price per linear foot, which shall include seed, fertilizer, lime, mulch/straw/netting, placement, watering and maintenance throughout the duration of the contract, and all appurtenances necessary for a complete installation.

2.31 SEEDING, TEMPORARY, EXTRA AS DIRECTED BY ENGINEER

A. Payment for temporary seeding shall be paid for at the Contract unit price per square yard, which shall include seed, fertilizer, lime, mulch/straw/netting, placement, watering and maintenance throughout the duration of the contract, and all appurtenances necessary for a complete installation.

2.32 CONCRETE CURB REMOVAL AND REPLACEMENT

A. Payment for concrete curb removal and replacement shall be paid for at the Contract unit price per linear foot, which shall include base, compaction, formwork, concrete, placement of concrete curb, curing compound, maintenance of traffic, removal of existing curb, and all appurtenances necessary for a complete installation.

2.33 DENSE GRADED AGGREGATE – DGA, EXTRA AS DIRECTED BY ENGINEER

A. Payment for dense graded aggregate shall be paid for at the Contract unit price per ton, which shall include placement of aggregate, compaction and all appurtenances necessary for a complete installation.

2.34 NO. 2 CRUSHED STONE, EXTRA AS DIRECTED BY ENGINEER

A. Payment for No. 2 crushed stone shall be paid for at the Contract unit price per ton, which shall include placement of aggregate, compaction and all appurtenances necessary for a complete installation.

2.35 FLOWABLE (CONTROLLED DENSITY) FILL AS DIRECTED BY ENGINEER

A. Payment for flowable fill shall be paid for at the Contract unit price per cubic yard measured in-place, which shall include placement of flowable fill, maintenance of traffic, and all appurtenances necessary for a complete installation.

2.36 CONCRETE AND ASPHALT SIDEWALK

A. Payment for concrete sidewalk removal and replacement shall be paid for at the Contract unit price per square yard, which shall include excavation, crushed stone, concrete, formwork, compaction, placement of concrete sidewalk, expansion joints, curing compound, and all appurtenances necessary for a complete installation.

2.37 SIDEWALK RAMPS, INCLUDING DETECTABLE WARNINGS

A. Payment for concrete sidewalk ramps removal and replacement shall be paid for at the Contract unit price per each, which shall include excavation, crushed stone, formwork, compaction, placement of concrete sidewalk, detectable warning tile, expansion joints, curing compound, and all appurtenances necessary for a complete installation.

2.38 CHAIN LINK FENCE AS DIRECTED BY ENGINEER

A. Payment for chain link fence removal and replacement shall be paid for at the Contract unit price per linear foot, which shall include posts, anchoring, concrete, fencing, gates, and all appurtenances necessary for a complete installation. The chain link fence shall be replaced from post to post unless specifically noted otherwise on the Contract Documents.

2.39 BYPASS PUMPING AND SETUP

A. Payment is for operation and setup of bypass pumping required for installation of all items shown in Contract Documents. This is to be paid for at the Contract lump sum as indicated on the Bid Schedule. Work shall be complete in place, which shall include compensation for all mobilizations, set ups, testing (per section 01520), takedowns, relocations, and demobilization for the pumps, hoses, line plugs, generator, rental fees, fuel, monitoring, piping, duty and backup pumps, check valve, adapters, hose, labor, maintenance, and all appurtenances necessary for the continued setup and operation of the bypass pumping system throughout the project. Provision of redundant pumping capability per Section 01520 is incidental to the cost of bypass pumping and shall be included in this pay item.

2.40 MAINTENANCE OF TRAFFIC

A. Payment is maintenance of traffic. This is to be paid at the contract lump sum price, complete in place, which shall include compensation for flaggers, arrow board, message board, etc., removal of equipment after work is completed, and all appurtenances and manpower necessary.

2.41 EASEMENT AND PROPERTY REQUIREMENTS (MOU CONDITIONS)

A. Payment is for fulfilling all easement and property requirements of Memorandums of Understanding (MOU Conditions) for properties affected by construction activities. These requirements are detailed on Drawing CN3.

2.42 MISCELLANEOUS ROADWAY MARKINGS

A. Payment for miscellaneous roadway markings shall be paid for at the Contract lump sum, which shall include materials, placement of stop bars, lettering, etc., all maintenance of traffic, including flaggers, arrow board, message board, etc., and all appurtenances and manpower necessary for a complete installation.

2.43. CONSTRUCT INTERNAL SWEEP FROM INLET PIPE INVERT TO BENCH

A. Payment for construction of the internal sweep shall be paid at the Contract unit price per each and shall include all labor, materials and equipment to complete the work as shown on the construction documents.

2.44 REPLACE RETAINING WALL

A. Payment shall be made at the contract unit price per lump sum, and shall include all labor, materials (including wall units, geogrid, drainage, and backfill), equipment, excavation, removal and disposal of existing wall, foundation preparation, and installation of the new retaining wall in accordance with the plans and specifications. No additional payment will be made for curves, corners, or height variations.

2.45 TENNIS COURT RECONSTRUCTION

A. Payment shall be at the contract lump sum price and will include full compensation for removal of existing materials for the construction of the new sewer, subgrade preparation, base material, paving, fencing, nets, striping, court surfacing, drainage improvements, and any other work necessary to provide a fully reconstructed and playable tennis court meeting the specified standards. All materials, labor, equipment, and incidentals are included.

2.46 LEXTRAN BUS SHELTER REPLACEMENT

A. Payment shall be made at the contract unit price per lump sum and shall include all labor, materials, and equipment necessary to remove and replace the existing shelter, prepare site foundation, coordinate with LexTran, furnish and install new shelter (including concrete pad, lighting, and signage as applicable) and restore disturbed areas. Shelter installation shall meet all ADA and LexTran requirements.

2.47 ALLOWANCE: THIRD PARTY PROFESSIONAL PRE-CONSTRUCTION PHOTOGRAPHIC DOCUMENTATION

A. An allowance has been established for pre-construction photographic documentation by a third-party professional. Payment is for all labor, materials, equipment, and other incidental costs required to perform the directed work per Section 01323.

*The lump sum allowances identified in the Bid Form are included for potential work as directed by the Engineer and approved by the Owner. The allowance shall not be expended,

in whole or in part, without written authorization from the Engineer and Owner. Payment under this item will be made only for actual work performed or materials provided under the allowance, as documented and approved. Any unused portion of the allowance will be deducted from the final Contract amount. The Contractor shall not perform work under this allowance without prior written direction.

2.48 ALLOWANCE: LANDSCAPING-3504 TATES CREEK ROAD

A. An allowance has been established landscaping at 3504 Tates Creek Road. The allowance covers 6 native trees. Payment is for all labor, materials, equipment, and other incidental costs required to perform the work.

*The lump sum allowances identified in the Bid Form are included for potential work as directed by the Engineer and approved by the Owner. The allowance shall not be expended, in whole or in part, without written authorization from the Engineer and Owner. Payment under this item will be made only for actual work performed or materials provided under the allowance, as documented and approved. Any unused portion of the allowance will be deducted from the final Contract amount. The Contractor shall not perform work under this allowance without prior written direction.

2.49 ALLOWANCE: MISCELLANEOUS SITE IMPROVEMENTS

A. An allowance has been established for Miscellaneous Site Improvements or other work not included in the Contract Documents but deemed necessary for the project during construction. Miscellaneous Site Improvements will be as directed by the Engineer in a Field Order which will document costs associated with the directed Miscellaneous Site Improvement(s). Costs shall include all labor, equipment, materials and other incidental costs required to perform he directed work. Funds from the Miscellaneous Site Improvements allocation not encumbered by a Field Order will be credited to the final contract amount in a Final Adjusting Change Order.

*The lump sum allowances identified in the Bid Form are included for potential work as directed by the Engineer and approved by the Owner. The allowance shall not be expended, in whole or in part, without written authorization from the Engineer and Owner. Payment under this item will be made only for actual work performed or materials provided under the allowance, as documented and approved. Any unused portion of the allowance will be deducted from the final Contract amount. The Contractor shall not perform work under this allowance without prior written direction.

PART 3 – EXECUTION

3.01 PAY ITEMS

A. The pay items listed hereinbefore refer to the items listed in the Bid Schedule and are the only pay items for this contract.

B. Any and all other items of work listed in the specifications or shown on the Contract Drawings for this contract shall be considered incidental to and included in the associated pay items.

END OF SECTION

SECTION 01200
PROJECT MEETINGS

PART 1 – GENERAL

1.01 PRECONSTRUCTION MEETING

A. A preconstruction meeting will be held after Award of Contract, but prior to starting work at the site. Contractor's Project Manager and Site Superintendent are required to attend, as are representatives of all major subcontractors. Progress schedule update shall be submitted in advance of each meeting.

1.02 PROGRESS MEETINGS

A. Progress meetings will be held monthly at the Division of Water Quality offices during the performance of the Work. Additional progress meetings may be called as progress of work dictates. Prior to each progress meeting, Contractor shall submit a progress report summarizing the work completed over the past month and providing a look ahead at the work to be done over the next month.

B. Minimum Agenda for meeting shall include:

1. Review and approve minutes of previous meetings.
2. Review progress of Work since last meeting.
3. Review proposed 30 day construction schedule.
4. Note and identify problems which impede planned progress.
5. Develop corrective measures and procedures to regain planned schedule.
6. Revise construction schedule as indicated and plan progress during next work period.
7. Maintaining of quality and work standards.
8. Complete other current business.
9. Schedule next progress meeting.

1.03 SPECIAL MEETINGS

A. Owner or Engineer may schedule special meetings at the site or at Division of Water Quality offices to resolve construction issues. Contractor and when appropriate, subcontractors, shall attend upon request. No additional compensation shall be paid for meeting attendance.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01210
ALLOWANCES

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. This Section includes administrative and procedural requirements governing allowances. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:

1. Undefined allowances. Undefined allowances are intended for work which has an unknown scope at the time of bidding. These will be handled in accordance with paragraph 1.07 of this specification.

C. The following allowances shall be included in the Contractor's bid:

2. Miscellaneous Site Improvements - $1,000,000 has been established for owner selected miscellaneous site improvements. An allocation has been established for Miscellaneous Site Improvements or other work not included in the Contract Documents but deemed necessary for the project during construction. Miscellaneous Site Improvements will be as directed by the Engineer in a Field Order which will document costs associated with the directed Miscellaneous Site Improvement(s). Costs shall include all labor, equipment, materials, and other incidental costs required to perform the directed work. Funds from the Miscellaneous Site Improvements allocation not encumbered by a Field Order will be credited to the final contract amount in a Final Adjusting Change Order.

3. Tennis Court Reconstruction Allowance (Item 66) - $100,000 has been established for Tennis Court Reconstruction at 3051 Kirklevington Drive.

4. Third Party Professional Pre-Construction Photographic Documentation- $7,000 has been established for pre-construction photographic documentation of existing conditions. An allocation has been established for utilization of an approved consultant to provide thorough documentation of existing conditions with photos and or videos.

5. Landscaping at 3504 Tates Creek Road- $2,000 has been established for landscaping as agreed upon by LFUCG and the property owner at this address.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.03 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, Contractor shall advise Engineer of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Engineer's request, obtain proposals for each allowance for use in making final selections and include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by the Engineer from the designated supplier.

1.04 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.05 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.06 DEFINED ALLOWANCES

A. Defined allowances shall include cost to Contractor of specific products and materials ordered by ____the contractor_____ under allowance and shall include taxes, freight, and delivery to the project site. Defined allowances are the same as Cash Allowances as defined in Article 11.02 of the General Conditions.

B. Contractor's costs at the Project site for labor, installation, overhead and profit, and similar costs related to the equipment ordered under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Contractor shall not be allowed any markup of subcontractors work or materials under the allowances. Markup shall be included as part of the Contract sum and not part of the allowance.

1.07 UNDEFINED ALLOWANCES

A. Undefined allowances shall include work for which the scope is not yet determined. The allowance amount is not guaranteed and is solely for the purpose of determining an initial Contract Price. Undefined allowances are the same as Contingency Allowances as defined in Article 11.02 of the General Conditions.

B. Once the scope of work is defined, the Contractor shall present cost and schedule as listed in 1.04.A above.

1.08 UNUSED MATERIALS

A. Contractor shall be responsible for returning unused materials purchased under an allowance to the manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

B. When it is not economically practical to return material for credit, Contractor shall be responsible for preparing and delivering unused material to Owner's designated storage location. Otherwise, disposal of unused material shall be Contractor's responsibility.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.02 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

END OF SECTION

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SECTION 01300
SUBMITTALS

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. Progress Schedule

1. Within thirty (30) days after execution of the Agreement, but at least 20 days prior to submitting the first application for a progress payment, the Contractor shall prepare and submit three (3) copies of his proposed progress schedule to the Engineer for review and approval.

2. If so required, the schedule shall be revised until it is approved by the Engineer.

3. The schedule shall be updated monthly, depicting progress to the last day of the month and three (3) copies submitted to the Engineer not later than the fifth day of the month with the application for progress payment.

4. The schedule shall be prepared in the form of a horizontal bar chart showing in detail the proposed sequence of the work and identifying construction activities for each structure and for each portion of work.

5. The schedule shall be time scaled, identifying the first day of each week. The Schedule shall be provided with estimated dates for Early Start, Early Finish, Late Start and Late Finish as applicable. The work shall be scheduled to complete the Project within the Contract time. The Late Finish date shall equal the Contract Completion Date.

6. The schedule shall show duration (number of days) and float for each activity. Float shall be defined as the measure of leeway in starting or completing a scheduled activity without adversely affecting the project completion date established by the Contract Documents.

7. The updated schedule shall show all changes since the previous submittal.

8. All revisions to the schedule must have the prior approval of the Engineer.

B. Equipment and Material Orders Schedule

1. Contractor shall prepare and submit three (3) copies of his schedule of principal items of equipment and materials to be purchased to the Engineer for review and approval.

2. If so required, the schedule shall be revised until it is approved by the Engineer.

3. The schedule shall be updated monthly and three (3) copies submitted to the Engineer not later than the fifth day of every month with the application for progress payment.

4. The updated schedule shall be based on the Progress Schedule developed under the requirements of Paragraph 1.01(A) of this Section.

5. The schedule shall be in tabular form with appropriate spaces to insert the following information for principal items of equipment and materials:

    a. Dates on which Shop Drawings are requested and received from the manufacturer.

    b. Dates on which certification is received from the manufacturer and transmitted to the Engineer.

    c. Dates on which Shop Drawings are submitted to the Engineer and returned by the Engineer for revision.

    d. Dates on which Shop Drawings are revised by manufacturer and resubmitted to the Engineer.

    e. Date on which Shop Drawings are returned by Engineer annotated either "Furnish as Submitted" or "Furnish as Corrected".

    f. Date on which accepted Shop Drawings are transmitted to manufacturer.

    g. Date of manufacturer's scheduled delivery.

    h. Date on which delivery is actually made.

C. Working Drawings

1. Within thirty (30) days after the Notice to Proceed, each prime Contractor shall prepare and submit three (3) copies of his preliminary schedule of Working Drawing submittals to the Engineer for review and approval. If so required, the schedule shall be revised until it is approved by the Engineer.

2. Working Drawings include, but are not limited to, Shop Drawings, layout drawings in plan and elevation, installation drawings, etc. Contractor shall be responsible for securing all of the information, details, dimensions, Drawings, etc., necessary to prepare the Working Drawings required and necessary under this Contract and to fulfill all other requirements of his Contract. Contractor shall secure such information, details, Drawings, etc., from all possible sources including the Drawings, Working Drawings prepared by subcontractors, Engineers, suppliers, etc.

3. In the event that the Engineer is required to provide additional engineering services as a result of a substitution of materials or equipment by the Contractor, the additional services will be provided in accordance with Section 01010 - Summary of Work, and will be covered in supplementary or revised Drawings which will be issued to the Contractor. All changes indicated that are necessary to accommodate the equipment and appurtenances shall be incorporated into the Working Drawings submitted to the Engineer.

4. Shop Drawings

   a. Contractor shall submit for review by the Engineer Shop Drawings for all fabricated work and for all manufactured items required to be furnished by the Contract Documents. Electronic submittals may be sent to katie.beard@primeeng.com.

   b. Structural and all other layout Drawings prepared specifically for the Project shall have a plan scale of not less than 1/4-inch = 1 foot.

   c. The submitted documents shall provide information indicating that the materials are in conformance with the Technical Specifications and Contract Documents.

   d. Where manufacturer's publications in the form of catalogs, brochures, illustrations or other data sheets are submitted in lieu of prepared Shop Drawings, such submittals shall specifically indicate the item for which approval is requested. Identification of items shall be made in ink, and submittals showing only general information are not acceptable.

5. Contractor Responsibilities

   a. All submittals from subcontractors, manufacturers or suppliers shall be sent directly to the Contractor for checking. Contractor shall thoroughly check all Drawings for accuracy and conformance to the intent of the Contract Documents. Drawings found to be inaccurate or otherwise in error shall be returned to the subcontractors, manufacturers, or suppliers by the Contractor for correction before submitting them to the Engineer.

   b. All submittals shall be bound, dated, properly labeled and consecutively numbered. Information on the label shall indicate Specification Section, Drawing number, subcontractors', manufacturer's or supplier's name and the name or type of item the submittal covers. Each part of a submittal shall be marked and tabulated.

   c. Working Drawings shall be submitted as a single complete package including all associated drawings relating to a complete assembly of the various parts necessary for a complete unit or system.

d. Shop Drawings shall be submitted as a single complete package for any operating system and shall include all items of equipment and any mechanical units involved or necessary for the functioning of such system.

e. ALL SUBMITTALS SHALL BE THOROUGHLY CHECKED BY THE CONTRACTOR FOR ACCURACY AND CONFORMANCE TO THE INTENT OF THE CONTRACT DOCUMENTS BEFORE BEING SUBMITTED TO THE ENGINEER AND SHALL BEAR THE CONTRACTOR'S STAMP OF APPROVAL CERTIFYING THAT THEY HAVE BEEN SO CHECKED. SUBMITTALS WITHOUT THE CONTRACTOR'S STAMP OF APPROVAL WILL NOT BE REVIEWED BY THE ENGINEER AND WILL BE RETURNED TO THE CONTRACTOR. Any comments added to the drawings by the Contractor shall be done in green ink so as to denote any Contractor notes.

f. If the submittals contain any departures from the Contract Documents, specific mention thereof shall be made in the Contractor's letter of transmittal. Otherwise, the review of such submittals shall not constitute approval of the departure.

g. No materials shall be ordered, fabricated or shipped or any work performed until the Engineer returns to the Contractor the submittals, herein required, annotated either "Furnish as Submitted" or "Furnish as Corrected".

h. Where errors, deviations, and/or omissions are discovered at a later date in any of the submittals, the Engineer's prior review of the submittals does not relieve the Contractor of the responsibility for correcting all errors, deviations, and/or omissions.

6. Procedure for Review

a. Submittals shall be transmitted in sufficient time to allow the Engineer at least thirty (30) working days for review and processing.

b. Contractor shall transmit two (2) prints of each submittal to the Engineer for review for all Drawings greater than 11-inches by 17-inches in size, as well as six (6) copies of all other material, OR electronic submittal to katie.beard@primeeng.com. If electronic submittals are used, the Contractor shall transmit two (2) hardcopies of each submittal to the Engineer once the submittal has been reviewed.

c. Submittal shall be accompanied by a letter of transmittal, in duplicate, containing date, project title, Contractor's name, number and titles of submittals, notification of departures and any other pertinent data to facilitate review.

d. Submittals will be annotated by the Engineer in one of the following ways:
"Furnish as Submitted" - no exceptions are taken.

"Furnish as Corrected" - minor corrections are noted and shall be made.

"Revise and Resubmit" - major corrections are noted and a resubmittal is required.

"Rejected" - Based on the information submitted, the submission is not in conformance with the Contract Documents. The deviations from the Contract Documents are too numerous to list and a completely revised submission of the proposed equipment or a submission of other equipment is required.

e. If a submittal is satisfactory to the Engineer, the Engineer will annotate the submittal "Furnish as Submitted" or "Furnish as Corrected", retain four (4) copies and return remaining copies to the Contractor.

f. If a resubmittal is required, the Engineer will annotate the submittal "Revise and Resubmit" and transmit five (5) copies to the Contractor for appropriate action.

g. Contractor shall revise and resubmit submittals as required by the Engineer until submittals are acceptable to the Engineer. It is understood by the Contractor that Owner may charge the Contractor the Engineer's charges for review in the event a submittal is not approved (either "Furnish as Submitted" or "Furnish as Corrected") by the third submittal for a system or piece of equipment. These charges shall be for all costs associated with engineering review, meetings with the Contractor or manufacturer, etc., commencing with the fourth submittal of a system or type of equipment submitted for a particular Specification Section.

h. Acceptance of a Working Drawing by the Engineer will constitute acceptance of the subject matter for which the Drawing was submitted and not for any other structure, material, equipment or appurtenances indicated or shown.

7. Engineer's Review

a. Engineer's review of the Contractor's submittals shall in no way relieve the Contractor of any of his responsibilities under the Contract. An acceptance of a submittal shall be interpreted to mean that the Engineer has no specific objections to the submitted material, subject to conformance with the Contract Drawings and Specifications. The Engineer will denote any notes in red ink so as to record his comments.

b. Engineer's review will be confined to general arrangement and compliance with the Contract Drawings and Specifications only, and will not be for the purpose of checking dimensions, weights, clearances, fittings, tolerances, interferences, coordination of trades, etc.

8. Record Working Drawings

a. Prior to final payment, the Contractor shall furnish the Engineer one complete set of all accepted Working Drawings, including Shop Drawings, for equipment, piping, electrical work, heating system, ventilating system, air conditioning system, instrumentation system, plumbing system, structural, interconnection wiring diagrams, etc.

b. Manufacturer's publications, submitted in lieu of prepared Shop Drawings, will not be required in reproducible form. However, three (3) sets of such material shall be furnished by the Contractor to the Engineer.

c. Working Drawings furnished shall be corrected to include any departures from previously accepted Drawings.

D. Construction Photographs

1. The General Contractor shall take photographs at the locations and at such stages of the construction as directed by the Engineer. Digital format shall be used. Provide all pictures for a given period on a CD or DVD.

2. Provide the equivalent of 36 different exposures per month for the duration of the Contract time. When directed by the Engineer, frequency of photographs may be increased to weekly sessions provided that the equivalent number of exposures is not exceeded. Engineer may waive requirements for photographs during inactive construction periods in favor of increased photographs during active construction sequences.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01320
PROGRESS SCHEDULES

PART 1 – GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. Scheduling Responsibilities:

1. In order to provide a definitive basis for determining job progress, a construction schedule of a type approved by the Owner will be used to monitor the project.

2. Each week the Contractor shall be responsible for preparing the schedule and updating it based on a tentative two week basis. It shall at all times remain the Contractor's responsibility to schedule and direct his forces in a manner that will allow for the completion of the work within the contractual period.

B. Construction Hours: see Section 01010 – Summary of Work – for construction working hours requirements.

C. Progress of the Work:

1. The work shall be started within ten (10) days following the Notice to Proceed and shall be executed with such progress as may be required to prevent delay to other Contractors or to the general completion of the project. The work shall be executed at such times and in or on such parts of the project, and with such forces, material and equipment, to assure completion of the work in the time established by the Contract.

2. The Contractor agrees that whenever it becomes apparent from the current monthly schedule update that delays have resulted and, hence, that the Contract completion date will not be met or when so directed by the Owner, he will take some or all of the following actions at no additional cost to the Owner:

a. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of work.

b. Increase the number of working hours per shift, shifts per working day or days per week, the amount of construction equipment, or any combination of the foregoing to substantially eliminate the backlog of work.

c. Reschedule activities to achieve maximum practical concurrency of accomplishment of activities, and comply with the revised schedule.

d. The Contractor shall submit to the Owner or the Owner's representative for review a written statement of the steps he intends to take to remove or arrest the delay to the critical path in the accepted schedule.

1.02 CONSTRUCTION SCHEDULE

A. Within ten (10) calendar days of the Notice to Proceed, the Contractor shall submit to the Engineer five (5) copies of his proposed schedule. The schedule will be the subject of a schedule review meeting with the Contractor, the Engineer and the Owner or the Owner's representative within one (1) week of its submission. The Contractor will revise and resubmit the schedule until it is acceptable and accepted by the Owner or the Owner's representative.

1.03 CONTRACT COMPLETION TIME

A. Causes for Extensions:

1. The Contract completion time will be adjusted only for causes specified in this Contract. In the event the Contractor requests an extension of any Contract completion date, he shall furnish such justification and supporting evidence as the Owner or the Owner's representative may deem necessary for a determination as to whether the Contractor is entitled to an extension of time under the provisions of this Contract. The Owner, with the assistance of the Engineer, will, after receipt of such justification and supporting evidence, make findings of fact and will advise the Contractor in writing thereof.

B. Requests for Time Extension:

1. Each request for change in any Contract completion date shall be initially submitted to the Owner within the time frame stated in the General Conditions. All information known to the Contractor at that time concerning the nature and extent of the delay shall be transmitted to the Owner at that time. Within the time frame stated in the General Conditions but before the date of final payment under this Contract, all information as required above concerning the delay must be submitted to the Owner. No time extension will be granted for requests which are not submitted within the foregoing time limits.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01323
THIRD PARTY PROFESSIONAL PRE-CONSTRUCTION PHOTOGRAPHIC DOCUMENTATION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, Procurement and Contracting Requirements, and General Requirements.

1.02 SUMMARY

A. Section Includes:

1. Photographic documentation.

1.03 PRICE AND PAYMENT PROCEDURES

A. Refer to Division 1 for general requirements for Allowances, Unit Prices, and Alternates.

1.04 PHOTOGRAPHIC AND VIDEO DOCUMENTATION VENDORS

A. Provide services from the following, or OWNER approved equal:

1. Multivista, Website: www.multivista.com, Email: m.rolfe@multivista.com, (614) 352-0555, 1001 Eastwind Drive, Suite 110, Westerville, Ohio 43081.

2. Self-performed pre-construction photographic documentation will not be accepted.

1.05 QUALITY ASSURANCE

A. Vendor Qualifications, General: Specialist (not the General Contractor or Construction Manager), experienced in construction photographic and video documentation for each type of equipment, technology, and service specified, carrying OSHA certifications, related insurance coverage(s), and other certification and clearances required for operations on the Project site, having a minimum of five years' experience engaged as a professional photographer/videographer of construction projects while using an advanced software platform, indexing system, and navigation interface, and having examples of at least 5 construction projects in the past 2 years of similar type, size, duration and complexity to this Project. Demonstrate the ability to contract through the project schedule. Must have a local office within 100 miles of the project site and be able to respond to site visit requests with qualified personnel within 24 hours of notice. Must respond to service and support requests/inquiries within 24 hours. Submit qualifications upon request.

1. In-House Software Programming And Development Team: Photographic and Video Documenter directly employs in-house software programming and development team to support, maintain, and when needed customize the software platform, online interface, mobile application, and BIM model integration services.

2. Attend Project meetings as required. Participate in any required project safety training.

1.06 PROJECT CONDITIONS

A. Verification for Photographic and Video Documentation, General:

1. Verify site conditions are acceptable for documentation work to proceed.

2. Notify Client of obstructions that impede documentation progress.

3. Verify necessity for access to neighboring properties and/or buildings, if any.

a. Notify Client of required access to neighboring property 7 calendar days prior to proceeding with field work.

1.07 PHOTOGRAPHIC AND VIDEO DOCUMENTATION, GENERAL

A. Single Source: Perform each type of documentation specified in this Section under a single Photographic and Video Documenter's responsibility, who meets the Vendor Qualifications specified in this Section's Quality Assurance Article.

B. Provide factual presentation. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

C. Use overlapping photographic techniques to ensure maximum coverage, including 360 degrees of exterior and interior features, where applicable.

D. Identification for Each Photograph and Video:

1. Project name.

2. Orientation in Key Plan.

3. Date taken.

E. Milestone Documentation: Document conditions prior to each construction milestone, including but not limited to each of the following:

1. Site Existing Conditions:

a. Document site to limits of the Work as indicated on Contract Drawings, and immediately surrounding area.

b. Document access roads/properties, a minimum of 250' from the construction limits, and immediately surrounding areas.

F. Permanent Record: Provide offline, digital media copies of final standard photographic, video, and webcam documentation ("The Permanent Record") upon completion of the contract.

1. Permanent Record shall include the underlying software platform, indexing and navigation system, typically as a DVD flash drive or external hard drive. Include one multiple-user license for the underlying software, indexing and navigation for accessing the digital media.

2. Online access shall terminate upon delivery of the final documentation copies or as otherwise agreed by the Client.

3. Intellectual property rights associated with the documentation prepared in direct service of the Project shall transfer to the Client, along with the digital media itself.

G. Additional Types of Documentation: If requested by Client or Client's agent in writing, make proposal for additional documentation not covered in the scope of this Section. Provide such additional documentation if approved by written Change Order.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

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SECTION 01400
QUALITY CONTROL

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. Testing Laboratory Services

1. Laboratory testing and checking required by the Specifications, including the cost of transporting all samples and test specimens, shall be provided and paid for by the Owner unless otherwise indicated in the Specifications.

2. Materials to be tested include, but are not necessarily limited to the following: cement, concrete aggregate, concrete, and reinforcing steel.

3. Tests required by the Owner shall not relieve the Contractor from the responsibility of supplying test results and certificates from manufacturers or suppliers to demonstrate conformance with the Specifications.

4. In place testing of compacted materials will be conducted as specified or recommended by Engineer.

5. Procedure

   a. The Contractor shall plan and conduct his operations to permit taking of field samples and test specimens, as required, and to allow adequate time for laboratory tests.

   b. The collection, field preparation and storage of field samples and test specimens shall be as directed by the Engineer with the cooperation of the Contractor.

6. Significance of Tests

   a. Test results shall be binding on both the Contractor and the Owner, and shall be considered irrefutable evidence of compliance or noncompliance with the Specification requirements, unless supplementary testing shall prove, to the satisfaction of the Owner, that the initial samples were not representative of actual conditions.

7. Supplementary and Other Testing

   a. Nothing shall restrict the Contractor from conducting tests he may require. Should the Contractor at any time request the Owner to consider such test results, the test reports shall be certified by an independent testing

laboratory acceptable to the Owner. Testing of this nature shall be conducted at the Contractor's expense.

1.02 IMPERFECT WORK OR MATERIALS

A. Any defective or imperfect work or materials furnished by the Contractor which is discovered before the final acceptance of the work, as established by the Certificate of Substantial Completion, or during the subsequent guarantee period, shall be removed immediately even though it may have been overlooked by the Engineer and estimated for payment. Any materials condemned or rejected by the Engineer shall be tagged as such and shall be immediately removed from the site. Satisfactory work or materials shall be substituted for that rejected.

B. The Engineer may order tests of imperfect or damaged work or materials to determine the required functional capability for possible acceptance, if there is no other reason for rejection. The cost of such tests shall be borne by the Contractor; and the nature, tester, extent and supervision of the tests will be as determined by the Engineer. If the results of the tests indicate that the required functional capability of the work or material was not impaired, consistent with the final general appearance of same, the work or materials may be deemed acceptable. If the results of such tests reveal that the required functional capability of the questionable work or materials has been impaired, then such work or materials shall be deemed imperfect and shall be replaced. The Contractor may elect to replace the imperfect work or material in lieu of performing the tests.

1.03 INSPECTION AND TESTS

A. The Contractor shall allow the Engineer ample time and opportunity for testing materials to be used in the work. He shall advise the Engineer promptly upon placing orders for material so that arrangements may be made, if desired, for inspection before shipment from the place of manufacture. The Contractor shall at all times furnish the Engineer and his representatives, facilities including labor, and allow proper time for inspecting and testing materials and workmanship. The Contractor must anticipate possible delays that may be caused in the execution of his work due to the necessity of materials being inspected and accepted for use. The Contractor shall furnish, at his own expense, all samples of materials required by the Engineer for testing, and shall make his own arrangements for providing water, electric power, or fuel for the various inspections and tests of structures and material.

B. Where other tests or analyses are specifically required in other Sections of these Specifications, the cost thereof shall be borne by the party (Owner or Contractor) so designated in such Sections. The Owner will bear the cost of all tests, inspections, or investigations undertaken by the order of the Engineer for the purpose of determining conformance with the Contract Documents if such tests, inspection, or investigations are not specifically required by the Contract Documents, and if conformance is ascertained thereby. Whenever nonconformance is determined by the Engineer as a result of such tests, inspections, or investigations, the Contractor shall bear the full cost thereof or shall reimburse the Owner for said cost. In this connection, the cost of any additional tests

and investigations, which are ordered by the Engineer to ascertain subsequent conformance with the Contract Documents, shall be borne by the Contractor.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

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SECTION 01510
TEMPORARY UTILITIES

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. The General Contractor shall provide temporary sanitary facilities for the construction operations of this Contract. The temporary services shall be provided for use throughout the construction period.

B. Temporary Sanitary Service

1. Sanitary conveniences, in sufficient numbers, for the use of all persons employed on the work and properly screened from public observation, shall be provided and maintained at suitable locations by the General Contractor, all as prescribed by State Labor Regulations and local ordinances. The contents of same shall be removed and disposed of in a manner consistent with local and state regulations, as the occasion requires. Sanitary facilities shall be removed from the site when no longer required.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

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SECTION 01515
FIELD OFFICES

PART 1 – GENERAL

1.01 CONTRACTOR'S FIELD OFFICE

A. The Contractor shall establish and maintain a field office on this project and have available at the office a responsible representative who can officially receive communications from the Owner and the Engineer. The Contractor shall have one complete, up-to-date set of Drawings, Specifications and Contract Documents (including all Addenda and Change Orders) in this office at all times, available for reference at any time. The office shall be provided with telephone service, toilet facilities, light, air conditioning and heat; the cost of which shall be borne by the Contractor. Notices, instructions, orders, directions or other communications from the Engineer, left at this office, shall be considered as received by the Contractor.

B. Field office and utilities shall be in accordance with all applicable codes and ordinances.

1.02 RESIDENT REPRESENTATIVE'S FIELD OFFICE

A. No field office for the resident representative will be required.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01520

MAINTENANCE OF UTILITY OPERATIONS DURING CONSTRUCTION

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. The sanitary sewer system shall be maintained in continuous operation during the entire construction period of all Contracts as hereinafter specified. The intent of this section is to outline the minimum requirements necessary to provide continuous transference of wastewater throughout the construction period.

B. Work under each Contract shall be scheduled and conducted by each Contractor so as to not reduce the quality of near-by water streams or cause odor or other nuisance except as explicitly permitted hereinafter. In performing the work shown and specified, the Contractor shall plan and schedule his work to meet the plant and collection system operating requirements, and the constraints and construction requirements as outlined in this Section. No discharge of raw or inadequately treated wastewater shall be allowed. The Contractor shall pay all civil penalties, costs, and assessments associated with any discharge of raw or inadequately treated wastewater associated with the Contractor's work.

C. The General Contractor shall be responsible for coordinating the general construction and for ensuring that permanent or temporary power is available for all existing, proposed, and temporary facilities that are required to be on line at any given time.

D. The Contractor has the option of providing additional temporary facilities that can eliminate a constraint, provided it is done without cost to the Owner and provided that all requirements of these Specifications are fulfilled and approved by the Engineer.

1.02 TEMPORARY BYPASS PUMPING

A. Requirements for this section shall apply to all pumping required for Contractor to perform tie-ins, shutdowns, etc. for construction of the work. Temporary bypass pumping shall be performed in accordance with this section unless noted otherwise herein. Temporary pumping system design calculations and equipment information shall be submitted for review by Engineer per Section 01300. Calculations shall be stamped by a professional engineer (PE).

B. Contractor shall furnish, install, maintain, and operate temporary bypass pumping facilities as required to complete the Work. Contractor shall be responsible for all construction necessary to accommodate pumps and piping including but not limited to structure modifications, pump base construction, pipe supports, etc.

C. The Contractor shall perform a test run of the bypass pumping set-up before being allowed to continue with the full scale bypass pumping.

D. Contractor shall design the temporary bypass pumping facilities to convey flows from the upstream manholes where existing manhole or sewer tie-ins, replacement, or modifications will be conducted in a manner that will prevent backup of the existing system.

E. All tie-ins, replacement, or modifications shall be performed during low flow conditions.

F. All tie-ins, replacement, or modifications Work shall be accomplished as quickly as possible. If Work required extends beyond 8-hours or weather causes higher flows in the existing system during the Work, the new Work shall be stopped and the existing system shall be placed back into service. The new Work shall be properly protected from damage. Any damage to the new Work or damage to surrounding areas caused by the new Work shall be repaired or replaced at the Owner's decision by the Contractor at the Contractor's sole expense.

G. Contractor shall provide all power, fuel, maintenance materials, parts, and other expendables in order to maintain temporary pumping through the duration of the Work.

H. Contractor shall provide one standby pump equal in capacity to the largest pump installed. If temporary pumping requires non-identical pumps in series, a standby pump of each type shall be provided. Temporary control system shall start standby pump on high level and dial-out to local contact who will respond and be on-site within an hour to check and address problem. High-high level shall also alarm and dial-out indicating that standby pump is not maintaining level. Temporary pumping system shall be provided by company that has spare pumps ready to be delivered and installed locally if problems occur.

I. Contractor shall provide standby power or 48-hour on-site fuel storage capacity for diesel engine type pumps to ensure continuous operation at all times.

J. Contractor shall provide sound attenuation for temporary pumping facilities to limit noise levels to no more than 85 dBA at a distance of 21 feet from the noise source.

K. Temporary pumping system shall remain fully operational until all modifications are complete and approved by Owner or Engineer.

L. Following successful completion of the new Work, Contractor shall remove all temporary pumps, piping and appurtenances and restore area and/or structures to original condition prior to start of work.

M. Contractor shall prepare Temporary Bypass Plan and submit to Owner and Engineer at pre-construction conference for review and approval.

N. Contractor shall reconnect to existing gravity sewer at the end of each day, weather delay, or completion of Work so that bypass pumping does <u>not</u> occur when not on jobsite. Overnight bypass pumping will only be allowed when directed by Engineer and Owner.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01530

PROTECTION OF EXISTING FACILITIES

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. Contractor shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of his operations under this Contract. Any damage or injury occurring on account of any act, omission or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.

B. Contractor shall comply promptly with such safety regulations as may be prescribed by the Owner or the local authorities having jurisdiction and shall, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of, his employees. In the event of the Contractor's failure to comply, the Owner may take the necessary measures to correct the conditions or practices complained of, and all costs thereof will be deducted from any monies due the Contractor. Failure of the Engineer to direct the correction of unsafe conditions or practices shall not relieve the Contractor of his responsibility hereunder.

C. In the event of any claims for damage or alleged damage to property as a result of work under this Contract, the Contractor shall be responsible for all costs in connection with the settlement of or defense against such claims. Prior to commencement of work in the vicinity of property adjacent to the work site, the Contractor, at his own expense, shall take such surveys as may be necessary to establish the existing condition of the property. Before final payment can be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained.

1.02 PROTECTION OF WORK AND MATERIAL

A. During the progress of the work and up to the date of final payment, the Contractor shall be solely responsible for the care and protection of all work and materials covered by the Contract.

B. All work and materials shall be protected against damage, injury or loss from any cause whatsoever, and the Contractor shall make good any such damage or loss at his own expense. Protection measures shall be subject to the approval of the Engineer.

1.03 EXISTING UTILITIES AND APPURTENANT STRUCTURES

A. The term existing utilities shall be deemed to refer to both publicly-owned and privately-owned utilities such as electric power and lighting, telephone, water, gas, storm drains, sanitary sewers and all appurtenant structures.

B. Where existing utilities and structures are indicated on the Drawings, it shall be understood that all of the existing utilities and structures affecting the work may not be shown and that the locations of those shown are approximate only. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.

C. Prior to beginning any excavation work, the Contractor shall, through field investigations, determine any conflicts or interferences between existing utilities and new utilities to be constructed under this project. This determination shall be based on the actual locations, elevations, slopes, etc., of existing utilities as determined in the field investigations, and locations, elevation, slope, or other information of new utilities as shown on the Drawings. If an interference exists, the Contractor shall bring it to the attention of the Engineer as soon as possible. If the Engineer agrees that an interference exists, he shall develop a plan to address the interference as required, and obtain the Owner's approval. Additional costs to the Contractor for this change shall be processed through a Change Order as detailed elsewhere in these Contract Documents. In the event the Contractor fails to bring a potential conflict or interference to the attention of the Engineer prior to beginning excavation work, any actual conflict or interference which does arise during the Project shall be corrected by the Contractor, as directed by the Engineer, at no additional expense to the Owner.

D. The work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Temporary connections shall be provided, as required, to insure uninterruption of existing services. Any damage resulting from the work of this Contract shall be promptly repaired by the Contractor at his own expense in a manner approved by the Engineer and further subject to the requirements of any authority having jurisdiction. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the Contractor shall be responsible for all costs thereof.

E. Where excavations by the Contractor require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction work, such support and protection shall be provided by the Contractor. All such work shall be performed in a manner satisfactory to the Engineer and the respective authority having jurisdiction over such work. In the event the Contractor fails to provide proper support or protection to any existing utility, the Engineer may, at his discretion, have the respective authority to provide such support or protection as may be necessary to insure the safety of such utility, and the costs of such measures shall be paid by the Contractor. This is not a pay item.

1.04 DOCUMENTATION OF EXISTING STRUCTURES

A. The term existing structures shall be deemed to refer to both publicly-owned and privately-owned buildings, structures, and other facilities on the ground surface and any foundations or extensions below the ground surface.

B. Prior to beginning any excavation work in close proximity to existing structures, the Contractor shall complete a Pre-Construction Survey to assess the condition of existing structures surrounding the work site. The survey must be performed a maximum of 7 days prior to excavation and submitted to the Engineer and Owner.

C. Documentation for the Pre-Construction Survey shall be provided as photographs, videos, and report forms to document each structure. Prior to the Pre-Construction Survey, the construction limits must be flagged. Take photographs and video to show existing conditions adjacent to property and to show existing buildings either on or adjoining property to accurately record physical conditions. Include video and photographs of the visible foundation and wall of the buildings, both inside and outside of each structure. Any existing deformities or cracks must be clearly documented in the video and photographs, and shall be documented from different vantage points.

D. All photographs and videos shall be digital and provided on compact disc (CD), digital video disc (DVD), or flash drive. Digital photographs and videos shall be time and date stamped. See Section 01010 for additional video requirements.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01531
TREE AND PLANT PROTECTION

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall be responsible for the protection of existing trees, shrubs, and plants on or adjacent to the work site that are shown or designated to remain in place by the Owner against unnecessary cutting, breaking, or skinning of trunk, branches, bark, or roots. Any damaged trees and plants that die or suffer permanent injury on account of any act, omission, or neglect on the part of the Contractor shall be removed when ordered by the Engineer and replaced by a specimen of equal or better quality at the expense of the Contractor.

1.02 PROTECTION OF TREES AND PLANTS

A. The term DBH (Diameter at Breast Height) shall be deemed to refer to the total cross sectional diameter in inches of a tree measured at a height of four and one-half (4 ½) feet.

B. The term Tree Protection Area (TPA) shall be deemed to refer to the circular area surrounding a tree of which the center is the center of the bole of the tree and the radial measurement is one (1) foot per inch up to twenty-four (24) inches DBH and 1.5 feet per inch DBH or trees over twenty-four (24) inches DBH or a lesser distance provided it will not adversely affect the health of protected tree(s).

C. All areas designated for existing tree preservation by the Engineer shall be protected during construction activity. The Contractor is responsible for furnishing, installation, maintenance and removal of orange plastic fencing at least four (4) feet tall attached to metal "tee" posts, securely driven into the ground, and attaching tree protection signage (12" x 18" aluminum sign, provided by LFUCG DWQ) to the "tee" posts at twenty-five (25) foot intervals. Maintenance of the fence, and surrounding area, shall cover repairs to fence, posts or signs, and grass and weed cutting, as required, for the duration of the project. Tree protection fencing shall be placed for a minimum of three (3) weeks before any construction traffic occurs under or near significant trees.

D. No vehicles, construction materials, equipment, fuel, or temporary or permanent earth fill shall be placed within a TPA. There shall not be any movement of any vehicles into nor within a TPA. No nails, rope, cable, signs, or fencing is to be attached to a tree within a TPA.

E. Fires shall not be permitted under or adjacent to trees and plants.

F. The Contractor shall contact the Division of Environmental Services (DES) 2 weeks prior to needing their root protection services and prior to construction traffic/excavation under

or near significant trees. The Contractor will not be allowed to proceed with their work if the roots have not been properly cut by DES. Failure to notify DES 2 weeks prior to work in the area shall not be grounds for additional contract time. All exposed roots shall be covered with earth as soon as possible. The Contractor shall protect root systems from mechanical damage and damage by erosion, flooding, run-off or noxious materials in solution.

G. If branches or trunks are damaged, it is the responsibility of the Contractor to prune branches immediately and protect the cut or damaged areas with emulsified asphalt compounded specifically for horticultural use in a manner approved by the Engineer.

PART 2 – PRODUCT (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01540

DEMOLITION AND REMOVAL OF EXISTING STRUCTURES AND EQUIPMENT

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. This Section covers the demolition, removal, and disposal of structures, pavement, curbs, sidewalk, and any existing equipment. The Contractor shall furnish all labor, materials and equipment to demolish and remove structures and equipment designated to be removed on Drawings.

1.02 TITLE TO EQUIPMENT AND MATERIALS

A. Contractor shall have no right or title to any of the equipment, materials or other items to be removed from the existing structures unless authorized by Owner.

1.03 CONDITION OF STRUCTURES AND EQUIPMENT

A. The Owner does not assume responsibility for the actual condition of structures and equipment to be demolished and removed.

PART 2 – PRODUCTS (NOT USED)

PART 3 – PART 3 - EXECUTION

3.01 DEMOLITION AND REMOVALS

A. The removal of all equipment and piping, and all materials from the demolition of structures shall, when released by the Owner and Engineer, be done by the Contractor and become the Contractor's property, unless otherwise noted, for disposition in any manner not contrary to the Contract requirements and shall be removed from the site to the Contractor's own place of disposal.

B. Any equipment piping and appurtenances removed without proper authorization, which are necessary for the operation of the existing facilities shall be replaced to the satisfaction of the Engineer at no cost to the Owner.

C. Excavation caused by demolitions shall be backfilled with fill free from rubbish and debris.

D. All materials removed by demolition or excavation shall be lawfully and properly handled and disposed according to applicable local, state, and federal laws. Where materials shall be disposed at landfill, manifests and documentation shall be provided to Owner showing / documenting that materials have been properly handled and disposed.

E. Manhole frames and covers that have been removed shall become the property of the Contractor and shall be disposed on in a legal manner.

END OF SECTION

SECTION 01550
SITE ACCESS AND STORAGE

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. Access Roads

1. The General Contractor shall construct and maintain such temporary access roads as required to perform the work of this Contract.

2. Access roads shall be located within the property lines of the Owner unless the Contractor independently secures easements for his use and convenience. Contractor shall submit written documentation to the Engineer for any Contractor secured easements across privately held property. Easement agreement shall specify terms and conditions of use and provisions for site restoration. A written release from the property owner certifying that all terms of the easement agreement have been complied by the Contractor shall be furnished to the Engineer prior to final payment.

3. Existing access roads used by the Contractor shall be suitably maintained by the Contractor at his expense during construction. Contractor shall not be permitted to restrict Owner access to existing facilities. Engineer may direct Contractor to perform maintenance of existing access roads when Engineer determines that such work is required to insure all weather access by the Owner.

4. The Contractor will maintain the primary roads to be free of mud and dirt. All mud and dirt carried from the access roads to the primary roads shall be washed and cleaned.

5. The Contractor shall obtain and pay all cost associated with any bonds required by the Kentucky Department of Transportation for the use of State maintained roads.

B. Parking Areas

1. Each Contractor shall construct and maintain suitable parking areas for his construction personnel on the project site where approved by the Engineer and the Owner.

C. Restoration

1. At the completion of the Work, the surfaces of land used for access roads and parking areas shall be restored by the Contractor to its original condition and to the satisfaction of the Engineer.

D. Traffic Regulations

1. Contractor shall obey all traffic laws and comply with all the requirements, rules and regulations of the Kentucky Transportation Cabinet, LFUCG, and other local authorities having jurisdiction to maintain adequate warning signs, lights, barriers, etc., for the protection of traffic on public roadways.

E. Storage of Equipment and Materials

1. Contractor shall store his equipment and materials at the job site in accordance with the requirements of the Contract Documents, and as hereinafter specified. All equipment and materials shall be stored in accordance with manufacturer's recommendations and as directed by the Owner or Engineer, and in conformity to applicable statutes, ordinances, regulations and rulings of the public authority having jurisdiction.

2. Contractor shall secure a site for staging area and material storage, including portable restroom facilities. Contractor shall not store materials or encroach upon private property without the written consent of the owners of such private property. Use of public lands must be with the written approval of the Owner.

3. Contractor shall not store unnecessary materials or equipment on the job site, and shall take care to prevent any structure from being loaded with a weight which will endanger its security or the safety of persons.

4. Materials shall not be placed within ten (10) feet of fire hydrants. Gutters, drainage channels and inlets shall be kept unobstructed at all times.

5. Contractor shall provide adequate temporary storage buildings/facilities, if required, to protect materials or equipment on the job site.

6. Contractor shall provide Engineer with copy of agreement with property owner of staging area. Contractor will be responsible for all restoration. Agreement between Contractor and property owner shall include language holding the Owner harmless from responsibility and liability.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01560

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 – GENERAL

1.01 GENERAL

A. Provide and maintain equipment and temporary construction, as necessary to provide controls over environmental and safety conditions at the construction site and adjacent areas. Remove physical evidence of temporary facilities at completion of Work.

B. Prohibited Construction Activities:

1. Dumping/disposing of excess or unsuitable excavated material in wetlands or floodplains, even with the permission of the property owner.

2. Locating stockpile storage areas in environmentally sensitive areas.

3. Indiscriminate, arbitrary, or capricious operation of equipment in any stream corridors, any wetlands, any surface waters, or outside the construction limits.

4. Pumping of sediment-laden water from trenches or other excavations directly into any surface waters, any stream corridors, any wetlands, or storm sewers; all such water will be properly filtered or settled to remove silt prior to release.

5. Discharging pollutants such as chemicals, fuels, lubricants, bituminous materials, raw sewage and other harmful waste into or alongside of rivers, streams, impoundments, or into natural or manmade channels leading thereto.

6. Permanent or unspecified alteration of the flow line of any stream.

7. Damaging vegetation outside of the construction area.

8. Disposal of trees, brush, and other debris in any stream corridors, any wetlands, any surface waters, or at unspecified locations.

9. Open burning of project debris without a permit.

10. Discharging injurious silica dust concentrations into the atmosphere resulting from breaking, cutting, chipping, drilling, buffing, grinding, polishing, shaping or surfacing closer than 200 feet to places of residences or commercial, professional, quasi-public or public places of human occupation.

11. Storing construction equipment and vehicles and/or stockpiling construction materials on property, public or private, not previously authorized for such purposes as noted in Section 01550.

12. Running well point or pump discharge lines through private property or public property and rights-of-way without an easement or the written permission of the property owner and the consent of the ENGINEER.

13. Non-compliance with the Contractor's, OSHA's, or the Owner's safety requirements.

14. Operations entailing the use of vibratory hammers or compactors outside the hours listed in Section 01010 - Summary of Work, or outside the hours allowed for construction by local ordinances or regulations.

1.02 SAFETY ADVISORY

A. Scope: Sewer Installation

1. Maintaining jobsite safety

2. Maintaining traffic safety

B. LFUCG-funded projects have a contractual and legal obligation for performance and breech of contract in regard to the safety of all exposed personnel. Reference the Occupational Safety Health Administration (OSHA) Multi Employer Citation Policy: Multi-employer Worksites, The Creating Employer, The Exposing Employer, The Correcting Employer, The Controlling Employer, Multiple Roles.

C. The Contractor shall at all times conduct the work safely in order to assure a safe work site. The Contractor shall be responsible for the safety of the Contractor's employees, agents and subcontractors, Owner's personnel and all other personnel or persons at the work site. The Contractor shall be responsible for the adequacy and safety of all construction methods or procedures and the safe prosecution of the work.

D. The Contractor shall be responsible at all times to conduct the work and keep the work site in compliance with federal, state, and local safety Laws and Regulations, including but not limited to Occupational Safety and Health (OSHA) requirements. This includes shaft drilling operations, concrete moving and placement, confined space entry requirements for trench construction, including use of a trench box or other shoring to support trench walls and proper means of exit from an excavation.

E. The Contractor shall have an authorized and competent safety representative as defined above on the work site at frequent and regular intervals, or more often, as conditions require. Failure to have such a person at the site as specified herein constitutes an unsafe practice.

F. The Contractor shall be responsible to suspend Work whenever a Work method or procedure or condition at work site is unsafe.

G. The Contractor shall submit a written notification to the Owner of any accident or injury. Such notification shall include the Contractor's investigation and what measures are

appropriate to avoid such accidents. Payment applications will not be authorized until such notice is provided.

H. Failure of the Contractor to comply with any provision of this Specification section or the Owner's safety requirements or any federal, state or local safety Laws and Regulations constitute just cause for the Owner to order suspension of Work.

I. None of the provisions of the section are intended to, nor shall be construed to, create any duty or responsibility on the Owner or Engineer to provide or enforce safety requirements of the Contractor. The duty, responsibility, and liability for safety shall remain with the Contractor.

1.03 AIR POLLUTION AND NOISE CONTROL

A. Contractor's vehicles and equipment shall be such as to minimize noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and in no case will noise levels be permitted which interfere with the work of the Owner or others.

1. Construction activities will be limited to hours specified in Section 01010 – Summary of Work.

2. Construction equipment will be provided with intake silencers and mufflers, as required by safety standards.

3. All construction vehicles should be equipped with proper emissions control equipment.

4. Periodically check equipment and machinery for proper tuning to minimize exhaust emissions and noise.

1.04 DUST CONTROL

A. Contractor shall be responsible for controlling objectionable dust caused by his operation of vehicles and equipment, clearing or for any reason whatever. Contractor shall apply water or use other methods subject to the Engineer's approval which will keep dust in the air to a minimum. Dust control measures shall be implemented multiple times throughout each working day if necessary.

1.05 PEST AND RODENT CONTROL

A. Provide rodent and pest control as necessary to prevent infestation of construction or storage area.

1. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties.

1.06 WATER CONTROL

A. Contractor shall comply with the Storm Water Pollution Prevention Plan (SWPPP) approved by LFUCG.

B. Provide methods to control surface water and water from excavations and structures to prevent damage to the Work, the site, or adjoining properties.

C. Provide, operate and maintain equipment and facilities of adequate size to control surface water.

D. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas and in conformance with all environmental requirements.

1.07 POLLUTION CONTROL

A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.

B. Provide equipment and personnel, perform emergency measures required to contain any spillages, and to remove contaminated soils or liquids.

1. Excavate and dispose of any contaminated earth offsite, and replace with suitable compacted fill and topsoil.

C. Take special measures to prevent harmful substances from entering public waters.

1. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.

D. Provide systems for control of atmospheric pollutants.

1. Prevent toxic concentrations of chemicals.

2. Prevent harmful dispersal of pollutants into the atmosphere.

E. All Contractor's equipment used during construction shall conform to all current federal, state and local laws and regulations.

1.08 EROSION AND SEDIMENT CONTROL

A. See Section 02372 for erosion and sediment control requirements.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01580

PROJECT IDENTIFICATION AND SIGNS

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide signs near the site of the Work. The sign shall set forth the description of the Work and the names of the Owner, Engineer, and Contractor.

PART 2 – PRODUCTS

2.01 IDENTIFICATION SIGN

A. Basic design shall be as shown in the sample on page 01580-2 below, and shall include at a minimum the names of the Project and the Owner. This sign shall be 3' x 6' and provided and installed by the Contractor.

B. Number Required: 2 Signs (Willowood & Tates Creek)

PART 3 – EXECUTION

3.01 INSTALLATIONS

A. Signs shall be installed at locations specified by the Engineer and installed in accordance with the detail below.

3.02 MAINTENANCE

A. The signs shall be maintained in good condition until the completion of the Project and then removed by the Contractor.

END OF SECTION

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SECTION 01631
PRODUCTS AND SUBSTITUTIONS

PART 1 – GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. General: Substitution of materials and/or equipment is defined in the General Conditions and more fully hereinafter.

B. Substitutions: The Contractor's requests for changes in the products, materials, equipment and methods of construction required by the Contract Documents are considered requests for "substitutions", and are subject to the requirements specified herein. The following are not considered as substitutions:

1. Revisions to the Contract Documents, where requested by the Owner and Engineer are considered as "changes" not substitutions.

2. Substitutions requested during the bidding period, which have been accepted prior to the Contract Date, are included in the Contract Documents and are not subject to the requirements for substitutions as herein specified.

3. Specified Contractor options on products and construction methods included in the Contract Documents are choices available to the Contractor and are not subject to the requirements for substitutions as herein specified.

4. Except as otherwise provided in the Contract Documents, the Contractor's determination of and compliance with governing regulations and orders as issued by governing authorities do not constitute "substitutions" and do not constitute a basis for change orders.

1.02 SUBMITTALS

A. The information required to be furnished for evaluation of product substitution will be as follows:

1. Performance capabilities, and materials and construction details will be evaluated based upon conformance with the Specifications. Products that do not conform with the Specification shall not be accepted.

2. Manufacturer's production and service capabilities, and evidence of proven reliability will be acceptable if the following is furnished.

a. Written evidence that the manufacturer has not less than (3) years' experience in the design and manufacture of the substitute product.

b. Written evidence of at least one application, of a type and size similar to the proposed substitute product, in successful operation in a wastewater treatment plant or collection system for a period of at least one year.

c. In lieu of furnishing evidence of a manufacturer's Experience and successful operation of an application of the product to be substituted, the Contractor has the option of furnishing a cash deposit or bond which will guarantee replacement if the product the furnished does not satisfy the other requirements specified in this section. The amount of each deposit or bond will be subject to the approval.

3. Specific reference to characteristics either superior or inferior to specified requirements will be evaluated based on their net effect on the project. Products with any characteristics inferior to those specified will not be acceptable unless offset by characteristics that, in the opinion of the Engineer, will cause the overall effect of the product on the project to be at least equal to that of those specified.

1.03 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same generic kind, from a single source, for each unit of work.

B. Compatibility of Options: Compatibility of products is a basic requirement of product selection. When the Contractor is given the option of selecting between two or more products for use on the project, the product selected must be compatible with other products previously selected, even if the products previously selected were also Contractor options. The complete compatibility between the various choices available to the Contractor is not assured by the various requirements of the Contract Documents, but must be provided by the Contractor.

C. The detailed estimate of operating and maintenance costs will be evaluated based on comparison with similar data on the specified products. Proposed substitute products which have an operating and maintenance cost that, in the opinion of the Engineer, exceeds that of the specified products will not be considered equal and will not be acceptable.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. General: Deliver, store, and handle products in accordance with manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft. Control delivery schedules to minimize long-term storage at the site and to prevent overcrowding of construction spaces. In particular coordinate delivery and installation to ensure minimum holding or storage times for items known or recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other sources of loss.

1. Deliver products to the site in the manufacturer's sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.

2. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

3. Store heavy materials away from the project construction in a manner that will not endanger the supporting construction.

PART 2 – PRODUCTS

2.01 GENERAL PRODUCT COMPLIANCE

A. General: Requirements for individual products are indicated in the Contract Documents; compliance with these requirements is in itself a Contract Requirement. These requirements may be specified in any one of several different specifying methods, or in any combination of these methods. These methods include the following:

1. Proprietary

2. Descriptive

3. Performance

4. Compliance with Reference Standards

    a. Compliance with codes, compliance with graphic details and similar provisions of the Contract Documents also have a bearing on the review and approval outcome.

B. Procedures for Selecting Products: Contractor's options in selecting products are limited by requirements of the Contract Documents and governing regulations. They are not controlled by industry traditions or procedures experienced by the Contractor on previous construction projects.

2.02 SUBSTITUTIONS

A. Conditions: Contractor's request for substitution will be received and considered when extensive revisions to the Contract Documents are not required, when the proposed changes are in keeping with the general intent of the Contract Documents, when the request is timely, fully documented and properly submitted, and when one or more of the following conditions is satisfied, all as judged by the Engineer; otherwise the requests will be returned without action except to record non-compliance with these requirements.

1. The Engineer will consider a request for substitution where the request is directly related to an "or equal" clause or similar language in the Contract Documents.

2. The Engineer will consider a request for substitution where the specified product or method cannot be provided within the Contract Time. However, the request will not be considered if the product or method cannot be provided as a result of the Contractor's failure to pursue the work promptly or to coordinate the various activities properly.

3. The Engineer will consider a request for substitution where the specified product or method cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

4. The Engineer will consider a request for a substitution where a substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. These additional responsibilities may include such considerations as additional compensation to the Engineer for redesign and evaluation services, the increased cost of other work by the Owner or separate contractors, and similar considerations.

5. The Engineer will consider a request for substitution when the specified product or method cannot be provided in a manner which is compatible with other materials of the work, and where the Contractor certifies that the substitution will overcome the incompatibility.

6. The Engineer will consider a request for substitution when the specified product or method cannot be properly coordinated with other materials in the work, and where the Contractor certifies that the proposed substitution can be properly coordinated.

7. The Engineer will consider a request for substitution when the specified product or method cannot receive a warranty as required by the Contract Documents and where the Contractor certifies that the proposed substitution receive the required warranty.

8. The Contractor shall reimburse the Owner any costs for review by the Engineer of proposed product substitutions which require major design changes, as determined by the Owner, to related or adjacent work made necessary by the proposed substitutions.

B. Work-Related Submittals: Contractor's submittal of and the Engineer's acceptance of shop drawings, product data or samples which relate to work not complying with requirements of the Contract Documents, does not constitute an acceptable or valid request for a substitution, nor approval thereof.

2.03 GENERAL PRODUCT REQUIREMENTS

A. General: Provide products that comply with the requirements of the Contract Documents and that are undamaged and, unless otherwise indicated, unused at the time of

installation. Provide products that are complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

1. Standard Products: Where they are available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

2. Continued Availability: Where, because of the nature of its application, the Owner is likely to need replacement parts or additional amounts of a product at a later date, either for maintenance and repair or replacement, provide standard, foreign or domestically produced products for which the manufacturer has published assurances that the products and its parts are likely to be available to the Owner at a later date. Domestically produced products are preferred, but not required.

PART 3 – EXECUTION

3.01 INSTALLATION OF PRODUCTS

A. General: Except as otherwise indicated in individual sections of these Specifications, comply with the manufacturer's instructions and recommendations for installation of the products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other work. Clean exposed surfaces and protect surfaces as necessary to ensure freedom from damage and deterioration at Time of Acceptance.

END OF SECTION

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SECTION 01731
CUTTING AND PATCHING

PART 1 – GENERAL

1.01 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the work or to make its parts fit together properly.

C. The Contractor shall not damage or endanger any portion of the Work or the Work of the Owner or any separate contractors by cutting, patching or otherwise altering any work, or by excavation.

D. Any cutting of existing structures or facilities shall be approved in advance by Owner or Engineer. Approval shall not impact Contractor's full liability for any damage caused.

1.02 QUALITY ASSURANCE

A. Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.

1.03 WARRANTY

A. Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. Existing Materials: Use materials identical to existing materials, to the extent practicable.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the functional performance of existing materials.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

3.02 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

3.03 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.

5. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

END OF SECTION

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SECTION 01740
CLEANING

PART 1 – GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. Maintain premises free from accumulations of waste, debris, and rubbish.

B. At completion of work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all exposed surfaces. Leave project clean and ready for occupancy.

1.02 RELATED DOCUMENTS

A. Cutting and Patching: Section 01731.

B. Project Closeout: Section 01770.

C. Cleaning for Specific Products of Work: Specification Section for that work.

1.03 SAFETY REQUIREMENTS

A. Hazards Control:

1. Store volatile wastes in covered metal containers, and remove from premises daily.

2. Prevent accumulation of wastes which create hazardous conditions.

3. Provide adequate ventilation during use of volatile noxious substances.

B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on project site.

2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

3. Do not dispose of wastes into streams or waterways.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 – EXECUTION

3.01 DURING CONSTRUCTION

A. Execute cleaning to ensure that building, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.

B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.

C. At reasonable intervals during progress of work, clean site and public properties, and dispose of waste materials, debris and rubbish.

D. Provide on-site containers for collection of waste materials, debris and rubbish.

E. Remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off Owner's property.

F. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.

G. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

3.02 FINAL CLEANING

A. Employ experienced workmen, or professional cleaners, for final cleaning.

B. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces.

C. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials, from sight-exposed interior or exterior finished surfaces; polish surfaces so designated to shine finish.

D. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.

E. Broom clean paved surfaces; rake clean other surfaces of grounds.

F. Maintain cleaning until project, or portion thereof, is occupied by Owner.

END OF SECTION

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SECTION 01770
PROJECT CLOSEOUT

PART 1 – GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Liquidated Damages: Supplemental General Conditions

B. Cleaning: Section 01740.

C. Project Record Documents: Section 01785.

1.02 SUBSTANTIAL COMPLETION

A. In order to initiate project closeout procedures, the Contractor shall submit the following:

1. Written certification to Engineer that project is Substantially Complete.

2. List of major items to be completed or corrected.

B. Engineer will make an inspection within seven (7) days after receipt of certification, together with Owner's Representative.

C. Should Engineer consider that work is Substantially Complete:

1. Contractor shall prepare, and submit to Engineer, a list of items to be completed or corrected, as determined by the inspection.

2. Engineer will prepare and issue a Certificate of Substantial Completion, containing:

a. Date of Substantial Completion.

b. Contractor's list of items to be completed or corrected, verified and amended by Engineer.

c. The time within which Contractor shall complete or correct work of listed items.

d. Time and date Owner will assume possession of work or designated portion thereof.

e. Responsibilities of Owner and Contractor for:

1) Insurance

2) Utilities

3) Operation of Mechanical, Electrical, and Other Systems.

4) Maintenance and Cleaning.

5) Security.

f. Signatures of:

1) Engineer

2) Contractor

3) Owner

3. Owner occupancy of Project or Designated Portion of Project:

a. Contractor shall:

1) Obtain certificate of occupancy.

2) Perform final cleaning in accordance with Section 01740.

b. Owner will occupy Project, under provisions stated in Certificates of Substantial Completion.

4. Contractor: Complete work listed for completion or correction, within designated time.

D. Should Engineer consider that work is not Substantially Complete:

1. Engineer shall immediately notify Contractor, in writing, stating reasons.

2. Contractor: Complete work, and send second written certification to Engineer, certifying that Project or designated portion of Project is substantially complete.

3. Engineer will reinspect work.

E. Should Engineer consider that work is still not finally complete:

1. Engineer shall notify Contractor, in writing, stating reasons.

2. Contractor shall take immediate steps to remedy the stated deficiencies, and send third written notice to the Engineer certifying that the work is complete.

3. Engineer and Owner will reinspect work at Contractor's expense.

1.03 FINAL INSPECTION

A. Contractor shall submit written certification that:

1. Contract Documents have been reviewed.

2. Project has been inspected for compliance with Contract Documents.

3. Work has been completed in accordance with Contract Documents.

4. Equipment and systems have been tested in presence of Owner's Representative and are operational.

5. Project is completed, and ready for final inspection.

B. Engineer will make final inspection within seven (7) days after receipt of certification.

C. Should Engineer consider that work is finally complete in accordance with requirements of Contract Documents, he shall request Contractor to make Project Closeout submittals.

D. Should Engineer consider that work is not finally complete:

1. Engineer shall notify Contractor in writing, stating reasons.

2. Contractor shall take immediate steps to remedy the stated deficiencies and send second written notice to Engineer certifying that work is complete.

3. Engineer will reinspect work.

1.04 CLOSEOUT SUBMITTALS

A. Project Record Documents: To requirements of Section 01785.

B. Guarantees, Warranties and Bonds: To requirements of particular technical Specifications and Section 01782.

C. Project Closeout Checklist: Contractor shall submit all required items to the Engineer and/or Owner with their responsibility identified. See Project Closeout Checklist included in this section.

1.05 INSTRUCTION

A. Instruct Owner's personnel in operation of all systems, mechanical, electrical, and other equipment.

1.06 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit final applications in accordance with requirements of General Conditions.

1.07 FINAL CERTIFICATE FOR PAYMENT

A. Engineer will issue final certificate in accordance with provisions of general conditions.

B. Should final completion be materially delayed through no fault of Contractor, Engineer may issue a Semi-Final Certificate for Payment.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PROJECT CLOSEOUT CHECKLIST

A. See attached Project Closeout Checklist.

RMP Project Closeout Checklist

DWQ Project Manager (DWQ PM): Bob Peterson, PE

RMP Project Manager (RMP PM):

Engineer of Record (EOR):

Contractor:

File Manager: Jody Scrivner

Project Name:

DWQ PM
RMP PM
EOR
Contractor
File Manager

	Task	From	To	CC	Complete/ Submitted	Approved	Closeout Requirement
	Contract Administration Closeout Checklist						
1	Plan of Operation (Pump Station and Wet Weather Storage Projects Only)	EOR	DWQ PM				Copy of plan to file [plan will include description of facility, how it was design to work, etc] DWQ PM will provide copy to Pump Station Maintenance or Plant Staff
2	Manufacturer's Startup (Pump Station and Wet Weather Storage Projects Only)	EOR	DWQ PM				Report from EOR/Manufacturer with date of startup
3	Training (Pump Station and Wet Weather Storage Projects Only)	Contractor	LFUCG Staff				Letter or email from EOR with sign in sheet of attendees to file
4	Startup with LFUCG (Pump Station and Wet Weather Storage Projects Only)	Contractor	EOR / LFUCG Staff				Letter or email from EOR with date of startup and attendees to file
5	Deliver copies of CCTV Logs	Contractor	EOR/DWQ PM				Hard Copies in File
6	Declaration of Beneficial Occupancy (Consent Decree Compliance)	EOR	DWQ PM	File Manager			Memo from EOR to file
7	Request for Substantial Completion and Punchlist Creation	Contractor	EOR	File Manager			Memo from Contractor to file
8	Verify all easements requirements (as listed in the MOU) have been satisfied	EOR	DWQ PM	Contractor			EOR Memo to File
10	EOR coordinates final inspection and prepares Punchlist	/EOR	Contractor	DWQ PM			Punchlist to file
11	Recommendation of release of retainage (less 200% of remaining work estimate)	EOR	DWQ PM	File Manager			Nothing to file
12	Release of retainage less 200% of remaining work estimate	DWQ PM	Contractor	EOR			Nothing to file
13	Prepare Final Adjusting Change Order	EOR	DWQ PM	RMP PM			Nothing to file
15	(Upon completion of punchlist) Letter requesting final pay and release of all retainage. Must include:	Contractor	EOR	DWQ PM			Letter/Email to file
17	*Waiver of Release, Claims, and Liens*	Contractor	EOR	DWQ PM			EOR Document to File
19	Recommendation for final pay and release of all retainage	EOR	DWQ PM	Contractor			EOR Memo to File
21	Recommendation for project acceptance and initiation of warranty period	EOR	DWQ PM	RMP PM			EOR Letter to file
	Engineering Services Closeout Checklist						
25	Record Survey and Drawings	EOR	DWQ PM				Record Survey can be included on record drawings. XYZ coordinates of all manholes, all as-built manhole elevations.Record Drawings to file
26	Model verification (record survey and drawings provided to cap consultant)	DWQ PM	CAP Consultant				Provide record drawings to CAP/Stantec, they will return verified model letter, letter goes to file
27	Consultant's *Certificate of Completion* to DOW	EOR	DOW(KIA if SRF funded)	DWQ PM, File Manager			Memo to file
29	Compile complete project construction and project closeout notebook with copies of contract documents, bonds, NTP, pay requests approvals, change requests/approvals, progress meeting agendas/summaries, Daily Inspection Reports and all closeout information listed above included.	EOR & DWQ PM	File Manager				Searchable, digital (pdf) submitted to file
30	(Pump Station and Wet Weather Storage Projects Only) Statement/Inventory of assets accepted into the system and asset values (includes engineering design, CA and RPR, easement costs, permit costs, and construction costs); includes lengths and sizes of all pipes, manholes, pump stations, air release valves, pump stations with description of facilities (screening, grit removal, pumps, buildings, chemical feeds, etc), and all other appurtenant structures	EOR	DWQ PM				Memo to file
	Division of Water Quality Closeout Checklist						

RMP Project Closeout Checklist

DWQ Project Manager (DWQ PM): Bob Peterson, PE

RMP Project Manager (RMP PM):

Engineer of Record (EOR):

Contractor:

File Manager: Jody Sommer

Project Name:

DWQ PM
RMP PM
EOR
Contractor
File Manager

	Task	From	To	CC	Completed/ Submitted	Approved	Closeout Requirement
31	Pump Station and Wet Weather Storage Projects Only) Asset inventory and asset values for inclusion in fixed asset inventory and GASB 34	DWQ PM	Financial Accounting	RMP PM		Mailing to file	
32	Statement of project completion, Consent Decree compliance and accepted into LPUCG system (POTW, fixed assets), initiation of operation, and establishing warranty period. DWQ PM and EOR follow-up with Contractor	RMP PM	DWQ PM	EOR, Consultant Program Manager, File Manager		DWQ Letter to file	
33	Record drawings submitted to KIA (KIA Funded projects only)	EOR	KIA	DWQ PM		Proof of submission to file	
35	Loan Recipient's Certificate of Completion (KIA Funded projects only)	File Manager	KIA			Proof of submission to file	
36	Submittal to KIA (via File Manager) stating initiation of operation date	RMP PM / File Manager	KIA			Memo to file	
37	KIA final project closeout per SRF Manual	File Manager	KIA			Mailing to file	
39	Distribute shop drawings and record drawings to PSMSLM or Plant Staff	DWQ PM	PSMSLM	RMP PM		Mailing to file	
40	Project File to OnBase file management system	DWQ PM	Chris Barsley			Mailing to file	
42	Release of Contractor	DWQ PM	RMP PM	File Manager		Copy to file	
43	Release of Engineer of Record	DWQ PM	RMP PM	File Manager		Copy to file	

END OF SECTION

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SECTION 01780
OPERATIONS AND MAINTENANCE MANUALS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Compile product data and related information appropriate for Owner's maintenance and operation of equipment furnished under the Contract. Prepare operating and maintenance data as specified.

B. In addition to maintenance and operations data, the manufacturer's printed recommended installation practice shall also be included. If not part of the operations and maintenance manual, separate written installation instructions shall be provided, serving to assist the Contractor in equipment installation.

C. Related requirements specified elsewhere:

1. Submittals: Section 01300.
2. Project Closeout: Section 01770.
3. Project Record Documents: Section 01785.
4. Warranties and Bonds: Section 01782.

1.02 FORM OF SUBMITTALS

A. Prepare data in the form of an instructional manual for use by Owner's personnel.

B. Format:

1. Size: 8-1/2 in. x 11 in.
2. Paper: 20 pound minimum, white.
3. Text: Manufacturer's printed data.
4. Photocopies must be clear and legible.
5. Drawings:
   a. Provide reinforced punched binder tab, bind in with text.
   b. Fold large drawings to the size of the text pages where feasible.

c. For flow or piping diagrams that cannot be detailed on the standard size drawings, a larger, appropriate size drawing may be submitted and supplied in a properly marked map packet.

6. Provide fly-leaf for each separate product, or each piece of operating equipment.

   a. Provide typed description of product, and major component parts of equipment.

   b. Provide indexed tabs.

7. Cover: Identify each volume with types or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:

   a. Title of Project.

   b. Identity of separate structure as applicable.

   c. Identity of general subject matter covered in the manual.

C. Binders:

1. Commercial quality, durable and cleanable, 3-hole, 3" or 4" D-ring binders, with oil and moisture resistant hard covers.

2. When multiple binders are used, correlate the data into related consistent grouping.

3. Imprinted on the front cover and side of each binder shall be the name of the Plant, the Contract Number and Volume Number.

4. Binders shall be new and not recycled form a prior data manual.

1.03 SUBMITTAL SCHEDULE

A. Submit one (1) copy of preliminary draft of proposed formats and outlines of contents prior to operation of equipment. Engineer will review draft and return with comments.

B. Submit one (1) copy of completed data for final review prior to the completion of the Contract and before payment in excess of 90% of the total Contract amount is authorized.

C. Provide two (2) copies plus pdf on CD of approved completed O & M Manual in final form ten (10) days prior to final inspection or acceptance to the Owner. Final version of each manual shall reflect any changes made during testing and start-up of equipment.

1.04 QUALITY ASSURANCE

A. Preparation of data shall be done by personnel:

1. Trained and experienced in maintenance and operation of the described products.

2. Completely familiar with requirements of this Section.

3. Skilled as a technical writer to the extent required to communicate essential data.

4. Skilled as a draftsman competent to prepare required drawings.

1.05 CONTENTS OF MANUAL

A. Each item of equipment shall be placed in a logical sequential order, as listed or ordered in the Contract Documents.

B. Content, for each unit of equipment and system, as appropriate:

1. Detailed description of the process and operation procedures as applicable.

2. Instructions for all components of the equipment whether manufactured by the supplier or not, including valves, controllers and other miscellaneous components.

3. Description of unit and component parts.

a. Function, normal operating characteristics, and limiting conditions.

b. Performance curves, engineering data and tests.

c. Complete nomenclature and commercial number of all replaceable parts.

d. Exploded and/or sectional drawing views.

e. Equipment model number.

4. Operating procedures:

a. Start-up, break-in, routine and normal operating instructions.

b. Regulation, control, stopping, shutdown and emergency instructions.

c. Summer and winter operating instructions.

d. Special operating instructions.

5. Maintenance Procedures:

a. Routine operations.

b. Guide to "trouble-shooting".

c. Disassembly, repair and reassembly.

d. Alignment, adjusting and checking.

e. Preventative maintenance schedule.

f. Recommended spare parts list and quantities.

g. Equipment parts list.

h. Local service center.

6. Servicing and Lubrication schedule.

a. List of lubricants required.

b. Lubrication procedures.

c. Lubrication schedule.

7. Internal and external wiring and piping diagrams numbered to correspond to the installation.

8. Description of sequence of operation by control supplier.

9. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.

a. Predicted life of parts subject to wear.

10. As-installed control diagrams by controls supplier.

11. Each Contractor's coordination drawings.

a. As-installed color coded piping diagrams.

12. Charts of valve tag numbers, with the location and function of each valve.

13. Other data as required under pertinent sections of Specifications.

C. Content, for each electrical system, as appropriate:

1. Description of system and component parts.

a. Function, normal operating characteristics, and limiting conditions.

b. Performance curves, engineering data and tests.

c. Complete nomenclature and commercial number of replacement parts.

2. Circuit directories of panel boards.

   a. Electrical service.

   b. Controls.

   c. Communications.

3. As-installed color-coded wiring diagrams.

4. Operating procedures:

   a. Routine and normal operating instructions.

   b. Sequences required.

   c. Special operating instructions.

5. Maintenance procedures:

   a. Routine operations.

   b. Guide to "trouble-shooting".

   c. Disassembly, repair and reassembly.

   d. Adjustment and checking.

6. Manufacturer's printed operating and maintenance instructions.

7. List of original manufacturer's recommended spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

8. Other data as required under pertinent sections of Specifications.

D. Prepare and include additional data when the need for such data becomes apparent during instruction of Owner's personnel.

E. Additional requirements for operating and maintenance data: The respective section of Specifications.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01782
WARRANTIES AND BONDS

PART 1 – GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. Compile specified warranties and bonds.

B. Compile specified service and maintenance contracts.

C. Co-execute submittals when so specified.

D. Review submittals to verify compliance with Contract Documents.

E. Submit to Engineer for review and transmittal to Owner.

1.02 RELATED DOCUMENTS

A. Bid Bond: Instructions to Bidders.

B. Performance and Payment Bonds: General Conditions and Supplemental General Conditions.

C. Guaranty: General Conditions and Supplemental General Conditions.

D. General Warranty of Construction: General Conditions.

E. Project Closeout: Section 01770.

F. Warranties and Bonds required for specific products: As listed herein.

G. Provisions of Warranties and Bonds, Duration: Respective specification sections for particular products.

1.03 SUBMITTALS REQUIREMENTS

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

B. Furnish two (2) original signed copies.

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

1. Product, equipment or work item.

2. Firm name, address and telephone number.

3. Scope

4. Date of beginning of warranty, bond or service and maintenance contract.

5. Duration of warranty, bond or service and maintenance contract.

6. Provide information for Owner's personnel:

   a. Proper procedure in case of failure.

   b. Instances which might affect the validity of warranty or bond.

7. Contractor name, address and telephone number.

1.04 FORM OF SUBMITTALS

A. Prepare in duplicate packets.

B. Format:

1. Size 8-1/2 in. x 11 in., punch sheets for 3-ring binder.

   a. Fold larger sheets to fit into binders.

2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS." List:

   a. Title of Project

   b. Name of Contractor

C. Binders: Commercial quality, three-ring, with durable and cleanable plastic covers.

1.05 TIME OF SUBMITTALS

A. For equipment or component parts of equipment put into service during progress of construction:

1. Submit documents within 10 days after inspection and acceptance.

B. Otherwise make submittals within 10 days after date of substantial completion, prior to final request for payment.

C. For items of work, where acceptance is delayed materially beyond the Date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing the date of acceptance as the start of the warranty period.

1.06 SUBMITTALS REQUIRED

A. Submit warranties, bonds (see section 00600), service and maintenance contracts as specified in the respective sections of the Specifications.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01785
PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.01 MAINTENANCE OF DOCUMENTS

A. Maintain at job site, one copy of:

1. Contract Drawings
2. Specifications
3. Addenda
4. Reviewed Shop Drawings
5. Change Orders
6. Other Modifications to Contract

B. Store documents in approved location, apart from documents used for construction.

C. Provide files and racks for storage of documents.

D. Maintain documents in clean, dry, legible condition.

E. Do not use record documents for construction purposes.

F. Make documents available at all times for inspection by Engineer and Owner.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Submittals: Section 01300.

1.03 MARKING DEVICES

A. Provide colored pencil or felt-tip marking pen for all marking.

1.04 RECORDING

A. Label each document "PROJECT RECORD" in 2-inch high printed letters.

B. Keep record documents current.

C. Do not permanently conceal any work until required information has been recorded.

D. Contract Drawings: Legibly mark to record actual construction:

1. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.

2. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.

3. Field changes of dimension and detail.

4. Changes made by Change Order or Field Order.

5. Details not on original Contract Drawings.

E. Specifications and Addenda: Legibly mark up each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

2. Changes made by Change Order or Field Order.

3. Other matters not originally specified.

F. Shop Drawings: Maintain as record documents; legibly annotate shop drawings to record changes made after review.

1.05 SUBMITTALS

A. At completion of project, deliver two hard copies and one CD with pdf of all record documents to Engineer.

B. Accompany submittal with transmittal letter, in duplicate, containing:

1. Date.

2. Project Title and Number.

3. Contractor's Name and Address.

4. Title and Number of each Record Document.

5. Certification that each Document as Submitted is Complete and Accurate.

6. Signature of Contractor, or His Authorized Representative.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 02100

CLEARING, GRUBBING, AND SITE PREPARATION

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. Includes all labor, material, and equipment required for the complete execution of the proposed construction work as shown on the Drawings and specified herein.

B. Principal items of work include:

1. Notifying all authorities owning utility lines running to or on the property. Protecting and maintaining all utility lines to remain and capping those that are not required in accordance with instructions of the Utility Companies, and all other authorities having jurisdiction.

2. Clearing the site within the Temporary Construction Easement, including removal of grass, brush, shrubs, trees, loose debris and other encumbrances except for trees marked to remain.

3. Boxing and protecting all trees, shrubs, lawns and the like within areas to be preserved. Relocating trees and shrubs, so indicated on the Drawings, to designated areas.

4. Repairing all injury to trees, shrubs, and other plants caused by site preparation operations shall be repaired immediately. Work shall be done by qualified personnel in accordance with standard horticultural practice and as approved by the Engineer.

5. Removing topsoil to its full depth from designated areas and stockpiling on site where approved by the Engineer for future use.

6. Disposing from the site all debris resulting from work under this Section.

1.02 STREET AND ROAD BLOCKAGE

A. Closing of streets and roads during progress of the work shall be in compliance with the requirements of the Owner and other authorities having jurisdiction. Access shall be provided to all facilities remaining in operation.

1.03 PROTECTION OF PERSONS AND PROPERTY

A. All work shall be performed in such a manner to protect all personnel, workmen, pedestrians and adjacent property and structures from possible injury and damage.

B. All conduits, wires, cables and appurtenances above or below ground shall be protected from damage.

C. Provide warning and barrier fence where shown on the Drawings and as specified herein.

PART 2 – EXECUTION

2.01 CLEARING OF SITE

A. Before removal of topsoil, and start of trenching for utility installation, the areas within the Temporary Construction Easement shall be cleared and grubbed.

B. Clearing shall consist of cutting, removal, and satisfactory disposal of all trees, fallen timber, brush, bushes, rubbish, sanitary landfill material, fencing, and other perishable and objectionable material within the areas to be excavated or other designated areas.

C. Excavation resulting from the removal of trees, roots and the like shall be filled with suitable material, as approved by the Engineer, and thoroughly compacted to ensure stability.

D. Unless otherwise shown or specified, the Contractor shall clear and grub a strip at least 15 ft. wide along all permanent fence lines installed under this Contract.

E. In temporary construction easement locations, only those trees and shrubs shall be removed which are in actual interference with excavation or grading work under this Contract, and removal shall be subject to approval by the Engineer. However, the Engineer reserves the right to order additional trees and shrubs removed at no additional cost to the Owner, if such, in their opinion, are too close to the work to be maintained or have become damaged due to the Contractor's operations.

F. All clearing, and grubbing is incidental to this pay item unless specifically called out in the plans.

2.02 STRIPPING AND STOCKPILING EXISTING TOPSOIL

A. Existing topsoil and sod on the site within areas designated on the Drawings shall be stripped to whatever depth it may occur and stored in locations directed by the Engineer.

B. The topsoil shall be free of stones, roots, brush, rubbish, or other unsuitable materials before stockpiling the topsoil.

C. Care shall be taken not to contaminate the stockpiled topsoil with any unsuitable materials.

2.03 GRUBBING

A. Grubbing shall consist of the removal and disposal of all stumps, roots, logs, sticks and other perishable materials to a minimum depth of 6-inches below ground surfaces.

B. Large stumps located in areas to be excavated may be removed during grading operations, subject to the approval of the Engineer.

2.04 DISPOSAL OF MATERIAL

A. All debris resulting from the clearing and grubbing work shall be disposed of by the Contractor as part of the work of this Contract. Material designated by the Engineer to be salvaged shall be stored on the construction site as directed by the Engineer for reuse in this Project or removal by others.

B. Burning of any debris resulting from the clearing and grubbing work will not be permitted at the site.

2.05 WARNING AND BARRIER FENCE

A. The fence shall be made of a visible, lightweight, flexible, high strength polyethylene material. The fence shall be MIRASAFE as manufactured by Mirafi, Inc., or equal.

B. Physical Properties

Fence:

Color:	International Orange
Roll Size:	4' x 164'
Roll weight:	34 lbs.
Mesh opening:	1-1/2" x 3"

Posts:

ASTM Designation:	ASTM 702
Length:	5 feet long (T-Type)
Weight:	1.25 #/Foot (min)
Area of Anchor Plate:	14 Sq. In.

C. Drive posts 12 to 18 inches into ground every 10' to 12'. Wrap fence material around first terminal post allowing overlap of one material opening. Use metal tie wire or plastic tie wrap to fasten material to itself at top, middle and bottom. At final post, cut with utility knife or scissors at a point halfway across an opening. Wrap around and tie at final post in the same way as the first post.

D. Use tie wire or tie wrap at intermediate posts and splices as well. Thread ties around a vertical member of the fence material and the post and bind tightly against the post. For the most secure fastening, tie at top, middle and bottom. Overlap splices a minimum of four fence openings, tie as above, fastening both edges of the fence material splice overlap.

END OF SECTION

SECTION 02221
ROCK REMOVAL

PART 1 – GENERAL

1.01 SUMMARY

A. The Contractor shall excavate rock, if encountered, as required to perform the required work, dispose of the excavated material, and furnish acceptable material for backfill in place of the excavated rock, as indicated on the Drawings and in the Specifications.

B. In General, if encountered, all rock will be removed as necessary for the installation of the facilities of this project. Including, but not limited to, rock in pipe trenches for the 30-inch sanitary trunk sewer.

C. In general, rock in pipe trenches shall be excavated so as to be not less than six (6) inches from the pipe after the pipe has been laid.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Excavation: Section 02222

B. Structural Fill and Embankment: Section 02223

C. Excavating, Backfilling, and Compacting for Utilities: Section 02225

1.03 REFERENCES

A. NFPA 495 - Code for the Manufacturer, Transportation, Storage and use of Explosive Materials.

B. Commonwealth of Kentucky Department of Mines and Minerals, Laws and Regulations Governing Explosives and Blasting.

1.04 SAFETY

A. Conform to Kentucky Department of Mines and Minerals code for explosive disintegration of rock.

B. Obtain permits from local authorities having jurisdiction before explosives are brought to site or drilling is started.

C. Conform to all federal, state, and local codes and regulations regarding safety.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Rock Definition

1. For mass excavation, competent rock is determined by the Owner's Geotechnical Engineer (or representative of) observing the teeth of a medium size excavator (such as a Cat 320 series) being dragged vertically across the top of the exposed rock. The equipment must meet the following specifications: 50,000 pounds (minimum weight), 150 HP (minimum horsepower), 2-foot minimum bucket width, using a rock bucket with rock teeth. The acceptance criteria is based upon removal of all loose soil, mud, and excess water in the bottom of the excavation.

PART 3 – EXECUTION

3.01 ROCK REMOVAL

A. Foundation bearing rock surfaces shall be benched to provide level bearing surfaces.

B. Unless otherwise noted, only mechanical methods for rock removal.

3.02 ROCK REMOVAL FOR STRUCTURES AND PIPING

A. The Contractor shall removal all material for the structures to the elevations shown on the plans to verify all necessary rock removal has been completed.

B. Contractor shall not solely rely on rock contours shown on the plans or the geotechnical report for the extent of rock removal, the Contractor must expose all elevations shown on the Contract Documents to ensure no additional rock removal is necessary.

C. The Contractor shall complete a full topographic survey of the cleared area and submitted to the Engineer for approval prior to backfilling and grading per the Contract Documents.

END OF SECTION

SECTION 02222
EXCAVATION FOR TUNNEL SHAFTS

PART 1 – GENERAL

1.01 SCOPE

A. The work described by this Section consists of furnishing all labor, materials, equipment and supplies as required to construct launching and exit shafts associated with tunnel construction.

B. Work shall be done in strict accordance with the Contract Documents, and in accordance with all Federal, State and local laws, regulations, and requirements.

C. All available and known geotechnical reports, logs, borings, and laboratory testing performed within close proximity of the project corridor have been made available as "technical data" and are not part of the Contract Documents. This is provided as information only and solely for the convenience of Bidders. The Owner and/or the Engineer do not warrant or guarantee the accuracy or correctness of this material with respect to actual subsurface conditions. Subsurface conditions are considered unclassified and no expectation of quantity, specific location of ground conditions, or geotechnical baselines are provided or assumed herein.

D. For all shafts defined under this Section, Contractor shall excavate and support of excavation using techniques and methods selected by the Contractor that are appropriate for prevailing ground conditions. Contractor shall review all available geotechnical reports and data and perform any additional subsurface investigations they deem necessary at their own expense for the planning and the selection of shaft construction techniques and methods in order to enable proper construction as shown on the Drawings and other requirements of the Contract Documents.

E. Shaft installation techniques and methods of construction shall include all equipment, materials, and selection of associated support of excavation best suited for ground conditions, as required to maintain face stability, reduce wear, advance heading within line and grade tolerances, transport spoils, and accomplish productivity assumed in Bid.

F. Dewatering shall be controlled such that the launching and exit shafts are free of water, but the surrounding groundwater table is not substantially lowered such that settlement along the tunnel drive or nearby existing structures and foundations does not occur.

G. The Contractor shall furnish all labor, equipment, and material required to complete the work including but not limited to the following:

1. Initial support system and all related components.

2. Spoil transportation, removal, and disposal.

3. Safety and security.

4. Hoisting and lifting.

5. Control equipment and required power.

6. Launching and exit shafts construction including, but not limited to, rehandling and disposal of unsuitable and excess materials, control of groundwater and surface water, utility adjustment/supports, tests, excavation, sheeting and shoring, shaft wall thrust blocking, backfilling, cleanup, and restoration of surface features, and all other work necessary for construction as specified and/or shown on the Drawings.

H. Follow all OSHA regulations regarding tunnel construction including but not limited to OSHA 29 CFR Part 1926. Obtain all permits required associated with OSHA regulations and requirements for confined space entry.

I. Conform with all requirements of the Kentucky Transportation Cabinet (KYTC) for work within their rights-of-way.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02225 – Excavation, Backfilling and Compaction for Sewers

B. Section 02441 – Tunneling by Slurry Microtunnel Boring Machine

C. Section 02442 – Tunneling by Tunnel Boring Machine

D. Section 02444 – Tunneling by Pipe Jacking with Shield Method

E. Section 02445 – Utility Hand Tunneling

F. Section 02446 – Tunneling by Guided Bore and Jack Method

G. Tunneling Method Table in Project Specific Notes (PSN)

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the other requirements of the Specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. Applicable codes, ordinances, statutes and governing rules and regulations of governing municipalities and counties, the Commonwealth of Kentucky, and the Federal Government.

2. American Association of State Highway and Transportation Officials (AASHTO).

3. American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering.

4. Occupational Safety and Health Administration (OSHA) Regulations and Standards for Underground Construction 29 CFR Part 1926, subpart S and other applicable OSHA parts.

5. Applicable ASTM and AWWA Standards for materials and methods.

6. Kentucky Transportation Cabinet (KYTC) Permit Guidance Manual

7. All applicable guidelines and restrictions of the United States Army Corps of Engineers (USACE) and Department of Environmental Protection (DEP).

1.04 DEFINITIONS

A. Unless otherwise stated or context otherwise requires, the definitions and provisions contained in this section shall govern the construction, meaning, and application of words and phrases utilized in this specification. For purposes of this specification, the following terms are defined as follows:

1. Exit Shaft or Retrieval Shaft: Shaft utilized for retrieval of tunneling equipment.

2. Ground Modification: soil stabilization by jet grouting, compaction grouting, void filling, soil mixing, slurry walls, or other ground stabilization technologies to meet project objectives specified herein.

3. Support of Excavation: The support system selected, designed and installed by Contractor to support launching shafts, exit shafts, and rescue shafts.

4. Launching Shaft or Entrance Shaft: Shaft utilized at the start of the tunneling operation.

5. Rescue Shaft: Shaft utilized to access tunneling equipment for repair or removal of obstruction.

6. Spoil: Excavated soil and bedrock material that has been generated by the shaft construction process.

1.05 DESIGN CRITERIA

A. The Contractor is responsible for the design, installation, maintenance and safety of the shaft's excavation and its support of excavation. All design calculations provided by the Contractor as part of the required submittals shall be sealed by a Licensed Professional Engineer registered in the Commonwealth of Kentucky.

1.06 SUBMITTALS

A. Conform to Section 01300 – Submittals.

B. Detailed shaft construction methodology sufficient to convey the following:

1. Proposed method of shaft excavation and support of excavation system

2. Drawings and design details for launching and exit shafts, indicating number required, proposed spacing, criteria for installing, and method of operation.

3. Number and duration of shifts planned to be worked each day in accordance with restrictions on work hours.

4. Sequence of work/operations.

5. Procedures for handling, control and disposal of surface water, and groundwater inflow.

6. Method of spoil transportation, surface storage, and disposal location. A description indicating the locations of material disposal sites and releases from property owners.

7. Survey methods and proposed procedures for alignment and grade control.

8. Identification of critical utility crossings and special precautions proposed.

C. Ground Modification Plan: Contractor shall design and submit proposed ground modification strategies for review and acceptance including soils stabilization methods and surface settlement prevention plan for areas adjacent to shafts.

D. Ventilation Plan. Provide shaft ventilation plan. Ventilation plan to include a written description, calculations, drawings, fan curves, and manufacturer's catalogue cut sheets. Ventilation plan shall be designed by a competent person with at least five (5) years of recent on-the-job experience on similar projects, involving shafts of similar size constructed by similar methods. Provide qualifications of Designer.

E. Settlement Monitoring Plan and Site Assessment:

1. Submit a settlement monitoring plan for review prior to construction. The plan shall be in accordance with Article 3.03.

F. Daily Reports. A shift log shall be maintained on a daily basis by Contractor. Submit reports no later than 24 hours after the end of the shift to the Engineer. Daily reports shall include at a minimum the following:

1. Details of shaft excavation progress.

2. Hours worked per shift, equipment and materials used, and the duration of different activities performed.

3. Groundwater control operations, groundwater inflow location and rates.

4. Observation of any lost ground or other ground movement.

5. Any unusual conditions or events.

6. Reasons for operational shutdown whenever construction is halted.

7. Air quality reports for dust, toxic and hazardous gases, and other atmospheric impurities in the working environment.

G. Record Drawings: Maintain at construction site a complete set of field drawings for recording of as-built conditions. All marks and notes shall be dated and thorough.

H. Permits: The Contractor shall be responsible for executing the requirements of permits obtained from the KYTC, United States Army Corps of Engineers, and any State and local authority where the project is located. The Contractor shall be responsible for any phase submittals required by the permits. All submittal information required by the project permits shall be channeled through the Engineer.

1.07 QUALIFICATIONS

A. The Contractor or Subcontractor performing shaft construction must demonstrate in writing that he has requisite past project experience constructing shafts similar to those for this Project.

B. The Contractor or Subcontractor shall have the following minimum experience related to shaft construction:

1. A minimum of five (5) years of experience performing utility tunneling with shafts of similar size.

2. Three (3) tunnel projects with shafts of similar size and depth completed within the last 10 years.

1.08 QUALITY ASSURANCE

A. Work shall be supervised by at least one (1) person with five (5) years of recent previous experience in shaft and tunnel construction. Experience shall be in a minimum of five (5) previous tunneling projects of similar size and scope.

B. All shaft excavation and support operations shall be performed under the supervision of experienced shift foremen with at least five (5) years of recent on-the-job supervision experience on similar projects involving shafts of similar size constructed using similar methods.

C. Operators shall be experienced in shaft excavation and support with prior knowledge and ability to properly operate the systems being employed. All operators shall have minimum of five (5) years' experience on shaft construction of similar size.

1.09 PRE-INSTALLATION MEETING

A. At least three weeks prior to commencing the work of this section, convene a Pre-Installation Meeting at the job site to be attended by:

1. Contractor and any sub-contractor performing any related work.

2. Project Owner.

3. Engineer.

4. Any other pertinent stakeholders.

B. Meeting shall cover settlement monitoring, work hours, safety, staging and storage of materials, schedule, any changes to on-site staff from original Work Plan submittal, permitting, and the development of record drawings, etc. to ensure successful implementation of all requirements of this specification during shaft construction.

1.10 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall accept material on site and inspect for damage.

B. The Contractor shall handle, support and store materials to prevent injury or damage.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Conduct operations to not interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

B. Conduct operations to not interfere with roadway traffic, except with prior approval by the Kentucky Transportation Cabinet (KYTC) (where applicable), Lexington-Fayette Urban County Government, and the Owner.

C. Provide temporary facilities to prevent erosion of disturbed construction area in accordance with the approved Erosion & Sedimentation Control Plan and Contract Documents.

D. Maintain existing stormwater flow patterns or submit measures to temporarily bypass in accordance with the Erosion & Sedimentation Control Plan and Contract Documents.

1.12 COORDINATION

A. Coordinate work with local, State, and Federal authorities and utility owners to avoid interference with or damage to existing facilities in or adjacent to construction areas.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: provide adequate shoring and bracing materials which will support loads imposed. Materials need not be new but shall be in serviceable conditions.

B. Structural Steel: ASTM A 36.

C. Steel Sheet Piles: ASTM A 328.

D. Timber Lagging: Any species, rough-cut, mixed hardwood, nominal three inches thick.

E. Portable Steel Trench Box shall be OSHA approved.

PART 3 – EXECUTION

3.01 PROJECT SITE CONDITIONS

A. Shaft construction shall not begin until the following have been completed:

1. Required submittals have been made and the Engineer has reviewed and accepted all submittals.

2. Notify the Owner and Engineer at least 14 days before beginning any excavation.

3. Installation of ground modification, if required.

4. Groundwater control, if required.

5. A Safety Officer has been designated and prepared a Health and Safety Plan in accordance with OSHA requirements for tunnel construction. The Safety Officer shall have held safety meetings and provided safety instruction for new employees as required by OSHA.

6. Pre-Installation Meeting has been held and all comments have been addressed from the meeting.

7. Settlement monitoring system is in place and pre-construction readings have been provided to the Engineer.

8. Pre-construction survey documents have been submitted to the Engineer.

B. Perform shaft construction to the extent indicated on the Drawings so as not to interfere with, interrupt or endanger surface activity thereon, and minimize subsidence of surface, structures, and utilities. Roadway, utilities, and/or structures damaged by shaft construction operations shall be repaired or replaced as necessary to restore them to their condition prior to beginning shaft construction in a timely manner, unless otherwise directed by the Engineer, at no additional cost to Owner.

C. Furnish all necessary equipment, power, water, and utilities for shaft construction, removal and disposal of spoil, grouting, and other associated work required for the Contractor's methods of construction.

D. Promptly clean up, remove, and dispose of all spoil.

E. Furnish all maintenance of traffic and establish and maintain all safety procedures on any highways whose thoroughfare is interrupted due to the tunneling operation.

F. Inspect the locations where shaft construction will be conducted, verify conditions under which the work will be performed, and provide all necessary details, whether shown or specified on the Drawings or not, for the orderly prosecution of the Work.

3.02 PREPARATION

A. Existing utilities shown on Drawings are shown for general information only. Contractor shall verify locations, sizes, and configurations of existing utility systems within potential conflict of installation operations.

B. Complete any required testing, inspection, surveying, etc., of any existing utilities required by the Contract Documents.

C. Call Local Utility Line Locate Service (811) not less than five working days before performing Work.

D. Request underground utilities to be located and marked within and surrounding the construction areas.

E. Locate, identify, and protect utilities indicated to remain from damage.

F. Protection

1. Protect plant life, lawns, rock outcroppings and other features remaining as portion of final landscaping.

2. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic. Repair or replace all items damaged during construction.

3. Repair or replace structures raised more than 0.50-inch due to shaft construction operations including pavement and sidewalk.

G. Ventilation

1. Furnish and operate a temporary ventilation system and air monitoring system in accordance with the approved ventilation plan and conforming to the requirements of OSHA at all times that personnel are present in the shaft. Operate and maintain a ventilation system that provides a sufficient supply of fresh air and maintains an atmosphere free of toxic or flammable gases in all underground work areas.

2. Before any personnel enters the shaft, the air quality must be tested and verified that the OSHA requirements pertaining to air quality are met or exceeded.

H. Barricades

1. Protect shafts and other open excavations with barricades and security fencing as indicated on the Drawings and with additional measures approved by the Engineer and Owner as required to prevent unauthorized personnel from accessing.

2. During non-work hours, isolate with additional measures approved by the Engineer and Owner as required to prevent unauthorized personnel from accessing.

3. Remove equipment daily from vehicular and pedestrian roads, sidewalk, and pathways not contained within the direct work area to permit access and use by public.

3.03 SETTLEMENT MONITORING

A. The Contractor will be held solely responsible for damages to highway and street surfaces, railroads, pavements, structures, structural embankments, sidewalks, curbing, and public utilities resulting from subsidence, failure of support of excavation system, or ground losses and for the refilling of voids with grout. Where such ground losses are so severe that they result in damage to surface pavement, existing utilities or structures, the Contractor shall be solely responsible for remedying such damage.

B. As a minimum, surface monitoring points shall be established consisting of settlement markers to detect surface movement of roadways and pavements.

C. Survey the site showing locations and elevations of existing ground, pavement, and other permanent features to establish a baseline for existing conditions adjacent to each shaft. All surveying performed for settlement monitoring shall be performed by a Professional Land Surveyor licensed in the Commonwealth of Kentucky at the Contractors expense.

D. Surface settlement marks:

1. Surface settlement markers shall be located adjacent to each shaft as designed by the Contractor and approved by the Engineer.

E. All markers/points shall be surveyed as follows:

1. Prior to beginning any work.

2. Every 24 hours by the licensed surveyor during shaft construction.

3. At the completion of shaft construction.

4. The same points shall also be surveyed 90 days after the work is completed and both shafts have been backfilled.

F. Ground Surface Movement:

1. Shaft construction shall be performed to prevent settlement and loss of ground.

2. Unless more stringent requirements are set forth by third party agencies, settlement of the ground surface shall not exceed 0.25-inch.

3. If the ground subsidence exceeds 0.25-inch, shaft construction operations shall stop, and remedial measures approved by the Engineer shall be implemented.

4. If any movement or settlement occurs which causes or might cause damage to an existing structure over, along or adjacent to the work, immediately stop any or all work except that which assists in making the work secure and in preventing further movement, settlement, or damage. Resume shaft construction only after all necessary precautions have been taken to prevent further movement, settlement, or damage, and repair the damage at the Contractor's expense and to the satisfaction of the Engineer.

G. Lateral Displacements: Unless more stringent requirements are set forth by third party agencies, lateral movement or deflection of shaft excavation support system shall be limited to 0.50-inch.

i. Report any settlement or movement immediately to the Engineer and applicable agency and take immediate remedial action.

3.04 GROUNDWATER CONTROL

A. Intercept and divert surface drainage, precipitation, and groundwater away from shaft excavations through use of dikes, curb walls, ditches, pipes, sumps, or other means within the conditions permitted by the approved Erosion & Sedimentation Control Plan and the Contract Documents.

B. Develop substantially dry shaft subgrades for prosecution of subsequent tunneling operations.

C. Shaft subgrades shall be kept continuously free from ground and surface waters during tunneling operations. Dewatering shall be controlled such that the launching and exit shafts are free of water, but the surrounding groundwater table is not substantially lowered.

D. Keep removal of soil particles to a minimum.

E. Water discharge from dewatering operations shall be directed into approved receiving basins or silt bags in accordance with all applicable regulatory requirements and the approved Erosion & Sedimentation Control Plan.

F. Should settlement or displacement be detected, notify the Engineer and applicable agency immediately and act to maintain safe conditions and prevent damage.

3.05 GROUND MODIFICATION PRIOR TO SHAFT CONSTRUCTION

A. Ground modification grout requirements are set forth in Section 02431 – Tunnel Grout.

B. The use of jet grouting, compaction grouting, void filling, soil mixing, slurry walls, permeation grouting, compensation grouting, ground freezing, or other ground modification technologies shall be carefully considered by the Contractor to safely permit Contractor's selected shaft construction method in loose and flowable soils or in rock that is fractured with joints, bedding planes, shears, or fault zones beneath the groundwater table. Contractor shall determine if ground modification is needed to maintain a stabilized shaft excavation by Contractor's selected means of excavation and be fully responsible for the determination of the necessity, selection, design, and implementation of ground modification strategies.

C. Ground modification strategies shall be designed to work in concert with Contractor's selected shaft excavation methods and implemented as needed to increase bearing capacity, provide settlement control, reduce permeability, and increase stand-up time at the face within the shaft, and shall be included in the Bid.

D. Contractor shall furnish all labor, equipment, materials, and supplies necessary for ground modifications required to meet project objectives specified herein.

3.06 EQUIPMENT

A. Contractor shall employ shaft excavation and support equipment capable of handling the various anticipated ground conditions and which minimize loss of ground and allow for satisfactory support of the excavation.

B. Fire Suppression: Contractor shall furnish, install, and maintain a fire suppression system in accordance with the General Conditions, and all local, State and Federal requirements.

3.07 SHAFT EXCAVATION AND INSTALLATION OF SUPPORT OF EXCAVATION

A. Shaft excavation shall remain within the easements and rights-of-way indicated on the Drawings, and to the lines and grades shown on the Drawings.

B. Contractor shall be responsible for developing procedures to support the ground in a safe manner, for maintaining stability of the ground, and for safety during excavation and

support installation. Contractor's method shall ensure full bearing of the ground against the support of excavation without significant settlement or movement of the surrounding ground.

C. Keep the excavation braced or otherwise supported where required to prevent falls, excessive raveling, or erosion. Maintain standby supports for immediate use when needed.

3.08 SPOIL TRANSPORT AND DISPOSAL

A. Transport and dispose of all excavated materials properly away from the construction site. Shaft spoil and muck shall be disposed of at legal disposal facilities and proof of such disposal shall be provided to the Engineer.

3.09 VENTILATION

A. Perform all shaft construction operations by methods and with equipment which will positively control dust, fumes, vapors, gases, fibers, fogs, mists, and other atmospheric impurities in accordance with OSHA safety requirements.

3.10 CONTROL OF ALIGNMENT

A. Establish benchmarks and survey control points. Benchmarks and control points shall be established by a licensed surveyor registered in the Commonwealth of Kentucky at the Contractors expense.

B. Verify benchmarks prior to start of construction and report any errors or discrepancies to the Engineer.

C. When satisfied that all benchmarks are correct, use these benchmarks to furnish and maintain all reference lines and grades for shaft construction. Submit to the Engineer copies of field notes used to establish all lines and grades and allow the Engineer to check set up prior to beginning shaft construction. The Contractor remains fully responsible for the accuracy of the work and the correction of it, as required.

D. Benchmark Movement. Contractor shall ensure that if settlement of the ground surface occurs during construction which affects the accuracy of the temporary benchmarks, Contractor shall detect and report such movement and reestablish temporary bench marks.

3.11 REPORTS

A. Maintain and submit daily activity reports in accordance with Article 1.06.F

3.12 SITE AND WORK SAFETY

A. Comply with applicable regulations of Federal Government, OSHA 29CFR 1926, and applicable criteria of ANSI A 10.16 "Safety Requirements for Tunnels, Shafts, and Caissons", as amended to date.

B. Safety is the sole responsibility of the Contractor.

3.13 SITE RESTORATION

A. Site restoration shall be in accordance with the Drawings and applicable sections of these Specifications.

B. At the conclusion of all tunneling operations, remove excavation support systems for launching and exit shafts. If withdrawal should damage or disturb the roadway subgrade, leave supports in place and cut off five (5) feet below finished grade unless otherwise directed by Engineer.

END OF SECTION

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SECTION 02222
EXCAVATION FOR TUNNEL SHAFTS

PART 1 – GENERAL

1.01 SCOPE

A. The work described by this Section consists of furnishing all labor, materials, equipment and supplies as required to construct launching and exit shafts associated with tunnel construction.

B. Work shall be done in strict accordance with the Contract Documents, and in accordance with all Federal, State and local laws, regulations, and requirements.

C. All available and known geotechnical reports, logs, borings, and laboratory testing performed within close proximity of the project corridor have been made available as "technical data" and are not part of the Contract Documents. This is provided as information only and solely for the convenience of Bidders. The Owner and/or the Engineer do not warrant or guarantee the accuracy or correctness of this material with respect to actual subsurface conditions. Subsurface conditions are considered unclassified and no expectation of quantity, specific location of ground conditions, or geotechnical baselines are provided or assumed herein.

D. For all shafts defined under this Section, Contractor shall excavate and support of excavation using techniques and methods selected by the Contractor that are appropriate for prevailing ground conditions. Contractor shall review all available geotechnical reports and data and perform any additional subsurface investigations they deem necessary at their own expense for the planning and the selection of shaft construction techniques and methods in order to enable proper construction as shown on the Drawings and other requirements of the Contract Documents.

E. Shaft installation techniques and methods of construction shall include all equipment, materials, and selection of associated support of excavation best suited for ground conditions, as required to maintain face stability, reduce wear, advance heading within line and grade tolerances, transport spoils, and accomplish productivity assumed in Bid.

F. Dewatering shall be controlled such that the launching and exit shafts are free of water, but the surrounding groundwater table is not substantially lowered such that settlement along the tunnel drive or nearby existing structures and foundations does not occur.

G. The Contractor shall furnish all labor, equipment, and material required to complete the work including but not limited to the following:

1. Initial support system and all related components.

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H. Follow all OSHA regulations regarding tunnel construction including but not limited to OSHA 29 CFR Part 1926. Obtain all permits required associated with OSHA regulations and requirements for confined space entry.

I. Conform with all requirements of the Kentucky Transportation Cabinet (KYTC) for work within their rights-of-way.

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A. Work shall be supervised by at least one (1) person with five (5) years of recent previous experience in shaft and tunnel construction. Experience shall be in a minimum of five (5) previous tunneling projects of similar size and scope.

B. All shaft excavation and support operations shall be performed under the supervision of experienced shift foremen with at least five (5) years of recent on-the-job supervision experience on similar projects involving shafts of similar size constructed using similar methods.

C. Operators shall be experienced in shaft excavation and support with prior knowledge and ability to properly operate the systems being employed. All operators shall have minimum of five (5) years' experience on shaft construction of similar size.

1.09 PRE-INSTALLATION MEETING

A. At least three weeks prior to commencing the work of this section, convene a Pre-Installation Meeting at the job site to be attended by:

1. Contractor and any sub-contractor performing any related work.

2. Project Owner.

3. Engineer.

4. Any other pertinent stakeholders.

B. Meeting shall cover settlement monitoring, work hours, safety, staging and storage of materials, schedule, any changes to on-site staff from original Work Plan submittal, permitting, and the development of record drawings, etc. to ensure successful implementation of all requirements of this specification during shaft construction.

1.10 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall accept material on site and inspect for damage.

B. The Contractor shall handle, support and store materials to prevent injury or damage.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Conduct operations to not interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

B. Conduct operations to not interfere with roadway traffic, except with prior approval by the Kentucky Transportation Cabinet (KYTC) (where applicable), Lexington-Fayette Urban County Government, and the Owner.

C. Provide temporary facilities to prevent erosion of disturbed construction area in accordance with the approved Erosion & Sedimentation Control Plan and Contract Documents.

D. Maintain existing stormwater flow patterns or submit measures to temporarily bypass in accordance with the Erosion & Sedimentation Control Plan and Contract Documents.

1.12 COORDINATION

A. Coordinate work with local, State, and Federal authorities and utility owners to avoid interference with or damage to existing facilities in or adjacent to construction areas.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: provide adequate shoring and bracing materials which will support loads imposed. Materials need not be new but shall be in serviceable conditions.

B. Structural Steel: ASTM A 36.

C. Steel Sheet Piles: ASTM A 328.

D. Timber Lagging: Any species, rough-cut, mixed hardwood, nominal three inches thick.

E. Portable Steel Trench Box shall be OSHA approved.

PART 3 – EXECUTION

3.01 PROJECT SITE CONDITIONS

A. Shaft construction shall not begin until the following have been completed:

1. Required submittals have been made and the Engineer has reviewed and accepted all submittals.

2. Notify the Owner and Engineer at least 14 days before beginning any excavation.

3. Installation of ground modification, if required.

4. Groundwater control, if required.

5. A Safety Officer has been designated and prepared a Health and Safety Plan in accordance with OSHA requirements for tunnel construction. The Safety Officer shall have held safety meetings and provided safety instruction for new employees as required by OSHA.

6. Pre-Installation Meeting has been held and all comments have been addressed from the meeting.

7. Settlement monitoring system is in place and pre-construction readings have been provided to the Engineer.

8. Pre-construction survey documents have been submitted to the Engineer.

B. Perform shaft construction to the extent indicated on the Drawings so as not to interfere with, interrupt or endanger surface activity thereon, and minimize subsidence of surface, structures, and utilities. Roadway, utilities, and/or structures damaged by shaft construction operations shall be repaired or replaced as necessary to restore them to their condition prior to beginning shaft construction in a timely manner, unless otherwise directed by the Engineer, at no additional cost to Owner.

C. Furnish all necessary equipment, power, water, and utilities for shaft construction, removal and disposal of spoil, grouting, and other associated work required for the Contractor's methods of construction.

D. Promptly clean up, remove, and dispose of all spoil.

E. Furnish all maintenance of traffic and establish and maintain all safety procedures on any highways whose thoroughfare is interrupted due to the tunneling operation.

F. Inspect the locations where shaft construction will be conducted, verify conditions under which the work will be performed, and provide all necessary details, whether shown or specified on the Drawings or not, for the orderly prosecution of the Work.

3.02 PREPARATION

A. Existing utilities shown on Drawings are shown for general information only. Contractor shall verify locations, sizes, and configurations of existing utility systems within potential conflict of installation operations.

B. Complete any required testing, inspection, surveying, etc., of any existing utilities required by the Contract Documents.

C. Call Local Utility Line Locate Service (811) not less than five working days before performing Work.

D. Request underground utilities to be located and marked within and surrounding the construction areas.

E. Locate, identify, and protect utilities indicated to remain from damage.

F. Protection

1. Protect plant life, lawns, rock outcroppings and other features remaining as portion of final landscaping.

2. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic. Repair or replace all items damaged during construction.

3. Repair or replace structures raised more than 0.50-inch due to shaft construction operations including pavement and sidewalk.

G. Ventilation

1. Furnish and operate a temporary ventilation system and air monitoring system in accordance with the approved ventilation plan and conforming to the requirements of OSHA at all times that personnel are present in the shaft. Operate and maintain a ventilation system that provides a sufficient supply of fresh air and maintains an atmosphere free of toxic or flammable gases in all underground work areas.

2. Before any personnel enters the shaft, the air quality must be tested and verified that the OSHA requirements pertaining to air quality are met or exceeded.

H. Barricades

1. Protect shafts and other open excavations with barricades and security fencing as indicated on the Drawings and with additional measures approved by the Engineer and Owner as required to prevent unauthorized personnel from accessing.

2. During non-work hours, isolate with additional measures approved by the Engineer and Owner as required to prevent unauthorized personnel from accessing.

3. Remove equipment daily from vehicular and pedestrian roads, sidewalk, and pathways not contained within the direct work area to permit access and use by public.

3.03 SETTLEMENT MONITORING

A. The Contractor will be held solely responsible for damages to highway and street surfaces, railroads, pavements, structures, structural embankments, sidewalks, curbing, and public utilities resulting from subsidence, failure of support of excavation system, or ground losses and for the refilling of voids with grout. Where such ground losses are so severe that they result in damage to surface pavement, existing utilities or structures, the Contractor shall be solely responsible for remedying such damage.

B. As a minimum, surface monitoring points shall be established consisting of settlement markers to detect surface movement of roadways and pavements.

C. Survey the site showing locations and elevations of existing ground, pavement, and other permanent features to establish a baseline for existing conditions adjacent to each shaft. All surveying performed for settlement monitoring shall be performed by a Professional Land Surveyor licensed in the Commonwealth of Kentucky at the Contractors expense.

D. Surface settlement marks:

1. Surface settlement markers shall be located adjacent to each shaft as designed by the Contractor and approved by the Engineer.

E. All markers/points shall be surveyed as follows:

1. Prior to beginning any work.

2. Every 24 hours by the licensed surveyor during shaft construction.

3. At the completion of shaft construction.

4. The same points shall also be surveyed 90 days after the work is completed and both shafts have been backfilled.

F. Ground Surface Movement:

1. Shaft construction shall be performed to prevent settlement and loss of ground.

2. Unless more stringent requirements are set forth by third party agencies, settlement of the ground surface shall not exceed 0.25-inch.

3. If the ground subsidence exceeds 0.25-inch, shaft construction operations shall stop, and remedial measures approved by the Engineer shall be implemented.

4. If any movement or settlement occurs which causes or might cause damage to an existing structure over, along or adjacent to the work, immediately stop any or all work except that which assists in making the work secure and in preventing further movement, settlement, or damage. Resume shaft construction only after all necessary precautions have been taken to prevent further movement, settlement, or damage, and repair the damage at the Contractor's expense and to the satisfaction of the Engineer.

G. Lateral Displacements: Unless more stringent requirements are set forth by third party agencies, lateral movement or deflection of shaft excavation support system shall be limited to 0.50-inch.

i. Report any settlement or movement immediately to the Engineer and applicable agency and take immediate remedial action.

3.04 GROUNDWATER CONTROL

A. Intercept and divert surface drainage, precipitation, and groundwater away from shaft excavations through use of dikes, curb walls, ditches, pipes, sumps, or other means within the conditions permitted by the approved Erosion & Sedimentation Control Plan and the Contract Documents.

B. Develop substantially dry shaft subgrades for prosecution of subsequent tunneling operations.

C. Shaft subgrades shall be kept continuously free from ground and surface waters during tunneling operations. Dewatering shall be controlled such that the launching and exit shafts are free of water, but the surrounding groundwater table is not substantially lowered.

D. Keep removal of soil particles to a minimum.

E. Water discharge from dewatering operations shall be directed into approved receiving basins or silt bags in accordance with all applicable regulatory requirements and the approved Erosion & Sedimentation Control Plan.

F. Should settlement or displacement be detected, notify the Engineer and applicable agency immediately and act to maintain safe conditions and prevent damage.

3.05 GROUND MODIFICATION PRIOR TO SHAFT CONSTRUCTION

A. Ground modification grout requirements are set forth in Section 02431 – Tunnel Grout.

B. The use of jet grouting, compaction grouting, void filling, soil mixing, slurry walls, permeation grouting, compensation grouting, ground freezing, or other ground modification technologies shall be carefully considered by the Contractor to safely permit Contractor's selected shaft construction method in loose and flowable soils or in rock that is fractured with joints, bedding planes, shears, or fault zones beneath the groundwater table. Contractor shall determine if ground modification is needed to maintain a stabilized shaft excavation by Contractor's selected means of excavation and be fully responsible for the determination of the necessity, selection, design, and implementation of ground modification strategies.

C. Ground modification strategies shall be designed to work in concert with Contractor's selected shaft excavation methods and implemented as needed to increase bearing capacity, provide settlement control, reduce permeability, and increase stand-up time at the face within the shaft, and shall be included in the Bid.

D. Contractor shall furnish all labor, equipment, materials, and supplies necessary for ground modifications required to meet project objectives specified herein.

3.06 EQUIPMENT

A. Contractor shall employ shaft excavation and support equipment capable of handling the various anticipated ground conditions and which minimize loss of ground and allow for satisfactory support of the excavation.

B. Fire Suppression: Contractor shall furnish, install, and maintain a fire suppression system in accordance with the General Conditions, and all local, State and Federal requirements.

3.07 SHAFT EXCAVATION AND INSTALLATION OF SUPPORT OF EXCAVATION

A. Shaft excavation shall remain within the easements and rights-of-way indicated on the Drawings, and to the lines and grades shown on the Drawings.

B. Contractor shall be responsible for developing procedures to support the ground in a safe manner, for maintaining stability of the ground, and for safety during excavation and

support installation. Contractor's method shall ensure full bearing of the ground against the support of excavation without significant settlement or movement of the surrounding ground.

C. Keep the excavation braced or otherwise supported where required to prevent falls, excessive raveling, or erosion. Maintain standby supports for immediate use when needed.

3.08 SPOIL TRANSPORT AND DISPOSAL

A. Transport and dispose of all excavated materials properly away from the construction site. Shaft spoil and muck shall be disposed of at legal disposal facilities and proof of such disposal shall be provided to the Engineer.

3.09 VENTILATION

A. Perform all shaft construction operations by methods and with equipment which will positively control dust, fumes, vapors, gases, fibers, fogs, mists, and other atmospheric impurities in accordance with OSHA safety requirements.

3.10 CONTROL OF ALIGNMENT

A. Establish benchmarks and survey control points. Benchmarks and control points shall be established by a licensed surveyor registered in the Commonwealth of Kentucky at the Contractors expense.

B. Verify benchmarks prior to start of construction and report any errors or discrepancies to the Engineer.

C. When satisfied that all benchmarks are correct, use these benchmarks to furnish and maintain all reference lines and grades for shaft construction. Submit to the Engineer copies of field notes used to establish all lines and grades and allow the Engineer to check set up prior to beginning shaft construction. The Contractor remains fully responsible for the accuracy of the work and the correction of it, as required.

D. Benchmark Movement. Contractor shall ensure that if settlement of the ground surface occurs during construction which affects the accuracy of the temporary benchmarks, Contractor shall detect and report such movement and reestablish temporary bench marks.

3.11 REPORTS

A. Maintain and submit daily activity reports in accordance with Article 1.06.F

3.12 SITE AND WORK SAFETY

A. Comply with applicable regulations of Federal Government, OSHA 29CFR 1926, and applicable criteria of ANSI A 10.16 "Safety Requirements for Tunnels, Shafts, and Caissons", as amended to date.

B. Safety is the sole responsibility of the Contractor.

3.13 SITE RESTORATION

A. Site restoration shall be in accordance with the Drawings and applicable sections of these Specifications.

B. At the conclusion of all tunneling operations, remove excavation support systems for launching and exit shafts. If withdrawal should damage or disturb the roadway subgrade, leave supports in place and cut off five (5) feet below finished grade unless otherwise directed by Engineer.

END OF SECTION

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SECTION 02223
STRUCTURAL FILL AND EMBANKMENT

PART 1 – GENERAL

1.01 SUMMARY

A. Structural Fill

B. Embankment

C. Compaction Requirements

1.02 RELATED SECTIONS

A. Excavation for Tunnel Shafts: Section 02222

B. Excavating, Backfilling, and Compacting for Utilities: Section 02225

C. Stream Restoration: Section 02373

1.03 QUALITY ASSURANCES

A. The Owner to perform soil testing and inspection service for quality control testing during earthwork operations.

1.04 REFERENCES

A. Commonwealth of Kentucky, Standard Specifications for Road and Bridge Construction, latest edition.

B. ANSI/ASTM D698 – Standard Test Method for Laboratory Compaction characteristics of Soil Using Standard Effort.

C. ANSI/ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Core Method.

D. ASTM D2922 – Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

E. ASTM D3017 – Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.05 TESTS

A. Contractor must provide laboratory tests and analysis of fill materials in accordance with applicable referenced standards and under provisions of Section 01400. The laboratory

test shall be conducted by a third party independent Laboratory acceptable to the Owner. The cost of the Laboratory testing shall be paid by the Contractor. Tests shall include, but not be limited to, gradation analysis, classification, liquid limit, plastic limit, plasticity index, and moisture/density relationships.

B. The Owner will pay all cost associated with field compaction testing that will be performed in accordance with applicable referenced standards and under provisions of Section 01400.

C. When ASTM D2922 is used, the calibration curves shall be checked and adjusted if necessary by the procedure described in ASTM D2922, paragraph ADJUSTING CALIBRATION CURVE. ASTM D2922 results in wet unit weight of soil; and when using this method, ASTM D3017 shall be used to determine the moisture content of the soil. The calibration checks of both the density and moisture gages shall be made at the beginning of a job on each different type of material encountered and at intervals as directed by the testing laboratory.

D. Testing as required for verification of design bearing capacities.

E. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to Owner.

1.06 SUBMITTALS

A. The Owner's testing agency shall submit reports directly to the Engineer in accordance with Section 01400, and copies to the Contractor. As a minimum, reports shall consist of the following:

1. Verification of each foundation subgrade.

2. Field density test reports.

B. The Contractor's testing agency shall submit reports directly to the Engineer in accordance with Section 01400, and copies to the Contractor. As a minimum, reports shall consist of the following:

1. Test reports on borrow material and structure excavation to be use for compacted fill.

2. One optimum moisture-maximum density curve for each type of soil encountered.

3. Report of actual unconfined compressive strength and/or results of bearing tests on each strata tested.

PART 2 – PRODUCTS

2.01 COMPACTED FILL MATERIALS

A. Soils (onsite or offsite) used for compacted structural fill, backfill, and embankment shall be inorganic clayey soils free of deleterious debris or rocks whose largest dimension is no larger than four (4) inches in any direction. The soil shall have a plasticity index of less than 25. Fill lifts shall be compacted to a minimum of 95 percent of the soil's maximum dry density (ASTM D 698) with a moisture content of compacted fill within two (2) percent of optimum moisture.

B. Crushed stone used for compacted structural fill shall be Kentucky Dense Graded Aggregate per Kentucky Transportation Cabinet Standard Specifications for Road and Bridge Construction, current edition, unless otherwise shown on the Drawings. All crushed stone backfill around structures will be DGA, unless otherwise noted on the drawings.

C. Open graded stone used for compacted backfill shall be Kentucky No. 57 size aggregate per Kentucky Transportation Cabinet Standard Specifications for Road and Bridge Construction, current edition, unless otherwise shown on the Drawings.

D. On-site soils shall be tested for suitability for use as structural fill material. The old fill material may be used as structural fill if tests show suitability and all deleterious materials are removed and large boulders are crushed to meet maximum particle size criteria specified in this section.

E. Frozen material shall not be placed in compacted fills.

F. All material, whether from the excavations or from borrow, shall be of such nature that after it has been placed and properly compacted, it will make a dense suitable fill. It shall not contain vegetation, masses of roots, individual roots more than 18 inches long or more than 1/2-inch diameter, stones over four (4) inches in diameter, or porous matter.

G. All structures bearing on rock that are undercut to rock shall be backfilled from competent rock bearing to bottom of foundation with lean concrete. The undercut area shall be equal to the dimensions of the structure plus an additional one (1) foot of width on each side of the structure for every one (1) foot of undercut below the design finished subgrade elevation. The lean concrete is to extend vertically, from the outmost edge of the zone of influence to the bottom of foundation elevation from the rock bearing surface.

H. All old undocumented fill shall be removed to stiff or better residual soil under any soil bearing structure, including the roadway or embankment for the roadway.

I. For structures which are backfilled from competent rock bearing with DGA, the undercut area shall be equal to the dimensions of the structure plus an additional one (1) foot width on each side of the structure for every one (1) foot of undercut below the design

finished subgrade elevation. The dense grade structural fill is to extend vertically, from the outmost edge of the zone of influence to the subgrade elevation from the rock bearing surface. Backfill from competent rock with DGA must be approved by the Project Engineer and the Design Geotechnical Engineer.

2.02 TOPSOIL

A. All topsoil and organic materials shall be stripped from the construction area and all structural fill areas.

B. Topsoil shall be as specified in Section 02373 – Stream Restoration.

PART 3 – EXECUTION

3.01 GENERAL

A. Granular and soil fill shall be placed in maximum 8-inch thick loose lifts and compacted to 95 percent of maximum dry density (ASTM D 698) and within three (3) percent of optimum moisture content as determined by the standard Proctor moisture density test. Any fill to be compacted with small compaction equipment (such as a plate compactor, trench compactor, or similar means) should be placed in maximum four (4) inch loose lifts. Minimal vibration should be used in compaction equipment on silty and clayey soils existing on the site.

B. If field conditions warrant, dry DGA may be placed at the direction of the Owner's Geotechnical Engineer. If dry DGA is placed, a "roller pattern" shall be performed to determine a target density.

C. Any area of the subgrade deemed to be soft, unsuitable material, or not readily capable of in-situ compaction, shall be removed. These areas shall be over-excavated to suitable material as approved by the Owner's Geotechnical Engineer or his representative. The over-excavated area shall be brought up to the desired grade using concrete, crushed stone fill, or compacted soil fill as required by the Owner's Geotechnical Engineer or his representative, and the Contract Documents. The fill material for the over-excavated area shall meet all compaction or strength requirements as specified herein. The Contractor shall be responsible for this work in areas where the Contractor has previously placed fill.

D. Maintain moisture content of backfill material to attain required compaction density as specified in the geotechnical report. Material deposited on the fill that is too wet shall be removed or spread and permitted to dry, assisted by disking or blading, if necessary, until the moisture content is reduced to the specified limits.

E. Backfill areas to contours and elevations. Use unfrozen materials. The Contractor shall keep the foundation and subgrade free from water or unacceptable materials after the fill operations have started.

F. Backfill systematically, as early as possible, to allow time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.

G. Verify areas to be backfilled are free of debris, snow, ice, or water, and ground surfaces are not frozen. Previously frozen material shall be removed or otherwise treated as required before new backfill is placed.

H. Employ a placement method so as not to disturb or damage foundation drainage and piping.

I. Walls below final grade shall be backfilled with a minimum 12-inch thick layer of free draining material up to two feet below final grade. The two feet above this free draining material should be backfilled with an impervious material that would retard surface water infiltration. The free draining material should extend down to a rock blanket beneath the bottom slab. See geotechnical report for additional guidance.

J. Where backfilling behind walls and other locations, as shown on the Drawings, provide filter fabric at the interface between crushed stone and soil backfilling.

K. Backfill shall not be placed against or on structures until they have attained sufficient strength to support all loads to which subjected without distortion, cracking, or damage. Deposit soil evenly around the structure.

L. For structures with concrete top slabs, there shall be no backfilling operations until the top slab is in place and cured for a minimum of 7 days and has reached 70% of its 28 day design strength , unless noted otherwise on the plans or approved by the Engineer.

M. Slope grade away from structures minimum two (2) inches in ten (10) feet, unless noted otherwise.

N. Make changes in grade gradual. Blend slopes into level areas.

O. Remove surplus excavation materials to designated areas.

P. Rough grading above compacted fill areas shall have been completed to approximately six (6) inches below finished grade and brought back up to grade with six (6) inches of topsoil.

Q. Tolerance for top surface of fill shall be plus or minus one (1) inch.

R. Plow, strip, or break up existing sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.

S. Maintain site grading during construction so that positive drainage of soils is promoted at all times.

T. Maintain a subgrade free of standing or ponding water.

U. For soils, underneath soil bearing structures, that will remain exposed overnight or for an extended period of time, place a lean concrete mudmat over the bearing areas. The concrete shall be at least four (4) inches thick.

3.02 STRUCTURAL FILL

A. Compacted Fill Under Structures

1. All fill under indirect rock-bearing structures shall be lean concrete unless otherwise shown on the Drawings.

2. Where compacted soil or compacted dense grade aggregate is shown on the Drawings to be under structures, compact soil or DGA fill to a minimum of 95 percent of maximum dry density and within plus or minus three (3) percent of optimum moisture content. On-site and off-site soils shall have a plasticity index of less than 30 percent. Fill shall be placed in maximum eight (8) inch lifts. Maximum particle size shall be four (4) inches in any one direction.

3. Where soil fill is shown on the drawings, compact the top 12 inches of soil subgrades to a minimum of 95 percent of maximum dry density and within plus or minus three (3) percent of optimum moisture content.

4. Structures bearing on rock shall bear directly on benched leveled solid bedrock or lean concrete backfill. Loose, weathered, and uneven rock shall be removed to reach a level, solid, bedrock. Provide concrete fill for the additional depth as required.

5. Structures shall not be supported on a combination of crushed stone or soil and bedrock. If rock is encountered above the soil subgrade level when excavating for structures bearing on soil, excavate bedrock to a point two (2) feet below the foundation level and fill with compacted crushed stone or soil, as required.

6. If field conditions warrant, dry DGA may be placed. If the DGA will be placed dry, field density testing will yield distorted results. A "roller pattern" may be performed to determined target dry density.

7. Any backfill required due to over blasting shall be placed in accordance with the Specifications at no additional cost to the Owner.

B. Compacted Fill Under Piping

1. Compact to a minimum of 95 percent of maximum dry density and within plus or minus three (3) percent of optimum moisture content.

2. Compact fill to a minimum of 95 percent of maximum dry density and within plus or minus three (3) percent of optimum moisture content. Soils shall have a plasticity index of less than 30 percent. Fill shall be placed in maximum eight (8) inch lifts. Maximum particle size shall be four (4) inches in any one direction.

3. For crushed stone or aggregate backfills in trenches or wall backfill and when using smaller compaction equipment the lift thickness should not exceed four (4) inches.

C. Compacted Backfill Around Structures

1. Compact to a minimum of 95 percent of maximum dry density and within plus or minus three (3) percent of optimum moisture content.

2. Soil backfill shall be used in accordance with 2.01(A) and shall be placed in maximum 8-inch loose lifts and compacted 95 percent of maximum dry density and within plus or minus three (3) percent of optimum moisture content as determined by the standard Proctor moisture density test. Any fill to be compacted with small compaction equipment (such as a plate compactor, trench compactor, or similar means) should be placed in maximum four (4) inch loose lifts. Minimal vibration should be used in compaction equipment on silty soils existing on the site.

D. Compacted Fill Under Roads, Drives, and Walks

1. Compact structural fill under roads, drives, and walks to a minimum of 95 percent of maximum dry density and within plus or minus three (3) percent of optimum moisture content.

2. Prior to stone base placement, the subgrade area shall be proofrolled (GVW with at least 80,000 pounds) to verify subgrade conditions. Undercutting or repair may be required, as directed by the geotechnical engineer.

3. Structural fill will be required under the roadway within the zone of influence. The zone of influence is defined as a 1:1 (one to one) slope from the proposed grade to the existing grade. The zone of influence must be proofrolled as previously stated. If pumping occurs, materials must be removed along the 1:1 (one to one) zone of influence.

3.03 EMBANKMENT

A. Embankment is considered to be fill areas of the site that do not support structures, piping, drives, or walks. This includes areas above piping elevations.

B. All compacted embankment areas shall be compacted to a minimum of 95 percent of maximum dry density and within plus or minus three (3) percent of optimum moisture content.

C. Fill placed on side slopes must be placed in horizontal lifts starting at the toe of the slope while securely benching the new fill material into the existing slope. Continue to place the fill in horizontal lifts until final proposed grade is reached.

3.04 TOPSOIL

A. Topsoil shall be spread and lightly compacted in accordance with Section 02920 – Lawns and Grasses.

3.05 FIELD QUALITY CONTROL

A. Quality Control Testing During Construction

1. Contractor to allow Owner's testing service to inspect structure subgrades and each compacted soil fill layer under structures, report to the Engineer on findings, and approve subgrades and fill layers before further construction work is performed. Inspection to be performed by a qualified soils engineering technician working under the direct supervision of a professional geotechnical engineer.

2. Testing service to perform field density tests in accordance with ASTM D698, ASTM D1556 (Sand Cone Method) or ASTM D2992 (Nuclear Density Method), as applicable.

    a. Building Slab and Foundations: Make at least one compaction/moisture percentage and field density test for every 100 square feet of subgrade and lift of compacted fill.

    b. Foundation Wall Backfill: Make at least one field density test for every 100 square feet per lift of compacted fill, but not less than one test per lift.

    c. Piping: Make at least one field density test for every 100 square feet of lift of compacted fill.

    d. Road, Drives, Walks: Make at least one field density test for every 100 square feet of subgrade or lift of compacted fill.

    e. Embankment: Make at least one field density test for every 2000 square feet of each lift of compacted fill.

3. Foundation Subgrade: For each strata of soil at each structure on which foundations will be placed, conduct at least one test to verify required design bearing capacities by means of portable dynamic cone penetration (DCP) testing.

B. If testing service reports and inspection show subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional cost to the Owner if requested by the Owner or Engineer.

C. Where settling is measurable or observable at filled areas during the general project warranty period, remove surface (pavement, sod, etc.), add and compact backfill material, and replace surface. Additional stabilization may be required per the design engineers and specific design.

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SECTION 02225

EXCAVATING, BACKFILLING, AND COMPACTING FOR SEWERS

PART 1 – GENERAL

1.01 SUMMARY

A. Excavating of trenches.

B. Bedding of pipe.

C. Backfilling trenches.

D. Installing identification tape.

1.02 PRODUCTS

1.03 BEDDING AND BACKFILLING STONE

A. Crushed Stone material shall conform to the Kentucky Transportation Cabinet's Standard Specifications for Road and Bridge Construction, Current Edition, latest revision.

B. Bedding Stone: No. 9 Crushed Limestone

C. Backfill Stone: No. 9 Crushed Limestone or No. 57 Crushed Stone

PART 2 – EXECUTION

2.01 GENERAL REQUIREMENTS

A. Trenching may be accomplished by means of a backhoe, trenching machine, hydro-excavation or by hand depending on the construction area. At the Contractor's option, trenching by a trenching machine or by backhoe is acceptable.

B. Clearing - All trees, stumps, bushes, shrubbery, and abandoned concrete or masonry structures within the limits of the trench shall be removed by the Contractor and disposed of in a manner in accordance with federal, state and local regulations. All clearing work shall be considered as incidental to the cost of laying pipe.

C. Bracing and Sheeting - Bracing and sheeting shall be provided to adequately protect the workers during pipe line installation.

1. All requirements of the Occupational Safety and Health Act (OSHA) shall be met during trenching and backfill operations.

2. As backfill is placed, the sheeting shall be withdrawn in increments not exceeding one (1) foot and the void left by the withdrawn sheeting shall be filled and with #9 stone.

3. The Engineer will not be responsible for determining requirements for bracing or sheeting.

2.02 TRENCHING

A. General:

1. The Contractor shall perform all excavation of every description and of whatever substances encountered, including clearing over the pipeline route. All excavations for the pipeline shall be open cut except where noted for bore and jack.

B. Trench Width:

1. Trench widths shall be in accordance with LFUCG RMP Standard Drawings.

C. Trench Depth:

1. The trench shall be excavated to a minimum of six (6) inches below pipe grade as noted on LFUCG RMP Standard Drawings.

2.03 GRAVITY SEWER PIPE BEDDING

A. Refer to LFUCG Standard Drawings.

2.04 GRAVITY SEWER PIPE BACKFILLING

A. Refer to LFUCG Standard Drawings.

2.05 INSTALLING IDENTIFICATION TAPE

A. Detectable underground marking tape shall be installed over pipes (gravity sewers and force mains). Care shall be taken to ensure that the buried marking tape is not broken when installed and shall be Lineguard brand or equal encased aluminum foil, Type III. The identification tape is manufactured by Lineguard, Inc., P.O. Box 426, Wheaton, IL 60187 or equal.

B. The identification tape shall bear the printed identification of the plastic utility line below it, such as "Caution – Buried Below". Tape shall be reverse printed; surface printing will not be acceptable. The tape shall be visible in all types and colors of soil and provide maximum color contrast to the soil. The tape shall meet the APWA color code and shall be two (2) inches in width. Colors are green for sewer and brown for force main.

END OF SECTION

SECTION 02240
DEWATERING

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor and equipment required to dewater all excavations.

B. Dewatering of all excavations shall be the responsibility of the Contractor, and no additional compensation will be allowed for same.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

A. Dewatering equipment shall be of adequate size and quantity to assure maintaining proper conditions for installing pipe, concrete, backfill or other material or structure in the excavation.

B. Dewatering shall include proper removal of any and all liquid, regardless of its source, from the excavation.

C. The site shall be kept free of surface water at all times. The Contractor shall install drainage ditches, dikes and shall perform all pumping and other work necessary to divert or remove rainfall and all other accumulations of surface water from the excavations. The diversion and removal of surface water shall be performed in a manner that will prevent flooding and/or damage to other locations within the construction area where it may be detrimental.

D. The Contractor shall provide, install and operate sufficient trenches, sumps, pumps, hose piping, well points, deep wells, etc., necessary to depress and maintain the ground water level below the base of the excavation during all stages of construction operations.

E. No groundwater from the excavated area shall be discharged into the sanitary sewer system.

F. Dewatering shall be in accordance with all state and local regulations/permits/plans.

G. Trench shall be dewatered as required and never shall the trench accumulate groundwater to a depth that will cause pipe to float.

END OF SECTION

SECTION 02260
EXCAVATION SUPPORT AND PROTECTION

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. This Section includes, but is not limited to, the following:

1. Shoring and bracing necessary to protect existing buildings, streets, walkways, utilities, and other improvements and excavation against loss of ground or caving embankments.

2. Maintenance of shoring and bracing.

3. Removal of shoring and bracing, as required.

B. Types of shoring and bracing systems include, but are not limited to, the following:

1. Steel H-section (soldier) piles.

2. Timber lagging.

3. Steel sheet piles.

4. Portable steel trench box.

C. Building excavation is specified in another Division 2 Section.

1.02 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.03 QUALITY ASSURANCE

A. Engineer Qualifications: A professional engineer legally authorized to practice in jurisdiction where Project is located, and experienced in providing successful engineering services for excavation support systems similar in extent required for this Project.

B. Supervision: Engage and assign supervision of excavation support system to a qualified professional engineer foundation consultant.

C. Regulations: Comply with codes and ordinances of governing authorities having jurisdiction.

D. Layout drawings for excavation support system shall be prepared by, or under the supervision of, a qualified professional engineer. System design and calculations must be acceptable to local authorities having jurisdiction.

1.04 JOB CONDITIONS

A. Before starting work, verify governing dimensions and elevations. Verify condition of adjoining properties. Take photographs to record any existing settlement or cracking of structures, pavements, and other improvements. Prepare a list of such damages, verified by dated photographs, and signed by Contractor and others conducting investigation.

B. Survey adjacent structures and improvements, employing qualified professional engineer, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

C. During excavation, resurvey benchmarks weekly, maintaining accurate log of surveyed elevations for comparison with original elevations. Promptly notify Engineer if changes in elevations occur or if cracks, sags, or other damage is evident.

1.05 EXISTING UTILITIES

A. Protect existing active sewer, water, gas, electricity and other utility services and structures.

B. Notify municipal agencies and service utility companies having jurisdiction. Comply with requirements of governing authorities and agencies for protection, relocation, removal, and discontinuing of services.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: Provide adequate shoring and bracing materials which will support loads imposed. Materials need not be new, but should be in serviceable condition.

B. Structural Steel: ASTM A 36.

C. Steel Sheet Piles: ASTM A 328.

D. Timber Lagging: Any species, rough-cut, mixed hardwood, nominal 3 inches thick, unless otherwise indicated.

E. Portable Steel Trench Box shall be OSHA approved.

PART 3 – EXECUTION

3.01 SHORING

A. Wherever shoring is required, locate the system to clear permanent construction and to permit forming and finishing of concrete surfaces. Provide shoring system adequately anchored and braced to resist earth and hydrostatic pressures.

B. Shoring systems retaining earth on which the support or stability of existing structures is dependent must be left in place at completion of work.

3.02 BRACING

A. Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move a brace, install new bracing prior to removal of original brace.

B. Do not place bracing where it will be cast into or included in permanent concrete work, except as otherwise acceptable to Engineer.

C. Install internal bracing, if required, to prevent spreading or distortion of braced frames.

D. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

E. Remove sheeting, shoring, and bracing in stages to avoid disturbance to underlying soils and damage to structures, pavements, facilities, and utilities.

F. Repair or replace, as acceptable to Engineer, adjacent work damaged or displaced through installation or removal of shoring and bracing work.

END OF SECTION

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SECTION 02370
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 shown in the Erosion and Sediment Control Plan or Stormwater Pollution Prevention Plan (hereinafter referred to generally as the SWPPP) and as specified herein and as required by the LFUCG Land Disturbance Permit, Chapter 16-Article X, Division 5 of the LFUCG Code of Ordinances, and the KPDES General Permit for Stormwater Discharges Associated with Construction Activities (KYR10).

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) on the site, and prevent them from being discharged offsite or into or alongside any body of water or into natural or man-made conveyances leading thereto.

C. The Contractor shall at all times minimize land disturbance and the period of time that the disturbed area is exposed without stabilization practices. In "critical areas" (within 25 feet of a perennial or intermittent stream, wetland, sinkhole, inlet or other waterbody) erosion prevention measures such as working during dry periods, use of sediment controls, and use of 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 sodding, mulching, seeding, providing erosion control blankets and turf reinforcement mats on all disturbed surfaces including waste area surfaces and stockpile and borrow area surfaces; covering small disturbed areas with tarps or other materials; scheduling work to minimize erosion; and providing diversion or interceptor ditches to minimize the discharge of sediment.

E. Temporary sedimentation controls include, but are not limited to, silt fences, rock check dams, berms, traps, barriers, fiber logs, storm drain inlet filters, and appurtenances on sloped surfaces to minimize the discharge of sediment.

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 and the site is stabilized in accordance with state and local requirements.

G. Prior to construction, the Contractor shall obtain an LFUCG Land Disturbance Permit and shall obtain coverage under the KPDES General Permit for Stormwater Discharges

Associated with Construction Activities (KYR10) (see Article 3.24 in this Section) if required. The Contractor shall be responsible for placement of pollutant, erosion, and sedimentation controls as shown in the Stormwater Pollution Prevention Plan (SWPPP) prior to excavation, fill, or grade work. If during the course of construction, the state and/or LFUCG determine additional controls are required, the Contractor shall furnish, install, and maintain additional seeding, mulch, blankets, sediment barriers, diversion or other ditches, 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 rainfall event of 0.5 inch or greater (or 4 inches of snow or greater).

I. Final stabilization practices on those portions of the project where land disturbance activities have permanently ceased shall be initiated within fourteen (14) days of the date of cessation of land disturbance activities. Temporary stabilization for those portions of the project where land disturbance has temporarily ceased (e.g., temporary seeding, mulching, etc.) shall be initiated within fourteen (14) days of the date of cessation of land disturbance activities.

J. Erosion and Sediment Control prevention measures shall be installed prior to removal of vegetation, grading, and/or stripping of topsoil. The Contractor is responsible for preparing and submitting the Kentucky Division of Water Notice of Intent and attachments and obtaining state permit approval, if applicable, prior to the beginning of any construction activities.

1.02 PERMITS AND NOTIFICATION REQUIREMENTS

A. The Contractor is responsible to submit a Stormwater Pollution Prevention Plan (SWPPP) for inclusion with permit applications. The Contractor may elect one of the following options to meet this requirement:

1. Utilize the SWPPP (which includes the Erosion and Sediment Control Plan) provided in the Construction Drawings and prepared by the Owner's Engineer as a basis for an updated SWPPP, and take sole responsibility for updating and implementing the SWPPP, or

2. Provide a SWPPP, including an Erosion and Sediment Control Plan, prepared by a professional engineer licensed in the Commonwealth of Kentucky, meeting all of the requirements of KYR10, Chapter 11 of the LFUCG Stormwater Manual, and Chapter 16-Article X, Division 5 of the LFUCG Code of Ordinances.

B. If applicable (i.e., for projects with a disturbed area of one acre or more), the Contractor shall submit a KPDES Notice of Intent specifically for Construction Activities (NOI-

SWCA) and receive notification of coverage before beginning any site disturbance, and 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.

C. A Land Disturbance Permit shall be obtained from the Lexington-Fayette Urban County Government Division of Engineering. See Article 3.25 in this Section for detailed requirements.

D. The Contractor shall comply with all additional requirements of LFUCG. It is the Contractor's responsibility to provide evidence to the Owner that all permits, including those associated with construction across or along a stream channel, if applicable, have been obtained prior to initiation of construction. Some permits are obtained during the design phase of the project. Typically, they should be included in the contract documents.

1.03 RELATED WORK

A. Section 02371 – Stormwater Pollution Prevention Plan (SWPPP)

B. Section 02373 – Stream Restoration

PART 2 – PART 2 – PRODUCTS

2.01 MULCH

A. Mulch or erosion control blankets / turf reinforcement mats (see Section 2.08) shall be used as a soil stabilization measure for any disturbed area inactive (i.e., not undergoing grading or excavation) for 14 days or longer. Areas requiring stabilization during December through February shall receive only mulch held in place with bituminous material. Mulching, blankets, or mats shall be used whenever permanent or temporary seeding is used. The anchoring of mulch, blankets, and mats 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 or mats 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 are appropriate for areas with less than five percent slopes, and do not require tacking. Wood chips shall be applied at 270 cubic yards per acre or 6 cubic yards 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 are appropriate for areas with less than five percent slopes, and 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. Recommended buffer distances between applied products and waterbodies shall be strictly followed.

G. Gravel or stone aggregate may be used in relatively small areas when incorporated into an overall landscaping plan. Before the gravel or crushed stone is applied, it shall be washed.

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 control blanket or turf reinforcement matting 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 run-on and runoff as necessary with diversions, grassed waterways, terraces, or sediment ponds.

D. Contractor shall use the following Permanent Seed Mix, with the following exceptions:

1. If a property owner landscaping agreement differs from this specification, the property owner landscaping agreement shall be followed on that property, or

2. The Construction Drawings identify a different seed mix.

The Permanent Seed Mix shall consist of the following mix spread at a rate of 5 pounds/1,000 square feet:

Common Name	%	lbs per 1,000 sq. ft.
Tall Fescue (turf type)	75	3.75
Annual Rye	15	0.75
Bluegrass	10	0.50
TOTAL	100%	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 determined by a soil test obtained by the Contractor. Fertilizer shall not be applied within 50 feet of a stream or other waterbody. 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 48 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 determined by a soil test obtained by the Contractor. Fertilizer shall not be applied within 50 feet of a stream or other waterbody. 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.

K. Sod shall be kept watered after installation until the project is considered substantially complete.

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. 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 EROSION CONTROL BLANKETS AND TURF REINFORCEMENT MATS

A. Mulch netting, erosion control blankets (ECBs), 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 when selected and installed in accordance with manufacturer's recommendations. TRMs shall be used at the water line to control toe erosion along stream banks and wave action in wet ponds. Erosion control blankets may be used to stabilize small ditches and swales and on recently planted slopes to protect seedlings until they become established.

B. Effective ECB and TRM installation 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. ECBs or TRMs shall be used in critical areas such as banks along waterways where concentrated flows are expected. Manufacturer's specifications shall be followed.

D. ECBs, TRMs, and netting shall be suitable for their intended purpose and shall be used as indicated in the Construction Drawings.

E. The ECB shall have a minimum useful life span of two (2) years. The material shall consist of interlocking, curled wood fibers and be capable of withstanding shear stresses up to 2.25 pounds per square foot and a velocity of nine (9) feet per second. The acceptable ECB shall be Curlex II as manufactured by American Excelsior Company or approved equal.

F. Product Documentation

The manufacturer shall provide the Engineer or other designated party with the QA/QC certifications for each shipment of ECB/TRM. The certification shall be signed by a responsible party employed by the manufacturer such as the QA/QC Manager, Production Manager, or Technical Services Manager. The QA/QC certifications shall include:

1. ECB/TRM lot and roll numbers (with corresponding shipping information)

2. Manufacturer's test data for raw materials used in the production.

3. Manufacturer's test data for finished production.

G. Product Labeling

1. Prior to shipment, the Manufacturer shall affix a label to each roll identifying the following characteristics:

2. Product identification information (manufacturer name and address, brand name, product code)

3. Lot number and roll number

4. Roll length and width

5. Total roll weight.

H. Packaging

1. The ECB/TRM shall be wound around a cardboard core to facilitate handling. The core is not intended to support the roll for lifting but should be sufficiently strong to prevent collapse during transit.

2. All rolls shall be labeled and bagged in packaging that is resistant to photodegradation by ultraviolet light.

I. The Contractor shall furnish the following to the Engineer:

1. Manufacturer's quality assurance/quality control certifications for each shipment to verify that the materials supplied for the project are in accordance with the requirements of this specification.

2. Manufacturer's warranty covering materials and workmanship.

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 and/or other ditches require stabilization, with seed, blankets, mats, or mulch.

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 if they discharge to landscaped areas. 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, ECBs, 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 a 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 or armoring 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. If used, check dams shall be constructed prior to the establishment of vegetation.

E. The maximum height at the center 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. Containment berms of earth or rock may be used. High velocity areas (e.g., overflows) shall be armored with rock, TRMs, or other suitable material.

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.

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:

PHYSICAL PROPERTY	REQUIREMENTS
Filtering Efficiency	80% (minimum)
Tensile Strength at 20%	50 pounds/linear inch (minimum)
Flow Rate	0.3 gallons/square foot/minute (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. Posts shall be no more than 6 feet apart.

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 shall be utilized on drop inlets and curb inlets that receive sediment-laden runoff from disturbed areas.

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	10 10 4 6 6	Well-Drained
Ladino *Plus* Timothy *Or* Orchardgrass *Or* Bromegrass	0.5 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 shall be designed by a professional engineer licensed in Kentucky, and shall be considered a permanent structure. Stream crossings shall be as close to perpendicular to the stream flow as possible.

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 the compacted earth fill shall be covered with at least six inches of KYTC No. 2 stone.

F. KYTC No. 2 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 – PART 3 – EXECUTION

3.01 GENERAL

A. Erosion and sediment control practices shall be consistent with the requirements of Chapter 11 of the LFUCG Stormwater Manual and other state and local regulatory agencies and in any case shall be adequate to minimize erosion of disturbed and/or regraded areas and discharge of sediment from the site.

B. Contractor is responsible for notifying and obtaining coverage from the Kentucky Division of Water concerning inclusion under the KPDES General Permit for Stormwater 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, or filtered through a sediment removal device. 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. Clean Water Act Section 401 and 402 requirements enforced by the US Army Corps of Engineers and the Kentucky Division of Water and 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 (where needed) 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

H. Erosion control blankets and turf reinforcement mats are considered protective mulches and may be used alone on erodible soils and during all times of year. Blankets and 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 (if needed) 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, overseed 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 if 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 inch 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 (if needed) 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 ½ inch by ¾ 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 shall 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 shall 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 EROSION CONTROL BLANKETS AND TURF REINFORCEMENT MATS

A. Blankets 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.

B. Placement

1. The blankets and mats shall be unrolled in the direction of surface water flow.

2. When using two blankets or mats side by side, the seams shall not be placed in the center of a channel but shall be offset by a minimum of one (1) foot.

3. Blankets and mats shall be stapled in place using U-shaped staples of the size, and at the prescribed intervals and arrangement, specified by the manufacturer.

4. When blankets or mats are laid side by side, they shall be stapled so as to anchor the edge of each roll.

5. The overlap of blankets and mats shall be in accordance with the manufacturer's recommendations.

6. If blanket/mat is unrolled along (parallel) to the contour installation must begin at the lower elevation and progress up slope with the upper blanket overlapping the lower as with roofing shingles.

C. Damage Repair

1. The patch material used for the repair of a hole or tear shall be the same type of material as the damaged blanket/mat.

2. The patch shall extend at least 12 inches beyond any portion of the damaged blanket/mat.

3. The repair patch shall be stapled in place as per manufacturer's recommendations.

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 (or blanket/mat) 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 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 ensure 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 ensure 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 seeded and mulched as needed to establish vegetative cover. Blankets or mats may be used instead of mulch, according to manufacturer's specifications.

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 secured to the slope using stakes 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 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 and mulching of the sediment trap berm and any 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 6 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. Where used, the 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.

N. Silt fence shall terminate in a "J" hook to prevent bypassing at the end of a row.

3.19 STORM DRAIN INLET PROTECTION

A. All storm drains receiving sediment-laden flows from disturbed areas shall be protected. Approved inlet protection methods include net or sand bags filled 2/3 with rock, geotextile filtration products, and Contractor-fabricated structures.

B. For a silt fence drop inlet protection structure, 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.

C. 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.

D. 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 shall 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.

E. 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.

F. 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.

G. The inlet protection structure shall be inspected after each rain, and repairs made as needed.

H. Sediment shall be removed and the device restored to its original dimensions when 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.

I. If a stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone shall be pulled away from the blocks, cleaned, and replaced.

J. Structures shall be removed after the area draining to the inlet protection structure has been properly stabilized.

3.20 FILTER STRIP

A. When planting filter strips, Contractor shall prepare seedbed, incorporate fertilizer based on a soil test, and apply mulch consistent with the seeding sections of this Specification. Fertilizer shall not be applied within 50 feet of a stream or other waterbody. 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 during low-flow conditions and 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 check dams.

3.23 CONSTRUCTION DEWATERING

A. All dewatering discharges shall pass through a sediment removal device. 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 STORMWATER 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 waterbody

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:

1. 1542 – Building Construction, nonresidential, except industrial and warehouses

2. 1623 – Water Main Construction, Sewer Construction

3. 1629 – Water and Wastewater Treatment Plant Construction

4. 1711 – Water Pump Installation

5. 1781 – Drilling Water Wells

F. The Contractor is responsible for implementing the approved Stormwater Pollution Prevention Plan (SWPPP) prior to commencement of site disturbance. The SWPPP shall include erosion prevention measures and sediment and pollutant control measures which are installed and maintained to minimize discharges of sediments and other pollutants from a 2-year, 24-hour storm event. The SWPPP shall be kept at the site and available for review by LFUCG and state officials.

G. The Contractor is responsible for the description of procedures to maintain erosion and sediment control measures during the period of construction.

H. The Contractor is responsible for identifying each Contractor and Subcontractor who will install each SWPPP erosion and sediment control measure.

I. Each Contractor and Subcontractor shall sign a statement certifying the awareness of the requirements of the SWPPP-related documents. Certification is attached at the end of this section.

J. The Contractor shall not start land disturbing activities until written permit coverage is obtained from the Kentucky Division of Water.

K. 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

L. The Contractor is responsible for completing and maintaining the required Self-Inspection Forms. A sample is included in this specification Section.

M. Amendments to the approved SWPPP 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 stormwater discharges from the construction site. All plan amendments shall be noted on the copy of the SWPPP maintained at the project site. Plan amendments that involve engineering design shall be prepared by an engineer licensed in Kentucky.

N. The Contractor shall submit the Notice of Termination (NOT) form to the Kentucky Division of Water, the LFUCG Division of Water Quality, and the LFUCG Division of Engineering when final stabilization has been achieved on all portions of the site and the erosion/sediment controls have been removed.

O. All subcontractors shall be required to comply with the requirements of the state permit and the Stormwater Pollution Prevention Plan (SWPPP).

P. Where to submit:

1. Complete KPDES FORM NOI-SW at the following website:
https://dep.gateway.ky.gov/eForms/default.aspx?FormID=7

2. Do not initiate work until receiving approval from the Kentucky Division of Water.

3. A complete copy of the NOI submittal shall also be provided to the following for approval/coverage verification:

Division of Water Quality
125 Lisle Industrial Avenue, Suite 180
Lexington, KY 40511

Division of Engineering
Lexington-Fayette Urban County Government
101 E. Vine St.
4th Floor
Lexington, KY 40507

3.25 LFUCG LAND DISTURBANCE PERMIT

A. The Contractor shall obtain a Land Disturbance Permit from the LFUCG Division of Engineering, after the LFUCG Division of Water Quality inspects the installation of the best management practices as required by the Stormwater Pollution Prevention Plan (SWPPP). The site grading plan shall show the original and finish grade contours. The grading plan shall be in conformance with the SWPPP and shall clearly show the initial phase of best management practices to be installed.

B. The Land Disturbance Permit checklist appears on the following page. It can be obtained from:

Division of Engineering
Lexington-Fayette Urban County Government
101 E. Vine St.
4th Floor
Lexington, KY 40507
(859) 258-3410
Attn: Land Disturbance Permit Section
https://www.lexingtonky.gov/new-development

C. All excess earthen/rock materials hauled off the site to a location in Fayette County shall be hauled to a site permitted by the Kentucky Division of Water and the LFUCG. The haul site shall be permitted in accordance with these specifications.

LFUCG Land Disturbance Permit Application & Erosion and Sediment Control Plan Checklist *v23Feb2018*

Permittee (Owner or Contractor):	Date:
Contact Person:	Contact Phone:
Site Address:	Zone:
Contractor Name: Reg #:	Contractor Phone:
Mailing Address:	Email:

Permitting Information and ESC Plan Narrative	**Yes**	**No**	**N/A**	**Page#**	**Notes**
KY DOW Construction NOI / KYR10 Permit					Required for disturbance ≥ 1 acre
US ACE Section 404 Permit					Required for stream crossings, wetland fills
KY DOW Stream Construction Permit / WQ Certif.					Required for stream crossings / encroachment
FEMA LOMR or CLOMR					If applicable
Project description and purpose					Brief summary
Land cover, soils, percent impervious area					Pre and post construction
Land cover / land use of adjacent property					Can designate on plan sheets
Work schedule with start/end dates					Sequencing, clearing, grading, revegetation
Phasing plan for large projects					25 acre limit on total disturbed area
BMP installation schedule					Can be included on plan sheets (see below)
Inspection and BMP maintenance schedule					Every 7 days, or every 14 days and after ½" rain
Material storage, waste & litter pollution prevention					Covered, away from drainage system, etc.
Fueling / vehicle maintenance pollution prevention					Conducted away from drainage system, etc.
Spill prevention, control, and countermeasures					If reportable quantities present at the site
Dust control plan					Consider if neighbors are present
Stabilized site exit inspection plan					For keeping offsite pavement clear of soil/debris
Stabilization plan and schedule for site areas					Seed/mulch/etc. within 14 days of inactivity
ESC Plan Site Map and Drawing Detail *(See LFUCG Stormwater Manual for BMP Design and Installation Information)*					
Plans stamped by a licensed professional					Required for engineered plan components
Location of the project; property lines					Include small locational map; street address
Limits of construction, disturbed area location/size					Flag off "no disturbance" areas
Topography and drainage patterns (pre and post)					1" = 50 ft; 2 ft contours
Buildings, utilities, paved areas, ditches, culverts					Show stormwater inlets within 100 ft of site
Retention ponds, detention basins, sediment traps					Stabilize immediately after construction
Access and haul roads					Consider dust control where neighbors present
Stabilized exit (50 ft #2 rock pad, shaker rack, etc.)					Must drain to a sediment control BMP
Silt fence or etc. at downslope perimeters					Super silt fence along critical areas
Diversion ditches/berms above disturbed areas					Stabilize immediately after construction
Protection for post-construction BMPs					Keep sediment out of post-construction BMPs
Slope stabilization (seed with mulch/blanket/mat)					See Figure 11-1 in Stormwater Manual
Inlet protection measures					Specify type(s) and location(s)
Outlet erosion protection measures					Specify type(s) and location(s)
Ditch stabilization (sod, or seed with blanket/mat)					Stabilize immediately after construction
Sediment basins (> 5 ac) and traps (< 5 ac)					Stabilize immediately after construction
Dewatering sites and methods					Must use sediment controls
50 ft natural vegetated buffer for all critical areas					Applies to streams, wetlands, sinkholes
Stream crossings					Crossing type, detail; USACE 404 permit req'd
Stockpile areas, equipment storage/fueling areas					Keep away from drainage system if possible
Waste and concrete wash water storage/disposal					Show initial area; can be moved as needed

LFUCG Use Only: *Review Date:* *Status – In Compliance: Yes No*	*Additional Info Needed: Yes No*
Reviewed By:	*Department: DOE DWQ DES*
Comments / Missing Items:	

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 Yes	No	N/A	Field Indicators for Compliance
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 gullying 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

Sediment Traps and Basins				Storage volume is at least 134 cubic yards for each acre of bare soil area drained Trap or basin is seeded/mulched and stabilized; no collapsing sidewalls or banks Outlet structure is stable and consists of rock-lined notched overflow or outlet riser Rock overflow is 6" lower in center to control overflow discharge Outlet riser pipe has concrete & rock base, ½ inch holes every 3" to 6", and trash rack Area near pipe outlet or overflow is stable, with no scour or erosion Sediment removed before trap or basin is halfway full; disposal is away from ditches
Maintenance of EPSC Management Practices				Sediment behind silt fence and other filters does not reach halfway to top Sediment traps and basins are less than half full of sediment Gullies repaired, silt fences and other controls inspected and repaired/replaced Written documentation of controls installed, inspection results, and repairs performed All controls removed and areas graded, seeded, and stabilized before leaving site
Materials Storage, Handling, and Cleanup				Materials that may leach pollutants stored under cover and out of the weather Fuel tanks located in protected area with double containment system Fuel and/or other spills cleaned up promptly; no evidence of unmanaged spills No evidence of paint, concrete, or other material washouts near drain inlets No storage of hazardous or toxic materials near ditches or water bodies
Waste Disposal				Trash, litter, and other debris in proper containers or properly managed No litter or trash scattered around on the construction site Provisions made for restroom facilities and/or other sanitary waste management Sanitary waste facilities clean and serviced according to schedule No disposal of any wastes into curb or other inlets, ditches, streams, or water bodies

Inspection Notes and Key Observations

List of Stabilized Areas: Vegetation is Established; Ditches are Stabilized; No Exposed Soil
Other Notes or Observations:
Corrective Actions Taken and/or Proposed Revisions to BMP Plan:

I certify under penalty of law that I understand the terms and conditions of the general Kentucky Pollutant Discharge Elimination System (KPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

Signature of Inspector: _____

Contractor and Subcontractor Certifications

SWPPP Files, Updates, and Amendments

This SWPP Plan and related documents (e.g., NOI, inspection reports, US ACE permits, etc.) will be kept on file at the construction site by _____ (name and title). The SWPPP will be updated by the Owner and/or Site Manager to reflect any and all significant changes in site conditions, selection of BMPs, the presence of any unlisted potential pollutants on site, or changes in the Site Manager, contractor, subcontractors, or other key information. Updates and amendments will be made in writing within 7 days and will be appended to the original BMP Plan and available for review.

Stormwater Pollution Prevention Plan Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly 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.

Signed: _____ Date: _____

Title: _____

I certify under penalty of law that I understand the terms and conditions of the general KPDES permit that authorizes the storm water discharges associated with the construction site activity identified as part of this certification.

Subcontractor Certification

The subcontractors below certify under penalty of law that they understand the terms and conditions of the general KPDES permit that authorizes the storm water discharges associated with the construction site activity identified as part of this certification.

Signed: _____ Date: _____

Title: _____

Signed: _____ Date: _____

Title: _____

Signed: _____ Date: _____

Title: _____

END OF SECTION

SECTION 02371

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

PART 1 – GENERAL

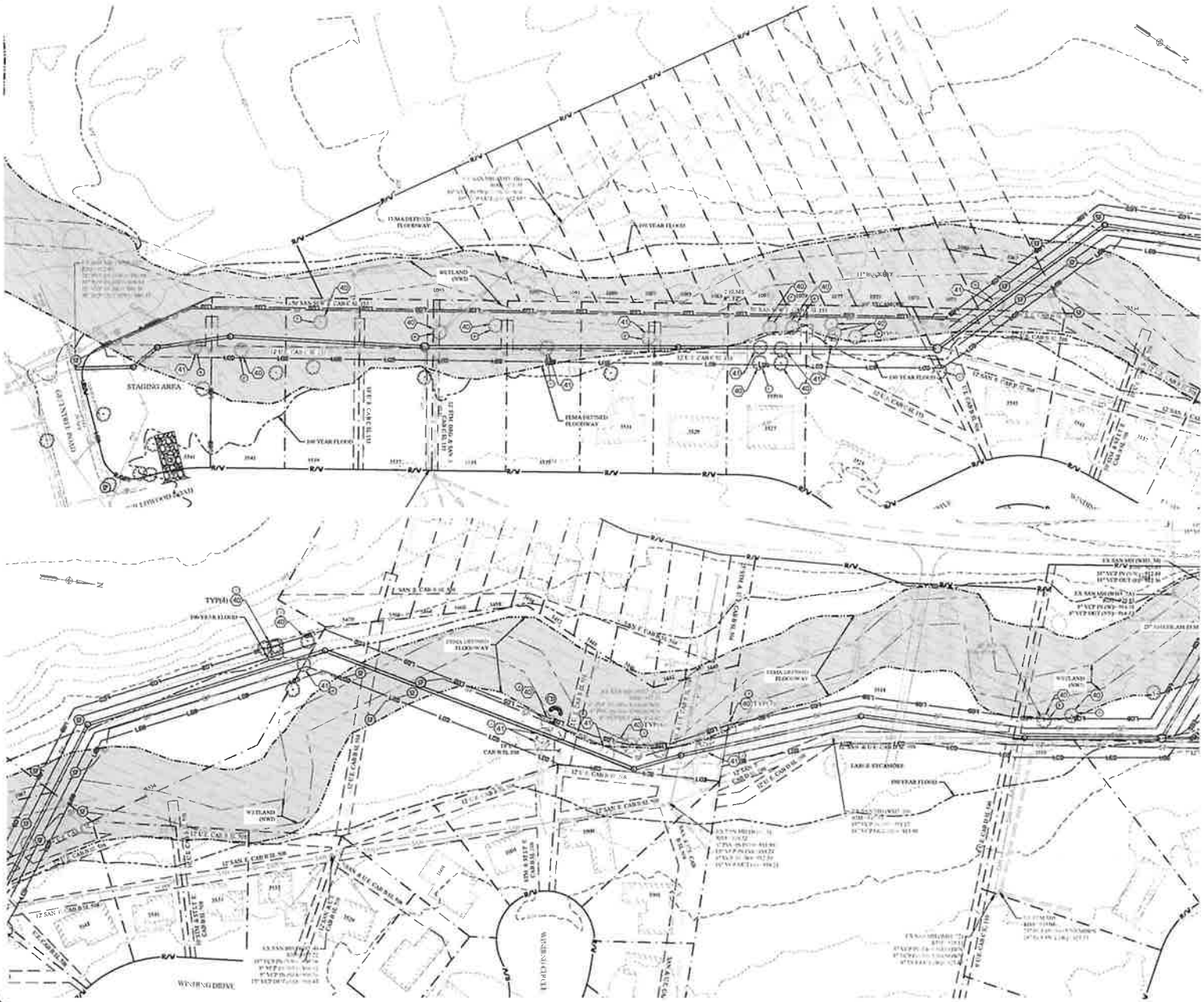
1.01 GENERAL

A. The Contract Documents include a SWPPP that has been reviewed by LFUCG Division of Water Quality. This SWPPP shall be used for establishing quantities and a lump sum price for providing the Erosion and Sediment Control Measures. The included SWPPP is largely complete but will require additional information from the contractor such as concrete washout locations, inlet protection types, etc. prior to being approved by LFUCG Division of Water Quality.

B. The Contractor may use this SWPPP, with necessary additions, to obtain the required permits, i.e. Land Disturbance Permit. If Contractor chooses to use this SWPPP, the Contractor takes sole responsibility for the content of the SWPPP and the implementation of the SWPPP during construction. If Contractor chooses to use this SWPPP, the contractor will be required to submit the SWPPP with necessary additions to LFUCG Division of Water Quality for approval.

C. Contractor may also choose to prepare its own SWPPP and submit to LFUCG Division of Water Quality for approval. No additional payment will be allowed for the Erosion and Sediment Control and conformance with SWPPP pay item.

END OF SECTION



EROSION PROTECTION AND SEDIMENT CONTROL LEGEND

GRAPHIC	DESCRIPTION	SYMBOL
	EROSION CONTROL MATTING (6 MONTH LONGEVITY)	(EM)
SF	SILT FENCE	(SF)
LOD	LIMITS OF DISTURBANCE	
	SILT CHECK DAM	(CD)
	INLET PROTECTION	(IP)
	CONSTRUCTION ENTRANCE	(CE)
	CONCRETE WASHOUT PIT	(CW)
	PUMP-AROUND FLOW DIVERSION (See sheet titled "Pump-Around Flow Diversion" Detail 2)	(PD)

SITE BMP PLAN

The phases listed below and controls shown on plans are a general overview and may be adjusted in the field due to Construction Activities and Construction Means and Methods

PHASE I - BMP PLAN (Clearing & Grubbing, Mass Grading) Erect erosion control fence along the property and the adjacent streets Construct construction entrance(s) as shown in the plan

PHASE II - BMP PLAN (Rough grading, roughing of parking lot, underground utilities and sewers work) During this phase of construction activities, silt fences shall be removed, relocated, and or added as construction progresses. Maintain the silt fence along the lower perimeter and public street(s). Install underground utilities and sewers using correct linear BMP measures. Rough in site grade Install silt fence along outside and toe of slope of cut.

PHASE III - BMP PLAN (Site Preparation) Maintain the silt fence along the perimeter. Seed and straw site that will not be covered by buildings or parking lot Where normal seed and straw methods are ineffective, or on slopes 3:1 or steeper, install erosion control matting, 6 month longevity.

PHASE IV - BMP PLAN (Final Construction) Remove silt fence and other controls that are inhibiting final construction and is no longer needed. Relocate silt fence as needed. Install Concrete Wash out pit, Final location may vary based on trades. Finish construction of the sidewalks, entrances, parking lots, and buildings. Finally, remove any remaining erosion control measures and protect any remaining disturbed areas with seed and straw.

KPDES NOI INFORMATION

Area of Site: 1.20 Acres
Lat 37° 58'38.58"N
Long 84°28'39.42"

Receiving Water Body: West Hickman

PLAN KEYNOTES

#1 Provide tree protection fencing TPZ

#1 Existing tree to be removed. Construction Engineer to walk line to confirm trees to be removed before construction

TREE TYPE	
A	HACKBERRY
B	DOGWOOD
C	BRADFORD PEAR
D	EASTERN RED CEDAR
E	FLOWERING DOGWOODS
F	EASTERN REDBUD
G	RED MAPLE
H	BLACK WALNUT
J	TO BE DETERMINED

GRAPHIC SCALE: 1" = 50'
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 9'

PRIME AE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
DIVISION OF WATER QUALITY
SEWER IMPROVEMENTS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT No. WH17
LFUCG BID No. XX-2022

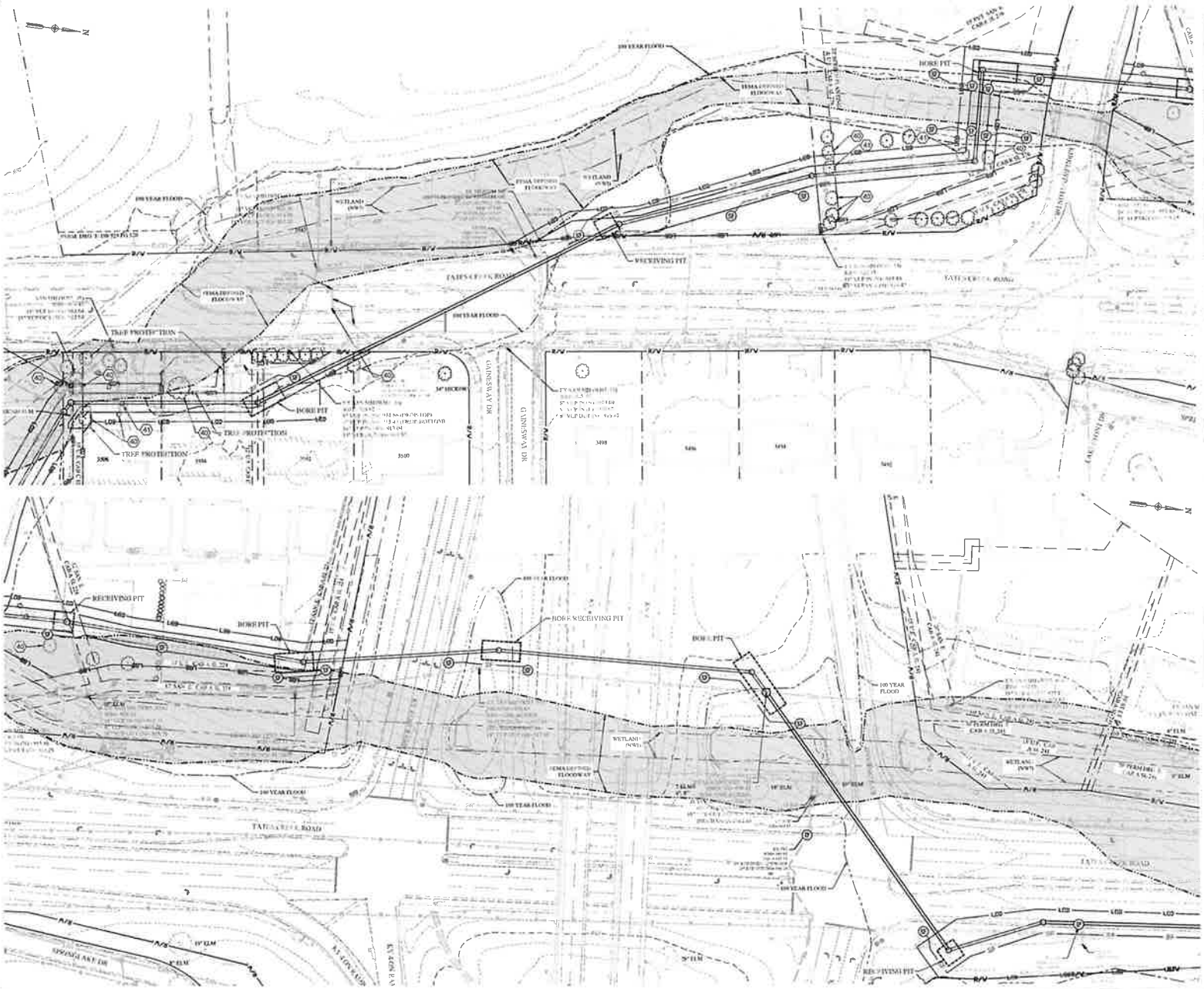
PROJECT NO.: 200126
DATE: 10/03/2025
DRAWN BY: KWH
CHECKED BY: KB

DESCRIPTION OF REVISION

EROSION PREVENTION & SEDIMENT CONTROL PLAN

SHEET NO.
EP-1

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Oct 03, 2025 - 1:44pm
Login Name: mcrist



EROSION PROTECTION AND SEDIMENT CONTROL LEGEND

GRAPHIC	DESCRIPTION	SYMBOL
	EROSION CONTROL MATTING (6 MONTH LONGEVITY)	(EM)
	SILT FENCE	(SF)
LOD	LIMITS OF DISTURBANCE	
	SILT CHECK DAM	(CD)
	INLET PROTECTION	(IP)
	CONSTRUCTION ENTRANCE	(CE)
	CONCRETE WASHOUT PIT	(CW)
	PUMP-AROUND FLOW DIVERSION (See sheet ### "Pump-Around Flow Diversion" Detail)	(PD)

SITE BMP PLAN

The phases listed below and controls shown on plans are a general overview and may be adjusted in the field due to Construction Activities and Construction Means and Methods

PHASE I - BMP PLAN (Clearing & Grubbing, Mass Grading) Erect erosion control fence along the property and the adjacent streets Construct construction entrance(s) as shown in the plan

PHASE II - BMP PLAN (Rough grading, rough-in of parking lot underground utilities and sewers work) During this phase of construction silt fences shall be removed, relocated, and or added as construction progresses Maintain the silt fence along the lower perimeter and public streets Install underground utilities and sewers using correct linear BMP measures Rough in site grade Install silt fence along rear/side and toe of slope of cut

PHASE III - BMP PLAN (Site Preparation) Maintain the silt fences along the perimeter Seed and straw any that will not be covered by buildings or parking lot Where normal seed and straw methods are ineffective, or on slopes 3:1 or steeper, install erosion control matting, 6 month longevity

PHASE IV - BMP PLAN (Final Construction) Remove silt fence and other controls that are inhibiting final construction and is no longer needed Relocate silt fence as needed Install Concrete Wash out pit, final location may vary based on trades Finish construction of the sidewalks, entrances, parking lots, and buildings Finally, remove any remaining erosion control measures and protect any remaining disturbed areas with seed and straw

KPDES NOI INFORMATION

Area of Site 1.29 Acres
Lat 37° 59' 05"N
Long 84°28'39.44"

Receiving water Body West Hickman

PLAN KEYNOTES

40 Provide tree protection fencing DMD

41 Existing tree to be removed Contractor/Engineer to walk line to confirm trees to be removed before construction

0' 50' 100' 150'
GRAPHIC SCALE 1" = 50'
HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

SEAL

PRIME AE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
MERRICK TRUNK
SEWER IMPROVEMENTS
DIVISION OF ENGINEERING AND ENVIRONMENTAL MANAGEMENT
REMEDIAL MEASURES PROJECT NO. WH-7
LFUCG BID NO. XX-2022

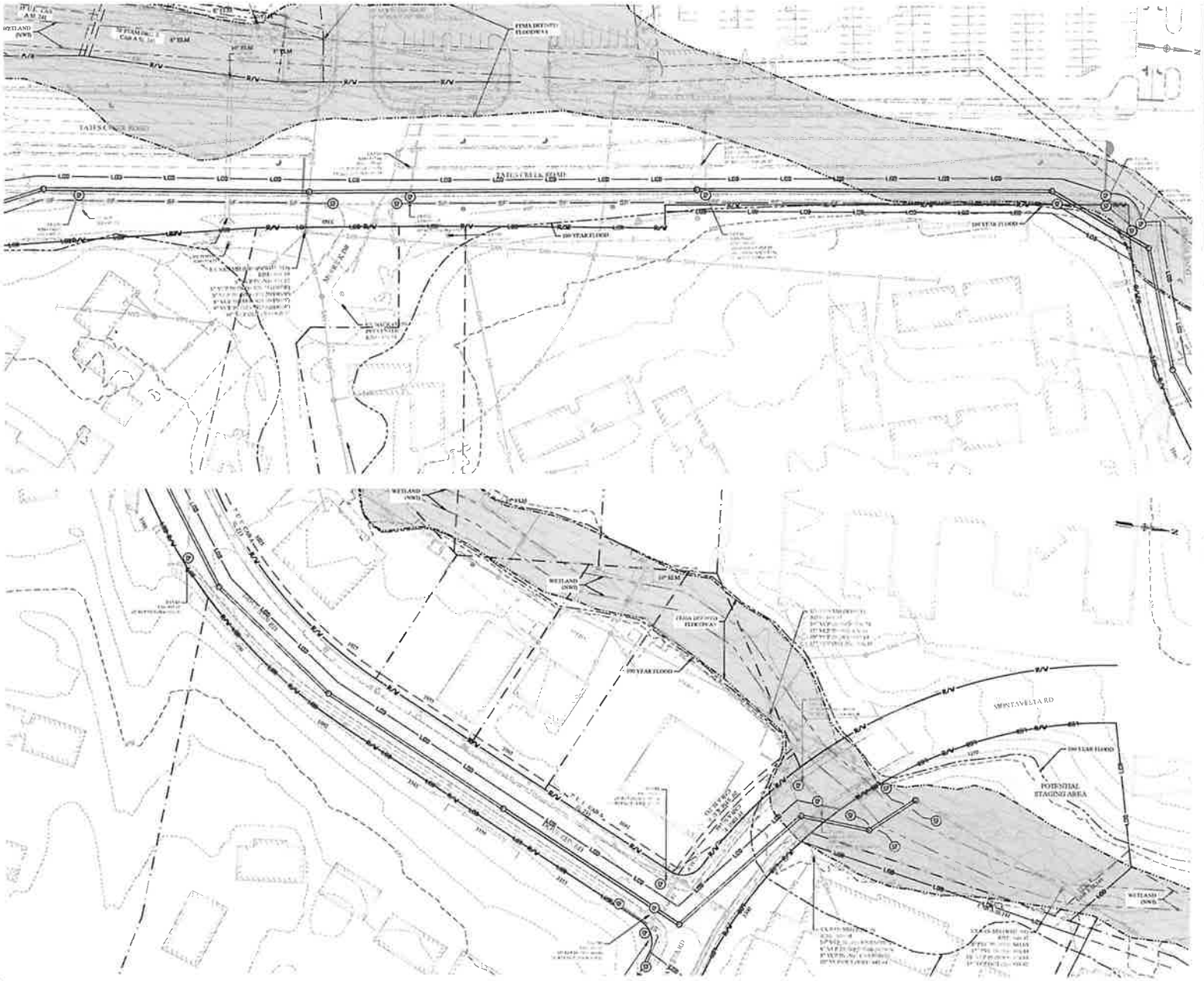
PROJECT NO.: 20012.6
DATE: 10/03/2025
DRAWN BY: KWH
CHECKED BY: KB

DESCRIPTION OF REVISION

EROSION PREVENTION & SEDIMENT CONTROL PLAN

SHEET NO.
EP-2

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EROSION PROTECTION AND SEDIMENT CONTROL LEGEND		
GRAPHIC	DESCRIPTION	SYMBOL
	EROSION CONTROL MATTING (6 MONTH LONGEVITY)	(EM)
	SILT FENCE	(SF)
LOD	LIMIT OF DISTURBANCE	
	SILT CHECK DAM	(SD)
	INLET PROTECTION	(IP)
	CONSTRUCTION ENTRANCE	(CE)
	CONCRETE WASHOUT PIT	(CW)
	PUMP-AROUND FLOW DIVERSION (See sheet ### "Pump-Around Flow Diversion" Detail)	(PD)

SITE BMP PLAN

The phases listed below and controls shown on plans are a general overview and may be adjusted in the field due to Construction Activities and Construction Means and Methods

PHASE I - BMP PLAN (Clearing & Grubbing, Mass Grading) Erect erosion control fence along the property and the adjacent streets Construct construction entrance(s) as shown in the plan

PHASE II - BMP PLAN (Rough grading, roughing in of parking lot, underground utilities and sewers work) During this phase of construction activities, silt fences shall be removed, relocated, and or added as construction progresses Maintain the silt fence along the lower perimeter and public street(s) Install underground utilities and sewers using correct linear BMP measures Rough in site grade Install silt fence along footwalk and toe of slope of cut

PHASE III - BMP PLAN (Site Preparation) Maintain the silt fences along the perimeter Seed and straw site that will not be covered by buildings or parking lot Where normal seed and straw methods are ineffective, or on slopes 3 1 or steeper, install erosion control matting, 6 month longevity

PHASE IV - BMP PLAN (Final Construction) Remove silt fence and other controls that are inhibiting final construction and is no longer needed Relocate silt fence as needed Install Concrete Wash out pit, final location may vary based on trades Finish construction of the sidewalks, entrances, parking lots, and buildings Finally, remove any remaining erosion control measures and protect any remaining disturbed areas with seed and straw

KPDES NOI INFORMATION

Area of Site 1 20 Acres
Lat 37° 9'39 55"N
Long 84°28'3 44"

Receiving water Body West Hickman

0' 50' 100' 150'
GRAPHIC SCALE: 1" = 50'
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
DIVISION OF WATER QUALITY
SEWER IMPROVEMENTS
MERRICK TRUNK
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH7
LFUCG BID NO. XX-2022

PRIME AE

PROJECT NO.: 200126
DATE: 10/03/2025
DRAWN BY: KWH
CHECKED BY: KB

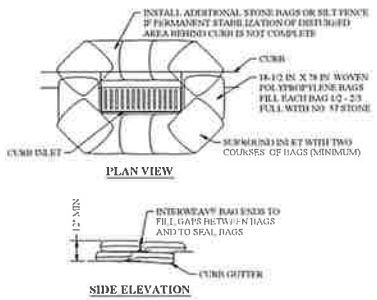
DESCRIPTION OF REVISION

EROSION PREVENTION & SEDIMENT CONTROL PLAN

SHEET NO.
EP-3

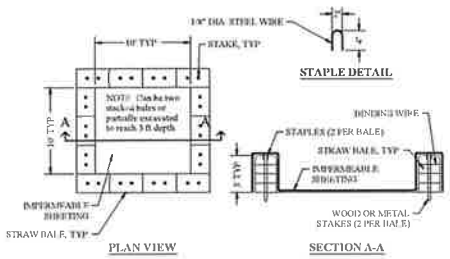
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Oct 03, 2025 - 8:57am
Logan Kohn



STORM INLET PROTECTION

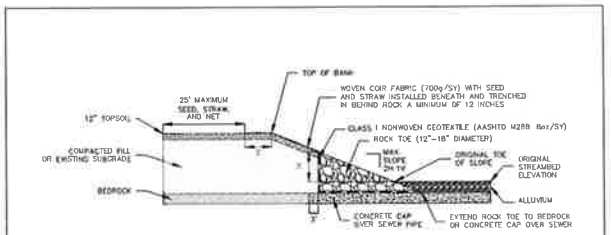
SCALE: NOT TO SCALE



1. Locate washout structure a minimum of 50 feet away from open channels, storm drain inlets, sensitive areas, wetlands, buffers and water courses and away from construction traffic
2. Size washout structure for volume necessary to contain wash water and solids and maintain at least 4 inches of freeboard. Typical components are 10 feet x 10 feet x 3 feet deep
3. Prepare soil base free of rocks or other debris that may cause tears or holes in the liner for liner, use 10 mil or thicker uv resistant, impermeable sheeting, free of holes and tears or other defects that compromise impermeability of the material
4. Provide a sign for the washout in close proximity to the facility
5. Keep concrete washout structure water tight. Replace impermeable liner if damaged (e.g., ripped or punctured). Empty or replace washout structure that is 75 percent full, and dispose of sediment and material properly. do not reuse plastic liner. Wet-vacuum stored liquids that have not evaporated and dispose of in an approved manner. Prior to forecasted rainstorms, remove liquids or cover structure to prevent overflows. Remove hardened solids, whole or broken up, for disposal or recycling. maintain runoff diversion around excavated washout structure until structure is removed

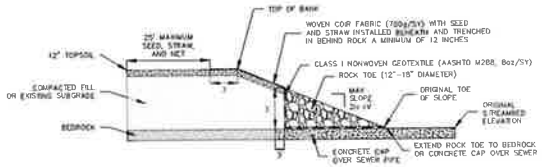
CONCRETE WASH PIT WITH STRAW BALES

SCALE: NOT TO SCALE



STREAMBANK RESTORATION PHASE I DETAIL
FOR ALLUVIUM STREAMBED

NOT TO SCALE



STREAMBANK RESTORATION PHASE I DETAIL (ROCK BOTTOM STREAM)

NOT TO SCALE

SPECIFICATIONS FOR GEOTEXTILE FABRIC

GRAB TENSILE STRENGTH	220 LBS. (MIN.) (ASTM D4632)
ELONGATION FAILURE	50% (MIN.) (ASTM D4632)
MULLEN BURST STRENGTH	430 LBS. (MIN.) (ASTM D3786)
PUNCTURE STRENGTH	125 LBS. (MIN.) (ASTM D4833) (MODIFIED)
EQUIVALENT OPENING	SIZE 40-80 (US STD. SIEVE) (CW-02215)

NOTES

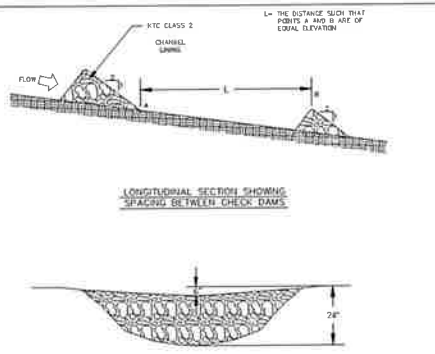
1. A STABILIZED ENTRANCE PAD OF CRUSHED STONE SHALL BE LOCATED WHERE TRAFFIC WILL ENTER OR LEAVE THE CONSTRUCTION SITE ONTO A PUBLIC STREET
2. SOIL STABILIZATION FABRIC SHALL BE USED AS A BASE FOR THE CONSTRUCTION ENTRANCE
3. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS OR EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS WARRANT AND REPAIR OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT
4. ANY SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC STREETS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY
5. WHEN APPROPRIATE, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING A PUBLIC STREET. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN

STORMWATER MANUAL

FIGURE 11-4

CONSTRUCTION ENTRANCE NOTES AND SPECIFICATIONS

(OCTOBER 1, 2020)

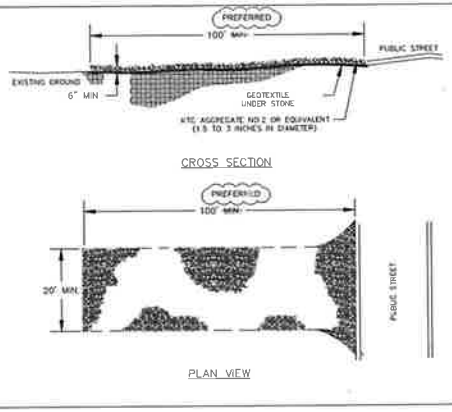


STORMWATER MANUAL

FIGURE 11-16

ROCK CHECK DAM

(OCTOBER 1, 2020)



STORMWATER MANUAL

FIGURE 11-3

CONSTRUCTION ENTRANCE

(OCTOBER 1, 2016)

PRIME AE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
MERRICK TRUNK
SEWER IMPROVEMENTS
DIVISION OF WATER QUALITY
REHABILITATION OF SSO WW-7
LFUCG BID NO. XX-2022

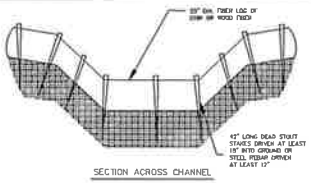
PROJECT NO.: 20012S
DATE: 10/03/2025
DRAWN BY: KWH
CHECKED BY: KB

DESCRIPTION OF REVISION

EROSION PREVENTION & SEDIMENT CONTROL PLAN (DETAILS)

SHEET NO.
EP-4

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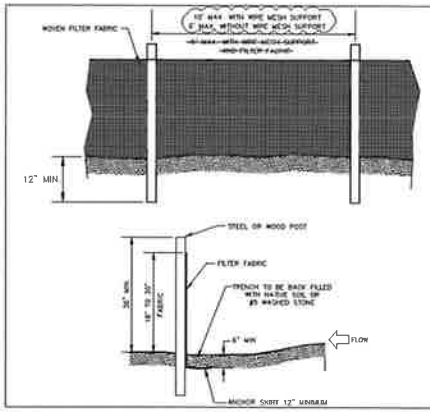


STORMWATER MANUAL

FIGURE 11-17

FIBER LOG CHECK DAM

(OCTOBER 1, 2020)



STORMWATER MANUAL

FIGURE 11-21

TEMPORARY SILT FENCE

(OCTOBER 1, 2020)

GENERAL NOTES

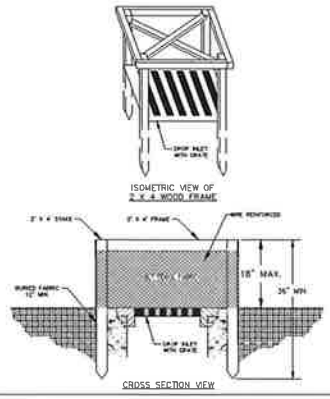
1. FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL AND CUT TO THE LENGTH OF THE BARRIER. WHEN JOINTS CANNOT BE AVOIDED, FILTER FABRIC SHALL BE SPLICED TOGETHER ONLY AT A POST WITH 3 FOOT MIN. OVERLAP, AND SECURELY SEALED.
2. ~~POSTS SHALL BE SPACED AT 6 FOOT INTERVALS IN AREAS OF RAPID RUNOFF.~~ (4)
3. POSTS SHALL BE AT LEAST 5 FEET IN LENGTH
4. STEEL POSTS SHALL HAVE PROJECTIONS FOR FASTENING WIRE AND FABRIC
5. WOOD POSTS SHALL BE 2 INCHES BY 2 INCHES OR EQUIVALENT. STEEL POSTS SHALL BE 1.33 LBS PER LINEAR FOOT.
6. 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 IN LENGTH, WIRE TIES 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
7. WASHED STONE SHALL BE USED TO BURY SKIRT WHEN SILT FENCE IS USED ADJACENT TO A CHANNEL, CREEK, OR POND
8. TURN SILT FENCE UP SLOPE AT ENDS

STORMWATER MANUAL

FIGURE 11-22

TEMPORARY SILT FENCE GENERAL NOTES

(OCTOBER 1, 2020)

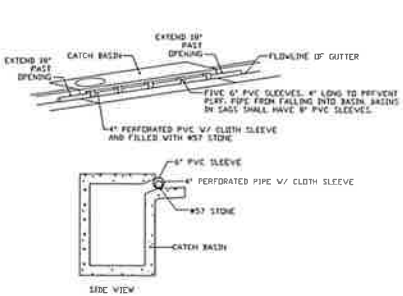


STORMWATER MANUAL

FIGURE 11-23

DROP INLET PROTECTION USING SILT FENCE

(OCTOBER 1, 2020)

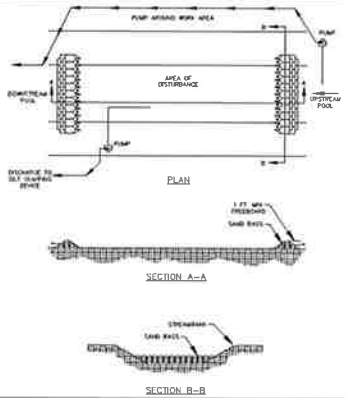


STORMWATER MANUAL

FIGURE 11-24

CATCH BASIN INLET PROTECTION DETAIL

(OCTOBER 1, 2020)

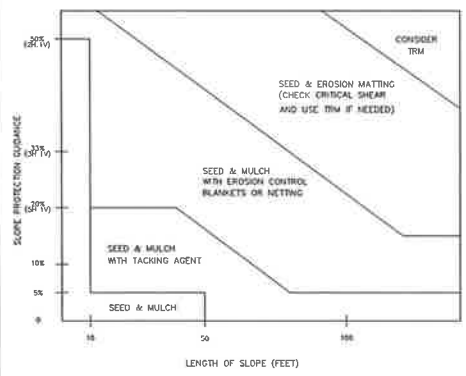


STORMWATER MANUAL

FIGURE 11-26

PUMP AROUND FLOW DIVERSION

(OCTOBER 1, 2020)

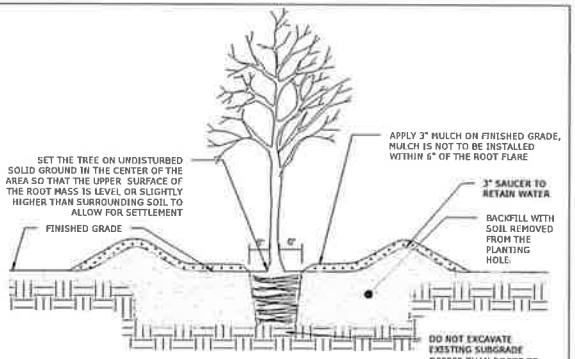


STORMWATER MANUAL

FIGURE 11-1

SLOPE PROTECTION GUIDANCE

(OCTOBER 1, 2020)



NOT TO SCALE

NOTES:

1. PRUNE TO REMOVE DEAD OR INJURED BRANCHES AND THOSE THAT ARE CROSSING AND IN CONTACT WITH OTHER BRANCHES.
2. DO NOT REMOVE MORE THAN 1/5 OF THE BRANCH SYSTEM. DO NOT CUT LEADER. TREE MUST RETAIN NATURAL CROWN SHAPE.
3. MAKE SURE THAT PLANTS ARE WELL WATERED BEFORE PLANTING AND THAT THE ROOT BALL IS THOROUGHLY WET.
4. IN POORLY DRAINED, COMPACTED SOILS PROVIDE DRAINAGE. BEFORE PLANTING, TEST DRAINAGE OF THE HOLE BY POURING A FEW GALLONS OF WATER INTO THE BOTTOM. IF THE WATER DOES NOT SOAK IN AFTER ONE HOUR CONTACT CITY ARBORIST FOR REMEDIAL DRAINAGE.
5. REMOVE OR REPOSITION SMALL GIRDLING ROOTS AND FINE ROOTS FOUND ABOVE THE MAIN ROOTS. PLANTS WITH LARGE GIRDLING ROOTS SHALL BE REJECTED AND REPLACED WITH MATERIAL OF EQUAL SPECIFICATION.
6. FOR BALLED & BURLAPPED: REMOVE TOP 1/3 OF THE BURLAP AFTER THE POSITION OF THE PLANT IS STABILIZED. THIS IS TO BE DONE AFTER THE HOLE HAS BEEN PARTIALLY BACKFILLED BUT BEFORE WATERING. NO BURLAP SHALL BE PULLED FROM UNDER THE BALL UNDER ANY CONDITION. ALL WIRE AND SURPLUS BINDING FROM TOP OF THE BALLS SHALL BE REMOVED. ALL NYLON OR OTHER STRINGS, TWINES, OR ROPES SHALL BE CUT AND REMOVED.

NOT TO SCALE

SEAL

PRIME AE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
NON-CONSENT AREA
SEWER IMPROVEMENTS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH-7
LFUCG BID NO. XX-2022

PROJECT NO.: 200126
DATE: 10/03/2025
DRAWN BY: KWH
CHECKED BY: KB

DESCRIPTION OF REVISION

EROSION PREVENTION & SEDIMENT CONTROL PLAN (DETAILS)

SHEET NO.
EP-5

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Login Name: mstroud

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SECTION 02373
STREAM RESTORATION

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, and equipment required for installing all structural and vegetative features associated with stream/creek crossings and streambank restoration areas. Work in this section may include installation of Temporary Stream Crossings and/or Streambank Restoration.

B. The Contractor shall take all measures necessary to minimize the use of equipment within the banks of a stream.

C. The Contractor shall follow the Streambank Restoration Phase I Details included in the RMP Standard Detail Drawings.

1.02 PERMIT REQUIREMENTS

A. The Contractor is responsible to meet and follow all of the requirements and provisions in all project permits. A copy of applicable permits acquired by the Owner is included in Section 00890 – Permits.

PART 2 – PRODUCTS

2.01 STREAM BUFFER PERMANENT SEEDING

A. Permanent Seed Mixture as listed in Section 02370 – Erosion and Sediment Control shall be used for permanent seeding where land disturbance has occurred within 25 feet of the stream bank, with the following exceptions:

1. If a property owner landscaping agreement differs from this specification, the property owner landscaping agreement shall be followed on that property, or

2. The Construction Drawings identify a different location and/or seed mix.

2.02 WOVEN COIR FABRIC

A. The Contractor shall submit a shop drawing for the proposed material for review and approval by the Owner's Engineer prior to placement.

B. Woven Coir Fabric shall be woven from machine twisted coir twines made of bristle coir. Woven Coir Fabric shall be Rolanka BioD-Mat 90 or approved equal meeting the following minimum requirements:

PROPERTY	TEST METHOD	TYPICAL
Mass/Unit Area (oz/yd^2)	ASTM D 3776	29
Tensile Strength (Machine Direction) (lbs./ft)	ASTM D 4595	1776
Tensile Strength (Transverse Directions) (lbs./ft)	ASTM D 4595	936
Elongation (Machine Direction) (%)	ASTM D 4595	52
Elongation (Transverse Direction) (%)	ASTM D 4595	24
Thickness (in.)	ASTM D 1777	0.35
Recommended Shear Stress ($lbs./ft.^2$)	N/A	5
Recommended Flow (ft/s)	N/A	16

C. Wooden stakes to fasten coir fabric to the soil shall be hardwood stakes that are solid and free of rot, with the following approximate dimensions: 1" x 2" x 18" (tapered to a point). The Contractor may fabricate or purchase stakes.

D. Sod staples for anchoring void spaces of the coir fabric shall be bio-degradable wooden stakes.

2.03 STONE

A. All stone shall consist of clean limestone of the specified size; hard, durable, and angular in shape, and resistant to weathering. Stone shall not contain deleterious amounts of shale, as determined by the Engineer. Porous or friable stone shall not be accepted.

B. Stone shall be of the size and quantity as shown on the Streambank Restoration Phase I Details.

2.04 TOPSOIL

A. Topsoil shall consist of the upper portion of the soil profile and shall be loose, friable soil that is free of stones larger than one inch (1"), sub-soil, refuse and other debris including stumps, roots, brush, weeds, and non-organic materials. The acceptable soil texture classification for topsoil, in accordance with the U.S. Department of Agriculture is: clay (40% maximum), silt (70% maximum), and sand (60% maximum). Manure and/or partially composted materials are not acceptable. Topsoil (both salvaged and furnished)

shall meet the following minimum standards through analytical testing, unless otherwise directed by LFUCG or the Owner's Engineer:

Organic Matter	> 3%
pH (range)	5.8 – 7.0
Soluble Salts	< 500 parts per million

B. The Owner's Engineer shall visually approve representative samples of topsoil. All operations involved in the placing, spreading, and rolling of the topsoil shall be subject to the approval of the Owner. Selected topsoil shall be obtained from approved stockpiles of materials from excavation, from stripping, from borrow areas, or from other approved sources.

PART 3 – EXECUTION

3.01 GENERAL

A. All work within and along a stream shall be consistent with all project permits and the requirements of the state and local regulatory agencies.

B. The Contractor shall take care to prevent the deposition of sediment into the stream.

C. Stream diversion operations shall be scheduled such that work is 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.

D. 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.

E. Removal of riparian vegetation in the stream buffer and on the stream banks 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. Within 25 feet of a stream, site regrading and reseeding shall be accomplished within 7 days after disturbance.

3.02 PERMANENT SEED

A. Permanent Seed shall be conducted in accordance with the specifications of Section 02370 – Erosion and Sediment Control.

3.03 WOVEN COIR FABRIC

A. When placing woven coir fabric, the surface of the soil should be smooth and free of rocks, roots and other obstructions.

B. Seed the prepared soil areas in accordance with Section 02370 - Erosion and Sediment Control.

C. Fabric shall be trenched, placed and staked in according to the Streambank Restoration Phase I Details.

D. Biodegradable wooden stakes shall be inserted sporadically within void spaces and areas with puckers in the fabric.

3.04 STONE

A. All stone shall consist of clean limestone of the specified size; hard, durable, and angular in shape, and resistant to weathering. Stone shall not contain deleterious amounts of shale, as determined by the Engineer. Porous or friable stone shall not be accepted.

B. Stone shall be of the size and quantity in according to the Streambank Restoration Phase I Details.

3.05 TOPSOIL

A. All proposed planted areas, not including stream banks, are to be covered with a minimum of 6 inches of topsoil prior to seeding or planting. Do not place topsoil within a stream channel or on a stream bank where full bank flow could erode and remove the material.

B. Topsoil shall be evenly placed and spread over the graded area to a depth of 6 inches.

C. Minimize compaction during all operations by utilizing equipment having low unit pressure ground contact and by limiting repeat passes over the same areas.

3.06 PUMP AROUND FLOW DIVERSION FOR STREAM CROSSINGS

A. For stream crossings, the Contractor shall install, maintain, and operate all cofferdams, pumps, and protective works needed to divert stream flow and other surface water through and around the project work zone.

B. The Contractor is responsible to determine the number and sizes of pumps necessary for dewatering needs.

C. The Contractor shall inform the Owner's Engineer of a plan for diverting the stream flow. The de-watering plan must be approved by the Owner prior to the start of work and it shall include information on the type, sizes of pumps, dam construction techniques, discharge outfall protection, and other relevant information.

D. 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.

E. The Contractor shall not construct in a stream when rainfall is expected during the time excavation will be occurring in the stream.

F. To capture or divert water flows, cofferdams can be used across the stream channel and secondary drainageways above (up-slope from) the work side as follows:

1. Cofferdams shall be constructed of materials that will have a minimal impact on the stream system. Cofferdams constructed of soil or material from the site shall not be used unless specifically directed by the Owner's Engineer.

2. Acceptable materials shall include stone, water structures, plastic barriers, or sand bags filled with clean and washed sand.

3. Contractor shall add sand bags filled with clean and washed sand as required to seal leaks in rock cofferdams.

4. The Contractor is responsible to install all cofferdams/diversion structures in a safe and correct manner. Cofferdams must be installed so as to withstand the pressures exerted by the stream flow or ponded water against the cofferdam.

5. Commercial projects used as cofferdams (i.e. water structures, plastic barriers) shall be installed in accordance with the manufacturer's specifications.

6. The Contractor is permitted to make only minor disturbances to the streambed or banks as may be required to properly install the cofferdam.

G. Stream flow shall be pumped around the cofferdams and discharged back into the same drainageway that the water was taken from.

H. The Contractor shall be responsible to provide all pumps, hoses, pipelines, fuel tanks, and other items required to pump the stream flow around the work site, and for providing supervision of the pumping operation during all hours the pumps are running.

1. The Contractor shall be responsible for calculating the required pump capacity to handle the average stream flow in the area of the work.

2. The Contractor shall provide pumps that are in good operating order and free of leaks. Pumps that are leaking fuel, lubricants, or other material, shall be immediately repaired or replaced as necessary. All pump equipment shall be properly equipped with mufflers and other noise suppression equipment to minimize noise impacts on the surrounding residences.

3. Discharge hoses shall be reasonably free of leaks at either the fittings or the discharge hose casing. No leaks from discharge lines shall be allowed to cause erosion.

4. The Contractor shall provide adequate suction hose length to allow the pumps to be placed back from the immediate edge of the stream. Electric sump type pumps are exempt from this requirement.

5. Only clean water will be allowed to enter the storm system or stream. The pumping operation shall not allow for sediment from the stream bottom to be pulled into the pump.

I. Contractor shall dewater the work area and pump the work zone dewatering water into a sediment trapping device.

J. Outlet protection shall be installed as required at the discharge point to prevent erosion of soils and the streambed or bank.

K. Contractor shall complete construction activities across the stream.

L. Contractor shall restore the streambed and banks.

M. Contractor shall remove all materials placed for the cofferdam and outfall protection 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.

3.07 TEMPORARY 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.

END OF SECTION

SECTION 02374

ESC PERMITTING, INSPECTION, AND PERMITTING PROCEDURES

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Permitting, Inspection, and Enforcement Procedures for Erosion and Sediment Control on Capital Projects

Division of Water Quality

Lexington-Fayette
Urban County Government

October 2025

Permitting, Inspection, and Enforcement Procedures for Erosion and Sediment Control on Capital Projects

Division of Water Quality

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This publication was developed by the Tetra Tech / Third Rock Consultants Stormwater Program Management Team under contract to LFUCG for purposes of implementing its Kentucky Division of Water (KDOW) Municipal Separate Storm Sewer System (MS4) Permit.

Permitting, Inspection, and Enforcement Procedures for Erosion, Sediment, and Stormwater Control on Division of Water Quality Capital Construction Projects

DWQ Remedial Measures Plan Projects

DWQ RMP Program Manager: Bob Peterson
DWQ Program Management Consultant: Hazen and Sawyer
Construction Contract Administrators (CA): DWQ Consultants
Resident Project Representative (RPR): DWQ Consultants
ESC Plan Reviewer: DWQ Stormwater Section – Amad Al-Humadi
Land Disturbance Permit (LDP) Issuer: DOE New Development
LFUCG Erosion and Sediment Control Compliance Inspector: RPR
Accela Data Entry: DWQ Compliance & Monitoring (C&M) – Kevin Lyne
Land Disturbance Permit (LDP) Permittee: Contractor

DWQ Wastewater Treatment Plant Capital Projects

DWQ Plant Engineer: Tiffany Rank
DWQ Project Manager: Varies
Construction Contract Administrators (CA): Rick Day, Rick Bowman
Resident Project Representatives (RPR): DWQ Consultant or DWQ Construction Management (Rick Day, Bill Warren, Phoebe Belew)
ESC Plan Reviewer: DWQ Stormwater Section – Amad Al-Humadi
Land Disturbance Permit (LDP) Issuer: DOE New Development
LFUCG Erosion and Sediment Control Compliance Inspector: RPR
Accela Data Entry: DWQ Construction Management – Brenda Whittington
Land Disturbance Permit (LDP) Permittee: Contractor

DWQ Stormwater and Sanitary Sewer Projects:

DWQ Section Managers: Mark Sanders, Chris Dent, Tiffany Rank, Bailee Young
Construction Contract Administrator (CA): Rick Day
Resident Project Representatives (RPR): DWQ Construction Management (Rick Day, Bill Warren, Phoebe Belew)
ESC Plan Reviewer: DWQ Stormwater Section – Rick Day or Amad Al-Humadi
Land Disturbance Permit (LDP) Issuer: DOE New Development
LFUCG Erosion and Sediment Control Compliance Inspector: RPR
Accela Data Entry: DWQ Construction Management – Brenda Whittington
Land Disturbance Permit (LDP) Permittee: Contractor

Permitting Procedures

1. Contractor shall develop a Stormwater Pollution Prevention Plan/Erosion and Sediment Control Plan (SWPPP/ESC Plan). A SWPPP/ESC Plan template is on the LFUCG website at https://www.lexingtonky.gov/new-development. On some projects, the construction contract documents may contain a SWPPP/ESC Plan prepared by LFUCG's consultant for purposes of establishing bid quantities. If the Contractor chooses to use this SWPPP/ESC Plan to obtain the required permits, the Contractor takes sole responsibility for the content of the SWPPP/ESC Plan and the implementation of the plan during construction.
2. Contractor must submit an application for a Land Disturbance Permit to the LFUCG Division of Engineering before beginning project construction. The permit application is available at https://aca3.accela.com/lexky/.
3. For projects with a disturbed area of ≥ 1 acre, the contractor must submit a Notice of Intent (NOI) to the KY Division of Water (KDOW) and obtain KYR10 Permit coverage before beginning construction of any kind on the site. The NOI can be submitted electronically at https://eec.ky.gov/Environmental-Protection/Water/PermitCert/KPDES/Documents/KYR10PermitPage.pdf.
4. Contractor cannot start project work until they have obtained the LFUCG Land Disturbance Permit and KYR10 Permit coverage (if applicable – see above).
5. DWQ will review the SWPPP/ESC Plan, confirm that the Contractor has obtained KYR10 Permit coverage (if applicable – see above), and authorize the Contractor to install the initial BMPs.
6. Contractor then installs the initial BMPs, prior to project work (general excavation, grading, etc.).
7. DWQ inspects the installation of the initial BMPs and authorizes DOE New Development to issue the Land Disturbance Permit. Contractor then begins the project.

Contractor Responsibilities

Contractor shall:

1. Develop a SWPPP/ESC Plan, or review and agree to use the SWPPP/ESC Plan prepared by LFUCG's consultant, or amend it as needed.

2. Attend a pre-construction conference with LFUCG.

3. Post the LFUCG Land Disturbance Permit and KYR10 Permit (if applicable) on the project sign at the site, and keep a copy of the SWPPP/ESC Plan on site and available for review.

4. Follow the SWPPP/ESC Plan; revise and redline it as conditions change on the site.

5. Install and maintain BMPs to prevent sediment from washing into streets, storm sewers, and streams. All runoff from disturbed areas must pass through a BMP before leaving the site.

6. Maintain a 50-foot vegetative buffer strip along perennial and intermittent streams (including impounded streams), wetlands, sinkholes, and inlets.

7. If work must be done within 50 feet of a perennial or intermittent stream, wetland, sinkhole, or inlet, complete work as soon as possible and stabilize the area within 24 hours after completing work.

8. Conduct an ESC inspection at least once every 7 calendar days and within 24 hours after each rainfall of 0.5 inches or greater (or 4 inches of snow or greater).

9. Complete and sign the inspection form after each inspection. Keep the completed inspection forms on site and available for review. Keep a backup record of inspection forms (photos or scans).

10. Stabilize inactive portions of the site with straw, blanket, seed, or other cover within 14 days of no activity, and provide permanent stabilization within 14 days of reaching final grade.

11. If the project has a KYR10 Permit, file a Notice of Termination with the KY Division of Water and forward to the LFUCG Division of Engineering and LFUCG Division of Water Quality when construction has been completed and the site is stabilized. Final stabilization is defined as follows from KYR10: "All soil disturbing activities at the site have been completed and either of the two following criteria are met – a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed."

12. Respond promptly to Verbal Warnings and Notices of Violation from LFUCG regarding correcting ESC problems.

Inspection Procedures for the Resident Project Representative

Weekly Field Inspections

1. Inspect the site each week and the next working day after a storm event of 0.5 inches or greater
2. Ensure the LFUCG Land Disturbance Permit and KYR10 Permit are posted at the site
3. Ensure SWPPP/ESC Plan is available for review
4. Ensure that the weekly and rain event completed inspection forms are available for review
5. Walk the perimeter of the entire site
6. Note downgradient controls:
    - Inspect ditches and sheet flow areas
    - Silt fences working?
    - Ditches vegetated / stabilized?
    - Significant sediment discharges?
7. Walk around internal disturbed areas
    - Idle for more than 14 days . . . stabilized?
8. Inspect all inlets and ditches
    - Inlets protected, ditches stabilized?
9. Check out material / fuel storage areas
    - Spills? Leaks? Leaching pollutants? Litter / waste managed?
10. Inspect concrete washout(s)
11. Inspect the construction entrance / exit
12. Inspect the 50-foot vegetative buffer strip adjacent to waterways. The buffer strip must be stabilized within 24 hours of any approved construction activity in the buffer strip.
13. Communicate inspection findings to Contractor, note issues that need attention
14. Complete the LFUCG inspection checklist
15. Submit an electronic copy of the completed checklist to the Project Manager and the Accela Data Entry Contact person on page 1 **the week of the inspection**.

Important Items for the Permittee / Contractor / RPR to Verify:

- Posted permits, plans, and inspection reports
- Graded / inactive areas stabilized with seed, mulch, blankets, mats, etc.
- Stabilized, non-eroding ditches
- Maintained silt fences and protected curb / drop inlets
- No mud on the street
- Trash and litter managed
- No disturbance in the 50-foot buffer zone adjacent to streams, wetlands, sinkholes, and inlets, unless approved; areas within the 50-foot buffer must be stabilized within 24 hours

Enforcement Procedures

1. The Contractor will be paid for erosion and sediment control based upon a schedule of values established within the Measurement and Payment section of the specifications (e.g., 25% paid once initial ESCs have been installed and LDP obtained, 50% paid in equal monthly payments for maintenance over the construction period, 25% paid for removal of ESCs and final stabilization). The intent of this provision is to pay the Contractor for ESC maintenance for each month that the BMPs are maintained and functioning properly.
2. The RPR shall follow the attached ***Compliance Assistance Guidance for DWQ Capital Project RPRs*** and implement the **Escalating Enforcement Process** described below.

Table 1 – ESC Escalating Enforcement Process

DWQ Capital Project	Escalating Enforcement Process
Remedial Measures Program	The RPR shall escalate the issue to the RMP Program Manager and RMP Program Management Consultant's Project Manager
Wastewater Treatment Plants Stormwater Section MS4/Water Quality Section Sanitary Sewers Capacity Assurance Program	The RPR shall escalate the issue to the DWQ Section Manager and the DWQ Construction Contract Administrator

3. DWQ will use all available means in the contract to obtain compliance, including:
   a. withholding payment
   b. notifying the Contractor that LFUCG intends to initiate the process for declaring that the Contractor is in default of the contract and specifying a deadline for addressing the ESC deficiencies
   c. initiating the process for calling the ESC Performance Bond
   d. issuing Notices of Violation (NOVs)
   e. stopping work

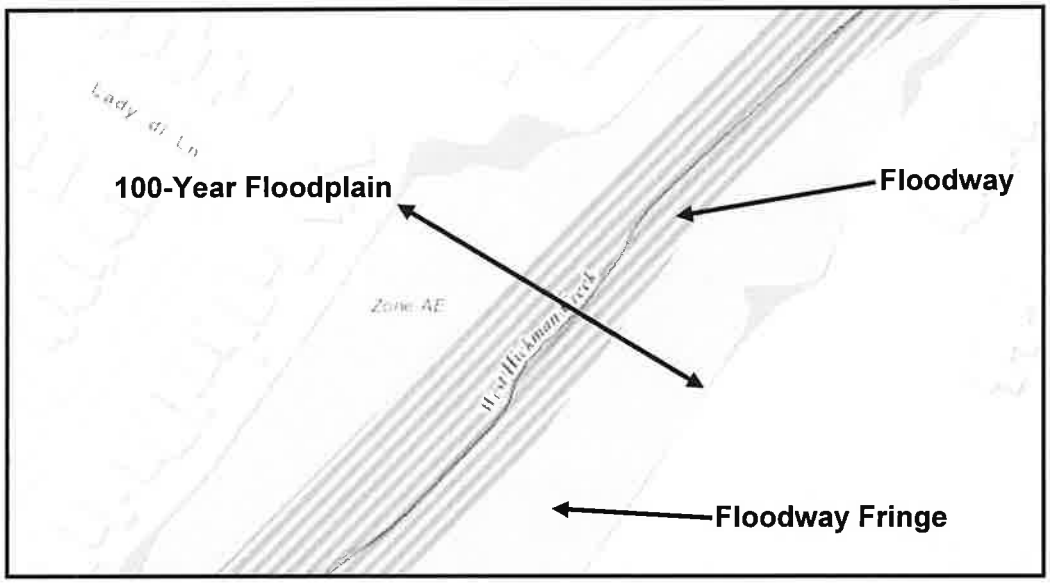
Compliance Assistance Guidance for DWQ Capital Project RPRs

Observed Condition	Verbal Warning to Correct within 3-5 days (See Note 1)	Verbal Warning to Correct within 24 hours (See Note 1)	Escalate the Issue Immediately in Accordance with Table 1
Construction Entrance to Public Road	Rock pad poorly installed/maintained	Rock pad not installed	
	Small amount of sediment on road	Rock pad completely covered with soil	
		Significant amount of sediment on road	
Unstabilized Areas	Flat inactive disturbed areas not stabilized in 14 days	Ditches not stabilized immediately after construction	
		Disturbed, inactive slopes not stabilized within 14 days	Disturbed, inactive slopes above waterways, wetlands, floodplains, critical areas[2] not stabilized within 24 hours
Inlet Protection	Sediment needs to be removed around inlet protection	Curb inlet protection not in place or improperly installed	Discharge of concrete wash water, chemicals, other pollutants into inlets, streams, wetlands, etc.
Silt Fencing	Does not match SWPPP/ESC Plan but critical areas[2] and roads are protected	Silt fence not installed per plan and critical areas[2] and roads are not protected	
	Does not comply with Stormwater Manual but is functional	Blowouts have occurred with discharge of sediment to critical areas[2]	Large quantities of sediment in critical areas[2]
	Needs maintenance/repair, but is not near an inlet or surface water	Not trenched in, is not functional	
		Silt fence needs repairs in critical areas[2]	
Soil Stockpiles	No perimeter controls, downstream BMPs in place	No perimeter controls, downstream BMPs not in place	
Permit Violations		Permit expired	Site not permitted (No LDP or KDOW NOI)
		Permit not posted or available on site	
		Contact name/phone not posted	
		No self-inspection reports; reports not on site	
		Self-inspection reports not current	
		SWPPP/ESC Plan not on site	
			Unapproved construction activities in 50-foot buffer zone around sinkholes, streams, wetlands, etc.
			Construction has started, BMPs not installed

1. Escalate the issue in accordance with Table 1 after the 2nd Verbal Warning.
2. Critical areas are areas within 25 feet of a stream, wetland, sinkhole, or inlet.

Policy for Storing Construction Material in the Floodway/Floodplain
Division of Water Quality Capital Projects
October 1, 2019

1. Excavated residual spoils from excavation may be stored in the floodway or floodway fringe under the following conditions:
   a. Spoil material may be stored no longer than 30 days in the floodway. Any material in the floodway after 30 days shall be removed.
   b. Spoil material may be stored in the floodway fringe (the area in the floodplain that is outside of the floodway) no longer than 180 days.
   c. Spoil material stored in the floodway or floodway fringe shall be enclosed by reinforced silt fence (Coir logs are not acceptable). Diversion berms/ditches shall be constructed upslope of stockpiles to minimize run-on water.
   d. Any evidence of erosion of the stored material shall be immediately mitigated.
2. Construction materials stored in the floodway shall be anchored to prevent floatation or displacement during a flood event.
3. Fuel tanks, lubricants, fertilizer, and chemical products or other potentially hazardous materials shall not be stored in the floodway or floodway fringe.
4. Prior to beginning construction, the contractor shall submit a Spoils Management Plan to LFUCG for review and acceptance. The plan shall be kept on site at all times.



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SECTION 02425
INITIAL TUNNEL SUPPORT

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. The Work described by this Section consists of furnishing all materials and incidentals required for the initial support system(s) proposed by the Contractor to be provided as a part of the tunneling operations.

B. The work shall be done in accordance with all Federal, State, and local laws, regulations and requirements as shown on the Drawings and as specified herein.

C. All available and known geotechnical reports, logs, borings, and laboratory testing performed within close proximity of the project corridor have been made available as "technical data" and are not part of the Contract Documents. These reports are provided as information only and solely for the convenience of Bidders. The Owner and/or the Consultant do not warrant or guarantee the accuracy or correctness of this material with respect to actual subsurface conditions. Subsurface conditions are considered unclassified and no expectation of quantity, specific location of ground conditions, or geotechnical baselines are provided or assumed herein.

D. Contractor shall review all available geotechnical reports and data and perform any additional subsurface investigations the Contractor deems necessary at his own expense for the planning and the selection of tunneling techniques and methods in order to enable proper construction as shown on the Drawings and other requirements of Contract Documents.

E. Contractor shall be responsible for designing, furnishing and installing the initial tunnel support system(s) that complement the means and methods selected in excavating the tunnels and shafts proposed for the Project.

F. Contractor may increase the diameter of the initial support system(s) from that indicated on the Drawings and as listed in the Tunneling Method Table in Project Specific Notes (PSN), at no additional cost to the Owner, if the Contractor deems it necessary to provide additional internal work area to account for all project site conditions, variability in subsurface conditions, selected tunnel construction methods, operational procedures, carrier pipe support and restraint systems, steering and guidance system accuracy, and line and grade tolerances to meet the carrier pipe acceptance criteria for the project. Contractor may also elect to increase the diameter of the initial support system(s) from that indicated on the Drawings and as listed in the Tunneling Method Table in Project Specific Notes (PSN), at no additional cost to the Owner, to best fit the Contractor's selected tunnel excavation equipment diameter, worker safety, tunnel construction production efficiency, or to otherwise reduce project risk. If Contractor elects to modify

the diameter from the minimum size shown in the Contract Documents, the Contractor accepts all responsibility for clearance from existing buried conflicts, acquiring approval for any modification or addenda to all right-of-way encroachment agreements, occupancy permits, or other established requirements and specifications of the entity being crossed. Contractor shall not increase the diameter of the initial tunnel support system if the combination of the selected tunnel construction means and methods and the increased tunnel lining diameter increases the potential for surface settlement or damage to existing structures.

G. Follow all OSHA regulations regarding confined space for installation of the initial support system(s).

H. Conform with all Kentucky Transportation Cabinet (KYTC) and Federal Highway Administration requirements for work within their respective highway rights-of-way and any additional requirements of the contiguous property and utility owners.

I. The Contractor shall retain the service of a professional engineer registered in the Commonwealth of Kentucky to design the initial support system(s) and prepare submittals as described herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02426 – Installation of Carrier Pipe in Tunnel

B. Section 02431 – Tunnel Grout

C. Section 02432 – Low Density Cellular Grout

D. Section 02441 – Tunneling by Slurry Microtunnel Boring Machine

E. Section 02442 – Tunneling by Tunnel Boring Machine

F. Section 02444 – Tunneling by Pipe Jacking with Shield Method

G. Section 02445 – Utility Hand Tunneling

H. Section 02446 – Tunneling by Guided Bore and Jack Method

I. Tunneling Method Table in Project Specific Notes (PSN).

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. Applicable codes, ordinances, statutes and governing rules and regulations of governing municipalities and counties, the State of Kentucky, and the Federal Government.

2. American Association of State Highway and Transportation Officials (AASHTO).

3. American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering.

4. Occupational Safety and Health Administration (OSHA) Regulations and Standards for Underground Construction 29 CFR Part 1926, subpart S and other applicable OSHA parts.

5. Applicable ASTM and AWWA Standards for materials and methods.

6. Kentucky Transportation Cabinet (KYTC) Permits Guidance Manual.

7. All applicable guidelines and restrictions of the United States Army Corps of Engineers (USACE) and Kentucky Department for Environmental Protection (DEP).

1.04 DEFINITIONS

A. Unless otherwise stated or particular context otherwise requires, the definitions and provisions contained in this section shall govern the construction, meaning and application of words and phrases utilized in this specification. For purposes of this specification, the following terms are defined as follows:

1. Face: The vertical surface and associated area where installation of initial support is ongoing at the head of a tunnel excavation.

2. Foot Block: Cement mortar, concrete or timber block foundation element that provides a reaction to the loads developed in a steel set.

3. Ground: Undifferentiated rock/soil materials encountered during excavation.

4. Ground Class: Characterization of the ground based upon physical observations and analysis.

5. Initial Tunnel Support: Any combination of ground support elements installed in the underground excavations prior to placement of the final lining or carrier pipe. Initial tunnel support includes all forms of segmental and pipe jacked liners, jacking pipe, casings, or sleeves. Initial support is required to be installed within the tunnel excavations to fully support the ground until such time as the final lining is in place and is structurally capable of resisting the ground loads.

6. Lagging: Short structural members used in ground requiring continuous support to bridge between steel sets and allow transfer of ground loads from the space

between the steel sets to the steel sets. Lagging may be made from dimensional timber, steel mat lagging (heavy gauge wire mesh), or solid steel lagging.

7. Overbreak: Earth excavated beyond the limits required to install the initial support system.

8. Steel Set: A structural steel member for use in a tunnel or shaft consisting of structural steel sections, butt and foot plates, bolts, nuts, washers, tie rods, spreaders, blocking, collar braces, lagging, and other associated support components as required to assemble, brace and fix the steel member, and continuously support ground loads, including those generated between the steel sets. Steel sets are rolled to an arch or circular shape and to the intended shape of the tunnel excavation. Steel sets may be provided with an invert strut member made from structural steel or concrete where ground conditions warrant this type of support. Steel sets are also referred to as Ribs or Ring Beams and shall be defined the same herein.

1.05 DESIGN CRITERIA

A. The Contractor is responsible for the design, installation, maintenance, and safety of the tunnel initial support system(s). All design calculations provided by the Contractor as part of the required submittals shall be sealed by a Licensed Professional Engineer registered in the Commonwealth of Kentucky.

1.06 SUBMITTALS

A. Conform to Section 01300 – Submittals

B. Submit manufacturer's product data for all materials required to be incorporated in the work.

C. Shop Drawings for fabricated materials, including:

1. Complete geometry, grade of materials used, and dimensions of all steel set support elements and assemblages, including butt and foot plates, welds, nuts and bolts, tie rods, braces, and lagging.

2. Details of anchorage systems, end hardware, bending radii, connections, shim plates, extensions, splices, longitudinal connectors and other accessories required for rock reinforcement systems.

D. Working Drawings and Method Statements

1. Working Drawings for all initial support system(s) proposed indicating the following:

a. Sizes, details, dimensions, spacing, and arrangement of elements, method of assembly, lists of materials, and such other data for all support elements

and systems of elements, as required to check the adequacy of the proposed installation.

b. Design calculations for initial support systems and pre-support and face support measures, including estimates of support deformations for each ground class.

c. Design calculations for pipe jacked support systems, such as casings and jacking pipe, including estimates of jacking loads, the allowable axial compressive force of the jacking pipe or casing, and joint tolerances for each ground class.

2. Method Statements

a. Sequence of installation of initial support systems and pre-support measures integrated into the excavation process, including requirements for assuring the transfer of ground loads to initial support systems.

b. Dimensions, spacing, and general pattern sequence of installation of the support systems with respect to the excavations and final lining tolerances.

c. Proposed construction methods and equipment for excavating and installing support systems, including pre-support measures.

d. Methods and details for supporting and grouting areas of overbreak or voids, if encountered.

e. Methods and details for repairing damage to initial support.

3. See Sections 02425, 02426, 02431, 02432, 02441, 02442, 02444, 02445 and 02446 for additional submittal requirements for tunneling support systems.

E. Quality Control:

1. Identify how the quality of materials and installation will be controlled including:

a. A written statement of site-specific quality control plans required by the Contractor's design engineer.

b. Methods for and frequency of monitoring initial support elements for loosening, deformation, or distress; and means for tightening, or supplementing with additional initial support.

c. Contingency support measures in the event that ground loads exceed the capacity of the initial support.

F. Provide resume and written documentation of the qualifications of the project manager, superintendent and shift foremen in accordance with Article 1.07.

G. Recordkeeping:

1. As-built records of all erected support, including locations, spacing, lengths, types, thicknesses, weights, and number. Integrate this information into daily records specified for tunnel excavation.

2. Records of all testing performed as required by the Contractor's design engineer.

1.07 QUALITY ASSURANCE

A. Work shall be supervised by at least one (1) person with five (5) years of recent experience in installation of the type of initial support system being installed. Experience shall include at least 2 projects of similar size and in similar ground conditions.

1.08 DELIEVERY, STORAGE, AND HANDLING

A. The Contractor shall accept material on site and inspect for damage.

B. The Contractor shall handle, support and store material to prevent injury or damage to the material.

PART 2 – MATERIALS

2.01 STEEL CASING PIPE

A. The casing pipe shall be smooth wall or spiral welded carbon steel pipe. The minimum interior diameter of the casing pipe shall be as indicated on the Drawings. Casing pipe shall be leak-proof construction and be capable of withstanding highway or railroad loadings where applicable. Casing pipe shall be steel pipe in sizes 12-inches and larger manufactured from steel having a minimum yield stress strength of 35,000 psi and shall have a minimum wall thickness as indicated by the table below.

Pipe Diameter Nominal Pipe Size (in.)	Minimum Nominal Wall Thickness (in.)
18	0.312
20	0.344
24	0.375
30	0.469
36	0.532
42	0.625

48	0.688

B. All joints shall be butt welded with a full depth, single "V" groove weld. Machined, interlocking, press-fit joints such as made by Northwest Pipe Company of Vancouver, WA or equal may be substituted if written acceptance has been acquired by all property owners and permitting authorities associated with crossing.

C. The casing pipe shall conform to ASTM A 139, Grade B (without hydro-test) or ASTM A53, Grade B (without hydro-test), and AWWA C200-75.

2.02 SEGMENTAL STEEL LINER PLATE

A. All segmental steel liner plate selected and installed by the Contractor shall be designed by a registered Professional Engineer licensed in the State of Kentucky and shall meet the latest AREMA specifications Chapter 1, Part 4 with the following factors of safety:

1. Joint Strength = 3.0,
2. Minimum Stiffness = 3.0 for 2-flange and 1.5 for 4-flange,
3. Critical Buckling = 2.0, and
4. To meet all appropriate corrosion protection through the selection of coatings and cathodic protection as needed.

B. All 2-flange liner plate shall be minimum 10 gage or thicker.

C. All 4-flange liner plate shall be minimum 8 gage or thicker.

D. The maximum width of liner plate shall be 18-inches.

E. Liner plate shall be fabricated from structural quality, hot rolled, new carbon-steel sheets or plates conforming to ASTM Specification A 569. The plate shall be hot-dip galvanized in accordance with ASTM Specification A 123 and AASHTO Designation M 167 but shall not be applied at a rate less than two (2) ounces of "Prime Western" zinc per square foot total of both sides.

F. All plates shall be punched for bolting on both longitudinal and circumferential seams and shall be so fabricated as to permit complete erection from the inside of the tunnel.

G. Structural Grout, see Section 02431, shall be placed under pressure to fill any voids which exist between the initial tunnel lining and the undisturbed earth through threaded grout holes with plugs. Holes shall be provided in every third ring of liner plate (a minimum of three grout holes per ring required unless otherwise directed by the Engineer) to permit grouting as the erection of tunnel liner plate progresses.

H. Bolts and nuts shall be a minimum of 5/8-inch diameter and length as recommended by the manufacturer of the liner plate and be manufactured domestically. For plate thicknesses equal to or greater than 0.209 inches, bolts shall conform to ASTM Specification A 449. For plate thicknesses less than 0.209 inches, bolts shall conform to ASTM A307. All nuts and bolts shall be galvanized in accordance with ASTM Specification A 153.

2.03 RIBS AND LAGGING

A. Structural steel for use in initial support shall be manufactured in accordance with ASTM A36.

B. Bolts, nuts, and fasteners conforming to ASTM A307.

C. End plates and foot plates shall be fabricated from steel conforming to ASTM A36.

D. Timber used for blocking, cribbing or any other structural use shall be Douglas Fir No. 1 grade or equal and of rectangular cross section.

E. Geotextile fabric shall be a monofilament synthetic fabric consisting of polyester or polypropylene in a manner approved by the Engineer. Geotextile shall be treated to resist degradation due to exposure to ultraviolet light and shall have a minimum of 90% retention of strength after 500 hours of exposure to UV. Geotextile fabric shall be Mirafi FW700 as manufactured by Mirafi, Inc., or approved equal.

PART 3 – EXECUTION

3.01 INSTALLATION – GENERAL

A. Work shall not begin until the required submittals have been made and the Engineer has reviewed and accepted all submittals related to the initial support system(s) to be utilized.

B. Continuously support the ground using a combination of steel sets, blocking, lagging, liner plate, casing, jacking pipe, structural sleeve, and ancillary support using the materials, methods, sequences, and contingency plans submitted, reviewed, and accepted.

C. Contractor shall notify Engineer of any changes that may be required or proposed due to unforeseen conditions.

3.02 INSTALLATION OF STEEL CASING

A. Steel casing shall be installed using one of the tunneling methods listed in the Tunneling Method Table in Project Specific Notes (PSN).

B. Promptly following completion of the casing installation, pressure grout to fill all voids existing outside of the casing pipe for all casings 36-inches and larger in outside diameter. If the outside diameter is less than 36-inches then the annular space outside the casing is to be grouted if the excavated diameter is more that 1inch larger than the outside diameter of the casing.

C. Grouting shall be performed from the interior of the casing pipe through grouting holes. Lubricant shall be displaced by the grout. Grouting shall be started in the lowest connections and shall proceed until grout begins to flow from upper connections. The void shall be completely filled. Displaced lubricant shall be disposed of off-site in accordance with applicable regulations and codes of all Federal, State, and local agencies.

D. Grout shall be in accordance with Section 02431 – Tunnel Grout.

E. Liquid grout pressure shall not exceed one-half of the existing overburden pressure.

F. After grouting is complete, pressure shall be maintained by means of stopcocks or other suitable devices until the grout has set sufficiently in the judgment of the Engineer, or for a minimum of 24 hours, whichever is longer. After the grout is set, grout holes shall be completely filled with dense concrete and finished neatly without evidence of voids or projections.

3.03 INSTALLATION OF STEEL LINER PLATES

A. Steel liner plates shall be assembled in accordance with the manufacturer's instructions.

B. The bottom 25% of culvert periphery shall be covered with concrete (or asphalt) to a depth of 1 inch above the crest of the corrugations. The concrete pavement shall be reinforced with 6 x 6 (W2.9 x W2.9) welded wire fabric. This wire shall be attached to the liner plate by either directly welding to the liner plate or by mechanical attachment to the bolts.

C. Exterior grouting of all segmental tunnel lining shall be kept as close to the heading as possible, using grout stops behind the liner plates if necessary. Grouting shall proceed as needed to cut off inflow of groundwater and material and stabilize the excavation, but in no event shall more than 6 lineal feet of tunnel excavation be progressed beyond the grouting. Grout shall be in accordance with Section 02431 – Tunnel Grout.

3.04 INSTALLATION OF RIBS AND LAGGING

A. Scale excavated surfaces and remove loose material prior to placing and blocking steel ribs. Brace each steel rib with blocking, collar braces, shims, and wedges as necessary to transfer ground loads to the steel sets.

B. Secure steel ribs against horizontal movement and distortion using tie rods and collar braces.

C. Immediately install lagging in the form of substantial timber or steel lagging.

D. Immediately crib areas of overbreak or over excavation with timber to provide contact between excavation and steel sets.

E. Perform all surveys necessary in a timely manner such that steel sets do not encroach on the necessary clearance for the final lining and any embedments.

F. Monitor installed support to ensure that any increase of loading with time, i.e. squeezing loads, is detected. Monitor for excessive deformations and instability locally. Install additional support in a timely manner to mitigate overstressing of the initial support system.

G. Final exterior grouting for rib & lagging shall shall take place immediately following installation of the rib & lagging. The distance from the face of tunnel to grouted segment section shall not exceed 6 feet. Grout shall be in accordance with Section 02431 – Tunnel Grout.

H. Liquid grout pressure shall not exceed one-half of the existing overburden pressure.

I. Low Density Cellular Grout shall be placed within the tunnel for all tunneling methods which include ribs and lagging.

3.05 CARRIER PIPE INSTALLATION

A. Contractor shall install carrier pipe in casing in accordance with Section 02426 – Installation of Carrier Pipe in Tunnel.

3.06 SITE AND WORK SAFETY:

A. Comply with applicable regulations of Federal Government, OSHA 29CFR 1926, and applicable criteria of ANSI A 10.16 "Safety Requirements for Tunnels, Shafts, and Caissons", as amended to date.

B. Safety is the full responsibility of the Contractor.

END OF SECTION

SECTION 02426
INSTALLATION OF CARRIER PIPE IN TUNNELS

PART 1 – GENERAL

1.01 SCOPE

A. This Section covers handling, transporting, and installing carrier pipe in two-pass tunnels.

1.02 SUBMITTALS

A. The following information shall be submitted in accordance with Section 01300 – Submittals.

1. Carrier pipe installation plan. A brief description of method of lowering pipe into shaft; method of transporting carrier pipe into the tunnel; method of positioning, aligning, and jointing pipe; and blocking plan. Include sketches for means of carrier pipe transporting, hoisting, and positioning and sketch of carrier pipe blocking plan.

2. Shop Drawings for casing spacers shall be prepared and submitted if casing spacers are the proposed means of carrier pipe support.

3. Buoyant force calculations, provisions to prevent floating, bulkhead design, and blocking details. The calculations shall include an analysis of the stresses and deformation induced on the carrier pipe. Submittal shall be signed and sealed by a Professional Engineer registered in the Commonwealth of Kentucky. Professional liability insurance shall be provided as specified in the Supplementary Conditions and Encroachment Permits.

PART 2 – PRODUCTS

2.01 PIPE MATERIAL

A. The carrier pipe shall be as listed in the Tunneling Method Table in Project Specific Notes (PSN).

B. Contractor shall be responsible for selecting appropriate pipes and pipe joints to safely carry the loads imposed during construction.

2.02 ANNULAR BACKFILL GROUT

A. Grout for filling of the annular space between pipe and tunnel initial support is required when Contractor utilizes ribs and lagging tunnel lining. In such case, the annular backfill

grout shall be as specified in Section 02431 - Tunnel Grout, or Section 02432 - Low Density Cellular Concrete. Annular backfill grout is not required when Contractor utilizes jacking pipe as initial tunnel lining.

2.03 CASING SPACERS

A. Stainless Steel Casing Spacers: Stainless steel casing spacers shall be bolt-on style with a shell made in two (2) sections of heavy T-304 stainless steel. Connecting flanges shall be ribbed for extra strength. The shell shall be lined with a PVC liner 0.090-inches thick with 85-90 durometer. All nuts and bolts are to be 18-8 stainless steel. Runners shall be made of ultra high molecular weight polymer with inherent high abrasion resistance and a low coefficient of friction. Runners shall be supported by risers made of heavy T-304 stainless steel. The supports shall be mig welded to the shell and all welds shall be fully passivated. Stainless steel casing spacers shall be made by Cascade Waterworks Mfg. Co., or equal.

B. Solid Polyethylene Casing Spacers (to be used with PVC pipe only): Solid polyethylene casing spacers shall be bolt-on style with a shell made in two (2) sections. Carrier pipe shall be wrapped with rubber strap inside casing spacer to prevent slippage. All nuts and bolts are to be 18-8 stainless steel. Solid polyethylene casing spacers shall be made by Calpico Inc., Advance Products & Systems, Inc., or equal.

C. Casing spacers shall be installed a maximum of eight (8) feet apart along the length of the carrier pipe with the casing pipe, within two (2) feet of each side of a pipe joint, and the rest evenly spaced. Each segment of pipe shall have a minimum of four (4) spacers installed on it. Manufacturer's recommendations may govern these requirements.

2.04 TUNNEL END SEALS

A. The ends of the tunnel shall be filled with concrete brick or cap block and mortar with two (2) weep holes at the bottom. Weep holes shall use 1-inch PVC pipe

PART 3 – EXECUTION

3.01 ACCEPTANCE CRITERIA FOR LINE AND GRADE TOLERANCES

A. Prior to installing the carrier pipe, Contractor shall verify that the initial support has been constructed so that the carrier pipe may be placed in conformance with the Contract Documents and all specified tolerances.

B. Deviation tolerances from line and grade shown on the Drawings for the carrier pipe installed within the initial tunnel support are as listed in the Tunneling Method Table in Project Specific Notes (PSN). Water shall be free draining between any two points at the pipe invert. Reverse grades and low points or sags shall NOT be permitted or accepted. Notify Engineer should misalignment of the initial support system preclude installation of the carrier pipe to the tolerances specified. For areas where alignment is installed with a

curve, maximum pipe segment length shall be coordinated with pipe manufacturer to assure that the maximum joint opening and deflection are not exceeded.

3.02 PIPE HANDLING

A. Handle and transport pipe into the tunnel in a manner that prevents damage to the pipe, joints and gaskets. Do not install pipe damaged during placement operations. If any damage occurs the Contractor may propose repair procedures for review and approval of Engineer or replace the pipe at no additional expense to the Owner.

3.03 TUNNEL CLEANUP

A. Prior to pipe placement in the tunnel, remove temporary tunnel utilities, such as electrical cord and ventilation piping. Remove loose material, dirt, standing water, and debris prior to pipe placement.

B. Temporary steel construction tracks may be left in place if they do not interfere with alignment of the carrier pipe or interfere with final placement of the annular grout.

3.04 PIPE MANUFACTURER REPRESENTATIVE

A. At the discretion of the Engineer, during the carrier pipe installation and annular backfill grouting, each pipe manufacturer shall provide his own supervisor to instruct the Contractor's pipe laying personnel in the correct procedure to be followed at no additional expense to the Owner.

3.05 CARRIER PIPE BLOCKING AND SUPPORT

A. Provide support and anti-flotation blocking adequate to:

1. Establish final pipe grade.

2. Support weight of carrier pipe without deformation or collapse during installation.

3. Provide restraint to hold carrier pipe stable to prevent flotation or movement during grouting operations.

B. Support and anti-flotation blocking may include steel beams, wooden blocking, casing spacers, initial grout or concrete bedding, liquid ballasting, or other methods as designed by Contractor's Engineer.

C. If casing spacers are used, then a minimum of three (3) casing spacers shall be provided per 14-foot joint of pipe with one (1) near each end and one (1) equally spaced along the carrier pipe with a maximum spacing of 8-feet apart. Additional casing spacers shall be provided as recommended by the casing pipe manufacturer.
   A. Secure the pipe support to the pipe and initial support in accordance with approved design.

3.06 JOINING PIPE IN TUNNELS

A. Join pipe segments to properly compress the gaskets and allow for the correct final positioning of the pipe for line and grade. Closely align pipes by bringing them loosely together by means of hydraulic jacks, locomotives, pipe mobiles, or winches. Once pipes have been loosely joined, pull them home by means of a hydraulic tugger or other similar method while suitably protecting pipe and joints against damage. Impact jointing such as ramming with locomotives or other mechanical equipment is not permitted. All joining of pipe shall at minimum be in accordance with manufacturer's recommendations.

B. When diameter allows for personnel entry, provide stationing on the inside of the pipe at the spring line of the tunnel carrier pipe written in bright fluorescent orange paint every 50 feet in numbers at least two (2) inches in height that will be visible during the internal videotaping process as described in Section 02532 – Sewage and Collection Lines, Section 3.05-D TV Survey.

3.07 3.7 LIMIT ON LENGTHS OF CARRIER PIPE INSTALLATION

A. Carrier pipe installation shall be constructed in reaches of manageable length that can be surveyed, inspected, and tested for acceptance, then grouted in place (only when ribs and lagging is used as initial tunnel support) prior to installing the next carrier pipe reach. Carrier pipe installation reaches shall be limited in length to the maximum reach lengths indicated in the table below. Under no circumstances shall the grouting pressures, reach lengths, lift heights, or heat of hydration during curing exceed carrier pipe manufacturer recommendations.

SCHEDULE - ANNULAR BACKFILL GROUTING MAXIMUM REACH LENGTH

TESTED IN-PLACE WET DENSITY	MAXIMUM REACH LENGTH
≥ 130 pcf	≤ 50 feet
120 pcf – 129 pcf	≤ 100 feet
110 pcf – 119 pcf	≤ 125 feet
100 pcf – 109 pcf	≤ 200 feet
90 pcf – 99 pcf	≤ 250 feet
80 pcf – 89 pcf	≤ 300 feet
75 pcf – 79 pcf	≤ 350 feet

B. Maximum reach length of annular backfill grout pours shall not exceed annular backfill grouting maximum reach lengths given in the schedule above unless Contractor can clearly demonstrate that placement beyond these maximum reach lengths can be

accomplished assuring complete backfill of the annulus with no thermal or pressure damage to the carrier pipe.

C. Grout set times for selected mix design can be used to modify the maximum reach lengths provided in the table above. Reach lengths must be limited to appropriate length and volume such that the complete reach length can be monolithically grouted prior to initial grout set and loss of fluidity.

3.08 BULKHEADS AND CRADLE SUPPORTS

A. Construct bulkheads to withstand imposed grout pressure without excessive leakage at the terminal ends of the casing/tunnel in accordance with the Drawings and at intermediate points as required.

B. Terminal bulkheads shall be constructed using concrete brick and mortar and have air and water vent holes. Wall shall be constructed flush with casing pipe opening. Brick shall have a nominal size 2-1/4 inches by 3-3/4 inch by 8 inch. Mortar shall be one part Portland cement blended with three parts sand (100% passing #4 sieve and minimum 95% passing No. 8 sieve) and have a minimum 7-day compressive strength of 500 psi. Prepared bag mixes are acceptable if approved by the Engineer.

C. Provide concrete cradles using concrete having a minimum strength of 3,000 psi at 28 days at terminal ends of casing/tunnel. Cradles shall be provided from the end of the casing/tunnel bulkhead to the first pipe joint outside the casing/tunnel.

3.09 TESTING PRIOR TO GROUTING ANNULAR SPACE

A. Carrier pipe invert shall be surveyed and hydraulic grade line verified prior to grouting of annular space.

B. After carrier pipe is installed in the initial support system the carrier pipe shall be pressure tested or joint tested in accordance with Section 2532 – Sewage and Collection Lines

3.10 ACCEPTANCE TESTING

A. Perform an as-built survey on installed carrier pipe of man-entry size pipe after grouting (All pipe 36 inches diameter or larger). Take invert elevations at each pipe joint in man-entry size pipe. Take two diameter readings, at right angles, randomly at an average of 20 feet spacing or less in man-entry size pipe. Pull a mandrel through non-man-entry size pipe to check for excessive deflection in accordance with Specification 2532 Sewage and Collection Lines.

END OF SECTION

SECTION 02441

TUNNELING BY SLURRY MICROTUNNEL BORING MACHINE (MTBM)

PART 1 – GENERAL

1.01 SCOPE

A. The work described by this Section consists of furnishing all labor, materials, equipment, supplies as required to install jacking pipe by pressure slurry microtunneling method as shown on the Drawings and specified herein. In tunnels where two-pass is indicated on the Drawings, placement of the carrier pipe inside the tunnel shall be in accordance with Section 02426 – Installation of Carrier Pipe in Tunnels and the Tunneling Method Table in Project Specific Notes (PSN).

B. Work shall be done in strict accordance with the Contract Documents, and in accordance with all Federal, State and local laws, regulations, and requirements.

C. All available and known geotechnical reports, logs, borings, and laboratory testing performed within close proximity of the project corridor have been made available as "technical data" and are not part of the Contract Documents. This is provided as information only and solely for the convenience of Bidders. The Owner and/or the Engineer do not warrant or guarantee the accuracy or correctness of this material with respect to actual subsurface conditions. Subsurface conditions are considered unclassified and no expectation of quantity, specific location of ground conditions, or geotechnical baselines are provided or assumed herein.

D. For all excavations defined under this Section, Contractor shall install the jacking/casing pipe using techniques and methods selected by the Contractor that are appropriate for prevailing ground conditions. Contractor shall review all available geotechnical reports and data and perform any additional subsurface investigations he deems necessary, at his own expense, for the planning and the selection of tunneling techniques and methods in order to enable proper construction as shown on the Drawings and other requirements of Contract Documents.

E. Tunneling installation techniques and methods of construction shall include all equipment, all associated support systems and their operation, ground modification where needed, lubrication to reduce jacking forces as needed, cutting face tooling and sizing, face access capabilities, and the use of engineered fluids, slurries, and soil conditioners as required to maintain face stability, reduce wear, advance heading within line and grade tolerances, transport spoils, and accomplish productivity assumed in Bid.

F. The minimum dimensions of the cross section of the tunnel excavation shall be determined by the Contractor based on the following:

1. the construction requirements for final installation of the carrier pipe,

2. minimum size limitations of the annular space as required for installation and to meet line and grade tolerances,

3. the minimum inside diameter of the casing pipe indicated on the Contract Drawings and in the Tunneling Method Table in Project Specific Notes (PSN), and

4. any right of way, encroachment, or occupancy requirements and specifications of governing permitting agencies such as the Kentucky Transportation Cabinet (KYTC).

G. Contractor may increase the casing diameter, at no additional cost to the Owner, as needed to account for the Contractor's selected means and methods, operational procedures, and to provide adequate internal tolerance to account for the prevailing project site and subsurface conditions. If Contractor elects to modify casing diameter from size shown in the Contract Documents, the Contractor accepts all responsibility for acquiring approval for any modification or addenda to all right-of-way encroachment agreements, occupancy permits, or other established requirements and specifications of the entity being crossed.

H. All tunnel enlargements made for construction purposes shall be fully supported during the excavation of the tunnel.

I. Where warranted in the experience of the Contractor or where identified on the Drawings, Ground Modification shall be applied as part of the appropriate preparation for tunneling activities to reduce risk of surface settlement and heaving, protect nearby structures and utilities, and successfully install the piping system within line and grade tolerance. Contractor shall design and include in his Bid the furnishing of all labor, equipment, materials, and supplies necessary for soil stabilization by jet grouting, compaction grouting, void filling, soil mixing, slurry walls or other ground modification technologies to meet project objectives specified herein.

J. Dewatering shall be controlled such that the launching and exit shafts are free of water, but the surrounding groundwater table is not substantially lowered such that settlement along the tunnel drive or nearby existing structures and foundations does not occur.

K. The Contractor shall furnish all labor, equipment, and material required to complete the work by microtunneling including but not limited to the following:

1. Microtunneling and jacking system and all related accessories.

2. Spoil transportation, separation apparatus, removal and disposal.

3. Safety and security.

4. Hoisting and lifting.

5. Control equipment and required power.

6. Launching Shaft and Exit Shaft construction including, but not limited to, rehandling and disposal of unsuitable and excess materials, control of groundwater and surface water, utility adjustment/supports, tests, excavation, sheeting and shoring, pit/shaft wall thrust blocking, jacking frame, backfilling, cleanup, and restoration of surface features, and all other work necessary for construction as specified and/or shown on the Drawings.

L. Follow all OSHA regulations regarding tunnel construction including but not limited to OSHA 29 CFR Part 1926. Obtain all permits required associated with OSHA regulations and requirements for confined space entry.

M. Conform with all requirements of the Kentucky Transportation Cabinet (KYTC) Kentucky Transportation Cabinet (KYTC) encroachment agreements for work within their rights-of-way.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02222 – Excavation

B. Section 02225 – Excavating, Backfilling and Compaction for Sewers

C. Section 02425 – Initial Tunnel Support

D. Section 02426 – Installation of Carrier Pipe in Tunnels

E. Section 02431 – Tunnel Grout

F. Section 02432 – Low Density Cellular Concrete

G. Tunneling Method Table in Project Specific Notes (PSN)

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. Applicable codes, ordinances, statutes and governing rules and regulations of governing municipalities and counties, the Commonwealth of Kentucky, and the Federal Government.

2. American Association of State Highway and Transportation Officials (AASHTO).

3. American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering.

4. Occupational Safety and Health Administration (OSHA) Regulations and Standards for Underground Construction 29 CFR Part 1926, subpart S and other applicable OSHA parts.

5. Applicable ASTM and AWWA Standards for materials and methods.

6. Kentucky Transportation Cabinet (KYTC) Kentucky Transportation Cabinet (KYTC) Permits Guidance Manual

7. All applicable guidelines and restrictions of the United States Army Corps of Engineers (USACE) and Kentucky Department for Environmental Protection (DEP).

1.04 DEFINITIONS

A. Unless otherwise stated or particular context otherwise requires, the definitions and provisions contained in this Section shall govern the construction, meaning and application of words and phrases utilized in this specification. For purposes of this specification, the following terms are defined as follows:

1. Annular Space: The void created between the outside of the jacking/casing pipe being installed and the extreme outer excavation limits created by MTBM shield. If a two-pass tunnel is installed, the annular space is also the void space between the casing pipe and the carrier pipe.

2. Carrier Pipe: A pipe used for conveyance of water or sewer. Carrier pipe shall be as specified in Section 02426 – Installation of Carrier Pipe in Tunnels.

3. Cutterhead: Rotating tool or system of tools on common support excavating at face of bore.

4. Control Console: Electronic unit located at ground surface controlling operation of microtunneling machine. Electronic information is transmitted to control console from heading of machine. This information includes head position, steering angle, jacking force, progression rates, and laser position.

5. Drive: Section of pipe installed by microtunneling from launching shaft to exit shaft.

6. Entrance and Exit Seals: Seals placed at the breakout into and out of the shafts. The seals are intended to prevent groundwater inflow and loss of ground into the shafts. The seals shall also prevent the lubricant from escaping from annular space during microtunneling.

7. Exit Shaft or Retrieval Shaft: Shaft utilized for retrieval of the microtunneling equipment.

8. Engineered Fluid: Slurry fluid normally water-based which may contain bentonite, polymers, and other Contractor-selected additives used in closed loop system of the microtunneling machine to accomplish the following tasks:

    a. Counterbalance the earth and groundwater pressures at the face of the machine,

    b. Form a filter cake to limit the amount of fluid loss into the ground and to stabilize the ground,

    c. Mix with the excavated material to transport the material to the surface for separation,

    d. Aid in the separation of the solids from the liquid at the separation plant.

9. Ground Modification: soil stabilization by jet grouting, compaction grouting, void filling, soil mixing, slurry walls or other ground stabilization technologies to meet project objectives specified herein.

10. Intermediate Jacking Stations (IJS): A series of hydraulic jacks spaced around the pipe circumference and temporarily installed between two pipe segments. The jacks are installed inside a steel casing fabricated to the same outside diameter as the pipe. The stations are used to distribute the thrusting force along the pipe string by dividing the string into independent reaches. Each intermediate jacking station pushes the reach of pipe segments located between that station and the next station forward in the direction of the tunnel drive.

11. Jacking Frame: Structural component housing hydraulic cylinders used to propel microtunneling machine and pipeline. Jacking frame serves to distribute thrust load to pipeline and reaction load to thrust wall or block.

12. Jacking Pipe: A casing pipe used as the initial support in a two-pass tunneling operation or as both the casing pipe and carrier pipe in a one-pass tunneling operation. The Contract Drawings and the Tunneling Method Table in Project Specific Notes (PSN) will indicate a carrier pipe within a casing pipe or initial tunnel support system for two-pass tunnel operations. One-pass tunneling shall only be allowed where expressly indicated as such.

13. Launching Shaft or Entrance Shaft: Excavation from which microtunneling equipment is launched for the installation of tunnel. May incorporate a thrust block or wall to spread reaction loads to the ground.

14. Lubricant: Fluid used during microtunnel installation to reduce friction between the jacking pipe and subsurface materials to reduce the overall jacking loads on jacking pipe.

15. Microtunneling: An underground method of constructing a tunnel that involves installing a pipe by jacking it into place from a launch shaft using hydraulic jacks without removal of the ground above the pipe. Excavation is carried out with a remotely controlled, fully-shielded, steerable, laser-guided, articulated microtunnel boring machine attached to the front of the jacking pipe.

16. Microtunnel Boring Machine (MTBM): A fully shielded, remotely operated (no man entry required), steerable, laser-guided, articulated shield. The shield is capable of exerting a continuous, controllable pressure at the tunnel heading, utilizing pressurized slurry (Slurry Shield) to prevent groundwater inflows and soil movement into the heading. The MTBM is propelled by thrust from a continuous string of jacking pipe that is advanced from the launching shaft by hydraulics jacks.

17. Obstruction: An Obstruction is defined as any buried object that meets all of the following conditions:

    a. lies within the cross section of the tunnel,

    b. impedes continued forward progress along the design path,

    c. is an object that is greater than 1/3 the diameter of the MTBM, and

    d. is a rock fragment having an unconfined compressive strength of 20,000 psi or greater or an impediment of foreign material that cannot be crushed or ingested such as metal or other foreign material not naturally occurring.

18. Obstruction Removal Shaft: A contingency shaft built to remove an obstruction to a MTBM, repair a damaged MTBM, or retrieve an obstructed MTBM.

19. Obstruction Removal Standby Time: Duration of work stoppage resulting from Obstruction encounter and removal. Contractor Daily Rate provided in Bid for Obstruction Removal Standby Time shall include all costs of specialist labor only, materials, equipment, production loss and other non-labor related costs associated with the work stoppage caused by an encountered Obstruction. See Section 00520 – Agreement for defined measurement and payment procedures for Obstruction Removal Standby Time.

20. Slurry: A fluid, normally water, used in a closed loop system for the removal of spoil and for the balance of groundwater pressure during microtunneling.

21. Slurry system: System including pumps, valves, pipe and other appurtenances utilized in Slurry Shields to convey excavated muck mixed with the slurry away from the heading and into the separation plant where separation of soil and slurry occurs.

22. Slurry Separation: Process in which excavated material is separated from circulation slurry.

23. Spoil: Excavated soil and bedrock material that has been mixed with either water or slurry and pumped to the surface to be separated and recycled or disposed.

24. Thrust block: Concrete or steel wall at the back of the launching shaft providing a reaction for jacks pushing the pipe.

25. Tunneling Methodology: A written description, together with supporting documentation that defines Contractor's plans and procedures for the tunneling operations.

26. Two-Pass Tunneling: Tunneling where initial support is installed concurrent with the excavation process to stabilize the tunnel excavation and a carrier pipe is installed in a subsequent phase or the second pass.

27. One-Pass Tunneling: Tunneling where the jacking pipe serves as both the initial tunnel support (casing pipe) and the carrier pipe. One-pass tunneling shall only be allowed where expressly indicated as such in the Contract Documents.

1.05 DESIGN CRITERIA

A. Microtunneling equipment selected for the project shall be compatible with the geologic conditions described in all available geotechnical data provided as Technical Data, and not included in the Contract Documents and any additional geologic testing performed by the Contractor that he deems necessary to select appropriate equipment.

B. Remotely operated microtunneling equipment shall be used for all microtunneling work.

C. Design of the jacking pipe, including pipe joints, reinforcement, stiffness, compressive strength, and determining acceptable pipe fabrication tolerances is the responsibility of the Contractor. Design of the jacking pipe shall consider all loadings on the pipe, including but not limited to ground, groundwater, jacking and surcharge. Maximum stresses applied to the pipe shall not exceed the manufacturer's recommended allowable stresses.

D. Contractor's Engineer shall design the launching and exit in accordance with this Section, Section 02222 – Excavation, and Section 02225 – Excavation, Backfilling and Compaction of Sewers.

E. Design backstops, thrust block and concrete seal for all earth loads, and to prevent significant water intrusion. The thrust block shall be perpendicular to the proposed pipe alignment and shall be designed to withstand the maximum jacking pressure to be used, with a factor of safety of at least 2.0, without excessive deflection or displacement.

F. The MTBM shall be capable of mining through and/or removing cobbles and boulders from the cutter face up to the Obstruction size defined above.

G. All design calculations provided by the Contractor as part of the required submittals shall be sealed by a Licensed Professional Engineer registered in the Commonwealth of Kentucky.

1.06 SUBMITTALS

A. Conform to Section 01300 – Submittals.

B. Equipment: Submit the following describing the microtunneling equipment and construction methods to be employed.

1. A detailed description of the microtunneling equipment and procedures to be employed. Provide manufacture's literature describing in detail the microtunneling system to be used including machine type, spoil removal system, guidance system, and provisions for injecting pipe lubricants. Describe machine capabilities and procedures for exerting a stabilizing pressure at the tunnel heading and minimizing loss of ground. Indicate range of face pressures anticipated to be required to stabilize the heading, and the methods and equipment to be used to monitor and control pressures. Contractor shall provide descriptions of projects on which this system has been successfully used including names, addresses, and telephone numbers of owner's representatives for these projects as well as length, diameter, and pipe material used.

2. Scheduling for microtunneling work identifying all major construction activities as independent items. The schedule shall include as a minimum the following activities: mobilization; construction of impervious barriers and plugs; shaft excavation and excavation support; jacking equipment setup; tunneling for each drive; backfill and contact grouting of pipe; site and greenway restoration; cleanup; and demobilization. The schedule shall also include the working hours for each activity, and a written description of the construction methods and equipment to be employed in completing each of the work activities shown on the schedule. The schedule shall be reviewed with the Owner and Engineer and be updated and resubmitted by the Contractor every two weeks.

3. A description of the alignment control and steering systems. Provide manufacturer's literature, drawings showing set up and support provisions, and other details for the laser. Submit a description of surveying methods to set laser positions and a description of procedures to check laser and reset or realign laser during construction. Confirm that these systems can achieve the required tunnel line and grade within the specified tolerances.

4. Capacity, number and arrangement of main jacks. Provide details of thrust ring, jacking controls, and pressure gauges. Provide an estimate of the maximum jacking force expected to be required to complete each drive.

5. Thrust block and jacking frame design and details. Submit calculations demonstrating that the ground behind the thrust block will sustain the maximum planned forces developed by he main jacks with a minimum safety factor of 2.0.

6. Details of pipe lubrication injection system and pipe lubricants to be used during microtunneling including manufacturer's literature.

7. Details of slurry system including slurry handling, separation, transport, and disposal equipment and procedures including details of the slurry additives, slurry separation plant, and the location of slurry and spoil disposal sites.

8. Drawings and design details for launching shaft and exit shaft, indicating number required, proposed spacing, or criteria for installing, and method of operation.

9. Drawings and design details for intermediate jacking stations, indicating number required, proposed spacing, or criteria for installing, and method of operation.

10. A safety plan for the microtunneling operations including provisions for lighting, ventilation, and electrical system safeguards.

11. Details of entrance and exit seals including materials and installation methods.

12. A detailed description, with a readily understandable visual representation, of all MTBM operation functions as seen by the operator (control operation computer screen), including what each function means and what the normal operating range is for that function.

C. Jacking Pipe: Submit details of the pipe to be used indicating materials of construction, wall thickness, reinforcement details, joint details, joint cushioning materials, gaskets, and grout fittings for all jacking pipe. Submittal shall include:

1. Test reports

2. Certificates

3. Prior to shipment of the pipe, submit certified affidavit of compliance stating that the pipe for this Contract was manufactured in accordance with the specifications.

D. Calculations: Submit the following calculations:

1. Design calculations for the jacking pipe demonstrating that the proposed pipe and pipe joint is capable of withstanding the jacking forces anticipated by the Contractor for each microtunneling run and the final in-place loading conditions. The criteria for truck loading shall be HS-20 in accordance with AASHTO requirements.

2. Design calculations demonstrating that the projected slurry pressure will not exceed the maximum allowable face pressure that can be exerted at the tunnel

face without fluid loss at the surface, adjacent surface waters, other structures or features, or heave of ground.

3. Detailed shoring calculations for the launching and exit shaft construction including all support members.

E. Ground Modification Plan: Contractor shall design and submit proposed ground modification strategies for review and acceptance including soils stabilization methods, surface settlement prevention plan for area along the tunnel heading, void filling, and blocking of the underground flow of water to prevent rapid dewatering through tunneling activities. Ground modification grout requirements are set forth in Section 02431 – Tunnel Grout.

F. Settlement Monitoring Plan and Site Assessment

1. Submit a settlement monitoring plan for review prior to construction. The plan shall be in accordance with Article 3.03.

G. Installation Plan

1. Submit description of proposed construction plan, dewatering plan, and plan to establish and maintain vertical and horizontal alignment.

2. Submit proposed jacking pipe annular space grout hole locations.

3. Identify methods used to control stormwater from entering shafts and to maintain normal stormwater flow adjacent to shafts.

4. Supply details of procedures and resources that will be employed to carry out the work including method and sequence of:

a. Establishment of drive line of MTBM and elevation at base of shaft.

b. Pipe handling and connections.

c. Maintaining line and grade, and re-establishment of line and grade as required.

d. Spoil separation and disposal or recycle process.

e. Spoil and slurry containment during microtunneling work.

f. Submit emergency response procedures to handle situations when jacking pipe is compromised and jeopardizes integrity of installation or safety.

g. Submit detailed schedule for microtunnel operation including construction of shafts, thrust blocking, equipment setup, jacking pipe, carrier pipe installation

(where applicable), testing, equipment removal, shaft closure and restoration.

H. Materials: Supply full details of the following materials:

1. Design mixes for all concrete and grout.

I. Contingency Plan: Contractor shall submit a proposed contingency plan for hitting a subsurface obstruction along the tunnel alignment.

J. Other Contingency Plans: Detailed contingency plans are required for the following:

1. High jacking forces.

2. Damaged pipe.

3. Surface settlement or heaving.

4. Loss of line and grade.

5. Major mechanical breakdown.

6. Stoppage of jacking.

7. Loss of cutter tools on the cutterhead of the MTBM.

K. Daily Reports: A shift log shall be maintained on a daily basis by Contractor. Submit reports no later than 24 hours after the end of the shift to the Engineer. Daily reports shall include at a minimum the following:

1. Location of face by station and progress of tunnel drive during shift.

2. Hours worked per shift on tunneling operations. Equipment and materials used, and the duration of different activities performed.

3. Completed field forms for checking line and grade of the tunneling operation, showing achieved tolerance relative to design alignment. Steering control logs will generally be acceptable for TBM driven tunnels.

4. Groundwater control operations, groundwater inflow location and rates.

5. Observation of any lost ground or other ground movement.

6. Any unusual conditions or events.

7. Reasons for operational shutdown whenever a drive is halted.

8. Air quality reports for dust, toxic and hazardous gases, and other atmospheric impurities in the working environment.

L. Record Drawings: Maintain at the construction site a complete set of field drawings for recording of as-built conditions. All marks and notes shall be dated, and thorough. Submit the following:

1. Submit record of actual locations of jacking pipe and elevations. Elevations shall be taken at each pipe joint and recorded to the nearest eighth of an inch (0.01 feet). Horizontal coordinates of all surveyed points shall be on the coordinate system utilized by the Owner.

2. Submit written report to verify there are no voids or defective joints in the entire length of jacking pipe. Upon completion of the pipe installation, the Contractor shall allow two (2) business days for the Engineer or other representative of the Owner to inspect the completed pipe installation.

3. Submit written Log of each drive to the Engineer and Owner for review within three (3) business days of completing each drive.

M. Permits: The Contractor shall be responsible for executing the requirements of permits obtained from the KYTC, United States Army Corps of Engineers and any State and local authority where the project is located. The Contractor shall be responsible for any phase submittals required by the permits. All submittal information required by the project permits shall be channeled through the Engineer.

1.07 QUALIFICATIONS

A. The Contractor or Subcontractor performing tunnel construction must demonstrate in writing that he has the requisite past project experience constructing tunnels similar to those on this Project.

B. The Contractor or Subcontractor shall have the following minimum experience related to tunneling by slurry microtunnel boring machine (MTBM):

1. A minimum of five (5) years' experience performing microtunneling of similar size and scope.

2. A minimum of 2,500 linear feet of pipe installed by pressure slurry microtunneling.

3. A minimum of 1,000 linear feet of 36-inch or larger jacking pipe/casing installed.

4. Three (3) tunnel projects completed in the last 10-years performed with a slurry microtunnel boring machine with individual, single drives of 500 linear feet or greater with reinforced concrete jacking pipe, fiberglass reinforced jacking pipe or carbon steel jacking pipe.

5. Two (2) tunnel projects completed in the last 10-years performed with a slurry microtunnel boring machine in rock with either mixed face or full face rock excavation.

6. Installed carrier pipe and grouted without voids the annular space of a minimum of 2,000 linear feet of tunnel construction.

7. Three (3) underground construction projects completed in the last ten (10) years that involved the design and construction of temporary or permanent shafts with dewatering.

C. See Tunneling Contractor Qualifications worksheets in Section 00410.

1.08 QUALITY ASSURANCE

A. Work shall be supervised by at least one (1) person with five (5) years of recent experience in microtunneling process. Experience shall be in a minimum of five (5) previous microtunneling projects of similar size and scope. Microtunneling operations shall be performed under the direction of the microtunneling supervisor who shall be in responsible charge throughout the microtunneling operation.

B. All tunneling operations shall be performed under the supervision of experienced shift foremen with at least five (5) years of recent on-the-job supervision experience on similar projects involving tunnels of similar size constructed using similar methods.

C. Operators shall be experienced in microtunneling with prior knowledge and ability to properly operate systems being employed. Operators shall have a minimum of five (5) years of experience in performing microtunneling of similar size (at least 2 projects with a jacking pipe diameter equal to or greater than required for this Project), segment lengths and ground conditions.

D. Operate systems following manufacturer's instructions and recommendations. Make available at all times copies of operations manuals to the Engineer and operational personnel on site.

E. Test full system in accordance with manufacturer's recommendations on completion of set up and before commencing drive. Record the test results and provide a copy of the test report to the Engineer.

F. Before commencement of any drive, demonstrate to the Engineer that required set up procedures and system checks are complete and required materials are at hand to commence drive. Do not commence drive until construction of receiving pit has been completed.

1.09 PRE-INSTALLATION MEETING

A. At least three weeks prior to commencing the work of this section, convene a Pre-Installation Meeting at the job site to be attended by:

1. Contractor and any sub-contractor performing any related work.

2. Owner.

3. Engineer.

4. Any other pertinent stakeholder as identified by Owner, Engineer, or Contractor.

B. Meeting shall cover settlement monitoring, work hours, safety, staging and storage of materials, schedule, any changes to on-site staff from original Work Plan submittal, permitting, and the development of record drawings, etc. to ensure successful implementation of all requirements of this specification during tunnel construction.

1.10 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall accept material on site and inspect for damage.

B. The Contractor shall handle, support and store pipe to prevent injury or damage to the pipe.

C. Support piping with nylon double slings during handling. Protect ends from damage affecting integrity of connection. The Contractor shall consult with the pipe manufacturer prior to delivery and comply with any additional recommendations made by manufacturer.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Conduct operations to not interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

B. Conduct operations to not interfere with roadway traffic, except with prior approval by the Kentucky Transportation Cabinet (KYTC) or other governing authority (where applicable) and the Owner.

C. Provide temporary facilities to prevent erosion of disturbed construction area in accordance with the approved Erosion & Sedimentation Control Plan and Contract Documents.

D. Maintain existing stormwater flow patterns or submit measures to temporarily bypass in accordance with the Erosion & Sedimentation Control Plan and Contract Documents.

1.12 COORDINATION

A. Coordinate work with local, state and federal authorities and utility owners to avoid interference with or damage to existing facilities in or adjacent to construction areas.

PART 2 – PRODUCTS

2.01 JACKING PIPE FOR TWO-PASS

A. Jacking pipe shall be steel pipe in accordance with Section 02425 – Initial Tunnel Support unless otherwise approved by the Engineer.

2.02 CARRIER PIPE

A. The carrier pipe shall be in accordance with the Tunneling Method Table in Project Specific Notes (PSN).

2.03 GROUT FOR JACKING PIPE EXTERIOR ANNULAR SPACE

A. Grout for pressure injection between the jacking pipe and the earth shall in accordance with Section 02431 – Tunnel Grout.

2.04 WATER

A. Water used in the preparation of pipe lubricant shall be clean, fresh, potable water, free from oil, acid, alkali, organic matter or other deleterious substances.

2.05 BENTONITE

A. Neat bentonite without additives shall be high quality Wyoming bentonite or similar. General grade civil engineering bentonite shall not be used as a pipe lubricant.

2.06 POLYMERS

A. Polymers used as pipe lubricant or additive to bentonite or slurry water shall be non-toxic.

PART 3 – EXECUTION

3.01 PROJECT SITE CONDITIONS:

A. Microtunneling shall not begin until the following have been completed:

1. Required submittals have been made and the Engineer has reviewed and accepted all submittals.

2. Notify the Owner and Engineer at least 30 days before beginning any excavation.

3. Launching shaft, exit shaft, thrust block, entrance and exit seals have been completed in accordance with the approved shop drawings and Contract Documents.

4. Installation of ground modification, if required.

5. Groundwater control for breaking out and breaking into the shafts has been established.

6. A Safety Officer has been designated and prepared a Health and Safety Plan in accordance with OSHA requirements for tunnel construction. The Safety Officer shall have held safety meetings and provided safety instruction for new employees as required by OSHA.

7. Pre-installation meeting has been held and all comments have been addressed from the meeting.

8. Settlement monitoring system is in place and preconstruction readings have been provided to the Engineer.

9. Pre-construction survey documents have been submitted to the Engineer.

B. Perform microtunneling for the jacking pipe to the extent indicated on the Drawings so as not to interfere with, interrupt or endanger surface activity thereon, and minimize subsidence of surface, structures, and utilities above and near tunnel. Roadway, utilities, and/or structures damaged by microtunneling operations shall be repaired or replaced as necessary to restore them to their original condition prior to beginning microtunneling operations in a timely manner, unless otherwise directed by the Engineer, at no additional cost to Owner.

C. Furnish all necessary equipment, power, water, and utilities for microtunneling, pipe lubricant mixing and pumping, slurry separation, removal and disposal of spoil, and other associated work required for the Contractor's methods of construction.

D. Promptly clean up, remove, and dispose of any spoil or slurry spillage.

E. Furnish all maintenance of traffic and establish and maintain all safety procedures on any highways whose thoroughfare is interrupted due to the microtunneling operation.

F. Inspect the locations where microtunneling will be conducted, verify conditions under which the work will be performed, and provide all necessary details, whether shown or specified on the Drawings or not, for the orderly prosecution of the work.

G. No vertical obstruction removal shafts shall be allowed within the limits of the travel ways of roads and highways without approval from the governing agency of the effected right-of-way. Vertical obstruction removal shafts may be permitted by the Engineer in areas outside of the travel way. Horizontal excavation rescue methods may be permitted by the Engineer. All proposed obstruction rescue shafts are subject to review and approval by the Kentucky Transportation Cabinet (KYTC) or LFUCG as applicable.

1. Should the Contractor need to construct an obstruction rescue shaft, the Contractor shall submit in writing for review by the Engineer, Owner, along with KYTC (where applicable) a complete plan for MTBM rescue methods.

2. The Contractor shall be responsible for obtaining all necessary permits as they relate to the proposed rescue operations.

3.02 PREPARATION

A. Existing utilities shown on Drawings are shown for general information only. Contractor shall verify locations, sizes and configurations of existing systems within potential conflict of installation operations.

B. Complete any required testing, inspection, surveying, etc., of any existing utilities required by the Contract Documents.

C. Call Local Utility Line Locate Service (811) not less than five working days before performing Work.

D. Request underground utilities to be located and marked within and surrounding the construction areas.

E. Locate, identify, and protect utilities indicated to remain from damage.

F. Protection:

1. Protect plant life, lawns, rock outcroppings and other features remaining as portion of final landscaping.

2. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic. Repair or replace items damaged during construction.

3. Repair or replace structures raised more than 0.50 inch due to pressure from tunneling operations including pavement, and sidewalk.

G. Ventilation

1. Furnish and operate a temporary ventilation system and air monitoring system conforming to the requirements of OSHA at all times that personnel are underground. Operate and maintain a ventilation system that provides a sufficient supply of fresh air and maintains an atmosphere free of toxic or flammable gases in all underground work areas.

2. Before any personnel enters the tunnel, the air quality must be tested and verified that the OSHA requirements pertaining to air quality are met or exceeded.

H. Barricades

1. Protect pits, shafts and other open excavations with barricades and security fencing as indicated on the Drawings and with additional measures approved by

the Engineer and Owner as required to prevent unauthorized personnel from accessing.

2. During non-work hours, isolate with additional measures approved by the Engineer and Owner as required to prevent unauthorized personnel from accessing.

3. Remove equipment daily from vehicular and pedestrian roads, sidewalk and pathways not contained within the direct work area to permit access and use by public.

3.03 SURFACE MONITORING

A. The Contractor will be held solely responsible for damages to highway or street surfaces, railroads, pavements, structures, structural embankments, sidewalks, curbing, and public utilities resulting from subsidence, collapsed jacking pipe, or ground losses into the pipe and for the refilling of voids with grout. Where such ground losses are so severe that they result in damage to underground or surface pavement, existing utilities or structures, the Contractor shall be solely responsible for remedying such damage. Where the filling of voids cannot be effectively carried out from below, the Engineer reserves the right to order the Contractor, at no additional cost to the Owner, to make openings from the surface for the purpose of backfilling the voids.

B. As a minimum, surface monitoring points shall be established consisting of settlement markers to detect surface movement of roadway and pavement.

C. Survey the site showing locations and elevations of existing ground, pavement, and other permanent features to establish a baseline for existing conditions along the centerline of the proposed pipe/tunnel, and along two parallel lines 20-feet on either side of the centerline. All surveying performed for settlement monitoring shall be performed by a surveyor licensed in the Commonwealth of Kentucky.

D. Surface settlement marks:

1. Markers shall be located at 25-foot centers along the tunnel center line.

E. All markers/points shall be surveyed as follows:

1. Prior to beginning any work.

2. At 50% completion of the tunnel.

3. The same points shall also be surveyed 90 days after the work is completed and both shafts have been backfilled.

F. Ground Surface Movement:

1. The microtunneling machine shall be operated so as to prevent both surface heave and loss of ground during microtunneling.

2. The use of engineered fluid including bentonite is required for microtunneling in poorly graded, rounded and subrounded, granular material below the groundwater table having less than 12 percent fines as defined by ASTM D2487 to ensure earth pressure balance, soil stability, and prevention from slurry migration during microtunneling as no additional cost to the Owner.

3. Unless more stringent requirements are set forth by third party agencies, settlement or heave of the ground surface along the alignment shall not exceed 0.25 inch.

4. If the ground subsidence or heave exceeds 0.25 inch the microtunneling operations shall stop and remedial measures approved by the Engineer shall be implemented.

5. If any movement or settlement occurs which causes or might cause damage to an existing structure over, along or adjacent to the work, immediately stop any or all work except that which assists in making the work secure and in preventing further movement, settlement or damage. Resume tunneling only after all necessary precautions have been taken to prevent further movement, settlement or damage, and repair the damage at the Contractor's expense and to the satisfaction of the Engineer.

6. Restrict the excavation of materials to only those that are physically displaced by the microtunnel itself in order to prevent loss of ground and settlement or possible damage to overlying structures. Control the advance rate and monitor the volume of material excavated and adjust operations as required to avoid loss of ground, overexcavation, and surface heave.

G. Lateral Displacements: Unless more stringent requirements are set forth by third party agencies, lateral movement or deflection of shaft excavation support system shall be limited to 0.5 inch.

H. Report any settlement or movement immediately to the Engineer and applicable agency and take immediate remedial action.

3.04 GROUNDWATER CONTROL

A. Intercept and divert surface drainage precipitation and groundwater away from excavation through use of dikes, curb walls, ditches, pipes, sumps or other means within the conditions permitted by the approved Erosion & Sedimentation Control Plan and the Contract Documents.

B. Develop substantially dry subgrade for prosecution of subsequent operations.

C. Launching and exit shaft subgrade shall be kept continuously free from ground and surface waters during tunneling operations. Dewatering shall be controlled such that the

launching and exit shafts are free of water, but the surrounding groundwater table is not substantially lowered such that settlement along the tunnel drive occurs.

D. Keep removal of soil particles to a minimum.

E. Water discharge from dewatering operations shall be directed into approved receiving basins or silt bag in accordance with all applicable regulatory requirements and the approved Erosion & Sedimentation Control Plan and the Contract Documents.

F. Should settlement or displacement be detected, notify the Engineer and applicable agency immediately and act to maintain safe conditions and prevent damage.

3.05 GROUND MODIFICATION PRIOR TO TUNNELING

A. Ground modification grout requirements are set forth in Section 02431 – Tunnel Grout.

B. The use of jet grouting, compaction grouting, void filling, soil mixing, slurry walls, permeation grouting, compensation grouting, ground freezing or other ground modification technologies shall be carefully considered by the Contractor to safely permit Contractor's selected tunneling activities in loose and flowable soils or in rock that is fractured with joints, bedding planes, shears, or fault zones beneath the groundwater table. Contractor shall determine if ground modification is needed to maintain a stabilized tunnel face and bore during tunneling by Contractor's selected means of excavation and be fully responsible for the determination of the necessity, selection, design, and implementation of ground modification strategies.

C. Ground modification strategies shall be designed to work in concert with Contractor's selected excavation methods and implemented as needed to increase bearing capacity, provide settlement control, reduce permeability and/or increase stand-up time along the face of excavation within the tunnel alignment or in the areas of excavation required to construct all launch, reception, and access structures and shall be included in the Bid.

D. Contractor shall furnish all labor, equipment, materials, and supplies necessary for ground modifications required to meet project objectives specified herein.

3.06 MICROTUNNELING EQUIPMENT

A. Microtunnel Boring Machine (MTBM): The MTBM shall be a pressurized face, slurry machine manufactured by a company that specializes in the design and fabrication of this type of equipment and has at least ten (10) years of experience. The machine shall be capable of excavating tunnels in geologic conditions as described in all available geotechnical data for the project site and shall satisfy the following requirements:

1. The MTBM shall be capable of fully supporting the face during both excavation and shutdown periods, and shall have the capability of exerting a controllable, continuous, stabilizing pressure at the face as required to prevent loss of ground and groundwater inflows. The machine shall be capable of synchronizing the rate

of excavation removed at the tunnel face with the rate of machine advance so there is no over-excavation or loss of ground.

2. The MTBM shall have an enclosed chamber for containing the slurry under pressure. A pressure gauge shall be provided so the operator can monitor the chamber pressure. The system shall be capable of measuring ground and groundwater pressure and making the adjustments required to counterbalance the ground and groundwater pressures as needed to prevent loss of slurry or groundwater inflow. Control slurry pressure system using variable flow slurry pumps, pressure control valves and minimum of two flow meters, one on feed side and one on return side.

3. The MTBM shall be remotely operated, laser-guided, and monitored continuously by the operator. A display showing the position of the MTBM in relation to design line-and grade shall be provided at the operation console to allow the operator to monitor face pressure, roll, inclination, laser position, steering altitude, rate of advance, installed length, thrust force, and cutterhead torque.

4. The MTBM shall have an articulated shield that is steerable in both vertical and horizontal directions to maintain line and grade within the specified tolerances. The cutterhead shall have a reversible drive system so that it can rotate in either direction to minimize rotation or roll of the pipe during installation.

5. Provide a slurry separation plant that is appropriate for the ground being excavated, and compatible with the anticipated excavation rate that is effective in removing the spoil from the slurry and is acceptable in terms of the available construction staging areas.

6. A pipe lubrication injection system shall be provided to inject pipe lubricants to minimize jacking forces. Lubrication of pipe exterior is determined by the Contractor during tunnel excavation and jacking pipe installation, but equipment shall be capable of continuously utilizing bentonite slurry lubrication or other approved material.

7. The tail of the MTBM shall have gaskets and/or seals to prevent material from flowing into the tunnel at the contact between the tail skin and the pipe.

8. The jacking system, including any intermediate jacking stations used, shall be capable of continuously monitoring the jacking pressure, the rate of advancement, and the distance jacked. The jacking system shall develop a uniform distribution of jacking forces on the end of the pipe. Use hydraulic cylinders with automatic shut off to prevent overstressing pipe being jacked.

9. The MTBM shall be equipped with the high pressure water jetting system capable of cleaning the cutterhead and the extraction/crushing chamber to improve production in cohesive soils.

10. The MTBM shall be capable of mining through the conditions outlined for the tunnel crossing and through boulders in sizes up to the diameter as defined by "Obstruction" in Article 1.04.A.16.

11. The MTBM shall conform to OSHA requirements for tunneling in potentially gassy conditions.

12. The MTBM shall allow personnel safe access to the tunnel face for cutter maintenance and removal of obstructions such as boulders through a suitable access door and through an air pressure chamber. The machine shall have equipment with the capability to place the tunnel face under pressure, if required.

B. The MTBM Control System shall provide the following minimum information to operator on uninterrupted basis:

1. Deviation of MTBM from required line and grade of casing, normally by reference to laser beam.

2. Grade and roll of MTBM.

3. Jacking load.

4. Torque and RPM of cutterhead.

5. Instantaneous jacking rate and total distance jacked.

6. Indication of steering direction.

7. Volume of slurry flow in both supply and return sides of slurry loop.

8. Indication of slurry by-pass valve position.

9. Indication of pressure of slurry in slurry chamber.

3.07 INSTALLATION – LAUNCHING AND EXIT SHAFTS

A. Excavate launching and exit shafts in accordance with this Section, Section 02222 – Excavation, and Section 02225 – Excavating, Backfilling and Compaction for Sewers .

B. Provide excavation supports as designed by the Contractor's Engineer.

C. Support soil, pavement, utilities or structures existing outside excavation.

D. Construct shafts to limit intrusion of groundwater. Install equipment to maintain shafts free of water while limiting effect on surrounding groundwater table. Dewatering pumps shall discharge into sediment filter bags or into sediment traps in accordance with local and State erosion and sediment control and stormwater requirements.

E. Furnish and install, to the extent required, thrust blocks or such other provisions as may be required in driving the jacking pipe forward.

F. Do not apply jacking loads until any concrete blocking used has achieved required design strength.

G. Upon completion of boring operations remove pits/shafts. Backfill, compact and restore disturbed area in accordance with Contract Documents.

3.08 INSTALLATION OF MICROTUNNEL

A. Provide a suitable jacking frame and thrust block to carry out the work that meets the specified requirements of this Section.

B. Prior to starting microtunneling operations, survey the location and orientation of the pipe guide rails to ensure they are on the proper line and grade and check to see that they are properly supported.

C. Set the pipe to be jacked on properly braced and supported pipe guide rails.

D. The axial forces from the thrust jacks shall be distributed to the pipe uniformly through a properly designed thrust ring and cushion material to prevent damage to the ends of the pipe. The jacking system shall be capable of continuously monitoring the jacking pressure and advance rate.

E. Pipes shall be jacked into position following the design line and grade of the pipeline without damaging the pipe. In the event a section of pipe is damaged during the jacking operations, the pipe shall be jacked through to the exit shaft and removed. Other methods of repairing the damaged pipe may be used, subject to approval by the Engineer.

F. The Contractor shall have a redundant lubricant injection system connected for immediate use in the event the primary system fails during the microtunnel operation. Lubricant injection shall be continuous until the casing is fully installed.

G. If in the judgment of the Engineer, a portion of the installed jacking pipe requires reinforcing because of collapse, the Engineer may direct the Contractor to furnish and place such reinforcement at no additional cost to the Owner. Reinforcement may also be directed when the stability of the soil adjacent to the pipe has been affected by the loss of ground.

H. The MTBM shall apply slurry pressure at the heading to stabilize the tunnel excavation and to balance the groundwater pressure and soil pressure, where applicable. The slurry pressure shall be maintained at a level slightly in excess of normal hydrostatic pressure and measured active soil pressure and monitored continuously.

I. The machine shall be steered to maintain line and grade within the tolerance specified. This shall be achieved by continuously monitoring line, grade, machine inclination, roll

and steering attitude during the operation. As a minimum, the thrust force, slurry chamber pressure, torque, rate of advance, distance along the drive, deviation from line and grade, roll, and steering adjustments shall be monitored and recorded for each pipe section installed.

J. The lengths of some microtunneling drives may require utilization of an Intermediate Jacking Station(s). The use of intermediate jacking stations (IJS) in a specific microtunneling drive is at the discretion of the Contractor. This capacity requires the IJSs pipe jacking equipment shall be not less than 50 percent greater than the calculated maximum jacking load (including factor of safety as specified).

K. Intermediate Jacking Stations (if used) shall be provided of sufficient numbers and spacing to ensure completion of the drive and be of individual capacity compatible with the maximum safe jacking capacity of the pipe.

L. Regardless of the results of design calculations or proposed pipe installation means and methods, the Contractor will be required to have at least two (2) Intermediate Jacking Stations available on site at all times until completion of microtunneling. However, the actual number of the IJS's at the site may be higher than two (2) and shall be determined by the Contractor.

M. Perform operations so trucks and other equipment do not create dirt or other nuisance on roads and streets. Immediately remove and dispose of spillage on these surfaces.

N. Microtunneling shall be performed in a manner to prevent voids from developing outside the jacking pipe.

1. Contractor to determine appropriate annular space between the outside of the jacking pipe and the excavated ground for the ground conditions, length of the drive, and to prevent surface settlement.

2. Outside diameter of MTBM shall not exceed outside diameter of jacking pipe by more than 2 inches without approval of the Engineer.

3. All void space between the outside of the jacking pipe and excavated ground shall be filled with grout as specified herein.

4. Restrict the excavation of the materials to the least clearance necessary to prevent binding in order to avoid loss of ground and consequent settlement or possible damage to overlying structures.

5. Control advance rate and the volume of material excavated to avoid overexcavation and heave.

O. As a minimum, the thrust force, rate of advance, distance along the drive, deviation from line and grade, and steering jack adjustments shall be monitored and recorded in the Daily Activity Log at 1-foot intervals for each pipe installed.

P. In low cover areas restrict, as necessary, slurry pressures at the face of excavation to avoid migration to the surface causing a loss of pressure at the face, in the slurry pipes, and higher potential for ground heaving or subsidence.

3.09 SLURRY SPOIL TRANSPORT AND DISPOSAL

A. Use slurry spoil transportation system. Monitor slurry pressure and adjust as required to adequately balance soil and groundwater pressures. Control slurry pressure and avoid excessive pumping pressures to prevent the discharge of slurry at the ground surface. Clean-up slurry discharges immediately. Wash any paved areas with water to avoid the tracking of slurry away from the discharge area.

B. A separation plant shall be provided to remove the excavated soil/rock from the slurry for disposal and to return the slurry back to the machine. Use shakers, settlement tanks, vibrating screens, desanders, hydro-cyclones, and centrifuges as required for effective spoil removal.

C. No additional compensation shall be considered for adding chemicals to the tunnel slurry to accelerate settling. No time extension shall be considered for slurry handling and problems that are direct result of an inadequate slurry separation system for ground conditions encountered.

D. Transport and dispose of all excavated materials properly away from the construction site. Slurry and muck shall be disposed of at legal disposal facilities and proof of such disposal shall be provided to the Engineer.

3.10 VENTILATION

A. Perform all tunneling operation by methods and with equipment which will positively control dust, fumes, vapors, gases, fibers, fogs, mists and other atmospheric impurities in accordance with specified OSHA safety requirements.

B. All intermediate or booster fans required for tunnel ventilation shall be installed within the tunnel. No ventilation fans will be allowed outside of the tunnel except at the shaft sites.

C. All ventilation fans not within the tunnel shall be placed within an enclosure to limit ambient noise.

3.11 CONTROL OF LINE AND GRADE

A. Establish benchmarks and survey control points. Benchmarks and control points shall be established by a licensed surveyor registered in the Commonwealth of Kentucky.

B. Verify benchmarks prior to start of construction and report any errors or discrepancies to the Engineer.

C. When satisfied that all benchmarks are correct, use these benchmarks to furnish and maintain all reference lines and grades for tunneling. Use these lines and grades to

establish the location of the pipe using a laser guidance system. Submit to the Engineer copies of field notes used to establish all lines and grades and allow the Engineer to check laser set up prior to beginning microtunneling. The Contractor remains fully responsible for the accuracy of the work and the correction of it, as required.

D. Microtunneling shall not commence until the Contractor's surveyor has verified in writing to the Engineer that the first pipe segment is at the correct location and elevation and is oriented at the correct horizontal and vertical direction. After the first segment has been installed, the Contractor's surveyor shall again verify in writing to the Engineer that alignment is correct. If alignment is not correct at this point, or any successive point, the microtunnel operation shall be stopped and shall not resume until the Contractor has modified the microtunnel operation as required to maintain proper alignment at no additional cost to the Owner.

E. Laser shall be mounted independently from the thrust block and jacking frame to maintain the alignment of the laser. Stop microtunneling operations and reset laser, if laser alignment shifts or is moved off of design alignment and grade for any reason. Laser should only be reset, in accordance with approved procedures, and by qualified surveying personnel.

F. Monitor line and grade continuously during microtunneling operations. Record deviation with respect to design line and grade at least once per foot and include in Daily Activity Log.

G. Control line and grade of the pipe to within the specified tolerances. When the excavation is off line or grade, make the necessary corrections, and return to the plan alignment at a rate of not more than 1 inch per 25 feet.

H. If alignment or elevations exceed the specified tolerances during the microtunneling operations as indicated by survey reports, the Contractor shall report the situation to the Engineer immediately. The microtunneling operation shall be stopped and shall not resume until the Contractor has submitted a modified microtunnel operation plan to the Engineer and it has been approved by the Engineer. The modified operations shall be implemented at no additional cost to the Owner.

I. The line and grade may be checked by the Engineer and/or Owner. Provide access to allow representative to check line and grade as requested. Said checking shall not substitute for the Contractor's own line and grade control responsibilities.

3.12 OBSTRUCTIONS DURING MICROTUNNELING

A. The Contractor shall notify the Engineer immediately and in writing within 10 hours of occurrence if tunneling forward progress is halted and Contractor believes an obstruction has been encountered. The Contractor shall submit a plan to remove the obstruction for approval. The Engineer shall investigate the event and review the plan promptly.

B. Upon written authorization by the Engineer, the Contractor shall proceed with removal of the obstruction by means of an Obstruction Removal Shaft, hand mining, removal of the MTBM, or other means reviewed by the Engineer in accordance with the Contractor's reviewed submittal(s).

C. The Contractor may propose alternate methods of removing, clearing or otherwise making it possible for the MTBM to advance past obstructions, however, any such method that does not allow visual observations of the nature of the obstruction to be made will not be considered for payment.

D. Obstruction removal shafts shall be constructed and removed in accordance with Section 02222 – Excavation, or as designed by the Contractor's Engineer, and Section 02225 - Excavating, Backfilling and Compaction for Sewers.

E. The Contractor shall remove, clear or otherwise make it possible for the MTBM and jacked pipe to advance past all obstructions encountered.

F. The Contractor shall receive no additional compensation for removing, clearing or otherwise making it possible for the MTBM to advance past obstructions unless the obstructions meet the obstruction definition as specified herein.

G. If an obstruction meeting the definition provided herein is identified, Contractor shall be paid for an obstruction removal shaft and for removal or repair of MTBM as required to continue installation. If following excavation, it is determined that there is not an impediment meeting the definition of an obstruction herein, there is no payment to Contractor.

H. The Contractor shall include a unit price for Obstruction Removal Standby Time in the bid to be used, if needed, for payment for standby time while an obstruction removal shaft is excavated to determine why forward motion is stopped. See Section 00520 – Agreement for defined measurement and payment procedures for Obstruction Removal Standby Time.

I. Time required to repair or replace damaged or worn cutters, improper operation, inadequate setup, and equipment failure that is not a direct result of an obstruction shall not be included in the obstruction removal standby time.

J. Where removal of an obstruction leaves a void around the exterior of the jacking pipe, the Contractor shall be required to fill the void to the satisfaction of the Engineer, Owner and applicable agencies.

3.13 REPORTS

A. Maintain and submit daily activity reports in accordance with Article 1.06.

B. Where tunneling system utilizes an electronic data logger, set up so that the above information is recorded and can be readily identified, printed, and filed with Engineer. Identify known errors with recorded data and explain in daily log submittal.

3.14 GROUTING OF ANNULAR SPACE OUTSIDE OF JACKING PIPE

A. Promptly following completion of the microtunneling drive, pressure grout to fill all voids existing outside of the jacking pipe to prevent surface settlement due to movement of soil into void space or loosened zone around pipe.

B. Grouting shall be performed from the interior of the jacking pipe through grouting holes. Lubricant shall be displaced by the grout. Grouting shall be started in the lowest connections and shall proceed until grout begins to flow from upper connections. The void shall be completely filled. Displaced lubricant shall be disposed of off-site in accordance with applicable regulations and codes of all Federal, State, and local agencies.

C. Grout shall be in accordance with Section 02431 – Tunnel Grout.

D. Liquid grout pressure shall not exceed one-half of the existing overburden pressure.

E. After grouting is complete, pressure shall be maintained by means of stopcocks or other suitable devices until the grout has set sufficiently in the judgment of the Engineer, or for a minimum of 24 hours, whichever is longer. If the tunnel is a two-pass tunnel, then after the grout is set the grout holes shall be completely filled with dense concrete and finished neatly without evidence of voids or projections. If the tunnel is a single pass tunnel the grout holes through the jacking pipe (carrier pipe) shall be plugged in accordance with pipe manufacturer's recommendations.

3.15 INSTALLATION OF CARRIER PIPE IN TWO-PASS TUNNEL

A. If jacking pipe was installed to be a casing with a separate carrier pipe, then install carrier pipe in casing in accordance with Section 02426 – Installation of Carrier Pipe in Tunnels.

3.16 SITE AND WORK SAFETY

A. Comply with applicable regulations of Federal Government, OSHA 29 CFR 1926, and applicable criteria of ANSI A 10.16 "Safety Requirements for Tunnels, Shafts, and Caissons", as amended to date.

B. Safety is the full responsibility of the Contractor.

3.17 SITE RESTORATION

A. Site restoration shall be in accordance with the Drawings and applicable sections of these specifications.

END OF SECTION

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SECTION 02431
TUNNEL GROUT

PART 1 – GENERAL

1.01 SCOPE

A. This Section covers mix design requirements, testing, furnishing and production of grout for:

1. Grouting of annular space between initial support system/casing and excavation;

2. Grouting of annular space between carrier and initial support system/casing;

3. Grouting voids in ground resulting from caving, loss of ground or settlement;

4. Cutoff grouting after excavation for eliminating or retarding groundwater infiltration into the underground excavations;

5. Consolidation grouting at tunnel face prior to excavation to provide excavation stability for tunneling operations;

6. Permeation Grouting near the exit shaft to fill the pores in soil and voids/fractures in disintegrated rock.

B. Requirements for furnishing and installing low density cellular concrete (LDCC) are covered in Section 02432 – Low Density Cellular Concrete.

1.02 DEFINITIONS

A. Annular Backfill Grout: Fluid grout mix used to fill the annular space, including all voids, between the tunnel carrier pipe and the initial support system/casing under low-pressure.

B. Final Exterior Grouting: Grouting of the exterior of tunnel support system/casing and the unexcavated ground.

C. Ground Stabilization Grouting: Grout injected under gravity or pressure from the surface, through the initial tunnel support or at the face of the tunnel as selected and designed by the Contractor. Ground stabilization grouting includes the following:

1. Grout used to fill voids, fissures, or under-slab settlement due to caving or loss of ground.

2. Grout used to retard the flow of groundwater.

3. Grout used for consolidation prior to excavation to provide stability at tunnel face.

4. Grout used to fill pores, voids, and fractures in disintegrated rock.

D. Void Repair Grouting: Pressure grouting of the exterior of the initial tunnel support or jacking pipe for the immediate filling of voids or larger overcut space to prevent settlement during tunnel excavation.

1.03 REFERENCE STANDARDS

A. ASTM C 138. Standard Test Method for Unit Weight, Yield and Air Content (Gravimetric) of Concrete.

B. ASTM C 144. Standard Specification for Masonry Mortar. ASTM C 150. Standard Specification for Portland Cement.

C. ASTM C 494. Standard Specification for Chemical Admixtures for Concrete.

D. ASTM C 618. Standard Specification for Fly Ash and Raw or Calcinated Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete.

E. ASTM C 869. Standard Specification for Foaming Agents and in Making Preformed Foam for Cellular Concrete.

F. ASTM C 937. Standard Specification for Grout Fluidifier for Preplaced Aggregate Concrete.

G. ASTM C 939. Test Method for Flow of Grout for Preplaced Aggregate Concrete.

H. ASTM C 940. Standard Test Method for Expansion and Bleeding of Freshly Mixed Grout for Preplaced Aggregate Concrete.

I. ASTM C 942. Standard Test Method for Compressive Strength of Grout for Preplaced Aggregate Concrete into Laboratory.

J. ASTM C 953. Standard Test Method for Time of Setting of Grout for Preplaced Aggregate Concrete in the Laboratory.

K. ASTM C 1017. Standard Specification for Chemical Admixture for use in Producing Flowing Concrete.

L. U.S. Army Corps of Engineers Specification CRD C 621, Non-shrink Grout.

1.04 SUBMITTALS. THE FOLLOWING INFORMATION SHALL BE SUBMITTED IN ACCORDANCE WITH THE SUBMITTALS SECTION:

A. A grout work plan addressing all four (4) grout type applications as defined in section 1.02 of this specification, including,

1. Description of materials and grout mix.

2. Working drawings and descriptions of proposed grouting systems and methods detailing type and location of equipment and operational procedures to accomplish each grouting operation, injection points, means of accurately measuring grout pressures and volumes, venting method, flowlines, grouting sequence, schedule and limits of lift segments, and stage volumes.

B. Copies of independent laboratory test reports, including all test data certifying that the selected products will produce grouts with the characteristics and the qualities required for completion of the Work.

C. A grout mix design report, including:

1. Grout type and designation.

2. Grout mix constituents and proportions, including materials by weight and volume.

3. Grout densities and viscosities, including wet density at point of placement per ASTM C567.

4. Initial set time of grout per ASTM 403.

5. Flow per ASTM C939.

6. Bleeding, shrinkage/expansion per ASTM C827 and CRD-C621.

7. Compressive strength per ASTM 495.

D. Logs of grouting operations indicating pressure, density, and volume for each grout placement.

E. The carrier pipe manufacturer's maximum allowable pressure that can be applied during backfilling accounting for grout density (unit weight) and volume of annular space (difference in outside diameter of carrier pipe and inside diameter of initial tunnel lining). Grouting pressure calculations showing grout pressure during annular space grouting will not exceed the carrier pipe manufacturer's recommendations for allowable grouting pressure and safety factor for each lift.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Grouting Materials: Conform to this section or Section 02432 - Low Density Cellular Concrete (LDCC), except as modified in the following paragraphs.

B. Grout Type Applications.

1. Grout for Annular Backfill Grouting. Standard sand-cement mix, structural sand-cement mix or LDCC for all carrier pipe installations. See Specification Section 02426 – Installation of Carrier Pipe in Tunnel.

2. Ground Stabilization. Standard sand-cement mix or structural sand-cement mix.

3. Final Exterior Grouting: Structural sand-cement mix.

4. Void Repair Grouting: Bentonite slurry or bentonite-cement mix.

C. Do not include toxic or poisonous substances in the grout mix or otherwise inject such substances underground.

2.02 GROUT

A. Employ and pay for a commercial testing laboratory, acceptable to Engineer, to prepare and test the grout mix design. Develop one or more mixes based on the following criteria as applicable:

1. Size of the annular void between final lining and initial support, or size of the void between initial support and the surrounding soil.

2. Absence or presence of groundwater.

3. Adequate retardation.

4. Non-shrink characteristics.

5. Pumping distances.

B. Prepare mixes that satisfy the required application. Materials used in sand-cement grout mixes shall meet the following standards:

1. Cement: ASTM C 150, Type II.

2. Fly Ash: ASTM C 618.

3. Water: Potable.

4. Slurry: ASTM C 138.

5. Sand for sand-cement mortar mix: ASTM C 144.

C. Prepare mixes that satisfy the required application. Materials used in bentonite-cement grout mix shall meet the following standards:

1. Cement: ASTM C 150, Type II.

2. Fly Ash: ASTM C 618.

3. Water: Potable.

4. Slurry: ASTM C 138.

5. Easy-to-mix, finely ground (200-mesh), premium-grade, high-yielding Wyoming sodium bentonite.

D. Provide grout that meets the following minimum requirements:

1. Standard sand-cement mortar grout and bentonite-cement mortar grout shall have minimum compressive strength (ASTM C495) of 100 psi, attained within 3 days, and sufficiently flowable to inject through lining and fill voids, with prompt setting to control grout flow and carrier pipe buoyancy. Wet density (unit weight) at placement shall be minimum 75 pcf.

2. Standard sand-cement mortar grout and bentonite-cement mortar grout shall have minimum compressive strength (ASTM C495) of 200 psi, attained within 28 days.

3. Structural sand-cement mortar grout shall have minimum 28-day unconfined compressive strength of 1,000 psi.

4. Laboratory Determine strength by ASTM C 942.

E. Fluidifier. Use a fluidifier, meeting ASTM C 937, which holds the solid constituents of the grout in colloidal suspension and is compatible with the cement and water used in the grouting operations.

F. Admixtures.

1. Use admixtures meeting ASTM C 494 and ASTM C 1017 as required, to improve pumpability, to control time of set, to hold sand in suspension and to reduce segregation and bleeding.

2. Do not use admixtures that promote steel corrosion.

3. Ensure that admixtures used in a mix are compatible. Provide written confirmation from the admixture manufacturers of their compatibility.

2.03 QUALITY ASSURANCE

A. Pipe Manufacturer Representative. Refer to Section 02426 – Installation of Carrier Pipe in Tunnel for pipe manufacturer field services employee requirements during annular backfill grouting.

PART 3 – EXECUTION

3.01 PREPARATION

A. Notify Engineer at least 24 hours in advance of grouting operations.

B. Select and operate grouting equipment to avoid damage to new or existing underground utilities and structures.

C. In selection of grouting placement consider pipe flotation, length of pipe, length of tunnel, depth from surface, type of final lining, type of pipe blocking and bulkheading, grout volume and length of pipe to be grouted between bu kheads.

D. Operate any dewatering systems until the grouting operations are complete.

3.02 EQUIPMENT

A. Batch and mix grout in equipment of sufficient size and capacity to provide the necessary quality and quantity of grout for each placement stage.

B. Use equipment for grouting of a type and size generally used for the work, capable of mixing grout to a homogeneous consistency, and providing means of accurately measuring grout component quantities and accurately measuring pumping pressures. Use pressure grout equipment which delivers grout to the injection point at a steady pressure.

3.03 GROUND STABILIZATION GROUTING

A. General

1. Ground stabilization grouting operations shall be carried out in accordance with approved shop drawings for each type of grout employed.

2. Carry out all hole washing, pressure testing, and grout injection operations in the presence of the Engineer.

3. Contractor shall modify the grout mixes as necessary to meet the characteristics of each hole.

4. All sanded grout mixtures shall contain a fluidifier, as required.

B. Materials Storage.

1. Furnish in undamaged, moisture proof sacks or other containers bearing manufacturer's label.

2. Store adequate supply at site to prevent delays.

3. Protect and keep dry, observing all manufacturer's recommendations.

4. Cement. Use 100 mesh screen to remove any cement lumps or other deleterious materials, if found in the cement.

5. Fluidifier. Reject material which has become hard due to moisture absorption.

C. Equipment

1. Drilling Equipment.

   a. Use rotary and/or percussion drilling equipment.

   b. Dry drilling shall not be permitted.

2. Grouting Equipment – General.

   a. Designed for mixing and injecting grout, maintained in satisfactory operating condition at all times, and capable of satisfactorily mixing and agitating the grout and forcing it into the grout holes in a uniform flow and at a constant pressure.

   b. The grouting equipment shall be on hand and in working order prior to start of tunnel and shaft excavation

   c. Clean equipment and tanks by constant recirculation of grout and by periodic flushing with water.

   d. Pipe system designed so that water flushing can be accomplished by closing grout injection valve, opening water supply valve and running grout pump at full speeds.

   e. Depending on type of grouting operation, the grouting equipment and fittings shall be capable of, and furnished with, sufficient fittings to simultaneously grout up to five (5) grout connections.

D. Pipes and Fittings.

1. Provide 1- 1/2 inch or larger grout pipe.

2. Embed pipes in the rock surface, and/or concrete bulkheads for consolidation grouting connections and/or air vents.

3. Set the inner end of pipes not less than two inches back from the finished inside surface.

4. Set the grout pipes so that grout can flow freely to the voids and crevices.

5. For Final Exterior Grouting clean out the grout ports installed in the tunnel pipes by drilling through the pipe ports and two inches into unexcavated rock.

6. Provide suitable stop valve at collar of hole for use in maintaining pressure required until grout has set.

E. Mixers and Agitators.

1. Provide mixer with transfer pump for transferring grout to agitator holding tank.

2. Deliver grout to injection point at a steady pressure without pulsation, using a grout pump at agitator tank.

3. Provide sufficient tank capacity to insure an uninterrupted supply of slurry to grout pump.

4. Provide means to increase or decrease water-cement ratio.

5. Equip water supply connection with accurate meter.

F. Grout Hose and Connections

1. Provide 1- 1/2 inch or larger grout hose capable of withstanding maximum anticipated water and grout pressures.

2. Make connections so as to prevent leakage.

3. Remove plugs on ends of grout holes or pipes to permit escape of air and water and the filling of spaces with grout.

4. At point of injection, provide suitable valves and accurate pressure gages so that pressure and grout flow at grout hole may be monitored and regulated by increasing or decreasing the flow in the grout return line.

5. Provide shutoff valve and flow-regulating diaphragm valve at each connection.

G. Pressure Gauges.

1. Provide one (1) at each point of injection on the manifold.

2. Provide one (1) at the grout pump.

3. Provide each gauge with seal preventing grout from entering gage.

4. Select gauge range so that maximum operating pressure is about two-thirds maximum capacity.

5. Do not grout without appropriate gauges in place and in working order.

6. Provide calibrated check gauge and check operating gages

H. Voids

1. Completely fill voids outside the limits of excavation caused by collapse of ground or in areas indicated in the Drawings. Fill with gravity or pressure injected standard sand-cement grout as necessary to fill the void.

   a. Take care in grouting operations to prevent damage to adjacent utilities or public or private property. Grout at a pressure that will not distort or imperil any portion of the work or existing installations or structures.

   b. Verify that the void has been filled by volumetric comparisons and visual inspection. In the case of settlement under existing slabs, take cores as directed by Engineer, at no additional cost to Owner, to demonstrate that the void has been filled.

3.04 VOID REPAIR GROUTING

A. Immediately upon discovery of a void or void(s) outside the limits of excavation caused by over excavation, overbreak, boulder or obstruction removal, an existing void, or collapse of ground, contractor shall stop tunnel excavation activities and backfill void space to prevent enlargement of void space and potential for surface settlement. Pump bentonite slurry or bentonite-cement mix to temporarily fill void until completing installation of initial tunnel support. Upon completion of installation of initial tunnel support fill the voids in accordance with final exterior grouting requirements below.

3.05 FINAL EXTERIOR GROUTING

A. Pump structural grout to grout the annular space between initial tunnel support and excavation. The schedule for installing and methodology for installing this grout and will be in accordance with Section 02425 – Initial Tunnel Support.

3.06 ANNULAR BACKFILL GROUTING FOR RIBS AND LAGGING

A. Fill the annular space between the carrier pipe and the tunnel initial support or jacking pipe with grout as defined herein.

B. Placement

1. Placement Limits: The limits of each grout placement stage shall be predetermined by the size and capacity of the batching equipment and the initial set time of the proposed grout. Under no circumstances shall placement continue at an injection point longer than that period of time for the mix to take initial set. Grout hole spacing, and locations shall be located according to the number of stages necessary to complete the grouting process. A stage or lift cannot be installed on another lift until a proper set has been attained. Placement procedures shall be approved by the admixture or additive manufacturer and submitted in writing to the Engineer.

2. Limit pressure on the annular space to prevent damage or distortion to the carrier pipe or initial support. Define the limiting and estimated required pressure range. Provide an open ended, high point tap or equivalent vent and monitor it at the bulkhead opposite to the point of grouting.

3. Pump grout until the material discharging is similar in consistency to that at point of injection.

4. Length of carrier pipe installed between grouting shall not exceed the annular backfill grouting maximum reach (lift segment) requirements in Specification Section 02426 – Installation of Carrier Pipe in Tunnel unless Contractor can clearly demonstrate that placement beyond these lengths can be accomplished with complete backfill of the annulus (no voids), no pressure damage to the carrier pipe and no thermal damage to the carrier pipe. Repeat this cycle until all carrier pipe is installed and grouted.

C. Protection and Clean Up

1. Take all necessary precautions to protect and preserve the interior of the carrier pipe from damage. Spills shall be minimized and shall be cleaned up immediately. Any damage to the pipe caused by or occurring during the backfilling operations shall be repaired by a method approved by the Engineer, at no additional cost to the Owner.

2. During backfill grouting work, provide for adequate disposal of all waste and wastewater. Remove and properly dispose of all waste resulting from backfill grouting operations.

3.07 STRUCTURAL GROUTING

A. Completely fill voids or structures as indicated on the Drawings. Fill with gravity or pressure injected structural sand-cement grout as necessary to fill the void.

B. Take care in grouting operations to prevent damage to adjacent utilities or public or private property. Grout at a pressure that will not distort or imperil any portion of the work or existing installation or structures.

C. Verify that the void or structure has been filled by volumetric comparisons and visual inspection.

3.08 FIELD QUALITY CONTROL

A. General. Field control tests, including unit weight (wet density), and compression tests shall be performed by the Contractor and the results submitted to the Engineer.

1. The frequency specified herein for each field control test is approximate. A greater or lesser number of tests may be made, as required by the Engineer.

2. Test specimens shall be collected within the tunnel at or near the connection where the grout is being injected.

3. The Contractor shall assist the Engineer in obtaining test cylinders. Supply all materials necessary for obtaining the test cylinders, including cylinder molds.

4. Monitor carrier pipe temperature for one week after grout placement no less than once per day. Submit temperature readings for the entire period to the Engineer.

B. Unit Weight. Unit weight (wet density) tests shall be made from the first batch mixed each day, after a change in mix design, every 30 minutes during pumping, and from each batch of grout from which compression test cylinders are made. Unit weight shall be determined in accordance with ASTM C 567. Unit weight at the point of placement shall be within plus or minus 5 percent of the unit weight established for the mix design being placed. Adjust mix as required to obtain the specified wet density.

C. Compression test cylinders shall be made in the field, cured and stored in the laboratory, and tested in accordance with ASTM C 495.

D. Each set of compression test cylinders shall be marked or tagged with the date and time of day the cylinders were made, the location (station) in the work where the grout represented by the cylinder was placed, batch number, and unit weight (wet density).

E. Each set of test cylinders shall consist of six (6) cylinders. Two cylinders from each set will be tested at an age of 3 days, two cylinders from each set will be tested at an age of 28 days and two cylinders from each set shall be kept as spares in case further testing is required.

F. Compressive strength of grout shall be considered satisfactory if both of the following requirements are met:

1. Average of three consecutive compressive strength tests equal or exceed the specified unconfined compressive strength. (A strength test shall be the average of two compressive strengths of two cylinders made from the same concrete sample and tested at the age specified.)

2. No individual compressive strength test (average of the two cylinders) is below the specified unconfined compressive strength by more than 20 percent.

G. Contractor to provide testing of grout as follows:

1. Annular Grouting for final lining in Tunnels or Tunnel Casings.

a. Make one set of six (6) compressive test specimens for every 100 cubic yards of grout installed in two-pass tunnel.

2. Ground Stabilization Grouting.

a. Make one set of four (4) compressive test specimens for every 100 cubic yards where ground stabilization grouting is performed.

3. Structural Grouting

a. Make one set of four (4) compressive test specimens for every 100 cubic yards where ground stabilization grouting is performed.

END OF SECTION

SECTION 02432
LOW DENSITY CELLULAR CONCRETE

PART 1 – GENERAL

1.01 SCOPE

A. This section includes filling the annular space and any voids outside the carrier pipe installed in the tunnels utilizing ribs and lagging, with low density cellular concrete (LDCC). In the event of conflicts with Section 02431 – Tunnel Grout, this specification takes precedence.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02426 – Installation of Carrier Pipe in Tunnels

B. Section 02431 - Tunnel Grout

1.03 DEFINITIONS

A. Low Density Cellular Concrete (LDCC). A lightweight cementitious material that contains stable air or gas cells uniformly distributed throughout the mixture of a volume percentage greater than 20 percent.

B. Annular Backfill Grouting. Grout used to fill the annular space between the tunnel carrier pipe and the initial support system/casing.

C. Foamed Density. The Foamed Density for this specification section shall mean the final low density mixture (unit weight) of the in-place LDCC which includes the combined mixed volume of wet concrete slurry and the added foaming agent.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS.

A. American Concrete Institute (ACI):

1. ACI 523.1 R, Guide for Cast-in-Place Low Density Concrete.

2. ACI 523.3R, Guide for Cellular Concretes above 50 pcf, and for Aggregate Concretes above 50 pcf with Compressive Strengths Less than 2500 psi.

B. American Society for Testing and Materials (ASTM):

1. ASTM C 94, Specification for Ready-Mixed Concrete.

2. ASTM C 138, Standard Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete.

3. ASTM C 150, Specifications for Portland Cement.

4. ASTM C 495, Standard Test Method for Compressive Strength of Lightweight Insulating Concrete.

5. ASTM C 567, Standard Test Method for Unit Weight of Structural Lightweight Concrete.

6. ASTM C 618, Specifications for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.

7. ASTM C 796, Standard Method of Testing Foaming Agents for Use in Producing Cellular Concrete Using Preformed Foam.

8. ASTM C 869, Standard Specification for Foaming Agents Used in Making Preformed Foam for Cellular Concrete.

1.05 SUBMITTALS

A. The following shall be submitted in accordance with Section 01300 - Submittals.

1. Quality Control. Submit qualifications of Contractor/Subcontractor, personnel, and manufacturer in accordance with the requirements of this section.

2. Qualifications. The Contractor or Subcontractor supplying and placing LDCC shall be capable of developing a mix design, and batching, mixing, handling and placing low density cellular concrete under tunnel conditions; shall have furnished and placed low density cellular concrete on at least four (4) tunnels within the last eight (8) years of the general type and the size specified herein and have been in successful operation; and shall have a record of experience and quality of work using low density cellular concrete that is satisfactory to the Engineer. Provide written evidence of these qualification requirements including project name, location, owner's name and contact information.

3. Personnel Qualifications. Workers, including the LDCC Contractor's superintendent and foreman, shall be fully qualified to perform the work. The LDCC Contractor's superintendent shall have previous experience under similar ground and tunnel conditions consisting of at least four (4) completed tunnels. At the discretion of the Engineer, placement of the LDCC shall be performed under the supervision of the foaming agent supplier's representative.

4. Product Data. Mix designs for each cellular concrete mix proposed for use. Each mix design shall show the ingredients of the mix and shall include:

   a. Type, brand, source, and amounts of cement, pozzolans, admixtures, and other additives.

   b. Source and amount of water.

c. Representative samples of materials for materials testing and mix proportion testing.

d. Combined grading of each mix design.

e. Specific gravity of all materials.

f. Results of required tests.

g. A certificate of compliance signed by the supplier identifying the type of fly ash and stating that the fly ash is in accordance with ASTM C 618 and these specifications. Supporting test data shall be furnished when requested by the Engineer. All testing and sampling procedures shall be in accordance with ASTM C 311.

h. Water: Use potable water. Verify with foaming agent supplier that water supplied contains no substance deleterious to the foaming agent.

i. Concrete Admixtures: Material specifications and instructions for use.

j. Air content, unit weight, and compressive strength test results for proposed mix design.

5. Equipment and associated manufacturer's specifications and operation instructions for equipment.

   a. Pumps.

   b. Foam generators and ancillary equipment.

6. Work Plan. The work plan for placing low density cellular concrete including sequence of work, type(s) of equipment, location of equipment, placing procedures, (i.e., batching, mixing, and pumping procedures), pumpline arrangement (including moving and breaking), intermediate and end bulkhead details, communications provisions, methods for monitoring mix, testing procedures, and cleanup procedures. The work plan shall include pumping pressures, pumping rates, volumes to be placed per day, injection locations, valving at injection locations to facilitate testing, method for monitoring carrier pipe temperature, and sequence of placement and pumping.

7. Test Reports and Certifications

   a. Mill test reports for cement.

   b. Certificates of compliance for each load of cement and pozzolan.

   c. Certificates of compliance for all admixtures.

d. A delivery ticket with the information stated in section 16 of ASTM C 94; excepting actual scale weights of materials shall be furnished to the Engineer with each batch of concrete before unloading at the site.

e. A printout of the actual scale weights for all loads batched shall be submitted to the Engineer at the end of each working day.

f. Daily reports and records of LDCC placement, including but not limited to, volumes placed, stationing of placement, injection locations, pressures, unit weight and air content testing results, time of placement, and designation of cylinder samples prepared that day.

g. Test reports indicating the results of compressive strength tests from a certified testing laboratory.

8. Provide grouting pressure calculations showing grout pressure during annular space grouting will not exceed the carrier pipe manufacturer's recommendations for allowable grouting pressure and safety factor for each lift segment. Annular volume, grade, length of lift segment, carrier pipe material, groundwater pressure, and subsurface conditions outside the initial tunnel lining shall be accounted for in submitted calculations.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Cement. Portland Cement, ASTM C 150, Type I or 11.

B. Water. Use potable water free from deleterious amounts of alkali, acid, and organic materials which would adversely affect the setting time or strength of the LDCC.

C. Admixtures. Admixtures may only be used when specifically approved by foaming agent supplier in writing.

D. Foaming Agent. Foaming agent shall comply with ASTM C 869 when tested in accordance with ASTM C 796.

E. ype and Manufacturer. Aerlite, Aerlite iX, or Mearl Geofoam Liquid Concentrate manufactured by Aerix Industries, Golden, CO, Foam Liquid Concentrate manufactured by Cellufoam Concrete Systems, Rheocell 30 manufactured by BASF Construction Chemicals, LLC of Cleveland, OH, or Elastizell EF by Elastizell Corporation of America of Ann Arbor, MI or approved equal.

F. Fly ash. Type F.

2.02 MIX DESIGN

A. General. Low density cellular concrete mix shall be designed in accordance with the requirements of ACI 523.1R, ACI 523.3R and the additional requirements specified herein. Mixes shall be adjusted in the field as necessary to meet the requirements of these specifications. The foaming agent material manufacturer's field services representative shall approve all changes to the mix designs.

B. Minimum 28-day compressive strength (ASTM C495): 200 psi. Minimum 56-day compressive strength (ASTM C495): 250 psi.

C. Limiting Requirements. Each LDCC mix shall be designed and controlled for the purposes of filling all annular voids, displacing water, and within the following limits unless otherwise specified:

1. Foamed Density (unit weight) of the LDCC shall be not less than 80 pcf, plus or minus 5 pcf, at the point of placement, unless a higher density is required to achieve strength requirements.

2. Only Type F flyash will be permitted. Flyash/cement ratios shall not exceed 1.0 by weight.

D. Preformed Foam. Preformed foam shall be generated by combining controlled quantities of air, water, and foaming agent under pressure. Foam shall retain its stability until the cement sets to form a self-supporting matrix. The resulting LDCC shall have essentially closed cell and low water absorptive characteristics. The concentration of foam agent shall be in accordance with the foaming agent material manufacturer's recommendations.

1. Admixtures: The admixture content, batching method, and time of introduction to the mix shall be in accordance with the manufacturer's recommendations for minimum shrinkage and for compliance with these specifications. Admixtures may be used when specifically approved by foaming agent material manufacturer and shall be in accordance with their recommendations. No calcium chloride or admixture containing chloride, other than impurities from admixture ingredients, will be acceptable.

2. A test mix shall be designed and tested in accordance with ASTM C 796 for each consistency intended for use. These results will be compared with field test results to confirm consistent properties are obtained in the field. Testing for each mix shall be as follows:

a. Two sets of compression test cylinders (3 inches by 6 inches), three cylinders per set, shall be made from each proposed LDCC mix.

b. One set of three cylinders shall be tested at an age of 7 days and the other set shall be tested at an age of 28 days. LDCC test specimens shall be made, cured, stored, and tested in conformity with ASTM C 495.

c. Determine total air content of each proposed LDCC mix in accordance with ASTM C 796.

d. Determine unit weight of each proposed LDCC mix in accordance with ASTM C 567.

2.03 EQUIPMENT

A. Use equipment for mixing and injecting LDCC which is designed for underground backfill grouting service. Provide batching, mixing and pumping equipment that is compatible and of sufficient size and capacity to place LDCC to distances and volumes proposed by the Contractor.

B. LDCC shall be made using preformed foam process equipment approved by the foaming agent material manufacturer.

C. Maintain equipment in good operating condition, capable of satisfactorily mixing, agitating, and forcing LDCC backfill into injection ports at a uniform flow rate under the required constant pressure.

D. Backfill grouting equipment shall be configured so flushing can be accomplished with grout intake valves closed, with water supply valve open, and with grout pump running at full speed.

E. An adequate inventory of spare parts or backup equipment shall be provided to ensure that operable backfill grouting equipment is available at all times during the work. Maintain sufficient quantities of spare pressure gauges, stop valves, and other wear parts on site.

F. Batch system shall provide graphical or digital printout records of batch scale readings, accurate to one (1) pound, of the dry mix ingredients before delivery to mixer.

G. At the point of injection, suitable valves and calibrated pressure gauges shall be provided so that the pressure and grout flow at the grout hole may be regulated and monitored. Provide at or very near the point of injection, a system of valves in the line transporting the grout that will allow easy access for collection of test specimens. Provide an automatic bypass valve set to the maximum pressure specified. Provide suitable stop valves at the injection point for use in maintaining pressure, as required, until grout has set. Use hoses or pipes of proper type and diameter to withstand maximum injection pressures used.

2.04 QUALITY ASSURANCE

A. Field Services. The foaming agent material manufacturer shall provide engineering field services to review the project and the material application prior to any preparation; to approve the applicator, the material used, the equipment, and the procedure to be used; to approve setup before production of LDCC; and to observe during initial application. The field representative of the material manufacturer shall submit, in writing, approvals of proposed material, equipment, application procedures, applicator, and setup before production.

B. Pipe Manufacturer Representative. Refer to Section 02426 – Installation of Carrier Pipe in Tunnel for pipe manufacturer field services employee requirements during annular backfill grouting.

PART 3 – EXECUTION

3.01 GENERAL

A. Low density cellular concrete shall be placed in accordance with the approved work plan.

B. Bulkheads shall be constructed at the end of each reach of pipe (lift segment) to be backfilled.

1. Bulkheads shall be constructed so the annular space will be completely backfill grouted.

2. Bulkheads shall incorporate a minimum 1-inch diameter drain pipe in the invert of the tunnel and invert of each grout lift to facilitate drainage of water during backfill grouting. This pipe shall be securely capped and plugged once LDCC backfill begins to flow from the drain line.

3. A minimum 1-inch diameter vent pipe shall be provided in the tunnel crown to allow entrapped air to escape and allow for visual confirmation that the annular space is filled. Vent outlets shall be provided where required by the contractor's bulkhead design.

C. Inform the Engineer at least 24 hours in advance of the times and locations where placement of LDCC is anticipated.

3.02 BATCHING AND MIXING

A. General. Conform to the requirements of accepted submittals and the foaming agent manufacturer's recommendations.

B. Mixing. All LDCC shall be mechanically mixed to produce a uniform distribution of the materials with a suitable consistency and the specified limiting requirements. Excessive

mixing shall be avoided in order to reduce the possibility of changes in unit weight and consistency.

1. In batch mixing operations, follow the manufacturer's recommendations concerning the order of charging the mixer with the various ingredients. The as-cast unit weight shall be monitored at the point of placement. Allowance should be made for any additional mixing that may result from the method of placement, such as mechanical or pneumatic pumping, and for any unit weight changes that may result from these methods.

2. For continuous mixing operations, provision shall be made for reasonably uniform and continuous rate of addition of all mix components at appropriate positions in the mixing machine, and in the correct ratio, to assure uniformity and the specified limiting requirements at the point of placement.

3.03 PLACING LDCC

A. General Requirements. All void space outside of the carrier pipe shall be completely filled with low density cellular concrete. Force LDCC into all irregularities around the tunnel to completely fill the tunnel annulus to the crown with low density cellular concrete to the maximum extent possible. Place LDCC in accordance with approved submittals.

B. Monolithic pours shall only be permitted if the carrier pipe is completely filled with water and Contractor can demonstrate that his placement techniques will not induce movement of the pipe.

C. If Contractor elects to not fill carrier pipe with water, Contractor shall place LDCC in three or more equal volume lifts.

D. Contractor shall submit calculations demonstrating that his method of placement shall not cause the carrier pipe temperature to exceed the maximum allowable temperature as designated by the pipe manufacturer from the heat of hydration of the LDCC.

E. Before installing carrier pipe in sections of tunnel that require structural sand-cement mortar grout for annular backfill, installation of upstream or downstream carrier pipe shall be temporarily suspended; a bulkhead shall be constructed, and the annulus backfilled with LDCC.

F. Similarly, when pipe installation is completed in a section of tunnel requiring structural sand-cement mortar grout in the annulus; installation of pipe shall be temporarily suspended; a bulkhead shall be constructed, and the annulus backfilled with the required material.

G. Length of carrier pipe installed between LDCC pours shall not exceed the annular backfill grouting maximum reach (lift segment) requirements in Specification Section 02426 – Installation of Carrier Pipe in Tunnel unless Contractor can clearly demonstrate that placement beyond these lengths can be accomplished with complete backfill of the

annulus (no voids), no pressure damage to the carrier pipe and no thermal damage to the carrier pipe. Repeat this cycle until all carrier pipe is installed and grouted.

H. Pressure gauges of appropriate range for monitoring the low density cellular concrete injection pressures shall be located in the line transporting the LDCC as close to the point of injection as possible.

I. Volume of LDCC injected shall be calculated on an indirect basis and compared with the anticipated volume per foot of pipe backfilled.

J. Provide a means of direct communication between the injection point and the pump operator.

3.04 FIELD QUALITY CONTROL

A. General. Field control tests, including unit weight (Foamed Density), air content test, and compression tests shall be performed by the Contractor and the results submitted to the Engineer.

1. The frequency specified herein for each field control test is approximate. A greater or lesser number of tests may be made, as required by the Engineer.

2. Test specimens shall be collected within the tunnel at or near the connection where the LDCC is being injected.

3. The Contractor shall assist the Engineer in obtaining test cylinders. Supply all materials necessary for obtaining the test cylinders, including cylinder molds.

4. Monitor carrier pipe temperature for one week after LDCC placement no less than once per day. Submit temperature readings for the entire period to the Engineer.

B. Unit Weight. Unit weight (Foamed Density) tests shall be made from the first batch mixed each day, after a change in mix design, every 30 minutes during pumping, and from each batch of LDCC from which compression test cylinders are made. Unit weight shall be determined in accordance with ASTM C 567. Unit weight at the point of placement shall be within plus or minus 5 percent of the unit weight established for the mix design being placed. Adjust mix as required to obtain the specified Foamed Density.

C. Air Content. An air content test shall be made from the first batch mixed each day, and from each batch of LDCC from which concrete compression test cylinders are made. Air content at the point of placement will be the difference between the Foamed Density at the point of placement less the Foamed Density at the point immediately before the addition of preformed foam. Air content shall be determined in accordance with ASTM C 138 except there will be no vibration or rodding of the sample.

D. Compression test cylinders shall be made in the field, cured and stored in the laboratory, and tested in accordance with ASTM C 495. One set of six (6) test cylinders (3 inches by 6 inches) shall be made for each shift when LDCC is placed. Each set of compression

test cylinders shall be marked or tagged with the date and time of day the cylinders were made, the location in the work where the LDCC represented by the cylinder was placed, batch number, unit weight (Foamed Density), and the air content. One additional set shall be made from each additional 200 cubic yards, or major fraction thereof, placed in any one shift. Two cylinders from each set will be tested at an age of 28 days and two cylinders from each set will be tested at an age of 56 days.

E. Compressive strength of LDCC shall be considered satisfactory if both of the following requirements are met:

1. Average of three consecutive compressive strength tests equal or exceed the specified unconfined compressive strength. (A strength test shall be the average of two compressive strengths of two cylinders made from the same concrete sample and tested at 28 days.)

2. No individual compressive strength test (average of the two cylinders) is below the specified unconfined compressive strength by more than 20 percent.

3.05 PROTECTION AND CLEAN UP

A. Take all necessary precautions to protect and preserve the interior of the pipe from damage. Spills shall be minimized and shall be cleaned up immediately. Any damage to the pipe caused by or occurring during the backfilling operations shall be repaired by a method approved by the Engineer, at no additional cost to the Owner.

B. During backfilling work, provide for adequate disposal of all waste and wastewater. Remove and properly dispose of all waste resulting from backfill grouting operations.

END OF SECTION

SECTION 02442

TUNNELING BY TUNNEL BORING MACHINE (TBM)

PART 1 – GENERAL

1.01 SCOPE

A. The work described by this Section consists of furnishing all labor, materials, equipment and supplies as required to install the initial tunnel support using tunnel boring machine (TBM) methods as shown and where allowed on the Drawings and specified herein. Initial tunnel support shall be as listed in the Tunneling Method Table in Project Specific Notes (PSN). Placement of the carrier pipe inside the tunnel shall be in accordance with Section 02426 – Installation of Carrier Pipe in Tunnels.

B. Work shall be done in strict accordance with the Contract Documents, and in accordance with all Federal, State and local laws, regulations, and requirements.

C. All available and known geotechnical reports, logs, borings, and laboratory testing performed within close proximity of the project corridor have been made available as "technical data" and are not part of the Contract Documents. This is provided as information only and solely for the convenience of Bidders. The Owner and/or the Engineer do not warrant or guarantee the accuracy or correctness of this material with respect to actual subsurface conditions. Subsurface conditions are considered unclassified and no expectation of quantity, specific location of ground conditions, or geotechnical baselines are provided or assumed herein.

D. For all excavations defined under this Section, Contractor shall install initial tunnel support using techniques and methods selected by the Contractor that are appropriate for prevailing ground conditions. Contractor shall review all available geotechnical reports and data and perform any additional subsurface investigations he deems necessary at his own expense for the planning and the selection of tunneling techniques and methods in order to enable proper construction as shown on the Drawings and other requirements of Contract Documents.

E. Tunneling installation techniques and methods of construction shall include all equipment, all associated support systems and their operation, cutting face tooling and sizing, face access capabilities, and initial tunnel support materials best suited for ground conditions, as required to maintain face stability, reduce wear, advance heading within line and grade tolerances, transport spoils, and accomplish productivity assumed in Bid.

F. The minimum dimensions of the cross section of the tunnel excavation shall be determined by the Contractor based on the following:

1. the construction requirements for final installation of the carrier pipe,

2. minimum size limitations of the annular space as required for installation and to meet line and grade tolerances,

3. the minimum outside diameter of the tunnel lining or casing indicated on the Contract Drawings, and

4. any right of way, encroachment, or occupancy requirements and specifications of governing permitting agencies such as the Kentucky Transportation Cabinet (KYTC).

G. Contractor may increase initial support size, at no additional cost to the Owner, if he deems it necessary to provide additional internal tolerance to account for all project site and subsurface conditions and his selection of construction methods and operational procedures. If Contractor elects to modify initial support size from size shown in the Contract Documents, the Contractor accepts all responsibility for acquiring approval for any modification or addenda to all right-of-way encroachment agreements, occupancy permits, or other established requirements and specifications of the entity being crossed.

H. As required, tunnel enlargements made for construction purposes shall be fully supported during the excavation of the tunnel and the annular space backfilled at no additional cost to the Owner.

I. Where warranted in the experience of the Contractor or where identified on the Drawings, Ground Modification shall be provided as part of the appropriate preparation for tunneling activities to reduce risk of surface settlement and heaving, protect nearby structures and utilities, and successfully install the piping system within line and grade tolerance. Contractor shall design and include in his Bid the furnishing of all labor, equipment, materials, and supplies necessary for ground stabilization by jet grouting, compaction grouting, void filling, soil mixing, slurry walls or other ground modification technologies to meet project objectives specified herein.

J. All dewatering shall be the responsibility of the Contractor and shall be controlled such that the launching and exit shafts are free of water to the extent required to complete the tunnel.

K. The Contractor shall furnish all labor, equipment, and material required to complete the work by TBM including but not limited to the following:

1. Tunnel boring machine system and all related accessories.

2. Initial tunnel support system and all related components.

3. Spoil transportation, removal and disposal.

4. Safety and security.

5. Hoisting and lifting.

6. Control equipment and required power.

7. Launching shaft and exit shaft construction including, but not limited to, rehandling and disposal of unsuitable and excess materials, control of groundwater and surface water, utility adjustment/supports, tests, excavation, sheeting and shoring, pit/shaft wall thrust blocking, backfilling, cleanup, and restoration of surface features, and all other work necessary for construction as specified and/or shown on the Drawings.

L. Follow all OSHA regulations regarding tunnel construction including but not limited to OSHA 29 CFR Part 1926. Obtain all permits required associated with OSHA regulations and requirements for confined space entry.

M. Conform with all requirements of the Kentucky Transportation Cabinet (KYTC) for work within their rights-of-way. When the requirements are in conflict, the ones that are more stringent shall take precedence.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02222 – Excavation

B. Section 02225 – Excavation, Backfilling and Compaction for Sewers

C. Section 02425 – Initial Tunnel Support

D. Section 02426 – Installation of Carrier Pipe in Tunnels

E. Section 02431 – Tunnel Grout

F. Section 02432 – Low Density Cellular Concrete

G. Tunneling Method Table in Project Specific Notes (PSN)

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. Applicable codes, ordinances, statutes and governing rules and regulations of governing municipalities and counties, the Commonwealth of Kentucky, and the Federal Government.

2. American Association of State Highway and Transportation Officials (AASHTO).

3. American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering.

4. Occupational Safety and Health Administration (OSHA) Regulations and Standards for Underground Construction 29 CFR Part 1926, subpart S and other applicable OSHA parts.

5. Applicable ASTM and AWWA Standards for materials and methods.

6. Kentucky Transportation Cabinet (KYTC) Permit Guidance Manual

7. All applicable guidelines and restrictions of the United States Army Corps of Engineers (USACE) and Department of Environmental Protection (DEP).

1.04 DEFINITIONS

A. Unless otherwise stated or particular context otherwise requires, the definitions and provisions contained in this section shall govern the construction, meaning and application of words and phrases utilized in this specification. For purposes of this specification, the following terms are defined as follows:

1. Annular Space: The void created between the outside of the initial support system being installed and the extreme outer excavation limits created by TBM. Also, the void space between the initial support and the carrier pipe when a two-pass tunnel is installed.

2. Carrier Pipe: A pipe used for conveyance of water or sewer. The pipe shall be as specified in the Tunneling Method Table in Project Specific Notes (PSN).

3. Drive: Section of initial support system installed by tunneling from launching shaft to exit shaft.

4. Exit Shaft or Retrieval Shaft: Shaft utilized for retrieval of tunneling equipment.

5. Ground Modification: soil stabilization by jet grouting, compaction grouting, void filling, soil mixing, slurry walls or other ground stabilization technologies to meet project objectives specified herein.

6. Initial Support: The first tunnel support installed by Contractor in a two-pass tunneling method.

7. Launching Shaft or Entrance Shaft: Excavation from which TBM is launched.

8. Obstruction: An Obstruction is defined as any buried object that meets all of the following conditions:

   a. lies within the cross section of the tunnel,

   b. impedes continued forward progress along the design path,

   c. is an object that is greater than 1/3 the diameter of the TBM, and

d. is a rock fragment having an unconfined compressive strength of 20,000 psi or greater or an impediment of foreign material that cannot be crushed or ingested such as metal or other foreign material not naturally occurring.

9. Obstruction Removal Shaft: A contingency shaft built to remove an obstruction to a TBM, repair a damaged TBM or retrieve an obstructed TBM.

10. Obstruction Removal Standby Time: Duration of work stoppage resulting from Obstruction encounter and removal. Contractor Daily Rate provided in Bid for Obstruction Removal Standby Time shall include all costs of specialist labor only, materials, equipment, production loss and other non-labor related costs associated with the work stoppage caused by an encountered Obstruction. See Section 00520 – Agreement for defined measurement and payment procedures for Obstruction Removal Standby Time.

11. Shield: Fabricated ground support, circular in section, providing 360 degree protection to workers inside the shield. The shield will have a cutting edge, and be equipped with independently operated hydraulic propulsion rams, allowing it to be steered. Initial support is erected within a tail section attached to the shield.

12. Spoil: Excavated soil and bedrock material that has been generated by the tunneling process.

13. Tunnel Boring Machine (TBM): Mechanized and fully shielded excavating equipment that is steerable, guided, and articulated, with a wheel type cutterhead that provides man entry to the tunnel face. The TBM provides support during the excavation process and with a cutterhead allowing both partial exposure of the face and full closure, by means of hydraulically operated gates.

14. Tunneling Methodology: A written description, together with supporting documentation that defines Contractor's plans and procedures for the tunneling operations.

15. Two-Pass Tunneling: Tunneling where initial support is installed concurrent with the excavation process to stabilize the tunnel excavation and a carrier pipe is installed in a subsequent phase or the second pass.

1.05 DESIGN CRITERIA

A. TBM equipment selected for the project shall be compatible with the geologic conditions described in all available geotechnical data provided as Technical Data, and not included in the Contract Documents, and any additional geologic testing performed by the Contractor that he deems necessary to select appropriate equipment.

B. The initial tunnel excavation support system shall be in accordance with Section 02425 – Initial Tunnel Support.

C. Contractor's Engineer shall design the launching shaft and exit shaft in accordance with this Section, Section 02222 – Excavation, and Section 02225 – Excavation, Backfilling, and Compaction for Sewers.

D. The TBM shall be capable of mining through and/or removing solid rock, cobbles and boulders from the cutter face up to the Obstruction size as defined above.

E. All design calculations provided by the Contractor as part of the required submittals shall be sealed by a licensed Professional Engineer registered in the Commonwealth of Kentucky.

1.06 SUBMITTALS

A. Conform to Section 01300 – Submittals.

B. Detailed tunnel methodology sufficient to convey the following:

1. Proposed method of tunnel excavation, type of face support and initial support system, as required.

2. Manufacturer and type of tunneling equipment proposed including specifications and type and output of lighting and ventilation systems.

3. Shop drawings for tunnel boring machine: Show design, dimensions, method of operation, face control capability, excavation system, propulsion system, initial support erection system, alignment control and arrangement of backup equipment/trailing gear.

4. Drawings and design details for launching shaft and exit shaft, indicating number required, proposed spacing, criteria for installing, and method of operation.

5. Describe methods, schedule and procedures for grouting voids outside the initial tunnel support.

6. Number and duration of shifts planned to be worked each day in accordance with restrictions on work hours.

7. Sequence of work/operations.

8. Procedures for handling, control and disposal of surface water, water input to the tunnel by Contractor, and groundwater inflow.

9. Method of spoil transportation from the face and up the shafts, surface storage, and disposal location. A description indicating the locations of material disposal sites and releases from property owners.

10. Survey methods and proposed procedures for alignment and grade control.

11. Identification of critical utility crossings and special precautions proposed.

12. Manufacturer and type of any lubricants and chemical grouts proposed.

C. Initial support design shall be in accordance with Section 02425 – Initial Tunnel Support.

D. Ground Modification Plan: Contractor shall design and submit proposed ground modification strategies for review and acceptance including soils stabilization methods, surface settlement prevention plan for area along the tunnel heading, void filling, and blocking of the underground flow of water to prevent rapid dewatering through tunneling activities. Ground modification grout requirements are set forth in Section 02431 – Tunnel Grout.

E. Ventilation Plan. Provide tunnel ventilation plan for review. Ventilation plan to include a written description, calculations, drawings, fan curves and manufacturer's catalogue cut sheets. Ventilation plan shall be designed by a competent person with at least five (5) years of recent on-the-job experience on similar projects, involving tunnels of similar size constructed by similar methods. Provide qualifications of Designer.

F. Settlement Monitoring Plan and Site Assessment:

1. Submit a settlement monitoring plan for review prior to construction. The plan shall be in accordance with Article 3.03.

G. Daily Reports. A shift log shall be maintained on a daily basis by Contractor. Submit reports no later than 24 hours after the end of the shift to the Engineer. Daily reports shall include at a minimum the following:

1. Location of face by station and progress of tunnel drive during shift.

2. Hours worked per shift on tunneling operations. Equipment and materials used, and the duration of different activities performed.

3. Completed field forms for checking line and grade of the tunneling operation, showing achieved tolerance relative to design alignment. Steering control logs will generally be acceptable for TBM driven tunnels.

4. Groundwater control operations, groundwater inflow location and rates.

5. Observation of any lost ground or other ground movement.

6. Any unusual conditions or events.

7. Reasons for operational shutdown whenever a drive is halted.

8. Air quality reports for dust, toxic and hazardous gases, and other atmospheric impurities in the working environment.

H. Record Drawings: Maintain at construction site a complete set of field drawings for recording of as-built conditions. All marks and notes shall be dated, and thorough. Submit the following:

1. Submit record of actual locations of initial support system and elevations. Elevations shall be taken at every 10 feet and recorded to the nearest eighth of an inch (0.01 feet). Horizontal coordinates of all surveyed points shall be on the coordinate system utilized by the Owner.

2. Submit written report to verify there are no voids or defects outside the initial support system.

3. Submit written Log from each TBM drive to the Engineer and Owner for review within three (3) business days of completing each drive.

I. Permits: The Contractor shall be responsible for executing the requirements of permits obtained from the KYTC, United States Army Corps of Engineers and any State and local authority where the project is located. The Contractor shall be responsible for any phase submittals required by the permits. All submittal information required by the project permits shall be channeled through the Engineer.

1.07 QUALIFICATIONS

A. The Contractor or Subcontractor performing tunnel construction must demonstrate in writing that he has requisite past project experience constructing tunnels similar to those for this Project.

B. The Contractor or Subcontractor shall have the following minimum experience related to tunneling by tunnel boring machine (TBM):

1. A minimum of five (5) years of experience performing utility tunneling of similar size and scope using TBMs with portions or all of the TBM drive in rock.

2. Excavated by TBM and appropriately installed initial tunnel support for a minimum of 5,000 linear feet of 66-inch or larger diameter tunnel with portions or all of the TBM drive in rock.

3. Three (3) tunnel projects excavated in rock meeting the following conditions:

   a. completed within the last 10-years,

   b. performed with a TBM,

   c. with individual, single drives of 400 linear feet or greater,

   d. with built in-place, initial tunnel support such as ribs and lagging, steel liner plate, concrete segments, or rock bolts and mesh, and

e. with carrier pipe installed and grouted in-place following tunneling and initial tunnel support installation.

C. See Tunneling Contractor Qualifications worksheets in Section 00410.

1.08 QUALITY ASSURANCE

A. Work shall be supervised by at least one (1) person with five (5) years of recent previous experience in tunneling using tunnel boring machines. Experience shall be in a minimum of five (5) previous tunneling projects of similar size, segment lengths and ground conditions with at least two (2) projects with a minimum 60-inch or larger diameter. Tunneling operations shall be performed under the direction of tunneling supervisor who shall be in responsible charge throughout the tunneling operation.

B. All tunneling operations shall be performed under the supervision of experienced shift foremen with at least five (5) years of recent on-the-job supervision experience on similar projects involving tunnels of similar size constructed using similar methods.

C. Operators shall be experienced in tunneling with prior knowledge and ability to properly operate the systems being employed. All operators shall have minimum of five (5) years' experience of performing tunneling of similar size, segment lengths and ground conditions with at least two (2) projects with a minimum 60-inch or larger diameter.

D. Operate systems following manufacturer's instructions and recommendations. Make available at all times copies of operations manuals to the Engineer and operational personnel on site.

E. Test full system in accordance with manufacturer's recommendations on completion of set up and before commencing tunneling operations. Record the test results and provide a copy of the test report to the Engineer.

F. Before commencement of any drive, demonstrate to the Engineer that required set up procedures and system checks are complete and required materials are at hand to commence drive.

1.09 PRE-INSTALLATION MEETING

A. At least three weeks prior to commencing the work of this section, convene a Pre-Installation Meeting at the job site to be attended by:

1. Contractor and any sub-contractor performing any related work.

2. Project Owner.

3. Engineer.

4. Any other pertinent stakeholder.

B. Meeting shall cover settlement monitoring, work hours, safety, staging and storage of materials, schedule, any changes to on-site staff from original Work Plan submittal, permitting, and the development of record drawings, etc. to ensure successful implementation of all requirements of this specification during pipe tunnel construction.

1.10 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall accept material on site and inspect for damage.

B. The Contractor shall handle, support and store materials to prevent injury or damage.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Conduct operations to not interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

B. Conduct operations to not interfere with roadway traffic, except with prior approval by the Kentucky Transportation Cabinet (KYTC) (where applicable) and the Owner.

C. Provide temporary facilities to prevent erosion of disturbed construction area in accordance with the approved Erosion & Sedimentation Control Plan and Contract Documents.

D. Maintain existing stormwater flow patterns or submit measures to temporarily bypass in accordance with the Erosion & Sedimentation Control Plan and Contract Documents.

1.12 COORDINATION

A. Coordinate work with local, state and federal authorities and utility owners to avoid interference with or damage to existing facilities in or adjacent to construction areas.

PART 2 – PRODUCTS

2.01 INITIAL SUPPORT SYSTEM

A. Initial tunnel excavation support system shall be in accordance with Section 02425 – Initial Tunnel Support.

PART 3 – EXECUTION

3.01 PROJECT SITE CONDITIONS

A. Tunneling shall not begin until the following have been completed:

1. Required submittals have been made and the Engineer has reviewed and accepted all submittals.

2. Notify the Owner and Engineer at least 30 days before beginning any excavation.

3. Installation of ground modification, if required.

4. Groundwater control for breaking out and breaking into the shafts has been established.

5. A Safety Officer has been designated in accordance with OSHA requirements for tunnel construction.

6. Pre-installation meeting has been held and all comments have been addressed from the meeting.

7. Settlement monitoring system is in place and pre-construction readings have been provided to the Engineer.

8. Pre-construction survey documents have been submitted to the Engineer.

B. Perform tunneling operations for the installation of the initial support system, if required, to the extent indicated on the Drawings so as not to interfere with, interrupt or endanger surface activity thereon, and minimize subsidence of surface, structures, and utilities above and near tunnel. Roadway, utilities, and/or structures damaged by tunneling operations shall be repaired or replaced as necessary to restore them to their condition prior to beginning tunneling operations in a timely manner, unless otherwise directed by the Engineer, at no additional cost to Owner.

C. Furnish all necessary equipment, power, water, and utilities for tunneling, removal and disposal of spoil, grouting, and other associated work required for the Contractor's methods of construction.

D. Promptly clean up, remove, and dispose of any spoil or slurry spillage.

E. Furnish all maintenance of traffic and establish and maintain all safety procedures on any highways whose thoroughfare is interrupted due to the tunneling operation.

F. Inspect the locations where tunneling will be conducted, verify conditions under which the work will be performed, and provide all necessary details, whether shown or specified on the Drawings or not, for the orderly prosecution of the work.

G. No vertical obstruction rescue shafts shall be allowed within the limits of the travel ways of roads and highways. Vertical obstruction rescue shafts may be permitted by the Engineer in areas outside of the travel way. Horizontal excavation obstruction rescue methods may be permitted by the Engineer. All proposed obstruction rescue shafts are subject to review and approval by the Kentucky Transportation Cabinet (KYTC) as applicable.

1. Should the Contractor need to construct an obstruction rescue shaft, the Contractor shall submit in writing for review by the Engineer, Owner and KYTC (where applicable) a complete plan for rescue indicating all means and methods.

2. The Contractor shall be responsible for obtaining all necessary permits as they relate to the proposed rescue operations.

3.02 PREPARATION

A. Existing utilities shown on Drawings are shown for general information only. Contractor shall verify locations, sizes and configurations of existing systems within potential conflict of installation operations.

B. Complete any required testing, inspection, surveying, etc., of any existing utilities required by the Contract Documents.

C. Call Local Utility Line Locate Service (811) not less than five working days before performing Work.

D. Request underground utilities to be located and marked within and surrounding the construction areas.

E. Locate, identify, and protect utilities indicated to remain from damage.

F. Protection

1. Protect plant life, lawns, rock outcroppings and other features remaining as portion of final landscaping.

2. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic. Repair or replace items damaged during construction.

3. Repair or replace structures raised more than 0.50 inch due to pressure from tunneling operations including pavement, and sidewalk.

G. Ventilation

1. Furnish and operate a temporary ventilation system and air monitoring system conforming to the requirements of OSHA at all times that personnel are underground. Operate and maintain a ventilation system that provides a sufficient supply of fresh air and maintains an atmosphere free of toxic or flammable gases in all underground work areas.

2. Before any personnel enters the tunnel, the air quality must be tested and verified that the OSHA requirements pertaining to air quality are met or exceeded.

H. Barricades

1. Protect pits, shafts and other open excavations with barricades and security fencing as indicated on the Drawings and with additional measures approved by the Engineer and Owner as required to prevent unauthorized personnel from accessing.

2. During non-work hours, isolate with additional measures approved by the Engineer and Owner as required to prevent unauthorized personnel from accessing.

3. Remove equipment daily from vehicular and pedestrian roads, sidewalk and pathways not contained within the direct work area to permit access and use by public.

3.03 SURFACE MONITORING

A. The Contractor will be held solely responsible for damages to highway and street surfaces, railroads, pavements, structures, structural embankments, sidewalks, curbing, and public utilities resulting from subsidence, failure of initial support system, or ground losses into the initial support system and for the refilling of voids with grout. Where such ground losses are so severe that they result in damage to underground or surface pavement, existing utilities or structures, the Contractor shall be solely responsible for remedying such damage.

B. As a minimum, surface monitoring points shall be established consisting of settlement markers to detect surface movement of roadway and pavement.

C. Survey the site showing locations and elevations of existing ground, pavement, and other permanent features to establish a baseline for existing conditions along the centerline of the proposed pipe/tunnel, and along two parallel lines 20-feet on either side of the centerline.

D. Surface settlement marks:

1. Surface settlement markers shall be located at 25-foot centers along the tunnel center line.

E. All markers/points shall be surveyed as follows:

1. Prior to beginning any work.

2. At 50% completion of the tunnel.

3. The same points shall also be surveyed 90 days after the work is completed and both shafts have been backfilled.

F. Ground Surface Movement:

1. The tunneling machine shall be operated so as to prevent both surface heave and loss of ground during tunneling.

2. Unless more stringent requirements are set forth by third party agencies, settlement or heave of the ground surface along the alignment shall not exceed 1 inch.

3. If the ground subsidence or heave exceeds 1 inch, the tunneling operations shall stop and remedial measures approved by the Engineer shall be implemented.

4. If any movement or settlement occurs which causes or might cause damage to an existing structure over, along or adjacent to the work, immediately stop any or all work except that which assists in making the work secure and in preventing further movement, settlement or damage. Resume tunneling only after all necessary precautions have been taken to prevent further movement, settlement or damage, and repair the damage at the Contractor's expense and to the satisfaction of the Engineer.

5. Restrict the excavation of materials to only those that are physically displaced by the shield itself, in order to prevent loss of ground and settlement or possible damage to overlying structures. Control the advance rate and monitor the volume of material excavated and adjust operations as required to avoid loss of ground, overexcavation, and surface heave.

G. Lateral Displacements: Unless more stringent requirements are set forth by third party agencies, lateral movement or deflection of shaft excavation support system shall be limited to 0.5 inch.

H. Report any settlement or movement immediately to the Engineer and applicable agency and take immediate remedial action.

3.04 GROUNDWATER CONTROL

A. Intercept and divert surface drainage, precipitation, and groundwater away from excavation through use of dikes, curb walls, ditches, pipes, sumps or other means within the conditions permitted by the approved Erosion & Sedimentation Control Plan and the Contract Documents.

B. Develop substantially dry subgrade for prosecution of subsequent operations.

C. Launching and exit shaft subgrade shall be kept continuously free from ground and surface waters during tunneling operations.

D. Keep removal of soil particles to a minimum.

E. Water discharge from dewatering operations shall be directed into approved receiving basins or silt bags in accordance with all applicable regulatory requirements and the approved Erosion & Sedimentation Control Plan.

F. Should settlement or displacement be detected, notify the Engineer and applicable agency immediately and act to maintain safe conditions and prevent damage.

3.05 GROUND MODIFICATION PRIOR TO TBM TUNNELING

A. Ground modification grout requirements are set forth in Section 02431 – Tunnel Grout.

B. The use of jet grouting, compaction grouting, void filling, soil mixing, slurry walls, permeation grouting, compensation grouting, ground freezing or other ground modification technologies shall be carefully considered by the Contractor to safely permit Contractor's selected tunneling activities in loose and flowable soils or in rock that is fractured with joints, bedding planes, shears, or fault zones beneath the groundwater table. Contractor shall determine if ground modification is needed to maintain a stabilized tunnel face and bore during tunneling by Contractor's selected means of excavation and be fully responsible for the determination of the necessity, selection, design, and implementation of ground modification strategies.

C. Ground modification strategies shall be designed to work in concert with Contractor's selected excavation methods and implemented as needed to increase bearing capacity, provide settlement control, reduce permeability and/or increase stand-up time along the face of excavation within the tunnel alignment or in the areas of excavation required to construct all launch, reception, and access structures and shall be included in the Bid.

D. Contractor shall furnish all labor, equipment, materials, and supplies necessary for ground modifications required to meet project objectives specified herein.

3.06 EQUIPMENT

A. Contractor shall employ tunneling equipment that will be capable of handling the various anticipated ground conditions and which minimize loss of ground ahead of the face and allow for satisfactory support of the excavated face.

B. Contractor shall provide a full-circle fully-shielded TBM conforming to the minimum required dimensions of the tunnel with a uniform perimeter free of projections that could produce overexcavation or voids. An appropriately sized over cutting bead may be provided to facilitate steering. In addition, the TBM shall:

1. Be capable of sustaining any ground loads which may be imposed upon it as well as any loads imposed by thrust jacks and other appurtenances such that it will maintain its true shape during use.

2. Be capable of propelling forward while maintaining the construction tolerances with respect to line, grade and direction. The propulsion system shall include a thrust ring or other provision that will distribute the jacking forces uniformly around the tunnel perimeter, so the shield can be advanced without damaging or distorting the initial support system. The propulsion system shall be designed so that in the event of a failure of any element of the propulsion system there will be no

movement backward and no overstressing or distortion of the tunnel initial support system.

3. Be capable of full face closure. TBM shall be equipped with hydraulically operated face doors or other means of closing off the face. During periods of downtime in excess of 24 hours, Contractor shall brace the face at the cutters by means acceptable to the Engineer.

4. Be equipped with appropriate tail section in which initial support is erected.

5. Be equipped with a cutting head capable of operating in both clock-wise and counter clock-wise directions and capable of correcting roll.

6. Be designed to handle adverse ground conditions including groundwater ingress.

7. Be capable of excavating curves to the minimum radii indicated on the Drawings.

8. Contractor shall furnish, install, and maintain a fire suppression system in accordance with the General Conditions, local, State, and Federal Laws.

C. Air Quality. Contractor shall provide equipment to maintain proper air quality of tunnel operations during construction in accordance with the requirements of 29 CFR Part 1926, Subpart S, Underground Construction. In addition, Contractor shall provide portable multiple gas detectors to measure oxygen (O2), carbon monoxide (CO), hydrogen sulfide (H2S), and lower explosive level of combustible gas (LEL) concentrations continuously at the TBM heading when the tunnel is occupied by personnel.

D. Lighting Fixtures. Contractor shall enclose lighting fixtures in watertight enclosures with suitable guards and provide separate circuits for lighting and other equipment.

E. Electrical Systems. Electrical systems shall conform to requirements of National Electrical Code - NFPA70.

F. Fire Suppression: Contractor shall furnish, install, and maintain a fire suppression system in accordance with the General Conditions, and all local, State and Federal requirements.

3.07 INSTALLATION – LAUNCHING AND EXIT SHAFTS

A. Excavate launching and exit shafts in accordance with Section 02222 – Excavation, and Section 02225 – Excavation, Backfilling and Compaction for Sewers.

B. Provide excavation supports as designed by the Contractor's Engineer.

C. Support soil, pavement, utilities and structures existing outside excavation.

D. Construct shafts to limit intrusion of groundwater. Install equipment to maintain shafts free of water while limiting effect on surrounding groundwater table. Dewatering pumps shall discharge into sediment filter bags or into sediment traps in accordance with State and local erosion, sediment control, and stormwater requirements.

E. Furnish and install, to the extent required, thrust blocks or such other provisions as may be required for the tunneling process.

F. Do not apply loads to concrete until it has achieved required design strength.

G. Upon completion of tunneling operations remove pits/shafts. Backfill, compact and restore area in accordance with the Contract Documents.

3.08 TUNNEL EXCAVATION AND INITIAL SUPPORT INSTALLATION

A. Tunnel excavation shall remain within the easements and rights-of-way indicated on the Drawings, and to the lines and grades shown on the Drawings.

B. Contractor shall be responsible for developing procedures to support the ground in a safe manner, for maintaining stability of the ground, and for safety during excavation and support installation. Contractor's method shall ensure full bearing of the ground against the initial support without significant settlement or movement of the surrounding ground.

C. Keep the face breasted or otherwise supported where required to prevent falls, excessive raveling, or erosion. Maintain standby face supports for immediate use when needed.

D. Control volume of spoil removed. Determine that the advance rate and the muck removal rate are compatible by muck car count or other methods to avoid overexcavation or loss of ground.

E. When the face of the machine is open for maintenance, monitor conditions that might threaten the stability of the heading, take appropriate action to prevent or limit influx of ground and water which would threaten the stability of the heading.

F. Install specified initial tunnel support system immediately behind TBM. Install initial support in accordance with Section 02425 – Initial Tunnel Support. Any damaged or displaced initial support, and any improperly installed support shall be removed and replaced or repaired immediately in a manner acceptable to the Engineer. All elements of the initial support shall be maintained in good condition until pipeline construction is complete. Any defect which threatens the satisfactory performance of the initial support shall be repaired immediately.

G. If ribs and lagging are selected as the initial tunnel support, the Contractor shall grout the annular space between the initial support system and the carrier pipe in accordance with Section 02431 – Tunnel Grout, and Section 02432 – Low Density Cellular Concrete.

H. If tunnel conditions require changes to the installation method or material, the Contractor shall submit complete information on proposed changes to Engineer for review.

I. Upon completion of the initial support system installation, the Contractor shall allow two (2) business days for the Engineer or other representative of the Owner to inspect the completed installation and to check for the presence of voids. Voids which are encountered shall be completely filled by the Contractor and the pipe shall be re-inspected after the voids are filled.

3.09 SPOIL TRANSPORT AND DISPOSAL

A. Transport and dispose of all excavated materials properly away from the construction site. Tunnel spoil, slurry, and muck shall be disposed of at legal disposal facilities and proof of such disposal shall be provided to the Engineer.

B. Control volume of spoil removed. Determine that the advance rate and the muck removal rate are compatible by muck car count to avoid over excavation or loss of ground or other contractor selected spoil removal method.

3.10 VENTILATION

A. Perform all tunneling operation by methods and with equipment which will positively control dust, fumes, vapors, gases, fibers, fogs, mists and other atmospheric impurities in accordance with OSHA safety requirements.

B. All intermediate or booster fans required for tunnel ventilation shall be installed within the tunnel. No ventilation fans will be allowed outside of the tunnel except at the shaft sites.

C. All ventilation fans not within the tunnel shall be placed within an enclosure to limit ambient noise.

3.11 CONTROL OF TUNNEL LINE AND GRADE

A. Establish benchmarks and survey control points. Benchmarks and control points shall be established by a licensed surveyor registered in the Commonwealth of Kentucky.

B. Verify benchmarks prior to start of construction and report any errors or discrepancies to the Engineer.

C. When satisfied that all benchmarks are correct, use these benchmarks to furnish and maintain all reference lines and grades for tunneling. Use these lines and grades to establish the location of the tunneling guidance system. Submit to the Engineer copies of field notes used to establish all lines and grades and allow the Engineer to check set up prior to beginning tunneling. The Contractor remains fully responsible for the accuracy of the work and the correction of it, as required.

D. Benchmark Movement. Contractor shall ensure that if settlement of the ground surface occurs during construction which affects the accuracy of the temporary benchmarks,

Contractor shall detect and report such movement and reestablish temporary bench marks.

E. Construct initial support to such tolerances that permit the installation of sewer pipe to be completed to the tolerances given in Section 02426 - Installation of Carrier Pipe in Tunnels and in the Tunneling Method Table in Project Specific Notes (PSN).

F. Maintain a means sufficient to control alignment and grade continuously.

G. Contractor shall survey the crown, invert, and springline on each side of the initial support at 50-foot intervals or more frequently if line and grade tolerances have been exceeded, to ensure the alignment is within the tolerances specified. The survey shall be conducted immediately behind the tunnel excavation to allow immediate correction of misalignment.

H. If excavation is off line or grade notify Engineer immediately and make alignment corrections to avoid reverse grades in gravity sewers. The maximum rate of return to established line and grade shall be 1 inch per 25 feet.

I. Check the survey control for tunneling against an aboveground undisturbed reference at least once each week and once for each 250 feet of tunnel constructed.

J. Initial support shall be clearly marked with paint every 50 feet along the tunnel with stationing as indicated on the Drawings.

3.12 OBSTRUCTIONS DURING TUNNELING

A. The Contractor shall notify the Engineer immediately and in writing within 10 hours of occurrence if tunneling forward progress is halted and Contractor believes an obstruction has been encountered. The Contractor shall submit a plan to remove the obstruction for approval. The Engineer shall investigate the event and review the plan promptly.

B. Upon written authorization by the Engineer, the Contractor shall proceed with removal of the obstruction by means of an Obstruction Removal Shaft, hand mining, removal of the TBM, or other means reviewed by the Engineer in accordance with the Contractor's reviewed submittal(s).

C. The Contractor may propose alternate methods of removing, clearing or otherwise making it possible for the TBM to advance past obstructions, however, any such method that does not allow visual observations of the nature of the obstruction to be made will not be considered for payment.

D. Obstruction removal shafts shall be constructed and removed in accordance with Section 02222 – Excavation, and Section 02225 – Excavation, Backfilling and Compaction for Sewers.

E. The Contractor shall remove, clear or otherwise make it possible for the TBM to advance past all obstructions encountered.

F. The Contractor shall receive no additional compensation for removing, clearing or otherwise making it possible for the TBM to advance past obstructions unless the obstructions meet the obstruction definition as specified herein.

G. If an obstruction meeting the definition provided herein is identified, Contractor shall be paid for obstruction rescue shaft and for removal or repair of TBM as required to continue installation. If following excavation, it is determined that there is not an impediment meeting the definition of an obstruction herein, there is no payment to Contractor.

H. The Contractor shall include a unit price for Obstruction Removal Standby Time in the bid to be used, if needed, for payment for standby time while an obstruction rescue shaft is excavated to determine why forward motion is stopped. See Section 00520 – Agreement for defined measurement and payment procedures for Obstruction Removal Standby Time.

I. Time required to repair or replace damaged or worn cutters, improper operation, inadequate setup, and equipment failure that is not a direct result of an obstruction shall not be included in the obstruction removal standby time.

J. Where removal of an obstruction leaves a void around the exterior of the initial tunnel support, the Contractor shall be required to fill the void to the satisfaction of the Engineer, Owner and applicable agencies.

3.13 REPORTS

A. Maintain and submit daily activity reports in accordance with Article 1.06.

3.14 GROUTING OF EXTERIOR ANNULAR SPACE FOR INITIAL TUNNEL SUPPORT

A. Grouting of the exterior annular space for initial tunnel excavation support system shall be in accordance with Section 02524 – Initial Tunnel Support, and Section 02431 – Tunnel Grout.

3.15 INSTALLATION OF CARRIER PIPE TUNNEL

A. Install carrier pipe in initial support system in accordance with Section 02426 – Installation of Carrier Pipe in Tunnels.

3.16 SITE AND WORK SAFETY

A. Comply with applicable regulations of Federal Government, OSHA 29 CFR 1926, and applicable criteria of ANSI A 10.16 "Safety Requirements for Tunnels, Shafts, and Caissons", as amended to date.

B. Safety is the full responsibility of the Contractor.

3.17 SITE RESTORATION

A. Site restoration shall be in accordance with the Drawings and applicable sections of these Specifications.

END OF SECTION

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SECTION 02446

TUNNEL BY GUIDED BORE AND JACK METHOD (GB&J)

PART 1 – GENERAL

1.01 SCOPE

A. The work described by this Section consists of furnishing all labor, equipment, materials, and incidentals required install casing pipe by trenchless hydraulic jacking within the limits of work as defined on the Contract Drawings and in the Tunneling Method Table in Project Specific Notes (PSN).

B. Work shall be done in accordance with all Federal, State, and local laws, regulations and requirements as shown on the Drawings and as specified herein.

C. All available and known geotechnical reports, logs, borings, and laboratory testing that have been performed within close proximity of the project corridor have been made available as "technical data" and not part of the Contract Documents. This provided as information only and solely for the convenience of Bidders. The Owner and/or the Consultant do not warrant or guarantee the accuracy or correctness of this material with respect to actual subsurface conditions. Subsurface conditions are considered unclassified and no expectation of quantity, specific location of ground conditions, or geotechnical baselines are provided or assumed herein.

D. Contractor shall review all available geotechnical reports and data and perform any additional subsurface investigations he deems necessary at his own expense for the planning and the selection of tunneling techniques and methods in order to enable proper construction as shown on the Drawings and other requirements of Contract Documents.

E. All dewatering shall be the responsibility of the Contractor and shall be controlled such that the launching and exit shafts are free of water to the extent required to complete the tunnel.

F. For all excavations defined under this Section, Contractor shall install steel casing using techniques and methods selected by the Contractor that, based on past experience, will be capable of handling the various anticipated ground conditions and is capable of minimizing loss of soil ahead of and around the machine providing full support of the excavated face.

G. The work, as detailed on the Drawings and described in these Specifications, shall include, but not be limited to, the following:

1. Pipe jacking by track type boring machine or hydraulic jacking frame.

2. Casing/tunnel excavation by mechanized cutting face appropriate for the prevailing subsurface conditions.

3. The use of an advanced guidance method such as laser guidance, steerable cutting heads, or a pre-bore pilot tube to meet line and grade tolerance requirements.

4. Removal of casing/tunnel spoil by helical spiral auger.

5. Supplying and installing casing/jacking pipe as initial excavation support.

6. Installation of carrier pipe and associated blocking and support.

7. Bulkheads and concrete cradles.

8. Filling of voids with grout between casing/jacking pipe and earth, if required.

9. Design and construction of launch and receiving shafts.

10. Dewatering at the shafts.

11. Dewatering of the tunnel alignment

12. Appropriate disposal of groundwater effluent.

13. Location markers and miscellaneous appurtenances as required to complete the installation.

H. The work shall include furnishing, installing and monitoring a settlement monitoring system.

I. Boring/tunneling activities shall not cause any damage to nearby structures, railroad tracks, utilities or pavement.

J. The Contractor shall be familiar with the conditions under which the work will be performed and with all necessary details as to the orderly prosecution of the work. Review and interpret available geotechnical reports and investigate work site soil conditions before bidding.

K. Contractor may choose to increase the casing diameter, at no additional cost to the Owner, as needed to account for the Contractor's selected means and methods, operational procedures, and to provide adequate internal tolerance to account for the prevailing project site and subsurface conditions. If Contractor elects to modify casing diameter from size shown in the Contract Documents, the Contractor accepts all responsibility for acquiring approval for any modification or addenda to all right-of-way encroachment agreements, occupancy permits, or other established requirements and specifications of the entity being crossed.

L. Follow all OSHA regulations regarding confined space for casing installation and temporary shaft excavations.

M. Conform with all Kentucky Transportation Cabinet (KYTC) and Federal Highway Administration requirements for work within their respective highway rights-of-way and any additional requirements of the contiguous property and utility owners. When the requirements are in conflict, the ones that are more stringent shall take precedence.

N. The use of a rescue shaft requires approval from all parties impacted by its excavation, dewatering, traffic effects, and/or disturbance. It is the responsibility of the Contractor to acquire such permission.

O. Direct jacking of carrier pipe without casing by the methods defined herein is prohibited.

P. The Contractor shall retain the service of a Professional Engineer registered in the Commonwealth of Kentucky to prepare boring/tunneling design and submittals described herein.

Q. If required by permit, boring/tunneling operations under roads or railroads will be on a continuous basis, 24 hours per day, 7 days a week until casing installation is complete.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02222 – Excavation

B. Section 02225 – Excavating, Backfilling, and Compaction for Sewers

C. Section 02426 – Installation of Carrier Pipe in Tunnels

D. Section 02431 – Tunnel Grout

E. Section 02432 – Low Density Cellular Concrete

F. Tunneling Method Table in Project Specific Notes (PSN)

1.03 REFERENCE STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. Applicable codes, ordinances, statutes and governing rules and regulations of governing municipalities and counties, the Commonwealth of Kentucky, and the Federal Government.

2. American Association of State Highway and Transportation Officials (AASHTO).

3. American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering.

4. Occupational Safety and Health Administration (OSHA) Regulations and Standards for Underground Construction 29 CFR Part 1926, subpart S and other applicable OSHA parts.

5. Applicable ASTM and AWWA Standards for materials and methods.

6. Kentucky Transportation Cabinet (KYTC) Permit Guidance Manual

7. All applicable guidelines and restrictions of the United States Army Corps of Engineers (USACE) and Department of Environmental Protection (DEP).

1.04 DEFINITIONS

A. Unless otherwise stated or particular context otherwise requires, the definitions and provisions contained in this section shall govern the construction, meaning and application of words and phrases utilized in this specification. For purposes of this specification, the following terms are defined as follows:

1. Annular Space: The void created between the outside of the initial support system being installed and the extreme outer excavation limits created by TBM. Also, the void space between the initial support and the carrier pipe when a two-pass tunnel is installed.

2. Carrier Pipe: A pipe used for conveyance of water or sewer. Carrier pipe shall be as specified in the Tunneling Method Table in Project Specific Notes (PSN).

3. Drive: Section of jacking pipe installed by tunneling from launching shaft to exit shaft.

4. Entrance and Exit Seals: Seals placed at the breakout into and out of the shafts. The seals are intended to prevent groundwater inflow and loss of ground into the shafts.

5. Exit Shaft or Retrieval Shaft: Shaft utilized for retrieval of the tunneling equipment.

6. Jacking Pipe: A casing pipe used as the initial support in a two-pass tunneling operation. The casing pipe is not a carrier pipe.

7. Launching Shaft: Excavation from which tunneling equipment is launched.

8. Spoil: Excavated soil and bedrock material that has been generated by the tunneling process.

9. Thrust block: Concrete or steel wall at the back of the launching shaft providing a reaction for jacks pushing the pipe.

10. Tunneling Methodology: A written description, together with supporting documentation that defines Contractor's plans and procedures for the tunneling operations.

11. Two-Pass Tunneling: Tunneling where initial support is installed concurrent with the excavation process to stabilize the tunnel excavation and a carrier pipe is installed in a subsequent phase or the second pass.

1.05 DESIGN CRITERIA

A. Tunneling equipment selected for the project shall be compatible with the geologic conditions described in all available geotechnical data provided as Technical Data, and not included in the Contract Documents, and any additional geologic testing performed the Contractor deems necessary to select appropriate equipment.

B. Design of the jacking pipe, including pipe joints, reinforcement, stiffness, compressive strength, and determining acceptable pipe fabrication tolerances is the responsibility of the Contractor as it relates to all loading on the pipe due to installation. Maximum compressive stresses applied to the pipe shall not exceed the manufacturer's recommended allowable stresses.

C. Contractor's Engineer shall design the launching and exit shafts in accordance with Section 02222 – Excavation.

D. Design backstops, thrust block and concrete seal for all earth loads, and to prevent significant water intrusion. The thrust block shall be perpendicular to the proposed pipe alignment and shall be designed to withstand the maximum jacking pressure to be used, with a factor of safety of at least 2.0, without excessive deflection or displacement.

E. All thrust wall and floor reaction concrete designs shall be the responsibility of the Contractor, if needed.

F. All design calculations provided by the Contractor as part of the required submittals shall be sealed by a licensed Professional Engineer registered in the Commonwealth of Kentucky.

1.06 SUBMITTALS

A. Conform to Section 01300 – Submittals

B. Detailed Tunnel Methodology sufficient to convey the following:

1. Casing/Jacking pipe shop drawings and material data from casing pipe manufacturer.

2. Bore pit excavation details including footprint drawing of bore pit, design and calculations for any sheeting or shoring utilized signed and sealed by a licensed Professional Engineer registered in the Commonwealth of Kentucky.

3. Construction sequence plan comprised of sketches, redline markups of Drawings or graphical representation, as well as a schedule or timeline and descriptions. The construction sequence plan shall include:

   a. Shaft excavation, dewatering, and shoring.

   b. Assembly and setup of rail-type hydraulic jacking frame or auger boring machine.

   c. Tunnel excavation equipment and procedures including cutter heads and attachments.

   d. Spoil removal.

   e. Installation of carrier pipe including arrangement and manufacturer's information and shop drawings for casing spacers or blocking design.

   f. Procedures for annular grouting of the space between the casing and the earth and installation of bulk head.

4. Settlement Monitoring Plan and Site Assessment:

   a. Submit a settlement monitoring plan meeting the requirements outlined in Article 3.08 for review prior to construction. The plan shall identify the location of settlement monitoring points, reference benchmarks, survey frequency and procedures, and reporting formats.

1.07 QUALIFICATIONS

A. The Contractor or Subcontractor performing tunnel construction must demonstrate in writing that he has requisite past project experience constructing tunnels similar to those on this Project.

B. The Contractor or Subcontractor shall have the following minimum experience related to Tunnel by Bore and Jack Method (GB&J):

   1. Five (5) years' experience performing bore and jack steel casing installation of similar diameter and scope.

   2. Installed a minimum of 5,000 linear feet of steel casing by bore and jack methods.

   3. Installed a minimum of 2,000 linear feet of 36-inch or larger steel casing.

   4. Three (3) tunnel projects completed in the last 10-years performed using bore and jack methods including laser guidance, steerable cutting heads, or pilot-tube pre-bore with individual, single drives of 200 linear feet or greater.

5. Two (2) tunnel projects completed in the last 10-years performed in rock.

PART 2 – MATERIALS

2.01 STEEL CASING PIPE

A. The casing pipe shall be in accordance with Section 02425 – Initial Tunnel Support.

2.02 CARRIER PIPE

A. The carrier pipe shall be in accordance with the Tunneling Method Table in Project Specific Notes (PSN).

2.03 GROUT

A. Grout shall be in accordance with Section 02431 – Tunnel Grout or Section 02432 – Low Density Cellular Grout, but the annular space between the carrier pipe and tunnel walls is only grouted when ribs and lagging is utilized.

2.04 SLURRY LUBRICATION

A. Slurry lubrication shall be the responsibility of the Contractor.

PART 3 – EXECUTION

3.01 INSTALLATION - GENERAL

A. Contractor shall follow the approved methods, sequence, and contingency plans submitted and approved.

B. Prior to beginning boring operations, the Contractor shall install a settlement monitoring system in accordance with Article 3.07.

C. If a combination of casing and tunnel is required, details of the proposed junction shall be submitted to and approved by the Engineer.

D. The Contractor shall be prepared to bore through weathered or partially weathered rock, if encountered, with a specialized bit or hand-mine if necessary. Encountering rock or water will not entitle Contractor to additional compensation.

E. When impossible to advance borehole or pipe, notify Engineer and submit a rescue plan for review.

F. If abandonment of the tunnel is required fill with grout, unless otherwise directed by the Engineer. Grout shall be in accordance with Section 02431 – Tunnel Grout.

G. The recommended methods and details shown on the Drawings and specified herein, are intended to indicate the minimum acceptable standard of quality required for the casing/tunnel installation. Other methods of installation, based on acceptable industry standards and techniques, may be acceptable for the installation. Under no conditions shall jetting or wet boring of the casing/tunnel be allowed.

H. All excavations and pits shall be well sheeted and braced as necessary for safe and adequate access for workmen, inspections, and materials and shall be of a size suitable to equipment and material handling requirements.

I. Shaft shoring shall be in accordance with plans and details provided by the Contractor's Engineer under Article1.04.

J. Shafts shall be excavated and backfilled in accordance with Section 02222 – Excavation and Section 02225 – Excavating, Backfilling and Compacting for Sewers, and meet all Federal and state OSHA requirements for a safe excavation.

K. If any surface movement, settlement, or heaving occurs which causes or might cause damage to an existing pavement, structure, or utility, located over, along or adjacent to the work, Contractor shall immediately stop all work except that which assists in making the work secure and in preventing further movement, settlement or damage. Resume boring/tunneling only after:

1. All necessary precautions have been taken to prevent further movement, settlement or damage, and all damage has been repaired at the Contractor's expense and to the satisfaction of the Engineer.

2. The Contractor selected method of tunnel excavation is appropriate and capable of further casing installation without expectation of similar unacceptable movement, settlement, or structural damage.

3.02 SHAFT DEWATERING

A. When water is encountered, develop and maintain a dewatering system of sufficient capacity to remove water continuously, keeping excavations free of water until backfill operation is in progress.

B. Keep removal of soils particles from dewatering to a minimum.

C. Dewater into sediment filter bags or construct sediment traps in accordance with State and local erosion, sediment, and stormwater controls.

D. Observe surface facilities to verify there is no settlement or displacement occurring due to dewatering.

E. Should settlement or displacement be detected, notify Engineer immediately and act to maintain safe conditions and prevent damage.

3.03 BORING AND JACKING

A. As the boring operation progresses, each new section of the casing pipe shall be 360° butt-welded to the next section previously jacked into place unless special interlocking joints are allowed. Butt welds shall conform to industry standards for boring operations.

B. The boring equipment to be used for installing the jacked casing shall be of such size and capacity to allow the boring to proceed in a safe and expeditious manner. The installation of the casing and boring of the hole shall be done as rapidly as possible and shall be done simultaneously to avoid voids, cave-ins or settlement and for safety of traffic above.

C. Provide slurry lubricant as needed to facilitate movement or lessen the danger of the jacking pipe seizing.

D. Maintain face of cutting head to preclude free flow of soft or poor soils material.

E. Grout ports shall be installed in the top section of the casing pipe at an interval sufficient for all voids to be filled by pressure grouting in accordance with Section 02431 – Tunnel Grout.

F. Notify Engineer immediately if an obstruction stopping forward motion of operation is encountered during installation. If the casing pipe is at least 30-inches in diameter, the auger shall be withdrawn, and the obstruction removed. If a bolder is encountered and is removed by blasting or other approved method, the void shall be filled with grout, as previously specified. No blasting shall be permitted until a detailed blasting plan is submitted to and approved by the Engineer.

3.04 GROUTING OF EXTERIOR ANNULAR SPACE FOR CASING PIPE

A. Promptly following completion of the casing installation, pressure grout to fill all voids existing outside of the casing pipe for all casings 36-inches and larger in outside diameter. If the outside diameter is less than 36-inches, then the annular space outside the casing is to be grouted if the excavated diameter is more that 1-inch larger than the outside diameter of the casing.

B. For casings 36-inches and larger in outside diameter, grouting shall be performed from the interior of the casing pipe through grouting holes. Lubricant shall be displaced by the grout. Grouting shall be started in the lowest connections and shall proceed until grout begins to flow from upper connections. The void shall be completely filled. Displaced lubricant shall be disposed of off-site in accordance with applicable regulations and codes of all Federal, State, and local agencies.

C. Grout shall be in accordance with Section 02431 – Tunnel Grout.

D. Liquid grout pressure shall not exceed one-half of the existing overburden pressure.

E. After grouting is complete, pressure shall be maintained by means of stopcocks or other suitable devices until the grout has set sufficiently in the judgment of the Engineer, or for a minimum of 24 hours, whichever is longer. After the grout is set, grout holes shall be completely filled with dense concrete and finished neatly without evidence of voids or projections.

3.05 CASING/TUNNEL ALIGNMENT

A. Contractor shall select and use proper equipment and operational procedures including advanced line and grade control systems to meet the horizontal and vertical alignment requirements of the project as identified on the Drawings within the acceptance criteria listed below. Contractor shall determine the need for and select systems and methods for achieving the adequate line and grade control appropriate for the ground conditions and constraints of the project including:

1. Water-level grade monitoring or laser-level line and grade monitoring systems.

2. Methods for tracking location of cutter head such as sonde receivers, or other systems.

3. Pilot tube pre-drilling to set and maintain alignment as necessary to meet Contract Documents.

4. Articulated, steerable cutterhead or other hydraulically actuated steering system.

B. The Contractor shall check the vertical and horizontal alignment of the casing by survey instrument in spacing intervals as deemed appropriate by the Contractor to meet the line and grade requirements and subsurface conditions of the project.

C. If excavated alignment is found to be off line or grade and the tunnel progresses, make alignment corrections to the installation of the casing as needed to meet required carrier pipe tolerances.

D. Following completion of tunnel, the Contractor shall set the line and grade modifications and spacer settings as needed to install the carrier pipe within the contract tolerances.

3.06 CARRIER PIPE INSTALLATION

A. Contractor shall install carrier pipe in casing in accordance with Section 02426 – Installation of Carrier Pipe in Tunnels.

3.07 ACCEPTANCE CRITERIA FOR LINE AND GRADE

A. Prior to installing the carrier pipe, Contractor shall verify that the casing has been installed so that the carrier pipe may be placed in conformance with the line and grade specified on the Drawings.

B. If the carrier pipe cannot be installed to the invert elevation shown on the Drawings, notify the Engineer and establish a plan for adjusting the grade of the pipeline to meet slope requirements.

C. Pipe installed and subsequently abandoned shall be fully grouted in accordance with either Section 02431 – Tunnel Grout, or Section 02432 – Low Density Cellular Concrete.

3.08 SURFACE MONITORING:

A. The Contractor will be held solely responsible for damages to highway and street surfaces, railroads, pavements, structures, structural embankments, sidewalks, curbing, and public utilities resulting from subsidence, failure of initial support system, or ground losses into the initial support system and for the refilling of voids with grout. Where such ground losses are so severe that they result in damage to underground or surface pavement, existing utilities or structures, the Contractor shall be solely responsible for remedying such damage. Where the filling of voids cannot be effectively carried out from below, the Engineer reserves the right to order the Contractor, at no additional cost to the Owner, to make openings from the surface for the purpose of backfilling the voids.

B. As a minimum, surface monitoring points shall be established consisting of settlement markers to detect surface movement of roadway and pavement.

C. Survey the site showing locations and elevations of existing ground, pavement, and other permanent features to establish a baseline for existing conditions along the centerline of the proposed pipe/tunnel, and along two parallel lines 20-feet on either side of the centerline.

D. Surface settlement marks:

1. Surface settlement markers shall be located at 25-foot centers along the tunnel center line.

E. All markers/points shall be surveyed as follows:

1. Prior to beginning any work.

2. At 50% completion of the tunnel.

3. The same points shall also be surveyed 90 days after the work is completed and both shafts have been backfilled.

F. Ground Surface Movement:

1. The tunneling machine shall be operated so as to prevent both surface heave and loss of ground during tunneling.

1. Unless more stringent requirements are set forth by third party agencies, settlement or heave of the ground surface along the alignment shall not exceed 1 inch.

2. If the ground subsidence or heave exceeds 1 inch the tunneling operations shall stop and remedial measures approved by the Engineer shall be implemented.

2. If any movement or settlement occurs which causes or might cause damage to an existing structure over, along or adjacent to the work, immediately stop any or all work except that which assists in making the work secure and in preventing further movement, settlement or damage. Resume tunneling only after all necessary precautions have been taken to prevent further movement, settlement or damage, and repair the damage at the Contractor's expense and to the satisfaction of the Engineer.

3. Restrict the excavation of materials to only those that are physically displaced by the equipment itself in order to prevent loss of ground and settlement or possible damage to overlying structures. Monitor the volume of material excavated and adjust operations as required to avoid loss of ground, over excavation or surface heave.

G. Lateral Displacements: Unless more stringent requirements are set forth by third party agencies, lateral movement or deflection of shaft excavation support system shall be limited to 0.5 inch.

H. Report any settlement or movement immediately to the Engineer.

3.09 SITE AND WORK SAFETY:

A. Comply with applicable regulations of Federal Government, OSHA 29CFR 1926, and applicable criteria of ANSI A 10.16 "Safety Requirements for Tunnels, Shafts, and Caissons", as amended to date.

B. Safety is the full responsibility of the Contractor.

3.10 SITE RESTORATION:

A. Site restoration shall be in accordance with the Drawings and applicable sections of these specifications.

END OF SECTION

SECTION 02532
SEWAGE COLLECTION LINES

PART 1 – GENERAL

1.01 SUMMARY

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

PART 2 – PRODUCTS

2.01 DUCTILE IRON (DI) PIPE

A. Ductile iron pipe shall be furnished cement lined in accordance with ANSI/AWWA C104/A21.4 with bituminous seal coat unless otherwise noted on the drawings or in Bid Form. Ductile iron pipe shall be furnished with rubber gasket push-on joints except as may otherwise be noted on the drawings or in difficult working areas and with approval of the Engineer. All pipe inside of casing pipe shall have restraining gaskets as specified in this Section. **All DI pipe and fittings shall be lined with Protecto 401 coating, or approved equal as specified hereinafter.**

B. Thickness design of ductile iron shall conform in all aspects to the requirements of ANSI/AWWA C150/A 21.50 latest revision.

C. Manufacture and testing of ductile iron pipe shall conform in all aspects to the requirements of ANSI/AWWA C151/A 21.51 latest revision.

D. Pipe Coatings

1. Interior Lining

a. Condition of Ductile Iron Prior to Surface Preparation

All ductile pipe and fittings shall be delivered to the application facility without asphalt, cement lining, or any other lining on the interior surface. Because removal of old linings may not be possible, the intent of this specification is that the entire interior of the ductile iron pipe and fittings shall not have been lined with any substance prior to the application of the specified lining material and no coating shall have been applied to the first six (6) inches of the exterior of the spigot ends.

b. Lining Material

The interior of all ductile iron pipe and fittings shall be lined with Protecto 401 Ceramic Epoxy as manufactured by Induron Protective Coatings, Permox CTF as manufactured by The Permite Corporation, or Perma-Shield PL Series 431 as manufactured by Tnemec Company, Inc. Any request for substitution must be accompanied by a successful history of lining pipe and fittings for sewer service, a test report verifying appropriate properties to be used in wastewater piping, and a certification of the test results.

c. Application

1) Applicator

The lining shall be applied by a competent firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.

2) Surface Preparation

Prior to abrasive blasting, the entire area to receive the protective compound shall be inspected for oil, grease, etc. Any areas where oil, grease, or any substance which can be removed by solvent is present, shall be solvent cleaned. After the surface has been made free of grease, oil, or other substances, all areas to receive the protective compounds shall be abrasively blasted using compressed air nozzles with sand or grit abrasive media. The entire surface to be lined shall be struck with the blast media so that all rust, loose oxides, etc., are removed from the surface. Only slight stains and tightly adhering annealing oxide may be left on the surface. Any area where rust reappears before lining must be reblasted.

3) Lining

After the surface preparation and within eight (8) hours of surface preparation, the interior of the pipe shall receive 40 mils nominal dry film thickness of epoxy. No lining shall take place when the substrate or ambient temperature is below 40 degrees Fahrenheit. The surface also must be dry and dust free. If flange pipe or fittings are included in the project, the lining shall not be used on the face of the flange.

4) Coating of Bell Sockets and Spigot Ends

Due to the tolerances involved, the gasket area and spigot end up to six (6) inches back from the end of the spigot end must be coated with 6 mils nominal, 10 mils maximum joint compound. The joint compound shall be applied by brush to ensure coverage. Care should be taken that the joint compound is smooth without excess buildup in the gasket

seat or on the spigot ends. Coating of the gasket seat and spigot ends shall be done after the application of the lining.

5) Number of Coats

The number of coats of lining material applied shall be as recommended by the lining manufacturer. However, in no case shall this material be applied above the dry thickness per coat recommended by the lining manufacturer in printed literature. The maximum or minimum time between coats shall be that time recommended by the lining material manufacturer. **No material shall be used for lining which is not indefinitely recoatable with itself without roughening of the surface.**

6) Touch-Up and Repair

Joint compound shall be used for touch-up or repair in accordance with manufacturer's recommendations.

d. Inspection and Certification

1) Inspection

a) All ductile iron pipe and fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined in SSPC-PA-2 Film Thickness Rating.

b) The interior lining of all pipe barrels and fittings shall undergo holiday inspection in accordance with American Waterworks Association Standard AWWA C210. Holiday inspection may be conducted any time after the coating has reached sufficient cure based on the coating manufacturer's recommendation.

c) Each pipe joint and fitting shall be marked with the date of application of the lining system along with its numerical sequence of application on that date and records maintained by the applicator of his work.

2) Certification

a) The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified.

e. Handling

1) Epoxy lined pipe and fittings must be handled only from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc., shall be placed inside the pipe and fittings for lifting, positioning, or laying.

2. Exterior Coating

a. Bituminous outside coating shall be in accordance with ANSI/AWWA C151/A 21.51 for pipe and ANSI/AWWA C110/A 21.10 for fittings.

E. Fittings and gaskets for mechanical and push-on joint ductile and cast iron pipe shall conform to the latest revisions of ANSI/AWWA C110/A 21.10 for mechanical and push-on joint fittings, ANSI/AWWA C111/A 21.11 for gaskets, and ANSI/AWWA C153/A 21.53 for mechanical and push-on joint compact fittings.

F. All ductile and cast iron fittings shall be ductile iron grade 70-50-05, 65-45-12, or 60-42-10 in compliance with AWWA C153 and AWWA C110.

G. Restrained joint pipe and fittings shall be a boltless system equal to "Field-Lok" restraining gaskets or "TRFLEX Joint" as manufactured by U.S. Pipe & Foundry Company.

H. Pipe shall be as manufactured by U.S. Pipe & Foundry Company, McWane Ductile, American Pipe Company, or equal.

I. Pipe or fitting shall have the ANSI/AWWA standard, pressure (or thickness) class, diameter, DI or ductile noted, manufacturer, and country and year where cast on the outside of the body.

2.02 POLYVINYL CHLORIDE (PVC) PIPE (SOLID WALL)

A. Bury depth 20 feet or less or encased in steel pipe: PVC pipe and fittings less than 15 inches in diameter shall conform to the requirements of ASTM Standard Specifications for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings, Designation D 3034. Pipe and fittings shall conform to ASTM D-1784. For depths 15 feet and less, pipe shall have a pipe diameter to wall thickness ratio (SDR) of 35. For depths greater than 15 feet up to 20 feet maximum, pipe shall be SDR 26. If the PVC pipe is encased in a steel pipe, PVC pipe shall be SDR 35 regardless of buried depth.

B. Bury depth 20 feet or less or encased in steel pipe: PVC pipe and fitting with diameters 18-inch and larger shall conform to the requirements of ASTM D-1784 and ASTM F-679. For depths 15 feet and less, pipe shall have pipe stiffness 46 (SDR 35). For depths greater than 15 feet up to 20 feet maximum, pipe shall have pipe stiffness of 115 (SDR 26). If the PVC pipe is encased in a steel pipe, PVC pipe shall be SDR 35 regardless of buried depth.

C. Bury depth greater than 20 feet: PVC pipe 8 inches through 36-inch PVC plastic pipe shall conform to ANSI/AWWA C900. Pipe shall be pressure Class 165, DR 25. PVC pipe shall have bell end and elastomeric gasket, and with plain end for cast-iron or ductile-iron fittings. Elastomeric gasket shall conform with the requirements of ASTM F-477. The seal of the National Sanitation Foundation Testing Laboratory must appear on each pipe.

D. Joints shall be push-on bell and spigot type using elastomeric ring gaskets conforming to ASTM D 3212 and F 477. The gaskets shall be securely fixed into place in the bells so that they cannot be dislodged during joint assembly. The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and groundwater, and which will endure permanently under the conditions of the proposed use.

E. Pipe shall be furnished in lengths of at least 12 feet. The centerline of each pipe section shall not deviate from a straight line drawn between the centers of the openings at the ends by more than 1/16 inch per foot of length.

F. PVC pipe shall be clearly marked at intervals of 5 feet or less with the manufacturer's name or trademark, nominal pipe size, PVC cell classification, the legend "Type PSM SDR 35 PVC Sewer Pipe" and the designation "ASTM D 3034", or "ASTM F-679". Fittings shall be clearly marked with the manufacturer's name or trademark, nominal size, the material designation "PVC", "PSM" and the designation 'ASTM D 3034", or "ASTM F-679". C900 for sewer would require the use of C900 sewer fittings.

G. PVC pipe fittings shall be compatible with selected pipe.

H. Pipe color shall be green.

I. PVC pipe installation shall conform to ASTM D-2321 latest revision.

J. Pipe shall be manufactured by JM Eagle, Diamond Plastics, or equal.

2.03 FIBERGLASS REINFORCED POLYMER MORTAR PIPE (FRPM)

A. References

1. ASTM D3262 – Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.

2. ASTM D4161 – Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.

3. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.

4. ASTM D3681 – Standard Test Method for Chemical Resistance of "Fiberglass" Pipe in a Deflected Condition.

5. ASTM D638 – Test Method for Tensile Properties of Plastics.

B. Materials

1. Pipe Class: Pipe shall be stiffness class 46 (SN) for depths 30 feet or less; SN 72 for depths greater than 30 feet.

2. Resin Systems: The manufacturer shall use only polyester resin systems with a proven history of performance in this particular application. The historical data shall have been acquired from a composite material of similar construction and composition as the proposed product.

3. Glass Reinforcements; The reinforcing glass fibers used to manufacture the components shall be of highest quality commercial grade E-glass filaments with binder and sizing compatible with impregnating resins.

4. Silica Sand: Sand shall be minimum 98% silica with a maximum moisture content of 0.2%.

5. Additives: Resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., when used, shall not detrimentally effect the performance of the product.

6. Elastomeric Gaskets: Gaskets shall meet ASTM F477 and be supplied by qualified gasket manufactures and be suitable for the service intended.

C. Manufacture and Construction

1. Pipes: Manufacture pipe to result in a dense, nonporous, corrosion-resistant, consistent composite structure. The interior surface of the pipes exposed to sewer flow shall be manufactured using a resin & glass reinforced liner or resin with a 50% elongation (minimum) when tested in accordance with D638. The interior surface shall provide crack resistance and abrasion resistance. The exterior surface of the pipes shall be comprised of a glass reinforced resin or sand and resin layer which provides UV protection to the exterior. Pipes shall be Type 1, Liner 1, Grade 1 or Type 1, Liner 2, Grade 3 per ASTM D3262.

2. Joints: Unless otherwise specified, the pipe shall be field connected with fiberglass sleeve couplings that utilized elastomeric sealing gaskets as the sole means to maintain joint watertightness. The joints must meet the performance requirements of ASTM D4161. Joints at tie-ins, when needed, may utilize gasket-sealed closure couplings.

3. Fittings: Flanges. Elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber-reinforced overlays. Fittings shall be FRPM. Tees with 6 inch stub for laterals

may have stubs constructed of FRPM or PVC SDR 35. Ductile iron (DI) fittings may be substituted for FRPM fittings. The **DI fittings shall be lined with Protecto 401 coating, or approved equal, and in accordance with DI pipe specification in this Section.**

4. Acceptable Manufacturer: HOBAS Pipe USA or Flowtite or Approved Equal.

D. Dimensions

1. Diameters: The actual outside diameter (18 inches to 48 inches) of the pipes shall be in accordance with ASTM D3262 and be in cast iron pipe sizes. For other diameters, OD's shall be per manufacturer's literature.

2. Lengths: Pipe shall be supplied in nominal lengths of 20 to 40 feet. Actual laying length shall be nominal +1, -4 inches. At least 90% of the total footage of each size and class of pipe, excluding special order lengths, shall be furnished in nominal length sections.

3. Wall Thickness: The minimum wall thickness shall be the stated design thickness.

4. End Squareness: Pipe ends shall be square to the pipe axis with a maximum tolerance of 1/8".

E. Testing

1. Pipes: Pipes shall be manufactured and tested in accordance with ASTM D3262.

2. Joints: Coupling joints shall meet the requirements of ASTM D4161.

3. Stiffness: Minimum pipe stiffness when tested in accordance with ASTM D2412 shall normally be 36 psi.

4. Strain Corrosion: The extrapolated 50-year strain corrosion value meet the requirements of Table 4 in ASTM D3262 when tested in accordance with ASTM 3681.

F. Installation

1. Burial: The bedding and burial of pipe and fittings shall be in accordance with the project plans and specifications and the manufacturer's requirements.

2. Pipe Handling: Use textile slings, other suitable materials or a forklift. Use of chains or cables is not allowed.

3. Jointing:

a. Clean ends of pipe and coupling components

b. Apply joint lubricant to pipe ends and elastomeric seals of coupling. Use only lubricants approved by the pipe manufacturer.

c. Use suitable equipment and end protection to push or pull the pipes together.

d. Do not exceed forces recommended by the manufacturer for coupling pipe.

e. Join pipes in straight alignment then deflect to required angle. Do not allow the deflection angle to exceed the deflection permitted by the manufacturer.

4. Field Tests:

a. Testing shall be in accordance with specification hereinafter in this Section 02532.

2.04 POLYPROPYLENE (PP) PIPE (TRIPLE-WALL)

A. Only Polypropylene Pipe with a triple-wall construction shall be acceptable. Triple wall pipe shall meet ASTM F2764.

B. Pipe shall have a minimum pipe stiffness of 46 psi when tested in accordance with ASTM D2412.

C. Bury depth shall be in accordance to the table below. The table below does not consider hydrostatic pressure. The presence of hydrostatic pressure will lower the maximum bury depths listed. Compaction levels shown are for standard Proctor density.

Maximum Cover Pipe, ft.			
Diameter, in.	Class 1	Class 2	
	Compacted	95%	90%
30	30	21	15
36	29	21	15
42	32	22	16
48	33	23	16
60	31	21	15

D. Pipe shall be joined using a bell and spigot joint meeting the requirements of ASTM F2764. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and groundwater, and which will endure permanently under the conditions of the proposed use. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gaskets are free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly. 30- through 60-inch diameters shall have a reinforced bell with a polymer composite band installed by the manufacturer.

E. Fittings shall conform to ASTM F2764. Bell and spigot connections shall utilize a welded or integral bell and valley or inline gaskets meeting the watertight joint performance requirements of ASTM D3212.

F. To assure watertightness, field performance verification may be accomplished by testing in accordance with ASTM F1417 or ASTM 2487. Appropriate safety precautions must be used with field-testing any pipe material. Contact the manufacturer for recommended leakage rates.

G. Polypropylene compound for pipe and fitting production shall be an impact modified copolymer meeting the material requirements of ASTM F2764.

H. Installation shall be in accordance with ASTM D2321 and manufacturers recommended installation guidelines.

I. When backfilling trench with flowable fill, Contractor shall use an anchoring system and incremental lifts to avoid pipe flotation. Contractor shall consult pipe manufacturer for requirements to avoid pipe flotation in flowable fill installations.

J. Pipe shall be manufactured by Advanced Drainage Systems, Inc. or equal.

2.05 CONNECTION TO EXISTING GRAVITY PIPE

A. Connections between new and existing gravity pipe shall use a Fernco Strong Back, Straub-Flex coupling, Arpol or approved equal.

B. Connections between like sizes of PVC pipe shall use a PVC GXG Repair Coupling.

C. For pipes 12 inches in diameter and larger, concrete cradle shall be poured under each coupling. The length of the cradle (longitudinally along the pipe) shall be at least one pipe diameter and centered on the coupling. The depth of the cradle shall be half a pipe diameter (measured from the bottom of the cradle to the invert of the pipe). Cradles shall be formed and poured in place and reach from springline to springline.

2.06 UNDERGROUND WARNING TAPE

A. All pipe shall include detectable underground warning tape. Warning tape shall have a minimum thickness of 5 mils, constructed of a minimum 0.0003" (0.3 mils) aluminum foil laminated between polyester and polyethylene sheeting, color coded to sewer, and suitable for direct bury.

B. Warning tape installed per LFUCG standard drawings.

PART 3 – EXECUTION

3.01 PIPE LAYING

A. Excavation, trenching, backfilling, and bedding requirements are set forth in Section 02225.

B. All pipe shall be laid with ends abutting and true to the lines and grades indicated on the Drawings. The pipe shall be laid straight between changes in alignment and at uniform grade between changes in grade. Pipe shall be fitted and matched so that when laid in the trench, it will provide a smooth and uniform invert.

C. Before each piece of pipe is lowered into the trench, it shall be thoroughly swabbed out to insure its being clean. Any piece of pipe or fitting which is known to be defective shall not be laid or placed in the lines. If any defective pipe or fitting shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without additional charge. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe and beveled to match the factory bevel for insertion into gasketed joints. Bevel can be made with hand or power tools.

D. The interior of the pipe, as work progresses, shall be cleaned of dirt, jointing materials, and superfluous materials of every description. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitted into the pipe bell so as to exclude earth or other material and precautions taken to prevent flotation of pipe by runoff into trench.

E. All pipe shall be laid starting at the lowest point and installed so that the spigot ends point in the direction of flow.

F. Pipe will have the same material specification between manholes.

3.02 PIPE ASSEMBLY

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

3.03 UTILITY CROSSING CONCRETE ENCASEMENT

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

includes underground water, gas, telephone and electrical conduit, storm sewers, and any other pipe as determined by the Engineer.

B. There are two cases of utility crossing encasement. Case I is applicable when the proposed sanitary sewer line is below the existing utility line. Case II is applicable when the proposed sanitary sewer line is laid above the utility line. In either case, the concrete shall extend to at least the spring line of each pipe involved.

C. Concrete shall be Class A and shall be mixed sufficiently wet to permit it to flow between the pipes to form a continuous bridge. In tamping the concrete, care shall be taken not to disturb the grade or line of either pipe or damage the joints.

3.04 TESTING OF GRAVITY SEWER LINES

A. After the gravity piping system has been brought to completion, and prior to final inspection, the Contractor shall rod out the entire system by pushing through each individual line in the system, from manhole to manhole, appropriate tools for the removal from the line of any and all dirt, debris, and trash. If necessary during the process of rodding the system, water shall be turned into the system in such quantities to carry off the dirt, debris, and trash.

B. During the final inspection the Engineer will require all flexible sanitary sewer pipe (PVC, FRP, DI, and PP) to be mandrel deflection tested after installation.

1. The mandrel (go/no-go) device shall be cylindrical in shape and constructed with nine (9) evenly spaced arms of prongs. The mandrel dimension shall be 95 percent of the flexible pipe's published ASTM average inside diameter. Allowances for pipe wall thickness tolerances of ovality (from shipment, heat, shipping loads, poor production, etc.) shall not be deducted from the ASTM average inside diameter, but shall be counted as part of the 5 percent allowance. The contact length of the mandrel's arms shall equal or exceed the nominal diameter of the sewer to be inspected. Critical mandrel dimensions shall carry a tolerance ± 0.001 inch.

2. The mandrel inspection shall be conducted no earlier than 30 days after reaching final trench backfill grade provided, in the opinion of the Engineer, sufficient water densification or rainfall has occurred to thoroughly settle the soil throughout the entire trench depth. Short-term (tested 30 days after installation) deflection shall not exceed 5 percent of the pipe's average inside diameter. The mandrel shall be hand pulled by the contractor through all sewer lines. Any sections of the sewer not passing the mandrel test shall be uncovered and the Contractor shall replace and recompact the embedment backfill material to the satisfaction of the Engineer. These repaired sections shall be retested with the go/no-go mandrel until passing.

3. The Engineer shall be responsible for approving the mandrel. Proving rings may be used to assist in this. Drawings of the mandrel with complete dimensioning

shall be furnished by the Contractor to the Engineer for each diameter and type of flexible pipe.

C. Low-pressure air tests shall be performed on all gravity sanitary sewers to verify water tightness of pipe joints and connections. The Contractor shall perform testing on each manhole-to-manhole section of sewer line after placement of backfill.

1. Testing of Polyvinyl Chloride (PVC), Fiberglass Reinforced Polymer Mortar (FRPM), Ductile Iron (DI), and Polypropylene (PP) pipe sewer lines shall be performed in accordance with the current editions of ASTM F1417, "Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air," and UNI-B-6, "Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe," respectively.

2. All testing equipment shall be inspected by the Engineer to ensure that equipment is functioning properly.

3. The rate of air loss in the section under test shall be determined by the time-pressure drop method. The time required in minutes for the pressure in the section under test to decrease from 3.5 to 2.5 psig shall be not less than that indicated in the referenced standards.

4. Immediately following the low-pressure air test, the Contractor shall notify the Engineer of the test results. A Low-Pressure Air Test Report shall be completed by the Contractor during testing. The report shall be completed according to the procedures outlined in LFUCG's Construction Inspection Manual, current edition. A copy of the completed Low-Pressure Air Test Report shall be provided to the Engineer and LFUCG-Division of Water Quality for each test.

5. Pipes failing the pressure test will not be accepted and shall be repaired or replaced until a successful test is achieved.

6. When conducting a low-pressure air test, the Contractor shall securely install and brace all plugs prior to pressurizing the pipe. Personnel shall not be permitted to enter manholes when the sewer pipe is pressurized.

D. TV Survey

1. TV survey and cleaning shall be performed on all gravity sewers.

2. Hydraulic cleaning and vacuum must be done prior to TV survey.

3. TV survey must be of dry pipe.

4. TV survey shall be Pipe Assessment Certification Program (PACP) level of quality and TV equipment must include a slope-inclinometer.

5. Acceptance of TV survey, completed sewers, and the repairs needed are to be determined at sole discretion of LFUCG.

6. TV survey shall include:

   a. Video file and shall be re-named to LFUCG's assets.

   b. PACP database must be in Microsoft Access format, version 4.4.2 which includes photos embedded in database.

   c. Report shall be provided in electronic version in PDF format.

E. The Contractor shall furnish suitable test plugs, water pumps, and appurtenances, and all labor required to properly conduct the tests. Suitable bulkheads shall be installed, as required, to permit the test of the sewer. The Contractor shall construct weirs or other means of measurements as may be necessary.

F. Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing the leaks and retesting as the Engineer may require without additional compensation.

END OF SECTION

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SECTION 02540
PIPE ABANDONMENT

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. This Section covers pipe abandonment procedures. The Contractor shall furnish all labor, materials and equipment to abandon pipe as described here or as shown on the Drawings.

B. Unless otherwise indicated, pipes 18-inches and larger which are located under pavement with public access shall be safeloaded. All other abandoned sewer pipe shall be plugged.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02225 – Excavating, Backfilling, and Compacting

B. Section 02240 - Dewatering

PART 2 – PRODUCTS

2.01 LEAN CONCRETE

A. Fill shall be a flowable, lean mix of concrete and sand, by the mix given as follows, per cubic yard batch:

Cement	30 pounds
Fly Ash, Class F	300 pounds
Natural Sand (S.S.D.)	3,000 pounds
Water (Maximum)	550 pounds

PART 3 – EXECUTION

3.01 SAFELOAD

A. The Contractor shall safeload the pipe by utilizing the lean concrete mix as described in paragraph 2.01 of this specification.

3.02 PLUG

A. The Contractor shall expose and cut the pipeline where shown or directed and construct a minimum 9-inch thick 3,000 psi concrete plug at the pipe openings. Approved mechanical plug may be used in lieu of the concrete plug.

END OF SECTION

SECTION 02608
MANHOLES

PART 1 – GENERAL

1.01 SUMMARY

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

1.02 DEFINITIONS

A. Standard Manhole: A standard manhole is defined as any manhole that is greater than 5 feet in depth, as measured from the invert of the manhole base at its center to the top (rim) of the manhole cover.

B. Shallow Manhole: A shallow manhole is defined as any manhole that is 5 feet or less in depth, as measured in the preceding sentence.

PART 2 – PRODUCTS

2.01 CONCRETE MANHOLES - GENERAL

A. Manholes shall conform in shape, size, dimensions, materials, and other respects as shown on the Drawings or specified herein.

B. All concrete manholes shall have precast reinforced concrete developed bases. No other type of base will be allowed. Invert channels shall be factory constructed, for up to 5' manholes, when the base is made. Sloping invert channels shall be constructed whenever the difference between the inlet and outlet elevation is 2 feet or less.

C. The concrete manhole walls (barrels and cones) and base shall be precast concrete sections manufactured with **cementitious crystalline admixture at dosage of 3.5% (2% for Xypex C-500 RED) by weight of cement.** The cementitious crystalline admixture shall be **Xypex C-1000 RED, Xypex C-500 RED, KIM K-301, or Crystal-X Admix-R**. The top of the cone shall be built of reinforced concrete to allow adjustment rings to be added for adjustment of the frame to meet the finished surface. Minimum strength of the concrete for the precast sections shall be 4,000 psi at the time of shipment.

D. **Manholes that receive sewage from a force main discharge, and within 2,000 LF downstream or to the nearest manhole beyond the 2,000 LF, shall have concrete admixture ConShield, Xypex Bio-San C500, or approved equal. This admixture**

would be in addition to the cementitious crystalline admixture listed in paragraph 2.01.C above.

E. Manholes located in the 100-year floodplain shall have a concrete base that includes an anti-flotation collar. The collar shall have a minimum radius 6-inches larger than the exterior wall of the base section. Contractor shall submit buoyancy calculations for all manholes within the 100-year floodplain to determine the actual width of the anti-floatation collar. Contractor shall assume buoyance of the manhole to an elevation equal to the 100-year flood elevation. Buoyancy calculations shall have a factor of safety of 1.2.

F. For concrete manholes, the inverts of the developed bases shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent, within the manhole, to the centerlines of adjoining pipelines.

G. For concrete manholes, the cast iron frames and covers shall be the standard frame and cover as indicated on the LFUCG Standard Drawings.

H. Manholes shall be manufactured by iCast, Oldcastle Infrastructure or approved equal.

2.02 PRECAST CONCRETE SECTIONS

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

B. The base section shall be monolithic for 4-foot and 5-foot diameter manholes. Manholes with diameter of 6 feet or larger shall have a monolithic base or base slab.

C. The wall sections shall be not less than 5 inches thick.

D. Type II or type III cement shall be used except as otherwise permitted.

2.03 CONCRETE MANHOLE - FRAMES AND COVERS

A. The Contractor shall furnish all cast iron manhole frames and covers as shown in LFUCG Standard Drawings.

B. Castings shall be designed for H-20 traffic loading.

C. The castings shall be of good quality, strong, tough, evengrained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.

D. Frames shall be set in mastic and bolted down in non-traffic areas with four ¾" SS Hilti anchor bolts and washers. Hilti anchor bolts shall be embedded a minimum of 4-inches

into precast concrete cone section. In traffic areas, the frame shall be set in mastic and Class A concrete donut poured around frame to the top of concrete cone section. The concrete donut shall be 12-inches in width and in depth up to within 1 ½-inches of surface for bituminous asphalt pavement.

E. All casting shall be thoroughly cleaned and subject to a careful hammer inspection.

F. Castings shall be at least Class 25 conforming to the ASTM Standard Specifications for Gray Iron Casting, Designation A48, latest revision.

G. Unless otherwise specified, manhole covers shall be 22-3/4 inches in diameter, weighing not less than 305 pounds per frame and cover. Manhole covers shall set neatly in the rings, with contact edges machined for even bearings and tops flush with ring edge. They shall have sufficient corrugations to prevent slipperiness. The covers shall have two (2) pick holes about 1-1/4 inches wide and 1/2 inch deep with 3/8-inch undercut all around. Covers shall not be perforated. Frames and covers shall be J.R. Hoe and Sons Mc-350, or approved equal.

H. All covers shall be marked in large letters "LEXINGTON KENTUCKY SANITARY SEWER" as shown in LFUCG Standard Drawings.

2.04 MANHOLE STEPS (CONCRETE MANHOLES)

A. Manholes steps shall be the polypropylene plastic type reinforced with a 1/2 inch diameter deformed steel rod. The step shall be 10-1/2 inches wide and extend 5-3/4 inches from the manhole wall. Steps shall line up over the downstream invert of the manhole. The steps shall be embedded into the manhole wall a minimum of 3-3/8 inches. Steps shall be uniformly spaced at 12-inch to 16-inch intervals.

B. Manhole steps shall be in accordance with LFUCG Standard Drawings.

2.05 PREMOLDED ELASTOMERIC-SEALED JOINTS

A. All holes for pipe connections in concrete barrels and bases shall have a factory-installed flexible rubber gasket to prevent infiltration. The pipe to manhole connectors shall conform to the latest revision of ASTM-C923. The pipe to manhole connectors shall be A-Lok Manhole Pipe Seal A-Lok Premium manufactured by A-Lok Corporation, Trenton, NJ; or an approved equal. Z-Lok Cast In Boot Connector manufactured by A-Lok Corporation may be used for pipe connections up to 18-inches in diameter.

2.06 MANHOLE DIAPHRAGM

A. Diaphragm manhole inserts shall be provided for all manholes with pipe connection diameters of 12-inches and greater.

B. Diaphragm manhole inserts shall be manufactured from corrosion-proof material suitable for atmospheres containing hydrogen sulfide and diluted sulfuric acid. Diaphragm shall be installed in all manholes per the General Notes.

C. The body of the manhole insert shall be made of high density ethylene hexene-1 copolymer material meeting ASTM Specification D 1248, Class A, Category 5 (the insert shall have a minimum impact brittleness temperature of -180 degrees Fahrenheit). The thickness shall be uniform 1/8 inch or greater. The manhole insert shall be manufactured to dimensions as shown on the Drawings to allow easy installation within the manhole frame.

D. Gaskets shall be made of closed cell neoprene. The gasket shall have a pressure sensitive adhesive on one side and shall be placed under the weight bearing surface of the insert by the manufacturer. The adhesive shall be compatible with the manhole insert material so as to form a long lasting bond in either wet or dry conditions.

E. Lift strap shall be attached to the rising edge of the bowl insert. The lift strap shall be made of 1 inch wide woven polypropylene web and shall be seared on all cut ends to prevent unraveling. The lift strap shall be attached to the manhole insert by means of a stainless steel rivet. Location of the lift strap shall provide easy visual location.

F. Standard ventilation shall be by means of a valve or vent hole. Vent holes shall be on the side wall of the manhole insert approximately 3/4 inch below the lip. The valve or vent hole will allow a maximum release of 5 gallons per 24 hours when the insert is full.

G. The manhole insert shall be manufactured to fit the manhole frame rim upon which the manhole cover rests. The Contractor is responsible for obtaining specific measurements of each manhole cover to insure a proper fit. The manhole frame shall be cleaned of all dirt, scale and debris before placing the manhole insert on the rim.

H. Diaphragm shall be Rainstopper manufactured by Rainstopper, Inc., or approved equal.

2.07 CLEANOUTS

A. Cleanouts shall be cast iron and extend to the finish grade and capped with a clean-out plug in accordance with details and at locations shown on the Drawings. Pipe shall be the same size as the gravity sewer line in which the cleanout is located. A 4-inch thick concrete pad, with 6" x 6", 1.9 x 1.9 wire mesh, 24 inches square, with the valve box lid section, shall be provided around each cleanout.

B. Cleanouts shall be in accordance with LFUCG Standard Drawings.

2.08 DROP CONNECTIONS

A. Drop connections shall be installed on exterior of manhole as shown on the LFUCG Standard Drawings. The pipe material inside the drop manhole shall be of the same material as the sanitary sewer line.

B. All outside drop manholes are to be precast. No field casting of drop manholes shall be allowed unless directed by the Engineer.

C. Drop invert shall be at the springline of the mainline pipe.

2.09 EXTERNAL SEALS

A. All manhole section joints shall receive an external seal. The external seal shall be installed per the manufacturer's recommendations and shall meet ASTM C 877 (Type II). External seals for standard manholes shall be MARMAC MacWrap with straps. External seals for external drop manholes shall be ConWrap CS-212.

PART 3 – EXECUTION

3.01 FABRICATION - PRECAST SECTIONS

A. Manhole sections shall contain manhole steps accurately positioned and embedded in the concrete when the section is cast.

B. All precast concrete manhole sections shall be cured in a manner to assure the highest quality:

1. Results of initial set tests (per ASTM C 403) shall be provided upon request. New test will be run in the event of change of cement supplier, mix design, or as otherwise necessary to maintain a quality product.

2. Forms on wet-cast concrete shall not be removed until the concrete attains compressive strength equal to 2500 psi based upon field-cured cylinders, cured under conditions which equal the most severe conditions to which the product is exposed.

3. Test cylinders for determining "shipping strength" shall be cured with similar methods as the product that they represent. In lieu of actual curing with the product, cylinders may be cured in curing chambers correlated in temperature and humidity with the product conditions.

4. Any precast concrete manhole section which freezes before attaining 500 psi compressive strength will be rejected.

C. No more than two (2) lifting hooks may be cast or drilled in each section.

D. Flat slab tops shall have a minimum thickness of 6 inches and reinforcement in accordance with ASTM C478.

E. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the precast sections.

F. Acceptance of the sections will be on the basis of material tests and inspection of the completed product and test cylinders if requested by the Engineer.

G. Cones shall be precast sections of similar construction.

H. It shall be the responsibility of the precast manufacturer to handle all materials in such a manner as to avoid all damage to the product before and during delivery. This damage is defined as, but is not limited to, structural or spiderweb cracking, chips, spalls, pop-outs, or other damage.

I. All precast concrete manhole sections shall be stored in a manner that will maintain product quality, as well as provide damage protection from yard traffic. All concrete pipe greater than 36" in diameter shall be "stulled" with a minimum of two each, 4" x 4" wood posts providing vertical support during storage. This requirement shall apply both at the manufacturer's storage yard and on the jobsite.

J. No precast concrete manhole sections shall be delivered to a jobsite or transported from the facility of origin until adequate quality and maturity has been attained, as described in these specifications.

1. All precast concrete manhole sections shall be a minimum age of 3 days.

2. All precast concrete manhole sections shall attain compressive strength equal to 4000 psi.

3. No precast concrete manhole sections shall be delivered without Certification. Any product delivered without acceptable Certification will be subject to rejection.

3.02 SETTING PRECAST MANHOLE SECTIONS

A. Precast-reinforced concrete manhole sections shall be set so as to be vertical and with sections and steps in true alignment.

B. Butyl mastic sealant shall be installed in all manhole joints in accordance with the manufacturer's recommendations and as shown in LFUCG Standard Drawings. Butyl mastic sealant shall meet Federal Spec SS-S-210A, AASHTO M-19875l, and ASTM C990. Butyl mastic sealant shall be NPC Bidco C-56 as manufactured by Trelleborg Engineered Systems, or approved equal. Sealant shall be a minimum bead of 1 inch in rope configuration.

C. All manhole section joints shall receive an external seal. The external seal shall be installed per the manufacturer recommendations and shall meet ASTM C 877 (Type II) and have Type 316 stainless steel ratcheting straps. External seals shall be MARMAC MacWrap for manholes with straps.

D. All holes in sections used for their handling shall be thoroughly plugged with rubber plugs made specifically for this purpose.

3.03 ADJUSTING MANHOLE FRAMES AND COVERS TO GRADE

A. Except where shown on the Drawings, the top of the precast concrete eccentric cone of a standard manhole or the top of the flat slab of a shallow manhole shall terminate 6 inches below existing grade in an unpaved non-traffic area except in a residential yard

and 13 inches below existing grade in a paved or unpaved traffic area and in a residential yard. The remainder of the manhole shall be adjusted to the required grade.

B. When a manhole is located in an unpaved non-traffic area other than in a residential yard, the frame and cover shall be adjusted to an elevation 1 inch above the existing grade at the center of the cover. If field changes have resulted in the installed manhole invert elevation to be lower than the invert elevation shown on the Drawings, the adjustment to an elevation of 1 inch above existing grade shall be accomplished by the use of precast concrete or cast iron adjusting rings. The area around the adjusted frame and cover shall be filled with the required material, sloping it away from the cover at a grade of 1 inch per foot.

C. When a manhole is located in a bituminous, concrete, or crushed stone traffic area, or in a residential yard, the frame and cover shall be adjusted to the grade of the surrounding area by the use of precast concrete or cast iron adjusting rings. The adjusted cover shall conform to the elevation and slope of the surrounding area.

1. The Contractor shall coordinate elevations of manhole covers in paved streets with the local public works department. If resurfacing of the street in which sewers are laid is expected within twelve (12) months, covers shall be set 1-1/2 inches above the existing pavement surface in anticipation of the resurfacing operations.

3.04 ADJUSTING SECTIONS

A. Only clean adjusting sections shall be used. Each adjusting section shall be laid in a bead of butyl mastic sealant and shall be thoroughly bonded.

3.05 SETTING MANHOLE FRAMES AND COVERS

A. Manhole frames shall be set with the tops conforming to the required elevations set forth hereinbefore. Frames shall be set concentric with the top of the concrete and in a full bead (1") of butyl mastic sealant so that the space between the top of the masonry and the bottom flange of the frame shall be completely watertight.

B. Manhole covers shall be left in place in the frames on completion of other work at the manholes.

3.06 VACUUM TESTING (ASTM C1244)

A. Scope

1. This test method covers procedures for testing precast concrete manhole sections and precast and cast in place drop manholes, when using the vacuum test method to demonstrate the integrity of the installed materials and the construction procedures. This test method is used for testing concrete manhole sections utilizing mortar, mastic, or gasketed joints.

B. References, ASTM Standards:

1. C 822 Terminology Relating to Concrete Pipe and Related Products.

2. C 924 Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method.

3. C 969 Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.

C. Summary of Practice

1. All lift holes and any pipes entering the manhole are to be plugged. All drop piping (precast or cast in place) shall be tested and included in the pressure testing zone. A vacuum will be drawn and the vacuum drop over a specified time period is used to determine the acceptability of the manhole.

D. Significance and Use

1. This is not a routine test. The values recorded are applicable only to the manhole being tested and at the time of testing.

E. Preparation of the Manhole

1. All lift holes shall be plugged.

   a. 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.

   b. All drop piping (precast or cast in place) shall be tested and included in the pressure testing zone.

F. Procedure

1. The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.

2. A vacuum of 10 inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 inches of mercury.

3. The manhole shall pass if the **minimum time** for the vacuum reading to drop from 10 inches of mercury to 9 inches of mercury **exceeds 60 seconds (one minute)**.

4. If the manhole fails the initial test, necessary repairs shall be made by an approved method. The manhole shall then be retested until a satisfactory test is obtained.

5. Use or failure of this vacuum test shall not preclude acceptance by appropriate water infiltration or exfiltration testing, (see Practice C 969), or other means.

G. Precision and Bias

1. No justifiable statement can be made either on the precision or bias of this procedure, since the test result merely states whether there is conformance to the criteria for the success specified.

END OF SECTION

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SECTION 02620
STORM UTILITY PIPING

PART 1 – GENERAL

1.01 SUMMARY

A. The Contractor shall furnish all labor, material, and equipment necessary to install storm utility drainage piping with all appurtenances as shown and detailed on the Drawings and specified herein.

1.02 SUBMITTALS

A. The Contractor shall comply with the requirements of Section 01300 of the specifications.

B. A notarized certification shall be furnished for all pipe and fittings which verifies compliance with all applicable specifications.

PART 2 – PRODUCTS

2.01 PIPING MATERIALS

A. Polyvinyl Chloride (PVC) Pipe

1. Solid Wall PVC Pipe (DR 18).

a. PVC pipe and fittings less than 15 inches in diameter shall conform to the requirements of ASTM Standard Specifications for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings, Designation D 3034. Pipe and fittings shall conform to ASTM D – 1784. All pipe shall have a pipe diameter to wall thickness ratio (DR) of a maximum of 18.

b. PVC pipe and fittings with diameters 18-inch through 27-inch shall conform to the requirements of ASTM D-1784 and ASTM F-679.

c. Joints shall be push-on bell and spigot type using elastomeric ring gaskets conforming to ASTM D 3212 and F 477. The gaskets shall be securely fixed into place in the bells so that they cannot be dislodged during joint assembly. The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and groundwater, and which will endure permanently under the conditions of the proposed use.

d. Pipe shall be furnished in lengths of not more than 20 feet. The centerline of each pipe section shall not deviate from a straight line drawn between the centers of the openings at the ends by more than 1/16 inch per foot of length.

e. PVC pipe shall not have a filler content greater than ten percent (10%) by weight relative to PVC resin in the compound.

f. PVC pipe shall be clearly marked at intervals of 5 feet or less with the manufacturer's name or trademark, nominal size, PVC cell classifications, the legend "Type PSM DR 18 PVC Sewer Pipe" and the designation "ASTM D 3034" or "ASTM F-679". Fittings shall be clearly marked with the manufacturer's name or trademark, nominal size, the material designation "PVC", "PSM" and the designation "ASTM D 3034", or "ASTM F-679".

g. PVC pipe shall have minimum pipe stiffness of 46 psi for each diameter when measured at 5 percent vertical ring deflection and tested in accordance with ASTM D-2412.

h. Five (5) copies of directions for handling and installing the pipe shall be furnished to the Contractor by the manufacturer at the first delivery of pipe to the job. PVC pipe installation shall conform to ASTM D-2321 latest revision.

B. Reinforced Concrete Pipe

1. All reinforced concrete pipe shall conform to the requirements of ASTM C76, latest edition. All RCP shall be class III with wall thickness "B".

2. Joints shall be bell and spigot type using rubber Forsheda 138 or Forcheda 103 gaskets (or approved equal) and shall conform to ASTM C443.

3. The pipe shall be furnished in standard lengths of 8 feet to 16 feet.

4. The pipe shall be permanently marked showing the nominal inside diameter, manufacture date, ASTM C76 class, and manufacturer's name. These markings for 30-inch diameter and larger shall be inscribed on the pipe exterior and stenciled on the interior with paint or permanent ink.

5. There shall be no lift holes.

2.02 CONCRETE

A. All concrete shall be in accordance with Section 03300 of the Specifications

PART 3 – EXECUTION

3.01 PIPE INSTALLATION

A. Pipe installation shall be in accordance with Specification Section 02225 – Excavation, Backfilling, and Compacting for Utilities.

B. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage pipe. Location and arrangement of piping layout shall take design considerations into account. Install piping as indicated to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

C. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

D. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

E. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

F. Install piping with 36-inch minimum cover. Install PVC sewer piping according to ASTM D-2321 and ASTM F-1668.

G. Clear interior of piping and manholes of dirt and superfluous material as work progresses.

3.02 PIPE JOINT CONSTRUCTION

A. Join PVC sewer piping according to ASTM D-2321 and ASTM D-3034 for elastomeric-gasket joints.

B. Join dissimilar pipe materials with nonpressure-type flexible couplings.

3.03 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate report for each system inspection.

2. Defects requiring correction include the following:

a. Alignment: less than full diameter of inside of pipe is visible between structures.

b. Deflection: flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping.

c. Crushed, broken, cracked, or otherwise damaged piping.

d. Infiltration: water leakage into piping.

e. Exfiltration: water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are with allowances specified.

4. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.

2. Test completed piping systems according to requirements of authorities having jurisdiction.

3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.

4. Submit separate report for each test.

5. Air Tests:

a. Test storm drainage according to requirements of authorities having jurisdiction, UNI-B-6, and

b. Test plastic gravity sewer piping according to ASTM F-1417.

6. Leaks and loss in test pressure constitute defects that must be repaired.

7. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.04 REPAIRS TO STORMWATER PIPE

A. Repairs to stormwater pipe shall be made using pipe manufactured of similar materials to the existing pipe and similar inside and outside dimensions.

B. Connections between new and existing stormwater pipe shall use a Fernco Strong Back, Straub-Flex coupling, Arpol or approved equal.

C. A concrete collar 8 inches in thickness shall be poured around the coupling. The length of the collar (longitudinally along the pipe) shall be at least one pipe diameter and centered on the coupling. Collars shall be formed and poured in place around the full circumference of the pipe.

D. Repairs using dissimilar materials must be approved by the Engineer in advance of the repair.

E. Upon completion of repairs as specified above, the interior and exterior of the pipe shall be visually inspected for acceptance.

END OF SECTION

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SECTION 02650
SEWER LINE CLEANING

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required to clean all sewer pipe, laterals and fittings installed and/or rehabilitated, as specified herein.

B. Cleaning shall include the proper high pressure water jetting, rodding, snaking, bucketing, brushing and flushing of sewers, laterals, and manholes prior to inspection by closed circuit television, pipeline rehabilitation or replacement, point repairs, manhole preparation, and testing operations.

C. Cleaning shall dislodge, transport and remove all sludge, mud, sand, gravel, rocks, bricks, grease, roots, sticks, and all other debris from the interior of the sewer pipe and manholes as required for pipeline rehabilitation.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Hydraulically propelled Sewer Cleaning Equipment

1. Hydraulically propelled sewer cleaning equipment shall be the movable dam type constructed such that a portion of the dam may be collapsed during cleaning to prevent flooding of the sewer.

2. The movable dam shall be the same diameter as the pipe being cleaned and shall provide a flexible scraper around the outer periphery to ensure total removal of grease.

3. Contractor shall take precautions against flooding prior to using sewer cleaning balls or other such equipment that cannot be collapsed instantly.

B. High Velocity Hydro-Cleaning Equipment shall have the following:

1. A minimum of 500-ft of high pressure hose.

2. Two or more high velocity nozzles capable of producing a scouring action from 15 to 45 degrees in all size lines to be cleaned.

3. A high velocity gun for washing and scouring manhole walls and floor.

4. Capability of producing flows from a fine spray to a long distance solid stream.

5. A water tank, auxiliary engines and pumps and a hydraulically driven hose reel.

6. Equipment operating controls located above ground.

C. Mechanical cleaning equipment for sewer mains shall be either power buckets or power rodders by the Sewer Equipment Company of America or equal.

1. Bucket machines

a. Be furnished with buckets in pairs

b. Use V-belts for power transmission or have an overload device. No direct drive machines will be permitted.

c. Be equipped with a take up drum and a minimum of 500-ft of cable.

d. Have sufficient dragging power to perform the work efficiently.

2. Power rodding machine

a. Either sectional or continuous.

b. Hold a minimum of 750-ft of rod.

c. The machine shall have a positive rod drive to produce 2000 pounds of rod pull.

PART 3 – EXECUTION

3.01 PERFORMANCE

A. Selection of cleaning equipment shall be based on the conditions of the manholes and lines at the time the work commences based on the pre-construction CCTV inspection to be conducted by the Contractor under this Contract.

B. Use properly selected equipment to remove all dirt, grease, rock and other deleterious materials and obstructions.

C. Protect existing sewer lines from damage caused by improper use of cleaning equipment.

D. Take precautions to avoid damage or flooding to public or private property being served by the line being cleaned.

E. Use sewage flow in the sewer lines to provide necessary pressures for hydraulic cleaning devices whenever possible.

F. Removal of Materials

1. Remove all solids and semi-solids at the downstream manhole of the section being cleaned.

2. Passing material from one section of a line to another will not be permitted.

G. Remove from the site and properly dispose of all solids or semi-solids recovered during the cleaning operation.

H. No sewer cleaning shall take place in a particular sewer segment until all upstream pipe segments have been cleaned. If cleaning is done in a downstream pipe segment in order to facilitate overall cleaning operations, the segment shall be re-cleaned at no additional cost, after all pipes upstream of that segment have been cleaned.

3.02 FIELD QUALITY CONTROL

A. Acceptance of this portion of the work shall be dependent upon the results of the television inspection. Lines not acceptably clean as to permit television inspection and rehabilitation shall be re-cleaned and re-inspected at no additional cost to the Owner.

3.03 FINAL SEWER CLEANING

A. Prior to final inspection and acceptance of each manhole-to-manhole section of the sewer system by the Engineer, the sewer shall be cleaned. Remove all accumulated construction debris, rocks, gravel, sand, silt and other foreign material from the sewer system. Once the large debris is removed, the sewer shall be flushed.

B. Following final cleaning, the Contractor shall inspect each manhole-to-manhole section in accordance with Specifications Section 2651 – Television Inspection.

C. Upon the Engineer's final manhole-to-manhole inspection of the sewer system, if any foreign matter is still present in the system, clean the sections and portions of the lines as required.

D. Place the new line in service as soon as is practical after acceptance by the Engineer.

END OF SECTION

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SECTION 02651
TELEVISION INSPECTION

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. Furnish all necessary labor, materials, equipment, services and incidentals required to visually inspect by means of closed-circuit television (CCTV) designated sewer line sections and sewer laterals, including, but not limited to, recording and playback equipment, materials and supplies.

B. The inspection shall be performed on one sewer line section (i.e. manhole to manhole) or one sewer lateral (i.e. sewer main toward property) at a time. The section being inspected shall be suitably isolated from the remainder of the sewer system.

C. Video recordings shall be made of the television inspections and copies of both the recordings and printed inspection logs shall be supplied to the Owner.

D. Contractor may have to perform point repairs, remove obstructions or remove protruding service connections to complete pre-rehabilitation TV inspection.

PART 2 – PRODUCTS

2.01 EQUIPMENT

A. The television camera used for sewer main inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera, television monitor and other components of the video system shall be capable of producing a minimum 500-line resolution color video picture. Picture quality and definition shall be to the satisfaction of the Engineer and if unsatisfactory, inspection shall be performed again with the appropriate changes made as designated by the Engineer at no additional cost to the Owner. The television inspection equipment shall have an accurate footage counter that shall display on the monitor, the exact distance of the camera from the centerline of the starting manhole.

PART 3 – EXECUTION

3.01 PROCEDURE

A. The camera shall be moved through the sewer main in either direction at a uniform rate, stopping when necessary to ensure proper documentation of the sewer's condition but in no case will the television camera be pulled at a speed greater than 30 fpm. Manual

winches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire sewer line section, the equipment shall be removed and repositioned in a manner so that the inspection can be performed from the opposite manhole. All set-up costs for the inspection shall be included in the unit prices bid. If, again, the camera fails to pass through the entire section, the Contractor shall perform point repairs as required on the Drawings, remove or cut protruding service connections, or re-clean or further remove roots or blockage at no additional cost to the Owner.

B. Whenever non-remote powered and controlled winches are used to pull the television camera through the line, telephones, radios, or other suitable means of communication shall be set up between the two manholes of the sewer line being inspected to ensure that good communications exist between members of the crew.

C. Measurement for location of defects shall be above ground by means of a meter device. Marking on cable, or the like, which would require interpolation for depth of manhole, shall not be allowed. Measurement meters shall be accurate to two-tenths of a foot over the length of the sewer line section being inspected. Accuracy of the measurement meters shall be checked daily by use of a walking meter, roll-a-tape, or other suitable device, and the accuracy shall be satisfactory to the Owner's representative.

D. The camera height shall be adjusted such that the camera lens is always centered (1/2 I.D. or higher) in the pipe being televised. Flow shall be controlled such that depth of flow shall not exceed 20% of pipe's diameter.

E. Lighting system shall be adequate for quality pictures.

3.02 RECORDING OF FIELD OBSERVATIONS

A. Television Inspection logs

1. Printed location records shall be kept which shall clearly show the location, in relation to adjacent manholes, of each source of infiltration discovered. In addition, other data of significance including the locations of building and house service connections, along with an estimation of infiltration from such services, joints, unusual conditions, roots, storm sewer connections, cracked or collapsed sections, presence of scale and corrosion, sewer line sections that the camera failed to pass through and reasons for the failure and other discernible features shall be recorded and annotated using the PACP system and a copy of such records shall be supplied to both the Owner and the Engineer.

B. Digital Recordings

1. The purpose of digital recording shall be to supply a visual and audio record of areas of interests of the pipe segments that may be replayed by the Owner.

Digital recording playback shall be at the same speed that it was recorded and shall be made in color. The Contractor shall be required to have all digital media and necessary playback equipment readily accessible for review by the Owner/Engineer during the project.

2. The Contractor shall perform CCTV inspection of each newly installed or rehabilitated pipe segment (manhole to manhole) after testing and before re-introducing any sewage flow into the pipe. Each test shall be witnessed by the Engineer and/or Owner.

3. The Contractor shall record each CCTV inspection on a DVD and submit such recordings to the Engineer as a prerequisite for Partial Utilization/Substantial Completion.

4. CCTV inspections shall be performed after all backfill has been placed and final grades have been established, and after all manhole and pipe testing has been performed and approved by the Engineer.

5. CCTV inspections shall be performed by a PACP certified and trained person.

6. Inspections shall include narration that notes the location and type of defects, if any.

7. At the completion of the project, the Contractor shall furnish all of the original digital recordings to the Owner. Each disc shall be labeled as to its contents. Labels shall include the disc number, date televised, sewer segment reach designation, street location, and manhole numbers on the disc. The Contractor shall keep a copy of the discs for 30 days after the final payment for the project, at which time the discs may be erased at the Contractor's option.

END OF SECTION

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SECTION 02700
ASPHALT PAVING

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. The asphalt paving replacement work includes the construction of an aggregate base course, asphalt binder and wearing courses to match existing courses and as specified herein. This work is to replace paving disturbed by the construction and any damages to paving by Contractor's operations, as well as new pavement and driveways, within the limits shown on the plans.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. The general provisions of the Contract apply to the Work specified in this Section.

B. Section 02225 – Excavating, Backfilling and Compacting for Sewers

PART 2 – PRODUCTS

2.01 MATERIALS

A. All roads in Fayette County shall be constructed in accordance with the following sections of the Kentucky Transportation Cabinet's (KTC) Standard Specifications for Road and Bridge Construction. Items not covered by the KTC specifications shall require a special design by the Engineer and shall be approved by LFUCG.

1.	Embankment	Division 200
2.	Excavation	Division 200
3.	Subgrade	Division 200
4.	Dense Graded Aggregate	Division 300
5.	Bituminous Concrete (Asphalt)	Division 400
6.	Concrete Paving	Division 500
7.	Chemical Stabilization	Division 200

2.02 SUBGRADE

A. The subgrade shall be free from ruts, large stones, and excessive dust. The subgrade shall be subjected to a subgrade proof-roll test so that soft, wet, or pumping areas may

be identified. The minimum total weight of the loaded dump truck shall be 37 tons. The truck shall be operated at walking speed over the entire subgrade. Any excessive deflections such as rutting or pumping shall be stabilized as directed by the Engineer.

B. Typical treatments of soft or wet areas of the pavement subgrade include removal and replacement (undercutting), "working-in" No. 2 stone, or installation of a geogrid/geotextile system and crushed stone. The extent and performance requirements of such improvements shall be set forth in the Contract Documents or as directed by the Engineer. Other means to stabilize the subgrade such as lime stabilization or cement modification as described in KTC Section 304, may be necessary.

C. The pavement subgrade shall be compacted to a uniform density throughout according to the requirements of the Contract Documents. If the density of the subgrade has been diminished by exposure or weather, after having been previously compacted, it shall be recompacted to the required density and moisture content.

D. Subgrade drainage systems or perforated pipe underdrains shall be installed in accordance with LFUCG Standard Drawings where indicated on the Improvement Plans.

2.03 GRANULAR BASE COURSE

A. The granular base course shall consist of compacted dense-graded aggregate (DGA) meeting the requirements set forth in Kentucky Transportation Cabinet's (KTC) Standard Specifications for Road and Bridge Construction. The Contractor shall submit to the Engineer the results of physical tests performed on the material to verify that it meets the requirements referenced above.

B. The DGA (Zone 3 per LFUCG-RMP Standard Drawing 201-1) shall be applied in thicknesses of no less than 6 inches in thickness. Each lift of DGA shall be compacted to a density no less than 84 percent of the solid volume density based on the oven-dry bulk specific gravity as determined by KM 64-607. A field density test of DGA placement may be required if deemed necessary by Engineer. The tests shall be conducted at a frequency of one test per 2,000 square feet with a minimum of one test per shift during which DGA is placed. The DGA shall be compacted using a vibratory roller or vibratory plate. The DGA shall be placed to achieve a moisture content less than 5%, and shall be stable with no rutting or pumping.

C. Before arriving at the site, the DGA shall be adequately mixed with water in a pugmill. During transportation and storage on site, the DGA shall be covered to prevent loss of moisture. If drying of the DGA occurs, the Contractor shall add water to the DGA and shall thoroughly mix the material before its placement.

2.04 ASPHALT BASE AND SURFACE COURSES

A. The materials and methods for construction for the asphalt base course and surface course shall meet the requirement of Kentucky Transportation Cabinet's (KTC) Standard

Specifications for Road and Bridge Construction. The Contractor shall submit test results of the aggregate gradation and asphalt content to the Engineer.

B. The pavement course thicknesses, and construction tolerances shall be specified in the Contract Documents. The surface of each course shall be checked with templates, straightedges, and/or stringlines for uniformity. All irregularities exceeding the allowable tolerances must be repaired as required by the Contract Documents or as directed by the Engineer.

2.05 TACK COAT

A. The tack coat shall be type SS-1h. Before applying the tack coat the area to receive pavement shall be cleaned. The tack coat shall be applied well in advance of the paving operation to allow all water to evaporate before the surface course is placed. Work shall be planned so that no more tack coat than is necessary for the day's operation is placed on the surface.

END OF SECTION

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SECTION 02775
SIDEWALKS

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and services required for constructing concrete sidewalks where shown on the Drawings and as specified herein.

PART 2 – PRODUCTS

2.01 GENERAL

A. Sidewalks shall be in accordance with LFUCG Standard Drawings.

2.02 CRUSHED STONE

A. Stone for sidewalk base shall be dense grade aggregate (DGA).

2.03 CONCRETE

A. Concrete for sidewalks shall be Class A concrete per Section 03300.

2.04 PREMOLDED EXPANSION JOINT FILLER

A. Premolded expansion joint filler shall be closed cell polyethylene foam type, Sonneborn Sonoflex F, Williams Products Expand-O-Foam, or equal. Seal joint with one-part self-leveling polyurethane sealant, Sonneborn Sonolastic SL 1, or equal, maximum 3/8 inches deep. Prepare and prime joints per manufacturer's instructions.

2.05 CURING COMPOUND

A. A white pigmented curing compound is required on all sidewalks per LFUCG Standard Drawings.

PART 3 – EXECUTION

3.01 BASE

A. Following finished grading, a base course of DGA shall be placed to a compacted thickness of four (4) inches. Immediately prior to placing concrete, DGA base shall be thoroughly wetted.

3.02 SURFACE

A. Concrete shall be in thickness shown on LFUCG Standard Drawings, struck off and worked with a float until mortar appears on the top. After surface has been thoroughly floated, it shall be brushed to leave markings of a uniform type, providing non-slip finish. No dusting or plastering will be allowed. Water shall not be added to the surface of the concrete at any time during the finishing procedure.

3.03 FINISHING

A. All joints and edges shall be finished with an edging tool. Dummy joints shall be formed about five (5) feet apart to form rectangular blocks. Expansion joints of 1/2 inch premolded expansion joint material shall be provided at the intersection of all vertical surfaces with the sidewalks slabs and at approximately 32 foot intervals along the walks.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE (LINE WORK)

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. Provide all labor, equipment, materials and services necessary for the manufacture, transportation and placement of all plain and reinforced concrete work, as shown on the Drawings or as ordered by the Engineer.

B. Concrete shall be in accordance with the latest edition of Standard Specifications for Road and Bridge Construction issued by the Kentucky Transportation Cabinet.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03600 - Grout

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of the Specifications, all work herein shall conform to or exceed the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. Kentucky Dept. of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition.
2. Kentucky Building Code
3. ACI 214 Recommended Practice for Evaluation of Strength Test Results of Concrete
4. ACI 304 Guide for Measuring, Mixing, Transporting, and Placing Concrete
5. ACI 305 Hot Weather Concreting
6. ACI 306 Cold Weather Concreting
7. ACI 318 Building Code Requirements for Structural Concrete
8. ACI 350 Code Requirements for Environmental Engineering Concrete Structures
9. ASTM C 31 Standard Methods of Making and Curing Concrete Test Specimens in the Field

10. ASTM C 39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

11. ASTM C 42 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

12. ASTM C 94 Standard Specification for Ready-Mixed Concrete

13. ASTM C 143 Standard Test Method for Slump of Portland Cement Concrete

14. ASTM C 172 Standard Method of Sampling Fresh Concrete

15. ASTM C 260 Standard Specification for Air-Entraining Admixtures for Concrete

16. ASTM C 457 Standard Recommended Practice for Microscopical Determination of Air-Void Content and Parameters of the Air-Void System in Hardened Concrete

17. ASTM C 1567 Standard Test Method for Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300, Submittals.

1. Sources of all materials and certifications of compliance with specifications for all materials.

2. Certified current (less than 1 year old) chemical analysis of the Portland Cement or Blended Cement to be used.

3. Certified current (less than 1 year old) chemical analysis of fly ash or ground granulated blast furnace slag to be used.

4. Aggregate test results showing compliance with required standards, i.e., sieve analysis, aggregate soundness tests, petrographic analysis, mortar bar expansion testing per ASTM C 1567, etc.

5. Manufacturer's data on all admixtures stating compliance with required standards.

6. Concrete mix design for each class of concrete specified herein.

7. Field experience records and/or trial mix data for the proposed concrete mixes for each class of concrete specified herein.

PART 2 – PRODUCTS

2.01 CONCRETE

A. Sidewalks, entrance pavements, concrete pavement subbase for asphaltic surface course, concrete pavement, curb gutter, and thrust blocking shall be Class A.

B. Concrete shall be as specified in the following table excerpted from Standard Specifications for Road and Bridge Construction, Edition of 2012, Kentucky Transportation Cabinet:

CONCRETE PROPORTIONIZING AND REQUIREMENTS KYDOT 601.03.03							
INGREDIENT PROPORTIONS AND REQUIREMENTS FOR VARIOUS CLASSES OF CONCRETE							
Class of Concrete	**Approximate Percent Fine to Total Aggregate**		**Maximum Free Water by W/C Ratio (lb/lb)**	**28-Day Compressive Strength(1) (psi)**	**Slump(4) (inches)**	**Minimum Cement Factor (lb/yd³)**	**Air Content (%)**
	Gravel	**Stone**					
A(5)	36	40	0.49	3,500	2-4(7)	564	6 ± 2
A Mod	36	40	0.47	3,500	4-7	658	6 ± 2
AA(2)	36	40	0.42	4,000	2-4 (12)	620	6 ± 2(11)
AAA(8)	36	40	0.40	5,500	3-7	686	6 ± 2(11)
B	40	44	0.66	2,500	3-5	451	6 ± 2
D(3)	35	39	0.44	4,000	3-5(6)	639	6 ± 2
D Mod(3)	35	39	0.42	5,000	3-5(6)	733	6 ± 2
M1(8) w/Type I Cement	36	40	0.33	4,000(9)	7 max.	800	6 ± 2
M2(8) w/Type III Cement	36	40	0.38	4,000(9)	7 max.	705	6 ± 2
P(5)	35	38	0.49	3,500	---(13)	564(10)	6 ± 2(11)

(1) The Department may direct non-payment, additional construction, or removal and replacement for concrete which test cylinders indicate low compressive strength and follow-up investigations indicate inadequate strength. The Department may require some classes to attain the required compressive strength in less than 28 hours.

(2) When the ambient air temperature while placing slab concrete is 71°F or more, add to the concrete a water-reducing and retarding admixture. The Engineer may require or allow, water-reducing and retarding admixture in slab concrete for ambient air temperatures of less

than 71°F. Only use one type of admixture for concrete placed during any individual contiguous pour.

(3) The Department will require a compressive strength of 5,000 psi or greater when specified in the Contract, at or before 28 days of prestressed members.

(4) The Engineer will allow slumps less than the minimum provided concrete is workable.

(5) The Department will allow the use of JPC pavement mixture for non-structural construction.

(6) At the option of the prestressed product fabricator, the Department will allow the slump of Class D or Class D Modified concrete to be increased to a maximum of 8 inches for all items, except products with voids. For products with voids, the slump may be increased to 7 inches. Provide a high range water reducer (Type F or G) in an amount not to exceed the following water/cement ratios:

Summer mix designs – 0.39

Spring and Fall mix designs – 0.37

Winter mix designs – 0.34

(7) The precast fabricator may increase the slump of Class A concrete to a maximum of 7 inches provided the fabricator uses a high range water reducer (Type F or G) and maximum water/cement ratio of 0.46.

(8) Use a high range water reducer (Type F or G).

(9) The Department will require 3,000 psi compressive strength before opening to traffic and 4,000 psi at 28 days.

(10) 611 lb/yd^3 when using coarse aggregate sizes No. 8, 78, or 9-M.

(11) 7 ± 2% when using coarse aggregate sizes No. 8, 78 or 9-M.

(12) The Department may allow the slump of AA concrete to be increased up to a 6 inch maximum, provided the W/C ratio does not exceed 0.40 and a high range water reducer (Type F or G) is used. Trial Batches will be required if producer has not previously supplied.

(13) The Department does not have slump requirements for Class P concrete mixes except for the edge slump requirements of Section 501.03.19.

2.02 FLOWABLE FILL

A. Flowable fill shall conform to Section 601 of the Standard Specifications for Road and Bridge Construction, Edition of 2012.

B. Flowable fill shall consist of a mixture of cement, sand, fly ash, and water. The loss on ignition for Class F fly ash shall not exceed 12 percent. Ensure that the concrete producer certifies mix proportions for flowable fill as follows:

Flowable Fill for Pipe Backfill. Proportion as follows, per cubic yard batch:

Cement	30 pounds
Fly Ash, Class F	300 pounds
Natural Sand (S.S.D.)	3,000 pounds
Water (Maximum)	550 pounds

C. Flowable fill shall obtain an average compressive strength of 50 to 100 psi at 28 days for application as pipe backfill. For applications requiring early opening to traffic or placement of pavement as soon as possible, the mixture shall conform to the following general guidelines:

1. Mixture bleeds freely within 10 minutes
2. Mixture supports a 150-pound person within three hours.

PART 3 – EXECUTION

3.01 PRODUCTION OF CONCRETE

A. All concrete shall be machine mixed. Hand mixing of concrete will not be permitted. The Contractor shall supply concrete from a ready mix plant. In selecting the source for concrete production the Contractor shall carefully consider its capability for providing quality concrete at a rate commensurate with the requirements of the placements so that well bonded, homogenous concrete, free of cold joints, is assured. Ready mixed concrete shall be in accordance with ASTM C94.

B. Each and every concrete delivery shall be accompanied by a delivery ticket containing at least the following information:

1. Date and truck number
2. Ticket number
3. Mix designation of concrete
4. Cubic yards of concrete
5. Cement brand, type and weight in pounds
6. Weight in pounds of fine aggregate (sand)
7. Weight in pounds of coarse aggregate (stone)
8. Air entraining agent, brand, and weight in pounds and ounces

9. Other admixtures, brand, and weight in pounds and ounces

10. Water, in gallons, stored in attached tank

11. Water, in gallons, maximum that can be added without exceeding design water/cement ratio

12. Water, in gallons, actually used (by truck driver)

13. Time of loading

14. Time of delivery to job (by truck driver)

C. Any truck delivering concrete to the job site, which is not accompanied by a delivery ticket showing the above information will be rejected and such truck shall immediately depart from the job site.

3.02 CONCRETE PLACEMENT

A. No concrete shall be placed prior to approval of the concrete mix design. Concrete placement shall conform to the recommendations of ACI 304.

3.03 CONCRETE WORK IN COLD WEATHER

A. Cold weather concreting procedures shall conform to the requirements of ACI 306.

B. The Engineer may prohibit the placing of concrete at any time when air temperature is 40°F. or lower. If concrete work is permitted, the concrete shall have a minimum temperature, as placed, of 55°F. for placements less than 12" thick, 50°F. for placements 12" to 36" thick, and 45°F. for placements greater than 36" thick. The temperature of the concrete as placed shall not exceed the aforementioned minimum values by more than 20°F, unless otherwise approved by the Engineer.

C. The addition of admixtures to the concrete to prevent freezing is not permitted. All reinforcement, forms, and concrete accessories with which the concrete is to come in contact shall be defrosted by an approved method. No concrete shall be placed on frozen ground.

3.04 CONCRETE WORK IN HOT WEATHER

A. Hot weather concreting procedures shall conform to the requirements of ACI 305.

B. When air temperatures exceed 85°F, or when extremely dry conditions exist even at lower temperatures, particularly if accompanied by high winds, the Contractor and his/her concrete supplier shall exercise special and precautionary measures in preparing, delivering, placing, finishing, curing and protecting the concrete mix. The Contractor shall consult with the Engineer regarding such measures prior to each day's placing operation and the Engineer reserves the right to modify the proposed measures

consistent with the requirements of this Section of the Specifications. All necessary materials and equipment shall be on hand an in position prior to each placing operation.

C. Preparatory work at the job site shall include thorough wetting of all forms, reinforcing steel and, in the case of slab pours on ground or subgrade, spraying the ground surface on the preceding evening and again just prior to placing. No standing puddles of water shall be permitted in those areas which are to receive the concrete.

D. The temperature of the concrete mix when placed shall not exceed 90°F.

E. Delivery schedules shall be carefully planned in advance so that concrete is placed as soon as practical after it is properly mixed. For hot weather concrete work (air temperature greater than 85°F), discharge of the concrete to its point of deposit shall be completed within 60 minutes from the time the concrete is batched.

F. The Contractor shall arrange for an ample work force to be on hand to accomplish transporting, vibrating, finishing, and covering of the fresh concrete as rapidly as possible.

3.05 QUALITY CONTROL

A. Field Testing of Concrete

1. The Contractor shall coordinate with the Owner's testing firm personnel as required for concrete testing.

2. Concrete for testing shall be supplied by the Contractor at no additional cost to the Owner, and the Contractor shall provide assistance to the testing laboratory in obtaining samples. The Contractor shall dispose of and clean up all excess material.

3. For every placement of concrete that is 10 cubic yards or less, the following tests shall be performed (as described in paragraphs B through E below):

   a. Consistency

   b. Unit Weight

   c. Air content

   d. Compressive Strength

   e. Temperature

4. For every placement of concrete that is larger than 10 cubic yards, the following tests shall be performed for every 50 cubic yards (as described in paragraphs B through E below):

a. Consistency – test the first truck and one additional truck randomly selected by the Owner's Resident Project Representative (RPR).

b. Unit Weight – test one truck randomly selected by the RPR

c. Air content - test the first truck and one additional truck randomly selected by the RPR.

d. Compressive Strength - test one truck randomly selected by the RPR

e. Temperature - test one truck randomly selected by the RPR

The sampling of concrete is approved at the truck discharge. If a concrete pump is employed, the Contractor is advised that 1.5-3.0% air is lost in pumping and such should be accounted for at the point of testing. Therefore, the air content should be adjusted to ensure that the air content meets the specification at the point of placement.

The first truck is defined as the first truck as accepted by the RPR. The RPR shall have the authority of the Owner to accept or reject all concrete.

5. Sampling is at the discretion of the RPR.

6. Additional testing may be required as deemed necessary by the Owner.

B. Consistency

1. The consistency of the concrete will be checked by the Owner's testing firm by standard slump cone tests. The Contractor shall make any necessary adjustments in the mix as the Owner or Engineer may direct and shall upon written order suspend all placing operations in the event the consistency does not meet the intent of the specifications. No payment shall be made for any delays, material or labor costs due to such eventualities.

2. Slump tests shall be made in accordance with ASTM C 143.

3. Concrete with a specified nominal slump shall be placed having a slump within 1" (higher or lower) of the specified slump. Concrete with a specified maximum slump shall be placed having a slump less than the specified slump.

C. Unit Weight

1. Samples of freshly mixed concrete shall be tested for unit weight by the Owner's testing firm in accordance with ASTM C 138.

D. Air Content

1. Samples of freshly mixed concrete will be tested for entrained air content by the Owner's testing firm in accordance with ASTM C 231.

2. In the event test results are outside the limits specified, additional testing shall occur. Upon discovery of incorrect air entrainment, the concrete shall be removed from the jobsite.

E. Compressive Strength

1. Samples of freshly mixed concrete will be taken by the Owner's testing firm and tested for compressive strength in accordance with ASTM C 172, C 31 and C 39, except as modified herein.

2. Each sampling shall consist of at least five (5) 6x12 cylinders or eight (8) 4x8 cylinders. Each cylinder shall be identified by a tag, which shall be hooked or wired to the side of the container. The Owner's testing firm will fill out the required information on the tag, and the Contractor shall satisfy himself that such information shown is correct.

3. The Contractor shall be required to furnish labor to the Owner for assisting in preparing test cylinders for testing. The Contractor shall provide approved curing boxes for storage of cylinders on site. The insulated curing box shall be of sufficient size and strength to contain all the specimens made in any four consecutive working days and to protect the specimens from falling over, being jarred or otherwise disturbed during the period of initial curing. The box shall be erected, furnished and maintained by the Contractor. Such box shall be equipped to provide the moisture and to regulate the temperature necessary to maintain the proper curing conditions required by ASTM C 31. Such box shall be located in an area free from vibration such as pile driving and traffic of all kinds and such that all specimen are shielded from direct sunlight and/or radiant heating sources. No concrete requiring inspection shall be delivered to the site until such storage curing box has been provided. Specimens shall remain undisturbed in the curing box until ready for delivery to the testing laboratory but not less than sixteen hours.

4. The Contractor shall be responsible for maintaining the temperatures of the curing box during the initial curing of test specimens with the temperature preserved between 60°F and 80°F as measured by a maximum-minimum thermometer. The Contractor shall maintain a written record of curing box temperatures for each day curing box contains test specimens. Temperature shall be recorded a minimum of three times a day with one recording at the start of the workday and one recording at the end of the work day.

5. When transported, the cylinders shall not be thrown, dropped, allowed to roll, or be damaged in any way.

F. Evaluation and Acceptance of Concrete

1. Evaluation and acceptance of the compressive strength of concrete shall be according to the requirements of ACI 214, ACI 318, and ACI 350.

2. The strength level of concrete will be considered satisfactory if all of the following conditions are satisfied.

    a. Every arithmetic average of any three consecutive strength tests equals or exceeds the minimum specified 28-day compressive strength for the mix (see Article 2.07).

    b. No individual compressive strength test results fall below the minimum specified strength by more than 500 psi.

    c. No more than 10% of the compressive tests have strengths greater than the maximum strength specified.

3. In the event any of the conditions listed above are not met, the mix proportions shall be corrected for the next concrete placing operation.

4. In the event that condition 2B is not met, additional tests in accordance with Article 3.10, paragraph H shall be performed.

5. When a ratio between 7-day and 28-day strengths has been established by these tests, the 7-day strengths shall subsequently be taken as a preliminary indication of the 28-day strengths. Should the 7-day test strength from any sampling be more than 10% below the established minimum strength, the Contractor shall:

    a. Immediately provide additional periods of curing in the affected area from which the deficient test cylinders were taken.

    b. Maintain or add temporary structural support as required.

    c. Correct the mix for the next concrete placement operation, if required to remedy the situation.

6. All concrete which fails to meet the ACI requirements and these specifications is subject to removal and replacement at no additional cost to the Owner.

G. Additional Tests

1. In the event the 28-day test cylinders fail to meet the minimum strength requirements as outlined in Article 3.10, paragraph F, the Contractor shall have concrete core specimens obtained and tested from the affected area immediately.

    a. Three cores shall be taken by the Owner's testing firm for each sample in which the strength requirements were not met.

    b. The concrete in question will be considered acceptable if the average compressive strength of a minimum of three test core specimens taken from a given area equal or exceed 85% of the specified 28-day strength and if the lowest core strength is greater than 75% of the specified 28-day strength.

2. Concrete placed with compressive strengths greater than the maximum strength specified shall be removed and replaced or repaired as deemed necessary by the Engineer.

3.06 CARE AND REPAIR OF CONCRETE

A. The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the Owner. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Care shall be exercised to avoid jarring forms or placing any strain on the ends of projecting reinforcing bars. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at no additional cost to the Owner.

B. Areas of honeycomb shall be chipped back to sound concrete and repaired as directed by the Engineer.

C. Concrete formwork blowouts or unacceptable deviations in tolerances for formed surfaces due to improperly constructed or misaligned formwork shall be repaired as directed by the Engineer. Bulging or protruding areas, which result from slipping or deflecting forms shall be ground flush or chipped out and redressed as directed by the Engineer.

D. Areas of concrete in which cracking, spalling, or other signs of deterioration develop prior to final acceptance shall be removed and replaced or repaired as directed by the Engineer. This stipulation includes concrete that has experienced cracking due to drying or thermal shrinkage of the concrete. Structural cracks shall be repaired using an epoxy injection system approved by the Engineer. Non-structural cracks shall be repaired using a hydrophilic resin pressure injected grout system approved by the Engineer, unless other means of repair are deemed necessary and approved by the Engineer. Extensive repair or replacement will be considered for concrete placed having compressive strengths greater than maximum strength specified. All repair work shall be performed at no additional cost to the Owner.

END OF SECTION

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SECTION 03600
GROUT

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. Furnish all materials, labor, and equipment required to provide all grout used in concrete work in accordance with the Contract Documents.

1.02 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. CRD-C 621	Corps of Engineers Specification for Non-shrink Grout
2. ASTM C 109	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch or 50 mm cube Specimens)
3. ASTM C 531	Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts and Monolithic Surfacings
4. ASTM C 579	Test Method for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacings
5. ASTM C 827	Standard Test Method for Early Volume Change of Cementitious Mixtures
6. ASTM C 144	Standard Specification for Aggregate for Masonry Mortar
7. ASTM C 1107	Standard Specification for Packaged Dry, Hydraulic Cement Grout (Nonshrink)

1.03 SUBMITTALS

A. Submit the following in accordance with Section 01300 - Submittals.

1. Certified test results verifying the compressive strength and shrinkage and expansion requirements specified herein.

2. Manufacturer's literature containing instructions and recommendations on the mixing, handling, placement and appropriate uses for each type of grout used in the work.

1.04 QUALITY ASSURANCE

A. Field Tests (required for pump station and storage tank projects)

1. Compression test specimens will be taken during construction from the first placement of each type of grout and at intervals thereafter as selected by the Engineer to insure continued compliance with these Specifications. The specimens will be made by the Contractor and observed by Engineer.

   a. Compression tests and fabrication of specimens for cement grout and non-shrink grout will be performed as specified in ASTM C 109 at intervals during construction as selected by the Engineer. A set of three specimens will be made for testing at seven days, 28 days and any additional time period as appropriate.

   b. Compression tests and fabrication of specimens for epoxy grout will be performed as specified in ASTM C 579, Method B, at intervals during construction as selected by the Engineer. A set of three specimens will be made for testing at seven days and any other time period as appropriate.

2. The cost of all laboratory tests on grout will be borne by the Owner, but the Contractor shall assist the Engineer in obtaining specimens for testing. The Contractor shall be charged for the cost of any additional tests and investigation on work performed which does not meet the specifications. The Contractor shall supply all materials necessary for fabricating the test specimens, at no additional cost to the Owner.

3. All grout, already placed, which fails to meet the requirements of these Specifications, is subject to removal and replacement at no additional cost to the Owner.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Non-Shrink Cement Grout (Applicable for projects with Gravity Sewers and Force Mains)

1. Non-shrink grout shall conform to CRD-C 621 and ASTM C 1107, Grade B or C when tested at a max. fluid consistency of 30 seconds per CDC 611/ASTM C939 at temperature extremes of 45°F and 90°F and an extended working time of 15 minutes. Grout shall be non-metallic, non-stain, and non-shrink and color similar to concrete. Grout shall have a min. 28-day strength of 7,000 psi. Non-shrink grout shall be, "Euco N-S" by the Euclid Chemical Company, "Sikagrout 212" by Sika Corporation, Conspec 100 Non-Shrink Non-Metallic Grout by Conspec, Masterflow 555 Grout by BASF Construction Chemicals.

B. Epoxy Grout (Applicable for projects with Structures)

1. Epoxy grout shall be "Sikadur 32 Hi-Mod" by Sika Corporation, "Duralcrete LV" by Tamms Industries, or "Euco #452 Series" by Euclid Chemical, Concresive 1090 by BASF Construction Chemicals.

2. Epoxy grout shall be modified as required for each particular application with aggregate per manufacturer's instructions.

C. Epoxy Base Plate Grout (Applicable for projects with Structures)

1. Epoxy base plate grout shall be Sikadur 42, Grout-Pak by Sika Corporation, or Masterflow MP by BASF Construction Chemicals.

PART 3 – EXECUTION

3.01 GENERAL

A. Concrete surfaces shall be cleaned of all dirt, grease and oil-like films. Additionally, concrete surfaces shall be free of debris, including chipping or roughening the surface if a laitance or poor concrete is evident. The finish of the grout surface shall match that of the adjacent concrete.

B. All mixing, surface preparation, handling, placing, consolidation, and other means of execution for prepackaged grouts shall be done according to the instructions and recommendations of the manufacturer.

C. The Contractor, through the manufacturer of a non-shrink grout and epoxy grout, shall provide on-site technical assistance upon request, at no additional cost to the Owner.

3.02 CONSISTENCY

A. The consistency of grouts shall such that it is able to completely fill the space to be grouted. Dry pack consistency is such that the grout is plastic and moldable but will not flow.

3.03 MEASUREMENT OF INGREDIENTS

A. Measurements for cement grout shall be made accurately by volume using containers. Shovel measurement shall not be allowed.

B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

3.04 GROUT INSTALLATION

A. Grout shall be placed quickly and continuously, shall completely fill the space to be grouted and be thoroughly compacted and free of air pockets. The grout may be poured in place, pressure grouted by gravity, or pumped. The use of pneumatic pressure or dry-

packed grouting requires approval of the Engineer. For grouting beneath base plates, grout shall be poured form one side only and thence flow across to the open side to avoid air-entrapment.

END OF SECTION

APPENDIX A
GEOTECHNICAL DATA

END OF SECTION

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GEOTECHNOLOGY

A Universal Engineering Sciences Company

GEOTECHNICAL EXPLORATION
LFUCG MERRICK AND WEST HICKMAN - PHASE II
LEXINGTON, KENTUCKY

Prepared for:

PRIME AE GROUP
LEXINGTON, KENTUCKY

Prepared by:

GEOTECHNOLOGY, LLC
ERLANGER, KENTUCKY

Date:

JANUARY 7, 2022

Geotechnology Project No.:

J038336.03

SAFETY
QUALITY
INTEGRITY
PARTNERSHIP
OPPORTUNITY
RESPONSIVENESS

GEOTECHNOLOGY
A Universal Engineering Sciences Company

January 7, 2022

Mr. Eddie Mesta, PE
PRIME AE Group
166 Prosperous Place
Suite 220
Lexington, Kentucky 40509

Re: Geotechnical Exploration
LFUCG Merrick and West Hickman - Phase II
Lexington, Kentucky
Geotechnology Project No. J038336.03

Dear Mr. Mesta:

Presented in this report are the results of our geotechnical exploration completed for the Merrick and West Hickman Trunks E&F to be located in Lexington, Kentucky. Our services were performed in general accordance with our Proposal P038336.03, which was dated October 6, 2021 and authorized by WA-02, dated December 8, 2021.

We appreciate the opportunity to provide the geotechnical services for this project. If you have any questions regarding this report, or if we may be of any additional service to you, please do not hesitate to contact us.

Respectfully submitted,
GEOTECHNOLOGY, INC.



Michelle E. Casto, PE
Senior Engineer

Andrew C. Casto, PE
Senior Project Manager

MEC/ACC:mec

Copies submitted: PRIME AE Group (email)

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GEOTECHNICAL EXPLORATION
LFUCG MERRICK AND WEST HICKMAN - PHASE II
LEXINGTON, KENTUCKY
January 7, 2022 | Geotechnology Project No. J038336.03

1.0 INTRODUCTION

The purposes of the geotechnical exploration were: to explore the subsurface conditions at the requested boring locations; and to provide geotechnical recommendations for the design and construction of the project, as defined in our proposal. Our scope of services included geotechnical borings, laboratory testing, engineering analyses, and preparation of this report.

2.0 PROJECT INFORMATION

The following project information was derived from:

- The site plan, which was titled "Geotechnical Exhibit", prepared by Integrated Engineering, dated October 2021;
- The LFUCG request for proposal, Attachment F Geotechnical Investigation Scope of Work and Performance Criteria; and
- Correspondence with you.

We understand that the project consists of the installation of the new sewer by horizontal directional drill methods in six locations. The proposed tunnel locations are as follows: crossing under Tates Creek Road just south[1] of Gainesway Drive; crossing under Kirklevington Drive near its intersection with Tates Creek Road; crossing under the off ramp from New Circle Road to Tates Creek Road; crossing under New Circle Road just west of Tates Creek Road; crossing under Tates Creek at the on ramp to New Circle Road; and crossing under New Circle Road east of the overpass at Greentree Road.

3.0 SUBSURFACE EXPLORATION

This phase of the subsurface exploration consisted of ten borings, numbered B-46, B-48, B-60, B-61, B-65 through B-67, B-69, B-119 and B-121. The boring locations were selected and staked in the field by Integrated Engineering. The locations of Borings B-46, B-48 and B-60 were changed by us during drilling due to traffic control or property access issues. The as-drilled locations of Borings B-46, B-48 and B-60 are listed on the boring logs located in Appendix B.

[1] For the purposes of this report, Tates Creek Road is assumed to be oriented in a north-south direction.

The borings were drilled between November 5 and 13, 2021, with a truck-mounted drill rig advancing hollow-stem augers, as indicated on the boring logs presented in Appendix B. Sampling of the overburden soils and bedrock was accomplished ahead of the augers at the depths indicated on the boring logs, with a 2-inch-outside-diameter (O.D.) split-spoon sampler in general accordance with the procedures outlined by ASTM D1586. Standard Penetration Tests (SPTs) were performed with the split-spoon sampler to obtain the standard penetration resistance or N-value[2] of the sampled material. Each of the borings was extended into the bedrock by rock coring with an NQ rock core bit affixed to a double-tube core barrel in general accordance with the procedures outlined by ASTM D2113. Photographs of the recovered rock core samples are included in Appendix D.

Observations for groundwater were made in the borings during drilling and at the completion of drilling. The borings were backfilled immediately, so long-term water readings were not taken. An engineer from Geotechnology provided technical direction during field exploration, observed drilling and sampling, assisted in obtaining samples, and prepared field logs of the material encountered.

Representative portions of the split-spoon samples were placed in glass jars with lids to preserve the in-situ moisture contents of the samples. The recovered rock core samples were placed in plastic or waxed cardboard core boxes. The glass jars and core boxes were marked and labeled in the field for identification when returned to our laboratory.

4.0 LABORATORY REVIEW AND TESTING

Upon completion of the fieldwork, the samples recovered from the borings were transported to our Soil Mechanics Laboratory, where they were visually reviewed and classified by the Project Geotechnical Engineer.

Laboratory testing was performed on selected soil samples to estimate engineering and index properties. Laboratory testing of the selected soil samples included various combinations of the following tests: moisture contents, Atterberg limits, gradation (particle-size) analyses, and hand penetrometer tests. Moisture content testing, uniaxial compression testing, Cerchar Abrasivity Index, Brazilian tensile strength, point load Index, punch penetration tests, Moh's hardness, and slake durability tests were also performed on selected rock core samples. The results of these tests are summarized in the Tabulation of Laboratory Tests in Appendix C, along with the corresponding laboratory test forms.

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[2] The standard penetration resistance, or N-value, is defined as the number of blows required to drive the split-spoon sampler 12 inches with a 140-pound hammer falling 30 inches. Since the split-spoon sampler is driven 18 inches or until refusal, the blows for the first 6 inches are for seating the sampler, and the number of blows for the final 12 inches is the N-value, which is reported as blows per foot (or bpf). Additionally, "refusal" of the split-spoon sampler occurs when the sampler is driven less than 6 inches with 50 blows of the hammer.

The boring logs, which are included in Appendix B, were prepared by the Project Geotechnical Engineer on the basis of the field logs, the visual classification of the soil and bedrock samples in the laboratory, and the laboratory test results. Soil and Rock Classification Sheets are also included in Appendix B, which describe the terms and symbols used on the boring logs. The dashed lines on the boring logs indicate an approximate change in strata as estimated between samples, whereas a solid line indicates that the change in strata occurred within a sample where a more precise measurement could be made. Furthermore, the transition between strata can be abrupt or gradual.

5.0 SUBSURFACE CONDITIONS

5.1 Stratification

Generally, the existing pavement or topsoil was underlain by 2.7 to 12.0 feet of fill, followed by native alluvial soils, where encountered, underlain by interbedded shale and limestone bedrock or by predominantly limestone bedrock with thin shale partings. The depth to bedrock ranged from 2.7 to 14.5 feet.

5.1.1 Pavement

Borings B-46 and B-48 were drilled within the pavement, and each encountered 10 inches of asphalt pavement. Boring B-46 encountered 4 inches of granular base beneath the asphalt and Boring B-48 encountered 6 inches granular base beneath the asphalt.

5.1.2 Topsoil

Each of the borings, with the exception of borings B-46 and B-48, encountered topsoil beneath the ground surface. The topsoil ranged from 2 to 11 inches thick.

5.1.3 Existing Fill

Existing fill was encountered beneath the pavement or the topsoil in each boring, except Boring B-119, and extended to depths ranging from 2.7 to 12.0 feet below the ground surface. The fill was typically described as brown, dark brown, dark gray, gray and/or black, moist, lean or fat clay, containing topsoil, organics, cinders, brick fragments, shale, gravel, sand, roots, oxide stains and limestone fragments and floaters. An exception is that a 3.2-foot-thick layer of loose clayey sand was encountered beneath the pavement and base in Boring B-48. One grain-size distribution on a sample of the clayey sand yielded 14.8 percent gravel, 58.0 percent sand, and silt and clay combined for 27.2 percent.

Moisture contents of the lean clay fill ranged from 21.4 percent to 33.9 percent, with the majority of the values in the low to mid-twenties. Four samples of lean clay classified as CL soils according to the Unified Soil Classification System (USCS) with liquid limits ranging from 42 to 49 percent and plasticity indices ranging from 17 to 24 percent. Two grain-size distributions of the lean clay fill yielded gravel, sand, silt and clay amounts of 0.8 and 16.6 percent, 12.9 and 17.9 percent, 43.0 and 36.7 percent, and 43.3 and 28.8 percent, respectively.

Moisture contents of the fat clay fill ranged from 27.8 to 30.1 percent. Two samples of fat clay classified as CH soils according to the USCS with liquid limits of 53 and 64 percent and plasticity indices of 26 and 35 percent, respectively. One grain-size distribution on a sample of the fat clay yielded 8.1 percent gravel, 20.2 percent sand, 18.4 percent silt and 53.3 percent clay.

5.1.4 Native Alluvial Soils

According to the United States Geological Survey (USGS) Geologic Map of the Coletown Quadrangle, East-Central Kentucky (Black, 1967), the subsurface profile consists of native alluvial soils underlain by the bedrock. Alluvial soils (or alluvium) are sedimentary soils that are deposited by fluvial or flowing water systems (e.g., streams, rivers, etc.). The referenced map describes the alluvium as follows:

- Silty clay, silt, sand, and gravel: Silty clay and silt, medium-dark-reddish-brown to yellowish-brown, especially in highland stream beds, in large part locally derived from limestone residuum. Sand, yellowish-brown, fine to medium, quartzose; forms thick deposits along banks of Kentucky River. Gravel, composed of pebble- to boulder-size limestone fragments and dark-reddish-brown limonite pebbles and granules, generally concentrated in steep drainages tributary to Kentucky River.

A 2.2 to 6.2-foot-thick layer of native alluvial soil was encountered in Borings B-60, B-65, B-67 and B-119 above the bedrock. The native alluvial was described as brown to dark brown or gray to dark gray, moist, primarily soft to medium stiff, lean clay with sand, gravel, organics, silt pockets, oxide stains and concretions, limestone and shale fragments.

Several moisture contents of the alluvium ranged from 20.7 to 27.9 percent. Two samples of alluvium classified as CL soils according to the USCS with liquid limits of 37 and 43 percent and plasticity indices of 14 and 22 percent, respectively. Two grain-size distributions on samples of the alluvium yielded 2.3 and 9.7 percent gravel, 23.9 and 24.7 percent sand, 35.9 and 40.4 percent silt, and 37.9 and 25.5 percent clay, respectively.

5.1.5 Bedrock

The fill and native overburden soils at the site are underlain by bedrock consisting of interbedded shale and limestone layers, or of predominantly limestone with thin shale partings. Bedrock was encountered in each of the borings, below depths ranging from 2.7 to 14.5 feet. The bedrock belongs to various bedrock formations as described in the following paragraphs.

According to the referenced USGS Geologic Map, two geologic fault lines, which extend in a northeast to southwest direction are shown to cross the proposed Merrick Trunk sewer alignment. The first fault line intersects the alignment near the Tates Creek Road and New Circle Road intersection, and the second intersects the alignment north of the Tates Creek Road and Armstrong Mill Road intersection. The referenced map shows that the bedrock underlying the overburden soils in the area between the faults along Tates Creek Road is from the Clays Ferry Formation and that the bedrock underlying the ground surface along the proposed Merrick Trunk north of New Circle Road is from the Grier and Curdsville Members of the Lower Part of the

Lexington Limestone formation. South of the southern fault line, the map indicates that the bedrock belongs to the Tanglewood Limestone Member formation.

Along the proposed West Hickman Trunk Sewer alignment, the bedrock underlying the overburden soils is primarily from the Tanglewood Limestone Member.

The referenced maps describe the bedrock formations as follows:

- Tanglewood Limestone member in the Lexington Limestone Formation: Limestone (calcarenite), medium-light-gray to medium-brownish-gray, fossil-fragmental, fine- to coarse-grained, sparry calcite cemented, partly phosphatic; very thin to thin even beds, partly crossbedded, irregularly bedded in part; colonial corals occur locally in lower half. Unit is thickest in northwest, intertongues with Millersburg Member to east and with Clays Ferry Formation to south.

- Clays Ferry Formation: Limestone, shale, and siltstone: Limestone, medium-light-gray to medium-brownish-gray, micrograined to coarse-grained, fossil-fragmental; in tabular beds generally less than 0.5 feet thick. Clay shale, medium-greenish-gray; weathers grayish-yellow; occurs as thin interbeds, constitutes 20 to 40 percent of unit. Siltstone, greenish-gray; in very thin beds; abundant near top of unit, decreases in abundance downward. Unit is thickest in southern fourth of quadrangle; lower half of unit intertongues northwestward with Lexington Limestone.

- The Grier Member of the Lower Part of the Lexington Limestone: Limestone, medium-light-gray to medium-gray, cryptograined to coarse-grained, fossiliferous throughout; lower half of unit consists of numerous zones of nodular limestone with minor gray shale partings, commonly contains dome-shaped bryozoans. These zones are interbedded with thin resistant beds of medium- to coarse-grained coquinoid limestone; the resistant beds are irregularly spaced throughout but are more closely spaced and somewhat thicker bedded in upper part of unit. Upper third commonly contains zones of thin-bedded cryptograined to micrograined, gastropod-bearing limestone. In southeastern quarter lower 25 feet contains zones of calcarenite lithologically similar to Curdsville Limestone Member below.

- The Curdsville Member of the Lower Part of the Lexington Limestone: Limestone (calcarenite), medium-light-gray to brownish-gray, partly fossiliferous, fine- to coarse-grained; in thin even beds, crossbedded in part; commonly contains very thin beds of micrograined limestone and lenticular bodies of dense chert.

Table 1 summarizes the depth to bedrock as encountered in each of the borings, as well as the different bedrock formations encountered in the particular borings.

Table 1. Summary of bedrock elevations in the borings and formations encountered.

Bore ID	Ground Surface El. (ft.)	Depth to Bedrock (ft.)	Top of Bedrock El. (ft.)	Bedrock Formation Encountered
B-46	922.8	9.0	913.8	Clays Ferry Formation
B-48	922.5	11.3	911.2	Clays Ferry Formation
B-60	928.0	14.5	913.5	Clays Ferry Formation
B-61	928.2	12.0	916.2	Clays Ferry Formation
B-65	927.5	7.8	919.7	Clays Ferry Formation
B-66	932.2	12.0	920.2	Lower part of Lexington Limestone Formation
B-67	945.4	11.7	933.7	Lower part of Lexington Limestone Formation
B-69	939.0	7.0	927.0	Lower part of Lexington Limestone Formation
B-119	926.0	4.5	921.5	Tanglewood Limestone Formation
B-121	925.8	2.7	923.1	Tanglewood Limestone Formation

The bedrock was cored in each of the borings. In general, the bedrock recovered by the rock cores was primarily described as medium strong to very strong limestone with weak shale partings or marled with shale. The rock quality designation (RQD)[3] values ranged from 0 to 96 percent, and were 58 percent on average. In general, the RQD values increased with depth, indicating that the quality of the rock was improving with depth. Table 3 summarizes the rock quality of the different formations based on the average value of the RQD and the categories provided in Table 2. Photographs of the rock core are provided in Appendix D of this report.

Table 4 summarizes the results of the laboratory tests completed on the rock core. There were occasional fractures in the rock core specimens as noted on the logs. The Rock Classification Sheet, which is included in Appendix B, describes the varying degrees of weathering along with the rock strength descriptions that are used on the appended boring logs.

[3] The rock quality designation (RQD) is defined as the percentage of rock core pieces recovered in lengths longer than 4 inches for the specified interval.

Table 2. Rock quality designation definitions.

RQD (%)	Description of Rock Quality
0 – 25	Very Poor
25 – 50	Poor
50 – 75	Fair
75 – 90	Good
90 – 100	Excellent

Table 3. Rock quality encountered by formation.

Bedrock Formation	RQD (%)		Description of Average Rock Quality
	Range	Average	
Clays Ferry	0-79	39	Poor
Lower part of Lexington Limestone	67-96	81	Good
Tanglewood Limestone	85-90	88	Good

Table 4. Summary of laboratory test results of the bedrock rock core samples.

	Samples Tested	Minimum	Maximum	Average
Moisture Content (%)	5	0.2	2.0	0.7
Dry Unit Weight (pcf)	5	161.7	169.1	166.0
Uniaxial Compressive Strength (psi)	5	1,620	9,750	5,414
Cerchar Abrasiveness Index (CAI)	5	1.3	1.5	1.4
Splitting Tensile Strength (psi)	5	357	1,380	854
Moh's Hardness	5	3.5	5.0	4.2
Corrected Point Load Index, $I_{s(50)}$ (psi)	5	335	753	649
Punch Penetration Peak Slope Index (kips/in.)	5	26.2	77.5	47.3
Slake Durability Index	5	71.9	99.0	92.5

5.2 Groundwater Conditions

As mentioned in Section 3.0, groundwater observations were made in the borings during drilling and at the completion of drilling. The borings were backfilled immediately, so long-term water readings were not taken. These measurements are documented on the boring logs in Appendix B.

Groundwater was encountered during drilling in Borings B-48 and B-61, at depths of 8.5 (in the fill above the bedrock) and 13.5 feet (within the bedrock), respectively.

Based on the groundwater observations and our local experience, groundwater seepage is anticipated near the ground surface along the creek areas, along the fill/native soil interface, along

the overburden soil/bedrock interface, along washed-out shale beds within the limestone bedrock, and in the saturated zones of fill or native soils that are within the perched groundwater zones, or that are below the groundwater table. Locally concentrated flow may occur due to saturated layers of fill or native soils (particularly the native sands or gravels) or along fractures in the bedrock. Additionally, groundwater levels and seepage amounts are expected to vary with time, location, season of the year, and amounts of precipitation.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on our engineering reconnaissance of the site, the borings, the visual examination of the recovered samples, the laboratory test results, our understanding of the proposed project, our engineering analyses, and our experience as Consulting Soil and Foundation Engineers in the Central Kentucky area, we have reached the following conclusions and make the following recommendations of this report.

6.1 Excavation Support

Excavation support should be the responsibility of the Contractor, regardless of whether the excavation is made by open cutting, trenchless technologies, or some other method. Excavation support should be designed and implemented such that excavations are adequately ventilated and braced, shored, and/or sloped in order to protect and ensure the safety of workers within and near the excavations and to protect adjacent ground, slopes, structures, and infrastructure. Federal, state, and local safety regulations should be satisfied. The analyses, discussions, conclusions, and recommendations throughout this report are not to be interpreted as pre-engineering compliance with any safety regulation.

Excavation support requirements for the installation of the proposed sewer will vary. Depending on the locations of the excavations relative to existing structures, slopes, roads, utilities, etc., excavation support may include, but not be limited to, trench boxes, temporary open cuts that are limited in length prior to backfilling operations, braced/shored excavations, or casing pipe for trenchless excavation methods.

The Contractor should recognize that the use of trench boxes that do not maintain full, tight contact with the sides of trench excavations do not help maintain the sides of trench excavations as they do not provide any lateral support for the trenches. Trench boxes used in this manner only provide a "shield" to help protect workers inside the trenches should the sides of the trench excavations move. Shored and braced excavations provide lateral resistance to excavation sides and should be designed with the intent of preventing the sides of excavations from experiencing any appreciable lateral movements.

Additionally, the Contractor should recognize that the some of the sewer installations may be in close proximity to existing utilities. Pressurized pipelines (e.g., water mains, gas mains, etc.) in these areas should be evaluated to determine the impact of the potential excavation and backfilling operations on the current thrust restraints of these pipelines. These evaluations should highlight critical areas where thrust restraint must be maintained and/or supplemented. The

maintenance of thrust restraint will need to be coordinated with the general utility excavation recommendations provided in the following section.

6.2 General Utility Excavation Recommendations

The excavations throughout this project will encounter a variety of materials (cf. Section 5.0). Those materials will include:

- Previously placed backfill and fill that is comprised of various soil types, including lean clay, fat clay, and clayey sand with gravel. The fill soils were noted to contain silt, topsoil, shale fragments, limestone fragments, limestone floaters, oxide stains, organics, and rubble consisting of, but not limited to, brick fragments and cinders.

- Native alluvial soils, consisting primarily of lean clay with some amounts of sand and gravel. The alluvial soils were noted to contain silt pockets, limestone fragments, shale fragments, oxide stains and concretions, and organics.

- Predominantly limestone bedrock with thin shale partings, as well as interbedded shale and limestone bedrock.

It should be noted that soils that are mostly granular in nature, such as those periodically encountered within layers of the fill and native alluvium, will tend to cave during trench excavation, and may require sheeting, shoring or other means of support by the Contractor to maintain safe working conditions in the trenches, and to protect paving, structures and infrastructure near the trenches.

Experience indicates that the overburden soils and highly weathered zones of bedrock can be excavated with conventional earthwork construction equipment (track-mounted hoes). Excavations that extend into the limestone bedrock will be difficult and require significant effort with large hoe ram equipment and/or blasting.

In the excavations that encounter bedrock, the Contractor should select a method of excavating the bedrock that will allow adequate care to be taken to protect nearby structures and infrastructure from vibration or other potential damage that might be caused during bedrock excavation. In addition, the Contractor should note that it is difficult to shear limestone layers neatly in the sides of trench excavations. Frequently, when limestone layers are encountered in trench excavations, the tendency is for the layers not to break even with the sides of the excavations, but rather to be pulled up in larger chunks, which tend to heave and ravel the bedrock and soils outside the limits of the intended trench. Where trench excavations will be made adjacent to existing pavements, structures, or utilities, it should be anticipated that there will be areas where this heave and raveling due to removal of limestone layers could cause collateral damage to the features adjacent to the trench, and the damaged items would have to be restored. In areas where such collateral damage cannot be tolerated, the bedrock should be pre-cut or sheared to reduce the risk of heaving and raveling outside the intended limits of the trench excavation. The Contractor should complete preconstruction surveys of the property located near

the proposed alignment to document existing conditions prior to any excavations. Upon completion of work, the contractor should perform post-construction surveys of the properties for which pre-construction surveys were performed.

If blasting is used for this project, the following recommendations should be considered. We recommend that blasting only be performed by a qualified blasting contractor after a blasting plan has been submitted to and approved by the Owner and the Engineer. The blasting plan should address limitations on ground accelerations to protect any potential shoring systems as well as any nearby private or public structures or infrastructure. The plan should also include a pre-construction survey, a monitoring program during construction and a post construction survey.

We recommend that caution be exercised to minimize over-blasting of the bedrock. Over-blasting can damage the bedrock below finished grade by fracturing the rock or heaving the overburden and the rock from its original position. This could result in a reduction of support for potential shoring members, a reduction of the bedrock support capacity beneath proposed structures, and potential settlement of structures and piping. If the bedrock exposed at or below the bearing elevations for structures appears to be damaged by over blasting, we recommend that the Project Geotechnical Engineer be contacted to determine the appropriate corrective measures. It is probable that over-blasted bedrock will have to be removed and replaced with compacted fill or flowable fill.

In areas where the proposed alignment will come in close proximity to structures and utilities, if any, we recommend that the sewer be installed in short lengths, so as to limit the open, unbackfilled length of the trench as necessary, to prevent movement of, or damage to, structures, the surrounding ground surface, slopes above and below the trench, and infrastructure. We recommend that backfill be placed and compacted close behind the installation of the pipe to limit the length of unbackfilled trenches as much as possible in these areas.

For sewer installations that are made on sloping terrain and/or near the toes of existing slopes, precautions should be made by the Contractor to help maintain the stability of these slopes, both during and after sewer construction. In these areas, we recommend that benches cut into the existing slopes be limited to only that which is needed to level the excavation equipment such that it can straddle and complete the proposed trench excavations required to install the sewer. These bench cuts should not be made until the proposed sewer is ready to be installed in the immediate area, and the existing slope grades should be re-established immediately after the sewer has been installed in this area. If possible, haul roads for equipment and material access should be located on relatively level ground where no bench cuts are required. Otherwise, access benches cut into the slopes and/or near the toes of the existing slopes could cause instability upslope of the trenches. It is important that bench excavations made for the project be restored with fill that is placed in accordance with the same compaction criteria as for the trench backfill that is discussed in Section 6.3.

Where the trenches penetrate silty or cohesionless soils, softer clays, or poorly compacted fill or backfill, maintaining the sides of the trench excavations and preventing the undermining of

adjacent pavements, structures, or utilities may be difficult. The Contractor should be prepared to maintain the sides of excavations and to minimize the sloughing of soils and loosened rock fragments into the trenches. Temporary shoring should be used wherever the bottom of the trench excavation will be within a 2H:1V outward and downward projection from the foundations of existing structures.

If soft or unstable soils are encountered at the bottoms of the proposed sewer trench excavations, we recommend that the soft or unstable materials be removed from below pipe invert level for the full trench width, as necessary, and replaced with compacted crushed stone to provide a stable trench bottom. The compacted crushed stone should be wrapped with a non-woven geotextile to reduce the migration of fine-grained soils and fine granular bedding into the crushed stone. The depth of the undercut and crushed stone fill below the pipe invert will vary with the soft/unstable soil conditions that are encountered; however, the depth of undercut below pipe invert level can be limited to a maximum of 24 inches. The crushed stone backfill should be placed and compacted in accordance with the recommendations for backfilling presented in Section 6.3 of this report. The specified pipe bedding should be placed over the compacted crushed stone and geotextile.

6.3 General Utility Backfill Recommendations

We anticipate that the sewer trenches made through pavements and within a specified distance of the edges of pavements will be backfilled with compacted granular pipe zone fill and then controlled density fill (flowable fill) up to pavement subgrade level or within 12 inches of the ground surface where outside of the pavement. We expect that trenches not through or near pavements will be backfilled with granular pipe zone fill and then the recompacted excavated soils up to surface grade.

We anticipate that most of the materials from the sewer trench excavations can be used as backfill (in areas designated for soil backfill rather than flowable fill) after the appropriate select pipe bedding and pipe zone fill for the pipe is placed. Above the pipe bedding and pipe zone fill, backfill materials may include inorganic clays, sands, and gravels. Backfill materials should not include large pieces of limestone or nested concentrations of limestone; asphalt, concrete, trash, construction or demolition debris, topsoil, or organic matter; or frozen or saturated material. Some of the excavated materials will have to be moisture-conditioned to near optimum moisture content before being re-used as backfill. Pieces of limestone that can be broken up and dispersed so that they do not nest or retard compaction may be incorporated in the backfill, provided that the limestone pieces are smaller than 18 inches in maximum dimension and 4 inches in thickness and that proper protection of the pipe from these pieces of limestone is provided. Larger pieces of limestone should be excluded from the backfill.

Soil trench backfill should be compacted to a moist, dense condition throughout the entire alignments of this project in order to reduce the potential for backfill settlement, which may form depressions that alter surface water drainage and/or adversely affect adjacent property, structures, or infrastructure. In addition, excavations made near or on sloping terrain would become less stable if the trenches were loosely backfilled. Therefore, backfill should be placed in shallow level lifts (or layers), 6 to 8 inches in loose thickness. Each lift should be moisture-

conditioned to within the acceptable moisture content range provided in Table 5, and compacted to at least the minimum percent compaction indicated in the same table.

Moisture-conditioning may include: aeration and drying of wetter soils; wetting drier soils; and/or thoroughly mixing wetter and drier soils into a uniform mixture. Where granular backfill is used that does not exhibit a well-defined moisture-density relationship, the granular material should be compacted to at least the minimum relative densities indicated in Table 6. Density and moisture tests should be regularly made in the backfill to document that the recommended degree of compaction and range of moisture contents are being achieved.

Table 5. Percent compaction and moisture-conditioning requirements for fill and backfill.

Area	Minimum Percent Compaction[a,b]	Acceptable Moisture Content Range[c]
Structural[d]	98% of SPMDD	-2% to +3% of OMC
Non-structural	95% of SPMDD	±3% of OMC

a [a] SPMDD = standard Proctor maximum dry density determined from ASTM D698.
b [b] For granular soils that do not exhibit a well-defined moisture-density relationship, refer to Table 6 for minimum relative density requirements.
c [c] OMC = optimum moisture content determined from ASTM D698.
d [d] Structural fill and backfill for foundations are defined as fill and backfill located within the zones of influence of structures. The zone of influence of a structure is defined as the area below the footprint of the structure and 2H:1V outward and downward projections from the bearing elevation of the structure.

Table 6. Relative density compaction requirements for granular fill and backfill.

Area	Minimum Relative Density[a,b]
Structural[c]	80%
Non-structural	75%

e [a] Relative density evaluated on the basis of the maximum and minimum index densities determined from ASTM D4253 and D4254, respectively.
f [b] For granular soils that exhibit a well-defined moisture-density relationship, refer to Table 5 for minimum percent compaction and moisture-conditioning requirements.
g [c] Structural fill and backfill for foundations are defined as fill and backfill located within the zones of influence of structures. The zone of influence of a structure is defined as the area below the footprint of the structure and 2H:1V outward and downward projections from the bearing elevation of the structure.

If flowable fill is utilized to backfill the trench excavations, we recommend that the flowable fill have a design strength of at least 30 psi for stability and not greater than 100 psi for potential future excavatability. The mix design and strength support information should be submitted and approved by the Engineer in advance of the use of the flowable fill on this project.

As discussed in the previous section, some of the sewer installations will be made on sloping terrain. In these areas, it may be necessary to excavate benches into the slopes for equipment

access. Wherever the benches are excavated, the slopes should be reconstructed immediately after the sewer is installed and backfilled. The excavated slope materials should be spread in thin lifts on horizontal benches, and each lift should be recompacted in accordance with the same moisture and density criteria as recommended for the trench backfill. If groundwater seepage is noted on the benches, the Project Geotechnical Engineer should be contacted for underdrainage recommendations before the soils are replaced and compacted. The reconstructed slopes should also be slightly overbuilt and then trimmed back to the original grades to achieve a well-compacted surface.

Best management practices (BMPs) should be implemented to reduce the effects of erosion and the siltation of adjacent properties. Upon completion of sewer installations, disturbed areas should be stabilized. It is also recommended that riprap and/or suitable armoring be used at the outlets of storm sewers and headwalls to reduce flow velocities and protect against erosion.

6.4 Groundwater

Groundwater was only encountered during drilling in two of the borings at depths of 8.5 and 13.5 feet. It should be noted that groundwater may be encountered where excavations are near the creek and extend below the creek elevation. Groundwater could also be encountered from within the weathered zone of the bedrock, and more concentrated seepage could be encountered from fractures and karstic features in the bedrock. The Contractor should be prepared to remove seepage that accumulates in excavations, on fill surfaces, or at subgrade levels. We recommend that the base of the pit excavations be sloped to a sump from which accumulating groundwater can be pumped. Groundwater levels and seepage amounts are expected to vary with time, location, season of the year, and amounts of precipitation.

6.5 Karst Bedrock

Based on the available geographic mapping from the Kentucky Geological Survey, the area between the fault lines, as discussed in 5.1.5, is shown as non-karst and the remaining project area is shaded as intense karst. The limestone bedrock formations have a high potential for development of karst-features such as sinkholes, springs, caves, etc; however, sinkholes were not mapped in the immediate vicinity of the proposed sewer trunks. The karst map did indicate four sinkholes along Tates Creek Road between about 0.1 and 0.4 miles south of the intersection with Armstrong Mill Road.

The potential exists for karstic features to be present which may develop and/or that cavities in the bedrock could collapse resulting in a loss of support. To lessen this risk, we recommend review of the exposed subsurface conditions in the pit excavations by the Project Geotechnical Engineer, or a representative thereof, to help identify potential karst features that could impact the proposed construction. It should be noted that this precautionary measure cannot identify all potential karst hazards, and therefore, there will always be some risk of sinkhole development and/or soil/bedrock dropout at these sites.

6.6 Lateral Earth Pressures

We recommend that the lateral earth pressures acting on temporary shoring systems be computed on the basis of the soil parameters provided in Table 7 and Table 8. The lateral earth pressures should also include surcharges for nearby footings, pavement loads, etc. Unless a site-specific analysis is performed, we recommend that surcharges be modeled as a uniform horizontal pressure equal to the vertical intensity of the surcharge multiplied by the recommended lateral earth pressure coefficient (K_o).

The earth pressure coefficient values provided in Table 7 are based on the condition that the ground surface above the top of the wall is level and not sloping toward the wall. For non-horizontal ground sloping toward the wall up to a gradient as steep as 2H:1V on its at-rest side, we recommend the earth pressure coefficient values provided in Table 8.

Table 7. Lateral earth pressure parameters for level (horizontal) ground surfaces.

Parameter	Value
Soil Unit Weight, γ (pcf)	125
Internal Angle of Friction, ϕ (°)	24
At-Rest Earth Pressure Coefficient, K_o	0.60

Table 8. Lateral earth pressure parameters for sloping (up to 2H:1V) ground surfaces.

Parameter	Value
Soil Unit Weight, γ (pcf)	125
Internal Angle of Friction, ϕ (°)	24
At-Rest Earth Pressure Coefficient, K_o	0.70

Where temporary shoring walls will be internally braced, earth pressures on the walls should be computed using apparent earth pressure distributions as discussed in FHWA-IF-99-015 (1999). The parameters in Table 7 and Table 8 may be used to define the apparent earth pressure distributions.

Where temporary shoring will derive its lateral support from embedment below the bottom of the excavation, we recommend that the temporary shoring be designed using a p-y approach. Where the vertical shoring elements will be close enough that their areas of resistance overlap, we recommend that an appropriate p-multiplier be applied in the analyses to account for the overlap and reduction in lateral resistance. We recommend that the p-multiplier be estimated per Section 10.7.2.4 from the *AASHTO LRFD Bridge Design Specifications* (AASHTO 2012).

The design of temporary shoring systems is beyond the scope of this report. We recommend that the contractor's shoring systems be designed by a Kentucky-registered Professional Engineer and be submitted to the Project Design Team for review prior to implementation.

7.0 RECOMMENDED ADDITIONAL SERVICES

The conclusions and recommendations given in this report are based on: Geotechnology's understanding of the proposed design and construction, as outlined in this report; site observations; interpretation of the exploration data; and our experience. Since the intent of the design recommendations is best understood by Geotechnology, we recommend that Geotechnology be included in the final design and construction process, and be retained to review the project plans and specifications to confirm that the recommendations given in this report have been correctly implemented. We recommend that Geotechnology be retained to participate in prebid and preconstruction conferences to reduce the risk of misinterpretation of the conclusions and recommendations in this report relative to the proposed construction of the subject project.

Since actual subsurface conditions between boring locations may vary from those encountered in the borings, our design recommendations are subject to adjustment in the field based on the subsurface conditions encountered during construction. Therefore, we recommend that Geotechnology be retained to provide construction observation services as a continuation of the design process to confirm the recommendations in this report and to revise them accordingly to accommodate differing subsurface conditions. Construction observation is intended to enhance compliance with project plans and specifications. It is not insurance, nor does it constitute a warranty or guarantee of any type. Regardless of construction observation, contractors, suppliers, and others are solely responsible for the quality of their work and for adhering to plans and specifications.

8.0 LIMITATIONS

This report has been prepared on behalf of, and for the exclusive use of, PRIME AE Group for specific application to the named project as described herein. If this report is provided to other parties, it should be provided in its entirety with all supplementary information. In addition, PRIME AE Group should make it clear that the information is provided for factual data only, and not as a warranty of subsurface conditions presented in this report.

Geotechnology has attempted to conduct the services reported herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions. The recommendations and conclusions contained in this report are professional opinions. The report is not a bidding document and should not be used for that purpose.

Our scope for this phase of the project did not include any environmental assessment or investigation for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors noted or unusual or suspicious items or conditions observed are strictly for the information of our client. Our scope did not include an assessment of the effects of flooding and erosion of creeks or rivers adjacent to or on the project site.

The analyses, conclusions, and recommendations contained in this report are based on the data obtained from the subsurface exploration. The field exploration methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Consequently, subsurface conditions may vary gradually, abruptly, and/or nonlinearly between sample locations and/or intervals.

The conclusions or recommendations presented in this report should not be used without Geotechnology's review and assessment if the nature, design, or location of the facilities is changed, if there is a substantial lapse in time between the submittal of this report and the start of work at the site, or if there is a substantial interruption or delay during work at the site. If changes are contemplated or delays occur, Geotechnology must be allowed to review them to assess their impact on the findings, conclusions, and/or design recommendations given in this report. Geotechnology will not be responsible for any claims, damages, or liability associated with any other party's interpretations of the subsurface data or with reuse of the subsurface data or engineering analyses in this report.

The recommendations included in this report have been based in part on assumptions about variations in site stratigraphy that may be evaluated further during earthwork and foundation construction. Geotechnology should be retained to perform construction observation and continue its geotechnical engineering service using observational methods. Geotechnology cannot assume liability for the adequacy of its recommendations when they are used in the field without Geotechnology being retained to observe construction.

A copy of "Important Information about This Geotechnical-Engineering Report" that is published by the Geotechnical Business Council (GBC) of the Geoprofessional Business Association (GBA) is included in Appendix A for your review. The publication discusses some other limitations, as well as ways to manage risk associated with subsurface conditions.

APPENDIX A – IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by:* the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.



GEOTECHNICAL BUSINESS COUNCIL
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APPENDIX B – BORING INFORMATION

Boring Logs

Soil Classification Sheet

Rock Classification Sheet

GEOTECHNOLOGY

A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: PRIME AE Group
BORING #: B-46
PROJECT: LFUCG Merrick and West Hickman - Phase II
PROJECT #: J038336.03
Lexington, Kentucky
PAGE #: 1 of 1
LOCATION OF BORING: Boring was drilled 18' west of the as-staked location that is shown on the Geotechnical Exhibit.

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
922.8	Ground Surface	0.0	0							
922.0	ASPHALT (10 inches)	0.8								
921.6	GRANULAR BASE, trace lean clay (4 inches)	1.2								
	Dark gray moist medium stiff LEAN CLAY, trace organics (fill).			I	1A 1B	SS	11-3-4	11	61	2.0
918.3		4.5	5							
	Dark gray, trace brown moist stiff LEAN CLAY, trace topsoil and organics with limestone fragments (fill).			I	2	SS	4-3-4	9	50	2.0
915.8		7.0								
	Dark gray, trace brown moist very stiff LEAN CLAY, trace fat clay and organics with oxide concretions and limestone fragments and floaters (fill)			I	3	SS	3-4-32	11	61	2.5
913.8	(CL).	9.0		I	4	SS	50/3"			
913.4	Interbedded gray moist very weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock).	9.4	10							
	Interbedded gray moist very weak to weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock). Limestone comprises 41 percent of interval and is in beds ranging from 1 to 9 inches thick. (Clays Ferry Formation)			I	5	RC	RQD = 43%	59	82	
907.4		15.4	15							
	Interbedded gray moist weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock). Limestone comprises 44 percent of interval and is in beds ranging from 0.75 to 6.75 inches thick. (Clays Ferry Formation)			I	6	RC	RQD = 42%	115	100	
897.8		25.0	25							
	Split spoon refusal at 9.3 feet and bottom of test boring at 25.0 feet.		30							

Datum: NAVD 88
Hammer Weight: 140 lb.
Hole Diameter: 8 in.
Drill Rig: B-57 Truck Rig D-5
Surface Elevation: 922.8 ft. +/-
Hammer Drop: 30 in.
Rock Core Diameter: 1.875 in.
Foreman: L. Kemmeter
Date Started: 11/10/2021
Pipe Size: 2 in. O.D.
Boring Method: HSA-3.25
Engineer: Michelle E. Casto
Date Completed: 11/10/2021

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: None
At Completion: Dry
After: --
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY

A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: PRIME AE Group

PROJECT: LFUCG Merrick and West Hickman - Phase II
Lexington, Kentucky

BORING #: B-48

PROJECT #: J038336.03

PAGE #: 1 of 1

LOCATION OF BORING: Boring was drilled 20' east of the as-staked location that is shown on the Geotechnical Exhibit.

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
922.5	Ground Surface	0.0							
921.7	ASPHALT (10 inches)	0.8							
921.2	GRANULAR BASE (6 inches)	1.3							
	Brown moist loose clayey SAND, little gravel (fill) (SM).		I	1	SS	7-3-5	5	28	
918.0		4.5							
	Dark gray moist medium stiff to stiff LEAN CLAY, trace sand with organics and shale fragments, trace brick fragments (fill) (CL).		I	2A	SS	4-3-2	13	72	2.0
				2B					0.5
915.5		7.0							
	Dark gray wet soft to medium stiff LEAN CLAY with organics, and brick and shale fragments (fill).		I	3	SS	WOH-4-WOH	9	50	0.75
			I	4A	SS	4-3-7	4	22	
911.2		11.3		4B					
	Interbedded gray moist very weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock).								
908.9		13.6							
	Interbedded gray moist very weak to weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock). Limestone comprises 45 percent of interval and is in beds ranging from 0.5 to 6 inches thick. (Clays Ferry Formation)		I	5	RC	RQD = 21%	15	52	
906.5		16.0							
	Interbedded gray moist very weak to weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock). Limestone comprised 36 percent of interval and is in beds ranging from 1 to 5.5 inches thick. (Clays Ferry Formation)		I	6	RC	RQD = 63%	96	96	
898.2		24.3							
	Bottom of test boring at 24.3 feet.								

Depth Scale (feet): 0, 5, 10, 15, 20, 25, 30

Datum: NAVD 88

Surface Elevation: 922.5 ft. +/-

Date Started: 11/5/2021

Date Completed: 11/5/2021

Hammer Weight: 140 lb.

Hammer Drop: 30 in.

Pipe Size: 2 in. O.D.

Hole Diameter: 8 in.

Rock Core Diameter: 1.875 in.

Boring Method: HSA-3.25

Drill Rig: B-57 Truck Rig D-5

Foreman: L. Kemmeter

Engineer: Michelle E. Casto

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted 8.5 ft.
At Completion Dry
After --
Backfilled Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY

A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: PRIME AE Group

PROJECT: LFUCG Merrick and West Hickman - Phase II
Lexington, Kentucky

BORING #: B-60

PROJECT #: J038336.03

PAGE #: 1 of 1

LOCATION OF BORING: Boring was drilled 40' north of the as-staked location that is shown on the Geotechnical Exhibit.

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
928.0	Ground Surface	0.0	0							
927.8	TOPSOIL (2 inches)	0.2		I	1A 1B	SS	3-3-4	9	50	
926.0	Brown moist stiff LEAN CLAY, trace sand and gravel with roots (fill).	2.0								
	Brown moist stiff to very stiff LEAN CLAY, little sand, trace gravel and topsoil (fill) (CL).			I	2	SS	3-3-4	13	72	2.5
			5	I	3	SS	2-2-2	9	50	1.25
921.0		7.0								
919.7	Brown moist very stiff LEAN CLAY, trace sand and gravel with dark gray silt pockets and oxide stains (fill).	8.3		I	4A 4B	SS	3-5-6	18	100	2.5 1.25
	Brown moist stiff LEAN CLAY with oxide stains (alluvium).		10	I	5	SS	3-3-4	18	100	1.25
916.0		12.0								
	Brown and gray moist medium stiff to stiff sandy LEAN CLAY, trace gravel with oxide concretions (alluvium) (CL).			I	6	SS	3-3-4	16	89	1.0
913.5		14.5								
912.9	Interbedded gray moist very weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock).	15.1	15	I	7	SS	50/1"	1	100	
	Interbedded gray moist very weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock). Limestone comprises 33 percent of interval and is in beds ranging from 0.25 to 3.75 inches thick. (Clays Ferry Formation)		20	I	8	RC	RQD = 5%	95	95	
904.5		23.5								
	Interbedded gray moist very weak to weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock). Limestone comprises 42 percent of interval and is in beds ranging from 0.25 to 8.25 inches thick. (Clays Ferry Formation)		25	I	9	RC	RQD = 40%	32	76	
901.0		27.0								
	Split spoon refusal at 15.1 feet and bottom of test boring at 27.0 feet.		30							

Datum: NAVD 88

Surface Elevation: 928.0 ft. +/-

Date Started: 11/8/2021

Date Completed: 11/8/2021

Hammer Weight: 140 lb.

Hammer Drop: 30 in.

Pipe Size: 2 in. O.D.

Hole Diameter: 8 in.

Rock Core Diameter: 1.875 in.

Boring Method: HSA-3.25

Drill Rig: B-57 Truck Rig D-5

Foreman: L. Kemmeter

Engineer: Michelle E. Casto

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: None
At Completion: Dry
After: --
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY

A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: PRIME AE Group

PROJECT: LFUCG Merrick and West Hickman - Phase II
Lexington, Kentucky

LOCATION OF BORING: As staked and shown on the Geotechnical Exhibit

BORING #: B-61
PROJECT #: J038336.03
PAGE #: 1 of 1

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
928.2	Ground Surface	0.0	0							
927.8	TOPSOIL (5 inches)	0.4		I	1A	SS	3-4-6	16	89	2.0
	Brown moist stiff sandy FAT CLAY, trace gravel and topsoil with oxide stains, trace roots with limestone fragments and floaters (fill) (CH).				1B					
924.0		4.2		I	2	SS	13-50/4"	8	80	1.5
922.7	Brown moist medium stiff LEAN CLAY, little topsoil with limestone floaters (fill).	5.5	5							
921.2	Dark brown moist medium stiff LEAN CLAY, little sand and gravel, trace cinders (fill).	7.0		I	3A	SS	8-5-5	17	94	0.9
					3B					0.8
918.7	Dark gray and brown moist medium stiff LEAN CLAY, trace gravel, organics and shale fragments with limestone floaters (fill).	9.5		I	4	SS	4-1-3	4	22	
916.2	Dark gray to black moist soft sandy LEAN CLAY with organics and shale fragments with limestone floaters (fill).	12.0	10	I	5	SS	7-10-14	18	100	
913.1	Interbedded gray moist to wet extremely weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock).	15.1		I	6	SS	8-52-22	16	89	
			15	I	7	SS	50/1"			
907.1	Interbedded gray moist very weak to weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock). Limestone and shale beds are uneven. Limestone comprises 25 percent of interval and is in beds ranging from 9.5 to 5.5 inches thick. (Clays Ferry Formation)	21.1	20	I	8	RC	RQD = 45%	54	75	
900.2	Interbedded gray moist weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock). Limestone and shale beds are even to uneven. Limestone comprises 39 percent of interval and is in beds ranging from 0.5 to 5 inches thick. (Clays Ferry Formation)	28.0	25	I	9	RC	RQD = 47%	83	100	
	Split spoon refusal at 15.1 feet and bottom of test boring at 28.0 feet.		30							

Datum: NAVD 88
Surface Elevation: 928.2 ft.
Date Started: 11/9/2021
Date Completed: 11/9/2021

Hammer Weight: 140 lb.
Hammer Drop: 30 in.
Pipe Size: 2 in. O.D.

Hole Diameter: 8 in.
Rock Core Diameter: 1.875 in.
Boring Method: HSA-3.25

Drill Rig: B-57 Truck Rig D-5
Foreman: L. Kemmeter
Engineer: Michelle E. Casto

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D= Disintegrated
I = Intact
U= Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted 13.5
At Completion Dry
After --
Backfilled Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY

A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: PRIME AE Group

PROJECT: LFUCG Merrick and West Hickman - Phase II

Lexington, Kentucky

LOCATION OF BORING: As staked and shown on the Geotechnical Exhibit

BORING #: B-65

PROJECT #: J038336.03

PAGE #: 1 of 1

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
927.5	Ground Surface	0.0	0							
927.3	TOPSOIL with roots (2 inches)	0.2		I	1A	SS	2-2-5	17	94	
927.0	Brown moist loose SAND and GRAVEL, trace lean clay and roots (fill).	0.5			1B					
925.5	Brown moist very stiff FAT CLAY, trace sand and gravel with oxide stains (fill).	2.0			1C					3.75
				I	2	SS	2-2-3	14	78	3.0
923.0	Brown and dark gray moist very stiff FAT CLAY, some topsoil, trace sand and gravel with oxide stains, trace organics (fill).	4.5								
	Dark gray moist medium stiff to stiff LEAN CLAY, trace organics (alluvium).		5	I	3	SS	3-3-5	18	100	1.0
920.5		7.0								
919.7	Dark gray wet soft LEAN CLAY, little sand with limestone fragments (alluvium).	7.8		I	4A	SS	40-50/5"	11	100	0.25
	Interbedded gray moist very weak unweathered SHALE and gray medium				4B					
918.2	strong to very strong LIMESTONE (bedrock).	9.3		I	5	SS	50/3"	3	100	
	Interbedded gray medium strong to very strong rubbly weathered LIMESTONE and gray moist very weak unweathered SHALE (bedrock). Limestone comprises 34 percent of interval and is in uneven beds up to 2 inches thick. (Clays Ferry Formation)		10	I	6	RC	RQD = 0%	21	34	
913.0		14.5								
	Interbedded gray medium strong to very strong LIMESTONE and gray moist very weak unweathered SHALE (bedrock). Limestone is fractured at 45-degree angle at 15.6', 15.9', 16.0', 16.7', 18.0', 18.5',', 18.9', 20.5', 22.1', and 22.5'. Limestone comprises 80 percent of interval and is in inclined beds ranging from 2 to 17.75 inches thick. (Clays Ferry Formation)		15							
			20	I	7	RC	RQD = 79%	109	91	
903.0		24.5								
	Split spoon refusal at 9.3 feet and bottom of test boring at 24.5 feet.		25							
			30							

Datum: NAVD 88

Surface Elevation: 927.5 ft.

Date Started: 11/8/2021

Date Completed: 11/9/2021

Hammer Weight: 140 lb.

Hammer Drop: 30 in.

Pipe Size: 2 in. O.D.

Hole Diameter: 8 in.

Rock Core Diameter: 1.875 in.

Boring Method: HSA-3.25

Drill Rig: B-57 Truck Rig D-5

Foreman: L. Kemmeter

Engineer: Michelle E. Casto

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH

First Noted	None
At Completion	Dry
After	--
Backfilled	Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY

A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: PRIME AE Group

PROJECT: LFUCG Merrick and West Hickman - Phase II

Lexington, Kentucky

LOCATION OF BORING: As staked and shown on the Geotechnical Exhibit

BORING #: B-66

PROJECT #: J038336.03

PAGE #: 1 of 1

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
932.2	Ground Surface	0.0	0							
932.0	TOPSOIL with roots (2 inches).	0.2		I	1A 1B	SS	18-11-19	8	44	
	Brown moist stiff LEAN CLAY, trace gravel, roots and topsoil with limestone floaters (fill).			I	2	SS	9-11-8	5	28	
927.7		4.5	5							
	Dark brown and gray moist medium stiff to stiff LEAN CLAY, little topsoil with organics, shale fragments and limestone floaters (fill).			I	3	SS	6-11-39	9	50	1.0
925.2		7.0								
	Brown, trace gray moist medium stiff LEAN CLAY with shale and limestone fragments (fill).			I	4	SS	11-7-6	7	39	0.75
922.7		9.5	10							
	Dark brown medium stiff LEAN CLAY with organics and limestone floaters, trace brick fragments (fill).			I	5	SS	3-11-9	14	78	0.75
920.2		12.0								
	Interbedded gray moist extremely weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock).			L	6	SS	50/2"	0	0	
918.0		14.2	15							
	Interbedded gray medium strong to very strong LIMESTONE with thin SHALE partings (bedrock). Limestone comprises 96 percent of the interval and is in beds ranging from 1 to 18 inches. (Lower part of Lexington Limestone Formation).			I	7	RC	RQD = 96%	75	99	
911.7		20.5	20							
	Interbedded gray medium strong to very strong LIMESTONE with thin SHALE partings (bedrock). Limestone comprises 90 percent of the interval and is in beds ranging from 1 to 8 inches. (Lower part of Lexington Limestone Formation).			I	8	RC	RQD = 71%	78	100	
905.2		27.0	25							
	Split spoon refusal at 8.0 feet and bottom of test boring at 27.0 feet.		30							

Datum: NAVD 88

Surface Elevation: 932.2 ft.

Date Started: 11/11/2021

Date Completed: 11/11/2021

Hammer Weight: 140 lb.

Hammer Drop: 30 in.

Pipe Size: 2 in. O.D.

Hole Diameter: 8 in.

Rock Core Diameter: 1.875 in.

Boring Method: HSA-3.25

Drill Rig: B-57 Truck Rig D-5

Foreman: L. Kemmeter

Engineer: Michelle E. Casto

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: None
At Completion: Dry
After: --
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY

A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: PRIME AE Group

PROJECT: LFUCG Merrick and West Hickman - Phase II

Lexington, Kentucky

LOCATION OF BORING: As staked and shown on the Geotechnical Exhibit

BORING #: B-67

PROJECT #: J038336.03

PAGE #: 1 of 2

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
945.4	Ground Surface	0.0	0							
944.5	TOPSOIL (11 inches).	0.9		I	1	SS	3-3-3	11	61	
	Brown moist very stiff LEAN CLAY, trace gravel with shale fragments and limestone floaters (fill).			I	2	SS	9-5-4	7	39	3.5
940.9		4.5	5	I	3	SS	6-7-50/2"	12	86	2.0
	Dark brown moist stiff LEAN CLAY with oxide stains, shale fragments and limestone floaters (fill) (CL).			I	4	SS	50/3"	3	100	4.5+
935.9		9.5	10	I	5	SS	11-50/5"	11	100	
933.7	Dark brown moist hard LEAN CLAY, trace gravel with oxide stains and limestone floaters (alluvium).	11.7		I	6	SS	50/4"	3	75	
930.2	Interbedded brown moist extremely weak weathered SHALE and gray medium strong to very strong LIMESTONE (bedrock).	15.2	15	I	7	SS	50/2"	2	100	
924.4	Interbedded gray medium strong to very strong LIMESTONE and brown moist extremely weak weathered SHALE (bedrock). The limestone comprises 80 percent of interval and is in beds ranging from 0.5 to 8.25 inches thick. (Lower part of Lexington Limestone Formation)	21.0	20	I	8	RC	RQD = 67%	69	99	
	Interbedded gray medium strong to very strong LIMESTONE marled with gray SHALE and thin wavy shale partings (bedrock). Clay seam noted at 27.0 feet. Limestone comprises 86 percent of interval and is in beds ranging from 1 to 10 inches thick. (Lower part of Lexington Limestone Formation)		25	I	9	RC	RQD = 86%	115	96	
			30							

Datum: NAVD 88

Surface Elevation: 945.4 ft.

Date Started: 11/12/2021

Date Completed: 11/12/2021

Hammer Weight: 140 lb.

Hammer Drop: 30 in.

Pipe Size: 2 in. O.D.

Hole Diameter: 8 in.

Rock Core Diameter: 1.875 in.

Boring Method: HSA-3.25

Drill Rig: B-57 Truck Rig D-5

Foreman: L. Kemmeter

Engineer: Michelle E. Casto

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: None
At Completion: Dry
After: --
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY

A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: PRIME AE Group

PROJECT: LFUCG Merrick and West Hickman - Phase II
Lexington, Kentucky

BORING #: B-67

PROJECT #: J038336.03

PAGE #: 2 of 2

LOCATION OF BORING: As staked and shown on the Geotechnical Exhibit

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
914.4		31.0	30							
	Interbedded gray weak to very strong LIMESTONE marled with SHALE and thin shale partings (bedrock). Limestone comprises 92 percent of interval and is in beds ranging from 2 to 10 inches thick. (Lower part of Lexington Limestone Formation)		35	I	10	RC	RQD = 81%	118	100	
904.6		40.8	40							
	Split spoon refusal at 12.8 feet and bottom of test boring at 40.8 feet.		45							
			50							
			55							
			60							

Datum: NAVD 88
Surface Elevation: 945.4 ft.
Date Started: 11/12/2021
Date Completed: 11/12/2021

Hammer Weight: 140 lb.
Hammer Drop: 30 in.
Pipe Size: 2 in. O.D.

Hole Diameter: 8 in.
Rock Core Diameter: 1.875 in.
Boring Method: HSA-3.25

Drill Rig: B-57 Truck Rig D-5
Foreman: L. Kemmeter
Engineer: Michelle E. Casto

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: None
At Completion: Dry
After: --
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY

A Universal Engineering Sciences Company

LOG OF TEST BORING

CLIENT: PRIME AE Group
BORING #: B-69
PROJECT: LFUCG Merrick and West Hickman - Phase II
PROJECT #: J038336.03
Lexington, Kentucky
PAGE #: 1 of 1
LOCATION OF BORING: As staked and shown on the Geotechnical Exhibit

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
939.0	Ground Surface	0.0	0							
938.7	TOPSOIL (3 inches)	0.3		I	1A 1B	SS	5-5-8	11	61	1.0
	Brown moist medium stiff to stiff LEAN CLAY, trace topsoil and roots with shale and limestone fragments and floaters (fill).			I	2	SS	6-11-19	8	44	2.0
934.5		4.5	5	I	3	SS	7-50/5"	2	18	
	Dark brown moist medium stiff LEAN CLAY, trace sand with limestone floaters (fill).			I	4	SS	50/1"	0	0	
932.0		7.0								
	Interbedded gray moist extremely weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock).									
929.9		9.1								
928.4	Interbedded gray medium strong to very strong LIMESTONE with marled SHALE and thin wavy shale partings (bedrock). Limestone comprises 95 percent of interval and is in beds ranging from 1 to 6 inches thick. (Lower part of the Lexington Limestone Formation)	10.6	10	I	5	RC	RQD = 56%	18	100	
	Interbedded gray medium strong to very strong LIMESTONE with marled SHALE and thin wavy shale partings (bedrock). Limestone comprises 88 percent of interval and is in beds ranging from 0.5 to 5 inches thick. (Lower part of the Lexington Limestone Formation)		15	I	6	RC	RQD = 74%	120	100	
918.4		20.6	20							
	Interbedded gray medium strong to very strong LIMESTONE with marled SHALE and thin wavy shale partings (bedrock). Limestone comprises 91 percent of interval and is in beds ranging from 0.5 to 6 inches thick. (Lower part of the Lexington Limestone Formation)		25	I	7	RC	RQD = 90%	101	100	
910.0		29.0	30							

Split spoon refusal at 7.6 feet and bottom of test boring at 29.0 feet.

Datum: NAVD 88 | Hammer Weight: 140 lb. | Hole Diameter: 8 in. | Drill Rig: B-57 Truck Rig D-5
Surface Elevation: 939.0 ft. | Hammer Drop: 30 in. | Rock Core Diameter: 1.875 in. | Foreman: L. Kemmeter
Date Started: 11/12/2021 | Pipe Size: 2 in. O.D. | Boring Method: HSA-3.25 | Engineer: Michelle E. Casto
Date Completed: 11/12/2021

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: None
At Completion: Dry
After: --
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY

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LOG OF TEST BORING

CLIENT: PRIME AE Group

PROJECT: LFUCG Merrick and West Hickman - Phase II
Lexington, Kentucky

LOCATION OF BORING: As staked and shown on the Geotechnical Exhibit

BORING #: B-119
PROJECT #: J038336.03
PAGE #: 1 of 1

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
926.0	Ground Surface	0.0	0							
925.7	TOPSOIL (3 inches)	0.3								
924.0	Dark brown moist stiff LEAN CLAY, trace gravel with roots and limestone fragments (alluvium).	2.0		I	1A 1B	SS	3-4-4	9	50	2.0
921.5	Dark brown moist medium stiff sandy LEAN CLAY with oxide stains, silt pockets, shale fragments and limestone fragments (alluvium) (CL).	4.5		I	2	SS	19-12-5	9	50	0.5
918.5	Interbedded brown moist extremely weak highly weathered SHALE and gray medium strong to very strong LIMESTONE (bedrock).	7.5	5	I	3	SS	50/2"	2	100	
916.3	Interbedded gray moist extremely weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock).	9.7	10							
909.0	Interbedded light gray and dark gray mediuim strong to very strong LIMESTONE with thin shale partings. Limestone comprises 67 percent of the interval and is in beds ranging from 0.5 to 4 inches thick. (Tanglewood Limestone Formation)	17.0	15	I	4	RC	RQD = 90%	84	96	
	Split spoon refusal at 5.2 feet and bottom of test boring at 17.0 feet.		20							
			25							
			30							

Datum: NAVD 88
Surface Elevation: 926.0 ft.
Date Started: 11/12/2021
Date Completed: 11/12/2021

Hammer Weight: 140 lb.
Hammer Drop: 30 in.
Pipe Size: 2 in. O.D.

Hole Diameter: 8 in.
Rock Core Diameter: 1.875 in.
Boring Method: HSA-3.25

Drill Rig: B-57 Truck Rig D-5
Foreman: L. Kemmeter
Engineer: Michelle E. Casto

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: None
At Completion: Dry
After: --
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY

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LOG OF TEST BORING

CLIENT: PRIME AE Group
PROJECT: LFUCG Merrick and West Hickman - Phase II
Lexington, Kentucky
LOCATION OF BORING: As staked and shown on the Geotechnical Exhibit

BORING #: B-121
PROJECT #: J038336.03
PAGE #: 1 of 1

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)	HP (tsf)
925.8	Ground Surface	0.0							
925.3	TOPSOIL (6 inches)	0.5	I	1A	SS	21-15-8	14	78	2.0
923.1	Dark brown moist medium stiff to stiff LEAN CLAY, trace topsoil with oxide stains and limestone floaters (fill).	2.7		1B					
	Interbedded brown moist extremely weak highly weathered SHALE and gray medium strong to very strong LIMESTONE (bedrock).		I	2A 2B	SS	3-4-26	4	22	1.0
919.7		6.1	I	3	SS	50/2"	2	100	
918.9	Interbedded gray moist extremely weak unweathered SHALE and gray medium strong to very strong LIMESTONE (bedrock).	6.9							
	Interbedded gray medium strong to very strong LIMESTONE and gray moist extremely weak unweathered SHALE with thin, partially wavy shale partings. Limestone comprises 83 percent of interval and is in beds ranging from 0.5 to 11 inches thick. (Tanglewood Limestone Formation)		I	4	RC	RQD = 85%	120	99	
908.8		17.0							
	Split spoon refusal at 5.2 feet and bottom of test boring at 17.0 feet.								

Depth Scale (feet): 0, 5, 10, 15, 20, 25, 30

Datum: NAVD 88
Surface Elevation: 925.8 ft.
Date Started: 11/13/2021
Date Completed: 11/13/2021
Hammer Weight: 140 lb.
Hammer Drop: 30 in.
Pipe Size: 2 in. O.D.
Hole Diameter: 8 in.
Rock Core Diameter: 1.875 in.
Boring Method: HSA-3.25
Drill Rig: B-57 Truck Rig D-5
Foreman: L. Kemmeter
Engineer: Michelle E. Casto

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
SS = Split-Spoon Sample
ST = Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: None
At Completion: Dry
After: --
Backfilled: Immediately

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

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SOIL CLASSIFICATION SHEET

NON COHESIVE SOILS
(Silt, Sand, Gravel and Combinations)

Density

Very Loose	- 4 blows/ft. or less
Loose	- 5 to 10 blows/ft.
Medium Dense	- 11 to 30 blows/ft.
Dense	- 31 to 50 blows/ft.
Very Dense	- 51 blows/ft. or more

Relative Properties

Descriptive Term	Percent
Trace	1 – 10
Little	11 – 20
Some	21 – 35
And	36 – 50

Particle Size Identification

Boulders	- 8 inch diameter or more	
Cobbles	- 3 to 8 inch diameter	
Gravel	- Coarse	- 3/4 to 3 inches
	- Fine	- 3/16 to 3/4 inches
Sand	- Coarse	- 2mm to 5mm (dia. of pencil lead)
	- Medium	- 0.45mm to 2mm (dia. of broom straw)
	- Fine	- 0.075mm to 0.45mm (dia. of human hair)
Silt		- 0.005mm to 0.075mm (Cannot see particles)

COHESIVE SOILS
(Clay, Silt and Combinations)

Consistency	Field Identification	Unconfined Compressive Strength (tons/sq. ft.)
Very Soft	Easily penetrated several inches by fist	Less than 0.25
Soft	Easily penetrated several inches by thumb	0.25 – 0.5
Medium Stiff	Can be penetrated several inches by thumb with moderate effort	0.5 – 1.0
Stiff	Readily indented by thumb but penetrated only with great effort	1.0 – 2.0
Very Stiff	Readily indented by thumbnail	2.0 – 4.0
Hard	Indented with difficulty by thumbnail	Over 4.0

Classification on logs are made by visual inspection.

Standard Penetration Test – Driving a 2.0" O.D., 1 3/8" I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6 inches of penetration on the drill log (Example – 6/8/9). The standard penetration test results can be obtained by adding the last two figures (i.e. 8+9=17 blows/ft.). Refusal is defined as greater than 50 blows for 6 inches or less penetration.

Strata Changes – In the column "Soil Descriptions" on the drill log, the horizontal lines represent strata changes. A solid line (————) represents an actually observed change; a dashed line (— — — —) represents an estimated change.

Groundwater observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water levels indicated on the logs.

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ROCK CLASSIFICATION SHEET

ROCK WEATHERING

Descriptions	Field Identification
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than it its fresh condition.
Highly Weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Residual Soil	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact with bedding planes visible, and the soil has not been significantly transported.

ROCK STRENGTH

Descriptions	Field Identification	Uniaxial Compressive Strength (psi)
Extremely Weak	Indented by thumbnail	40-150
Very Weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife.	150-700
Weak	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer.	700-4,000
Medium Strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single blow of a geological hammer.	4,000-7,000
Strong	Specimen requires more than one blow of a geological hammer to fracture.	7,000-15,000
Very Strong	Specimen requires many blows with a geological hammer to fracture.	15,000-36,000
Extremely Strong	Specimen can only be chipped with geological hammer.	>36,000

BEDDING

Descriptive Term	Bed Thickness
Massive	> 4 ft.
Thick	2 to 4 ft.
Medium	2 in. to 2 ft.
Thin	< 2 in.

APPENDIX C – LABORATORY TEST DATA

Tabulation of Laboratory Tests

Particle-Size Analysis Test Forms

Rock Uniaxial Compressive Strength Test Forms

Slake Durability Index Test Forms

Mohs Hardness Test Form

Abrasiveness of Rock Using the Cerchar Method Test Forms

Splitting Tensile Strength of Intact Rock Core Test Forms

Punch Penetration Index Test Forms

Axial Point Load Strength Index of Rock Test Forms

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GEOTECHNICAL EXPLORATION
LFUCG MERRICK WEST
HICKMAN TRUNK SEWERS
PHASE II
LEXINGTON, KENTUCKY
J038336.03

TABULATION OF LABORATORY TESTS

Boring No.	Sample No.	Depth (ft.) From	Depth (ft.) To	Moisture Content (%)	Dry Unit Weight (pcf)	Atterberg Limits (%) LL	PL	PI	Gradation Analysis (%) Gravel	Sand	Silt	Clay	USCS Classification	Uniaxial Compressive Strength (psi)	Cerchar Abrasiveness Index (CAI)	Splitting Tensile Strength (psi)	Moh's Hardness	Corrected Axial Point Load Index, $I_{s(50)}$ (psi)	Punch Pentration Peak Slope Index (kips/in)	Slake Durability Index
B-46	1B	2.6	4.0	28.1																
B-46	2	5.0	6.5	21.6																
B-46	3A	7.5	8.3	22.4		49	25	24					CL							
B-46	4	9.0	9.3	11.0																
B-46	RC-5A	9.9	10.1														4.0			
B-46	RC-5B	15.0	15.2																44.8	
B-46	RC-6A	15.8	16.0															694		
B-46	RC-6B	17.7	18.1												1.4					
B-46	RC-6C	18.8	19.1																	71.99
B-46	RC-6D	22.9	23.0													1,380				
B-46	RC-6E	23.0	23.3	2.0	161.7									2,860						
B-48	1	2.5	4.0						14.8	58.0	27.2		SM							
B-48	2B	6.0	6.5	27.8		42	23	19					CL							
B-48	3	7.5	9.0	26.1																
B-48	4B	11.3	11.5	7.3																
B-60	1B	0.2	1.5	33.9																
B-60	2	2.5	4.0	22.8																
B-60	3	5.0	6.5	24.2		44	23	21	0.8	12.9	43.0	43.3	CL							
B-60	4A	7.5	8.3	23.7																
B-60	4B	8.3	9.0	23.8																
B-60	5	10.0	11.5	23.9																
B-60	6	12.5	14.0	26.2		43	21	22	2.3	23.9	35.9	37.9	CL							
B-60	RC-8A	15.4	15.6														3.5			
B-60	RC-8B	18.2	18.5													357				
B-60	RC-8C	21.5	21.7																77.5	
B-60	RC-8D	21.9	22.1															335		
B-60	RC-8E	22.4	22.7												1.3					
B-60	RC-8F	23.1	23.5																	96.24
B-60	RC-9A	26.3	26.8	0.2	166.7									5,480						
B-61	1B	0.4	1.5	27.8		64	29	35	8.1	20.2	18.4	53.3	CH							
B-61	2	2.5	3.3	30.1		53	27	26					CH							
B-65	RC-7A	15.3	15.6													956				
B-65	RC-7B	17.0	17.3															726		
B-65	RC-7C	19.4	19.6														4.5			
B-65	RC-7D	19.6	19.9												1.5					
B-65	RC-7E	21.4	21.8																54.4	
B-65	RC-7F	23.4	23.9																	96.62
B-65	RC-7G	22.7	23.3	0.2	168.5									7,360						
B-67	2	2.5	4.0	21.4																
B-67	3	5.0	6.5	22.9		42	25	17	16.6	17.9	36.7	28.8	CL							
B-67	5	10.0	10.9	23.4																

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GEOTECHNICAL EXPLORATION
LFUCG MERRICK WEST
HICKMAN TRUNK SEWERS
PHASE II
LEXINGTON, KENTUCKY
J038336.03

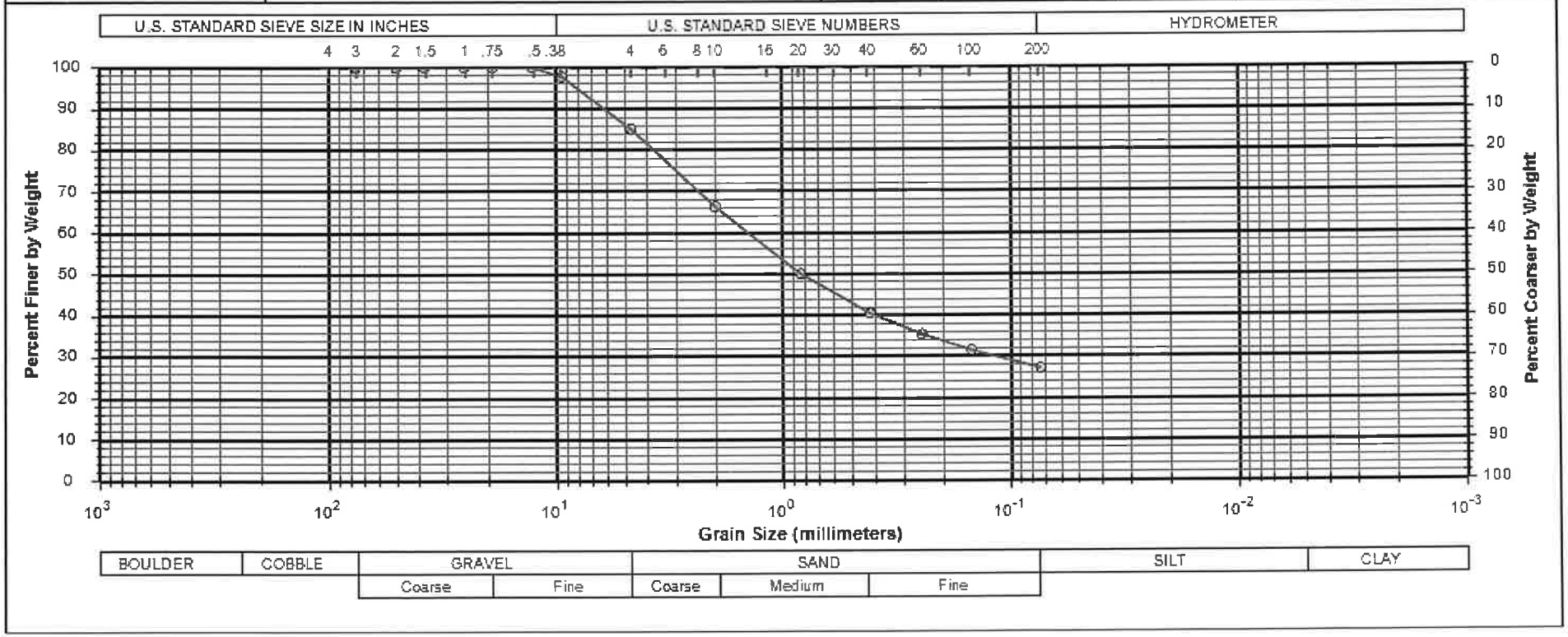
TABULATION OF LABORATORY TESTS

Boring No.	Sample No.	Depth (ft.) From	Depth (ft.) To	Moisture Content (%)	Dry Unit Weight (pcf)	Atterberg Limits (%) LL	PL	PI	Gradation Analysis (%) Gravel	Sand	Silt	Clay	USCS Classification	Uniaxial Compressive Strength (psi)	Cerchar Abrasiveness Index (CAI)	Splitting Tensile Strength (psi)	Moh's Hardness	Corrected Axial Point Load Index, $I_{s(50)}$ (psi)	Punch Pentration Peak Slope Index (kips/in)	Slake Durability Index
B-67	RC-9A	21.8	22.2																	98.67
B-67	RC-9B	23.8	24.1																26.2	
B-67	RC-9C	25.4	25.6														5.0			
B-67	RC-10A	31.0	31.2															735		
B-67	RC-10B	33.0	33.0												1.3					
B-67	RC-10C	37.2	27.8	0.2	169.1									1,620						
B-67	RC-10D	39.0	39.3													1,040				
B-119	1B	0.3	1.5	20.7																
B-119	2	2.5	4.0	27.9		37	23	14	9.7	24.7	40.4	25.2	CL							
B-121	RC-4A	7.8	8.4	0.7	163.7									9,750						
B-121	RC-4B	10.7	11.0																	99.04
B-121	RC-4C	11.0	11.1														4.0			
B-121	RC-4D	12.8	13.1																33.7	
B-121	RC-4E	14.0	14.4												1.3					
B-121	RC-4F	14.7	15.1													535				
B-121	RC-4G	15.9	16.1															753		

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PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	PRIME AE Group							**Project No.:**	J038336.03
Project:	Geotechnical Exploration, LFUCG Merrick and West Hickman - Phase II, Lexington, KY							**Date:**	12/03/2021
Boring No.:	B-48	**Sample No.:**	SS-1	**Depth (ft.):**	2.5	**Gravel (%)**	**Sand (%)**	**Silt & Clay (%)**	**USCS**
Sample Description:	Brown moist loose clayey SAND, little gravel (fill).					14.8	58.0	27.2	SM
						LL	**PL**	**PI** / **Group Index**	**WC (%)**

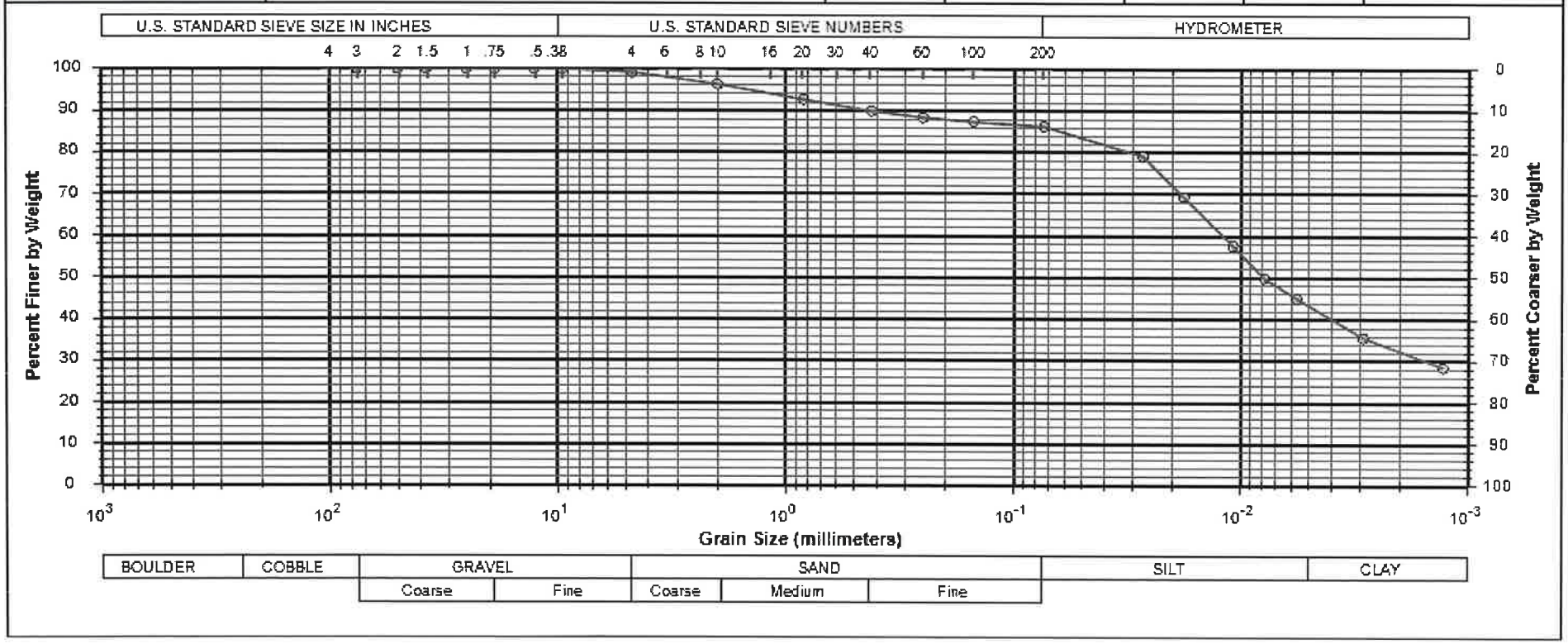


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PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	PRIME AE Group								**Project No.:**	J038336.03
Project:	Geotechnical Exploration, LFUCG Merrick and West Hickman - Phase II, Lexington, KY								**Date:**	12/08/2021
Boring No.:	B-60	**Sample No.:**	SS-3	**Depth (ft.):**	5.0	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Brown moist stiff to very stiff LEAN CLAY, little sand, trace gravel and topsoil (fill).					0.8	12.9	43.0	43.3	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						44	23	21		24.2

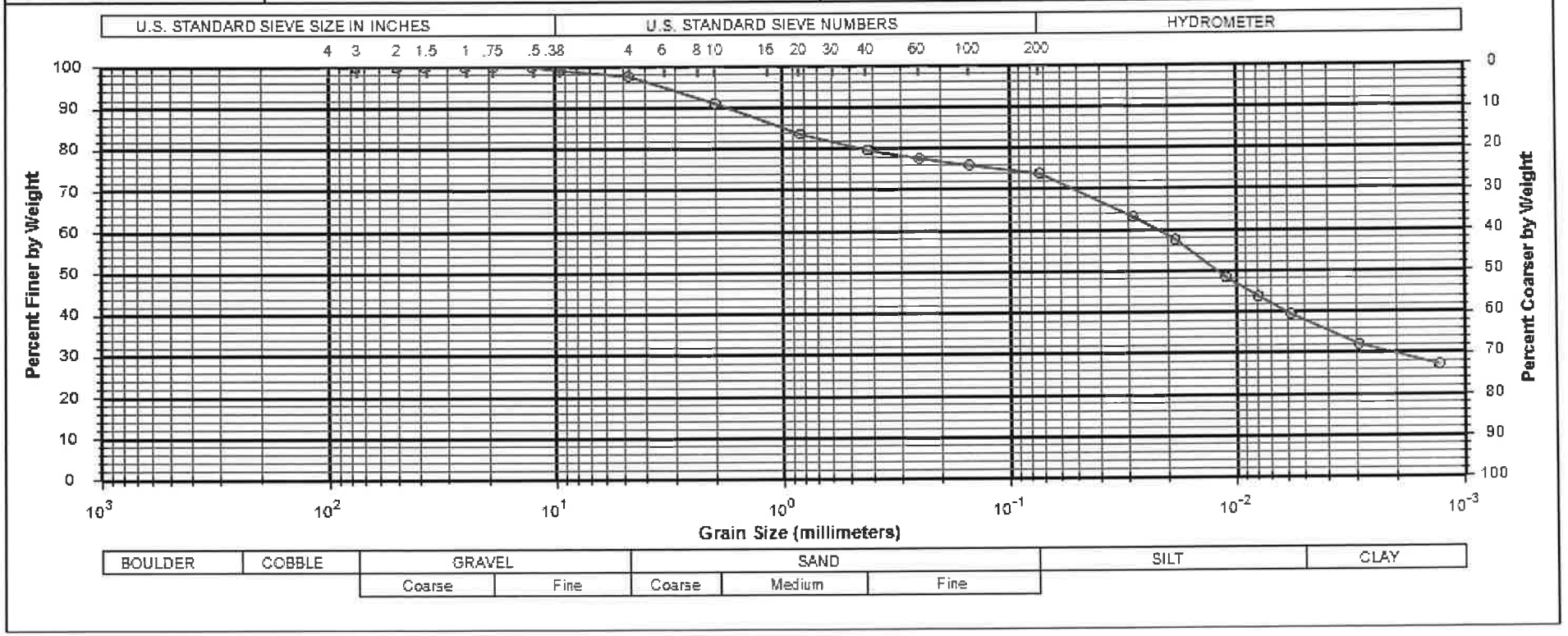


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PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	PRIME AE Group								**Project No.:**	J038336.03
Project:	Geotechnical Exploration, LFUCG Merrick and West Hickman - Phase II, Lexington, KY								**Date:**	12/08/2021
Boring No.:	B-60	**Sample No.:**	SS-6	**Depth (ft.):**	12.5	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Brown and gray moist medium stiff to stiff sandy LEAN CLAY, trace gravel with oxide concretions (alluvium).					2.3	23.9	35.9	37.9	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						43	21	22		26.2

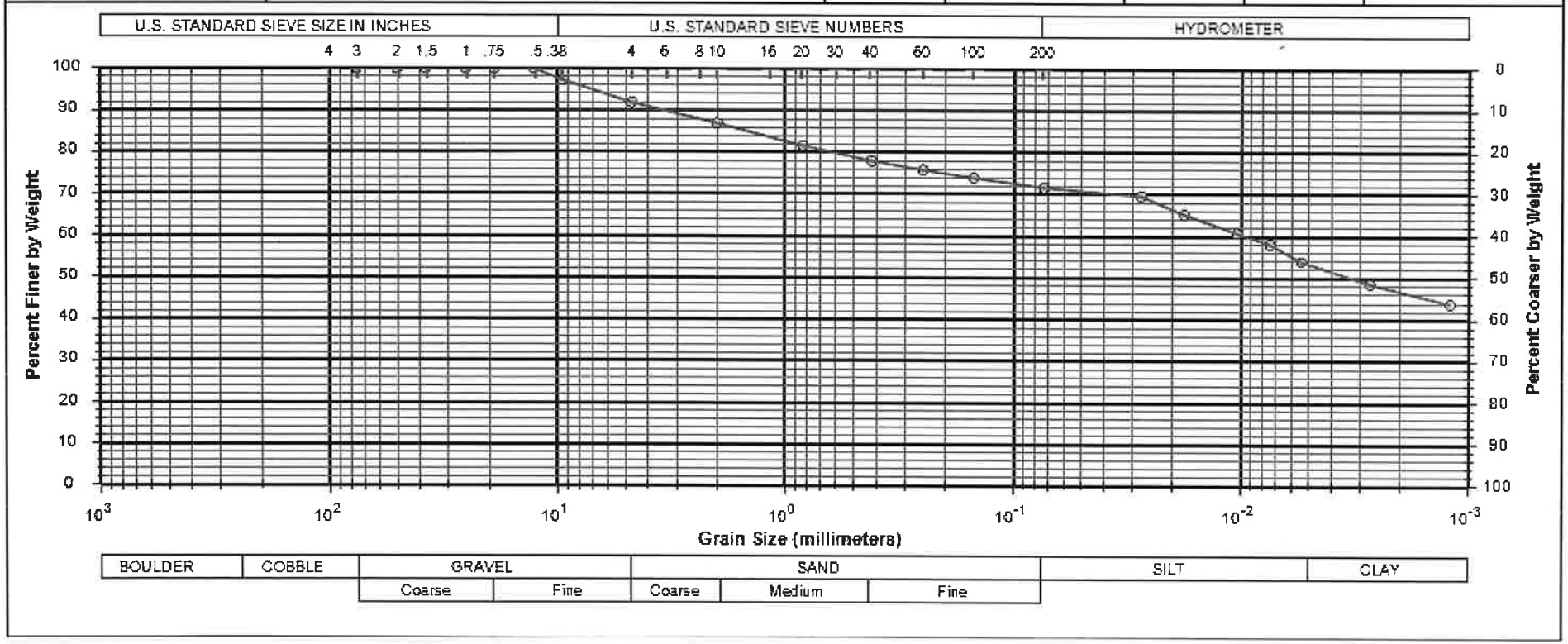


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PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	PRIME AE Group								**Project No.:**	J038336.03
Project:	Geotechnical Exploration, LFUCG Merrick and West Hickman - Phase II, Lexington, KY								**Date:**	12/08/2021
Boring No.:	B-61	**Sample No.:**	SS-1B	**Depth (ft.):**	0.4	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Brown moist stiff sandy FAT CLAY, trace gravel and topsoil with oxide stains, trace roots with limestone fragments and floaters (fill).					8.1	20.2	18.4	53.3	CH
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						64	29	35		27.8

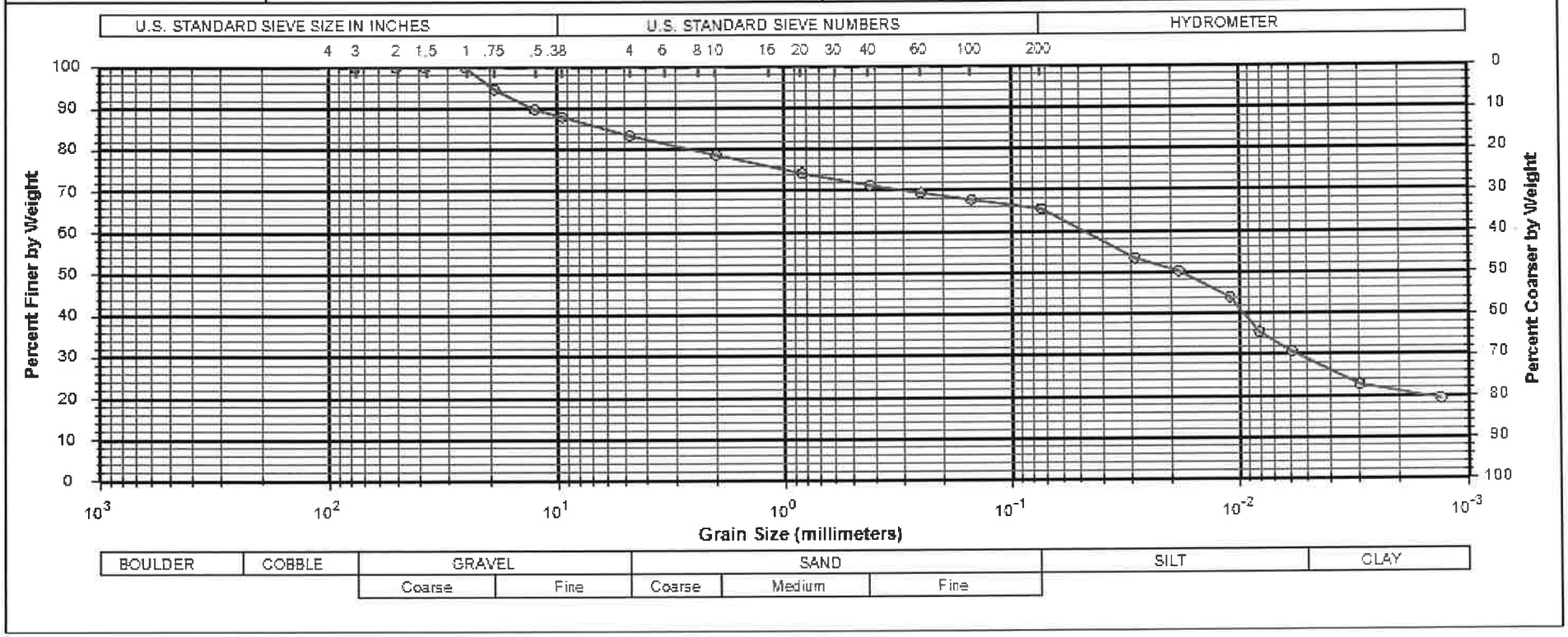


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PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	PRIME AE Group								**Project No.:**	J038336.03
Project:	Geotechnical Exploration, LFUCG Merrick and West Hickman - Phase II, Lexington, KY								**Date:**	12/08/2021
Boring No.:	B-67	**Sample No.:**	SS-3	**Depth (ft.):**	5.0	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Dark brown moist stiff LEAN CLAY with oxide stains, shale fragments and limestone floaters (fill).					16.6	17.9	36.7	28.8	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						42	25	17		22.9

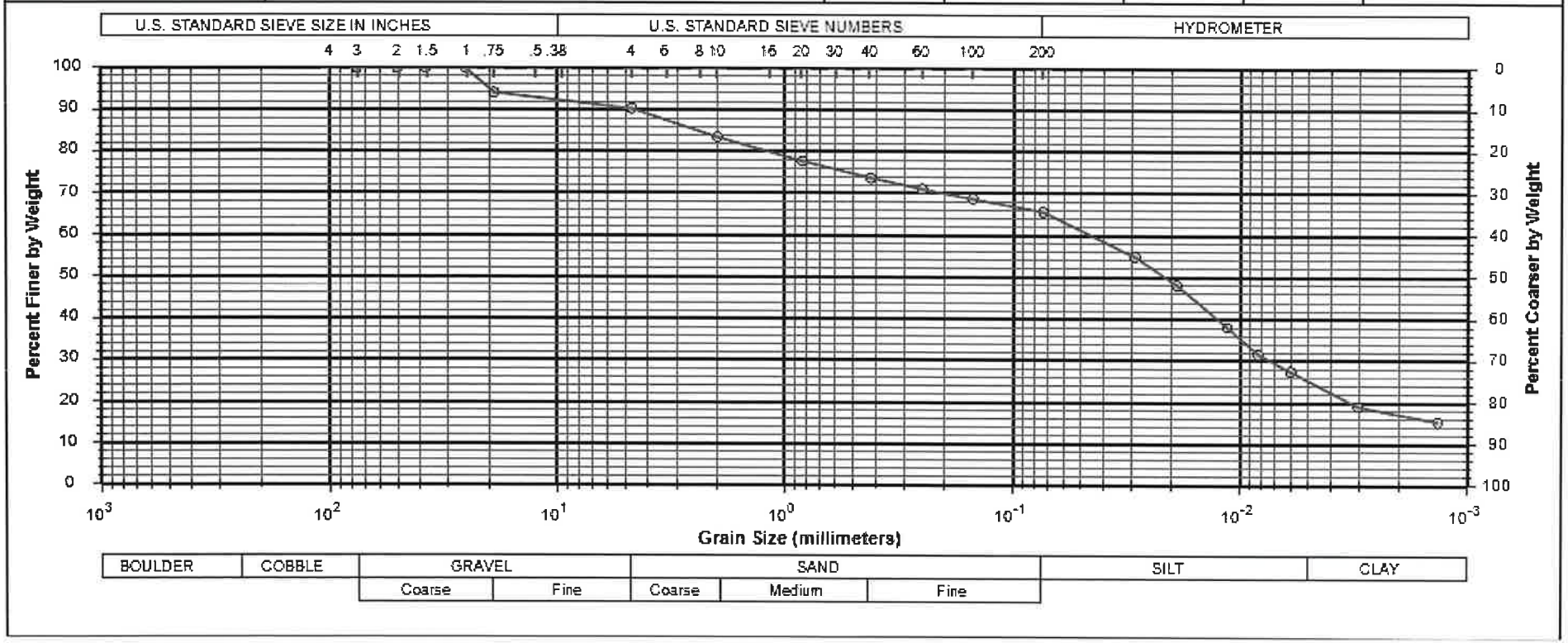


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PARTICLE-SIZE ANALYSIS OF SOILS ASTM D-422

Client:	PRIME AE Group								**Project No.:**	J038336.03
Project:	Geotechnical Exploration, LFUCG Merrick and West Hickman - Phase II, Lexington, KY								**Date:**	12/08/2021
Boring No.:	B-119	**Sample No.:**	SS-2	**Depth (ft.):**	2.5	**Gravel (%)**	**Sand (%)**	**Silt (%)**	**Clay (%)**	**USCS**
Sample Description:	Dark brown moist medium stiff sandy LEAN CLAY with oxide stains, silt pockets, shale fragments and limestone fragments (sediment).					9.7	24.7	40.4	25.2	CL
						LL	**PL**	**PI**	**Group Index**	**WC (%)**
						37	23	14		27.9



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UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

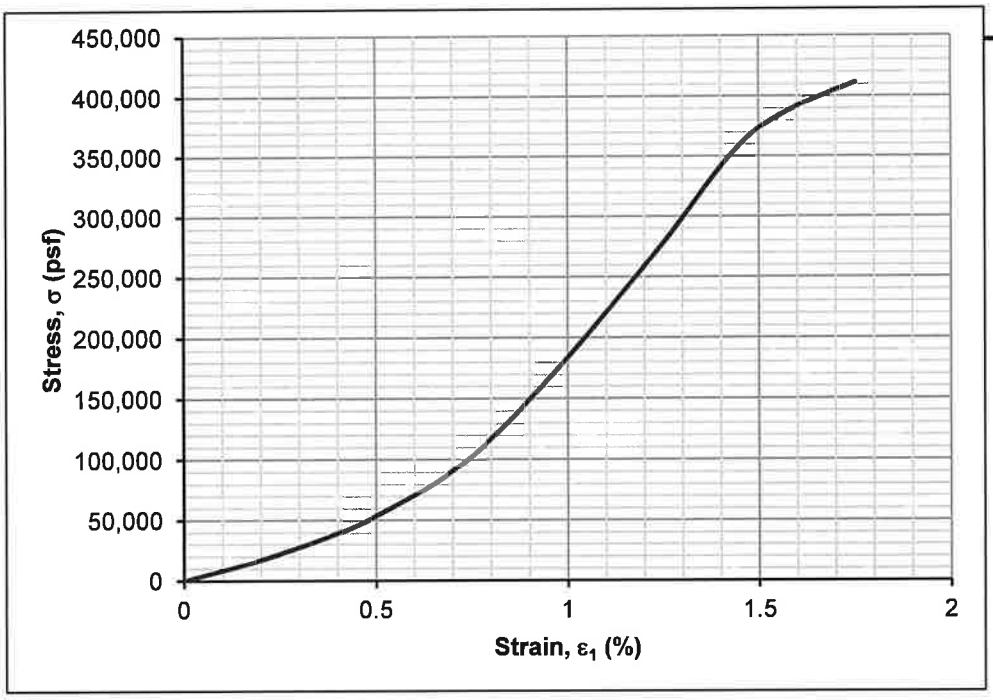
DATE: 12/7/2021

CLIENT : PRIME AE Group
PROJECT NO.: J038336.03
PROJECT: LFUCG Merrick and West Hickman - Phase II
LOCATION: Lexington, KY

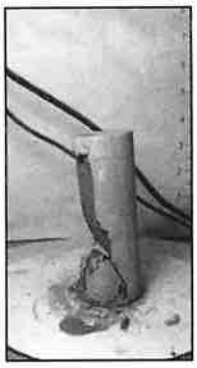
BORING NO.: B-46 SAMPLE NO.: RC-6E DEPTH (ft.): 23.0-23.4
SAMPLE DESCRIPTION: Gray moist weak unweathered SHALE (bedrock).
BEDROCK FORMATION: Clays Ferry Formation
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: 10-k Load Frame with Load Cell No. 1008

SAMPLE DATA	
DIAMETER (in.):	1.86
HEIGHT (in.):	4.06
HEIGHT TO DIAMETER RATIO:	2.2
WET UNIT WEIGHT (pcf):	164.9
DRY UNIT WEIGHT (pcf):	161.7
MOISTURE CONTENT (%):	2.0

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**1.3**
TIME TO FAILURE (min.):	**1.3**
AXIAL STRAIN AT FAILURE (%):	**1.8**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**412.0**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**2,860.0**



FAILURE SHAPES


FRONT VIEW


SIDE VIEW

REMARKS :

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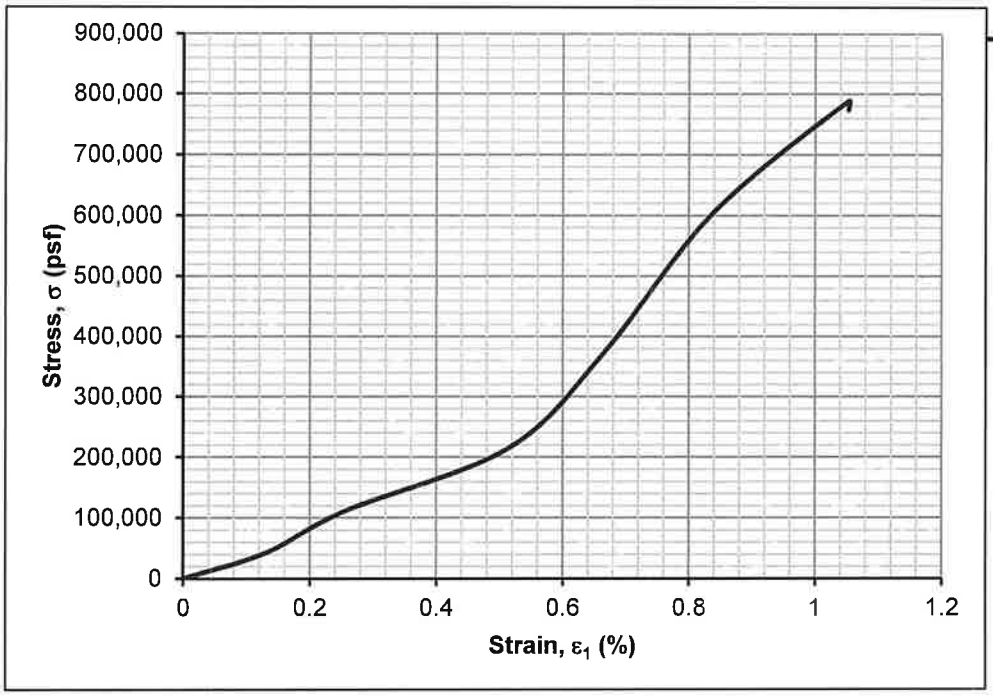
UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

CLIENT : PRIME AE Group
DATE: 11/18/2021
PROJECT NO.: J038336.03
PROJECT: LFUCG Merrick and West Hickman - Phase II
LOCATION: Lexington, Kentucky

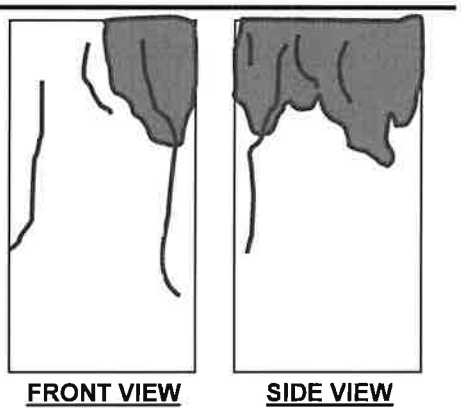
BORING NO.: B-60 SAMPLE NO.: RC-9A DEPTH (ft.): 26.3-26.8
SAMPLE DESCRIPTION: Gray medium strong LIMESTONE with thin shale partings (bedrock).
BEDROCK FORMATION: Clays Ferry Formation
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.86
HEIGHT (in.):	4.66
HEIGHT TO DIAMETER RATIO:	2.5
WET UNIT WEIGHT (pcf):	167.1
DRY UNIT WEIGHT (pcf):	166.7
MOISTURE CONTENT (%):	0.2

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**0.6**
TIME TO FAILURE (min.):	**1.7**
AXIAL STRAIN AT FAILURE (%):	**1.1**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**789.0**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**5,480.0**



FAILURE SHAPES



REMARKS :

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UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

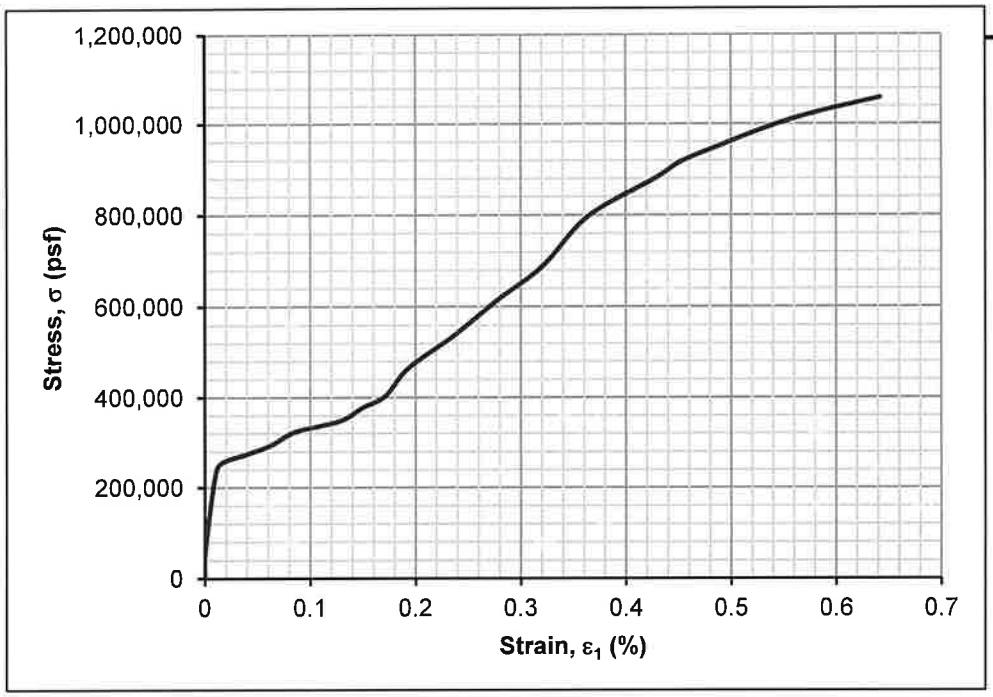
DATE: 11/18/2021

CLIENT : PRIME AE Group
PROJECT NO.: J038336.03
PROJECT: LFUCG Merrick and West Hickman - Phase II
LOCATION: Lexington, Kentucky

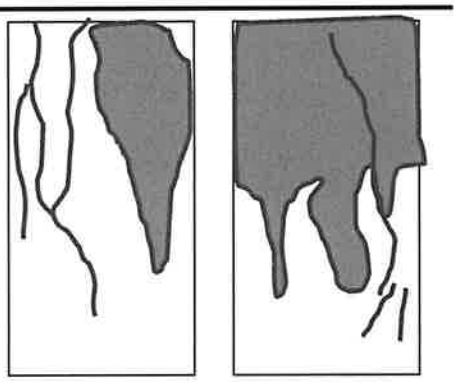
BORING NO.: B-65 SAMPLE NO.: RC-7G DEPTH (ft.): 22.7-23.3
SAMPLE DESCRIPTION: Gray strong LIMESTONE marled with shale (bedrock).
BEDROCK FORMATION: Clays Ferry Formation
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.85
HEIGHT (in.):	4.67
HEIGHT TO DIAMETER RATIO:	2.5
WET UNIT WEIGHT (pcf):	168.8
DRY UNIT WEIGHT (pcf):	168.5
MOISTURE CONTENT (%):	0.2

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**0.1**
TIME TO FAILURE (min.):	**9.0**
AXIAL STRAIN AT FAILURE (%):	**0.6**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**1,060.0**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**7,360.0**



FAILURE SHAPES



FRONT VIEW SIDE VIEW

REMARKS :

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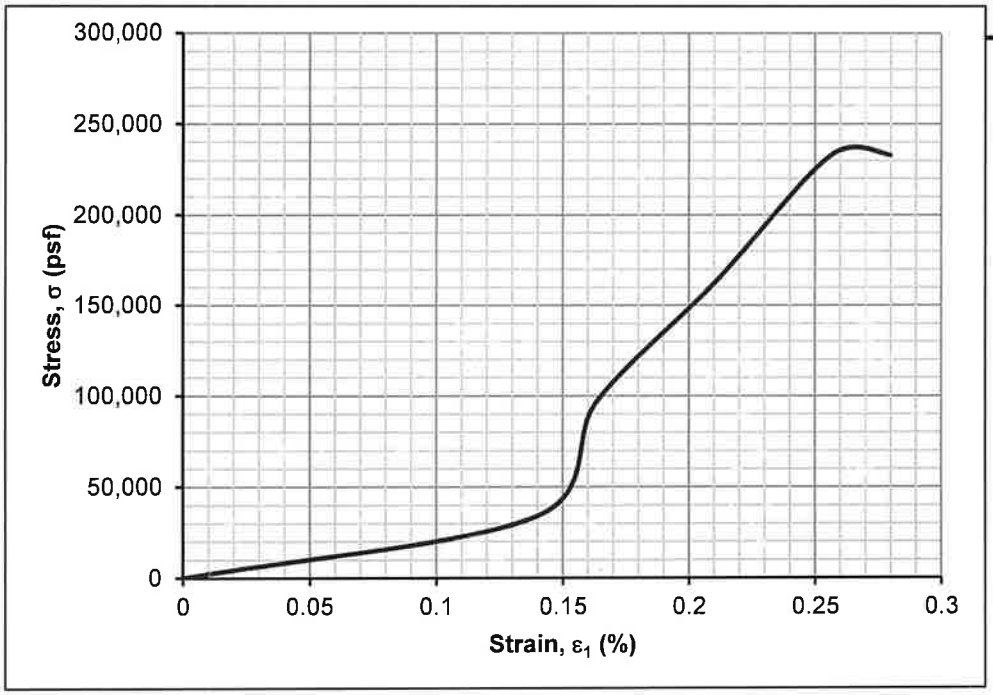
UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

CLIENT : PRIME AE Group
DATE: 11/18/2021
PROJECT NO.: J038336.03
PROJECT: LFUCG Merrick and West Hickman - Phase II
LOCATION: Lexington, Kentucky

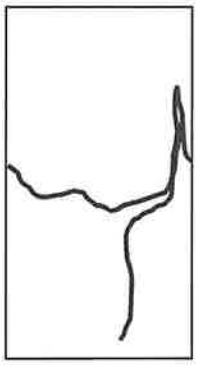
BORING NO.: B-67 SAMPLE NO.: RC-10C DEPTH (ft.): 37.2-37.8
SAMPLE DESCRIPTION: Gray weak LIMESTONE with thin shale partings (bedrock).
BEDROCK FORMATION: Lower part of Lexington Limestone Formation
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.86
HEIGHT (in.):	4.29
HEIGHT TO DIAMETER RATIO:	2.3
WET UNIT WEIGHT (pcf):	169.4
DRY UNIT WEIGHT (pcf):	169.1
MOISTURE CONTENT (%):	0.2

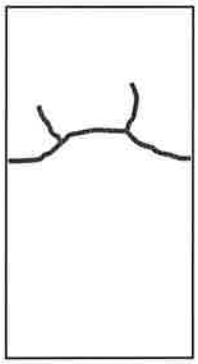
FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**0.2**
TIME TO FAILURE (min.):	**1.1**
AXIAL STRAIN AT FAILURE (%):	**0.3**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**233.0**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**1,620.0**



FAILURE SHAPES



FRONT VIEW



SIDE VIEW

REMARKS : Fast break along shale seam.

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UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012 - METHOD C

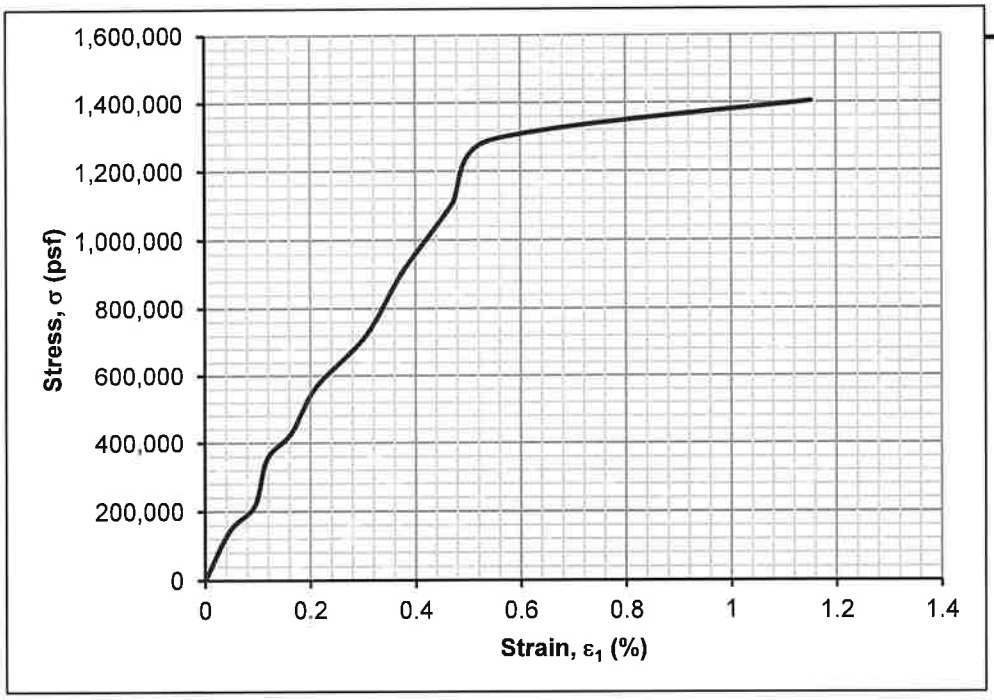
DATE: 11/18/2021

CLIENT : PRIME AE Group
PROJECT NO.: J038336.03
PROJECT: LFUCG Merrick and West Hickman - Phase II
LOCATION: Lexington, Kentucky

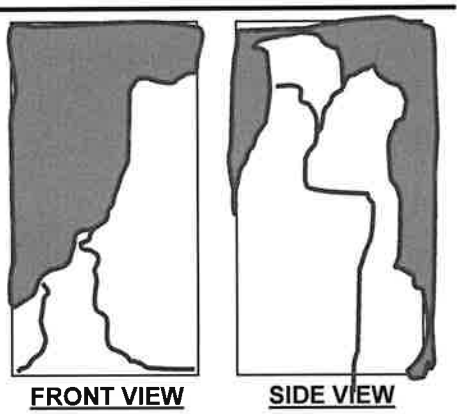
BORING NO.: B-121 SAMPLE NO.: RC-4A DEPTH (ft.): 7.8-8.4
SAMPLE DESCRIPTION: Gray strong LIMESTONE marled with shale (bedrock).
BEDROCK FORMATION: Tanglewood Limestone Formation
LOAD DIRECTION: 90° to Lithology TEST TEMPERATURE (°F):
COMPRESSION APPARATUS.: Forney QC-200-08

SAMPLE DATA	
DIAMETER (in.):	1.87
HEIGHT (in.):	4.25
HEIGHT TO DIAMETER RATIO:	2.3
WET UNIT WEIGHT (pcf):	164.8
DRY UNIT WEIGHT (pcf):	163.7
MOISTURE CONTENT (%):	0.7

FAILURE DATA	
AVERAGE RATE OF AXIAL STRAIN TO FAILURE (%/min.):	**0.5**
TIME TO FAILURE (min.):	**2.5**
AXIAL STRAIN AT FAILURE (%):	**1.2**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (ksf):	**1,400.0**
UNIAXIAL COMPRESSIVE STRENGTH, q_u (psi):	**9,750.0**



FAILURE SHAPES



REMARKS :

GEOTECHNOLOGY
A Universal Engineering Sciences Company

SLAKE DURABILITY OF SHALES AND SIMILAR WEAK ROCKS
ASTM D-4644

Client:	PRIME AE Group	**Report Date:**	12/10/2021
Project No.:	J038336.03		
Project:	LFUCG Merrick and West Hickman - Phase II		
Location:	Lexington, KY		

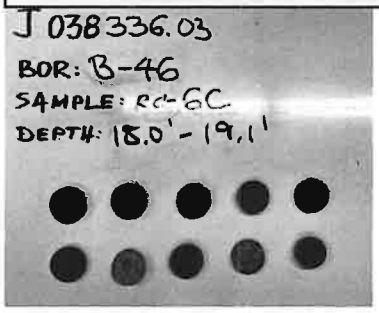
Boring No.:	B-46
Sample No.:	RC-6C
Depth:	18.0-19.1
Description:	Gray moist weak unweathered SHALE (bedrock).

Water Content	Wet S & T (g)	Dry S & T (g)	Tare Wt. (g)	W.C. (%)	Dry Sample Wt. (g)
	932.64	922.53	432.64	2.06	489.89

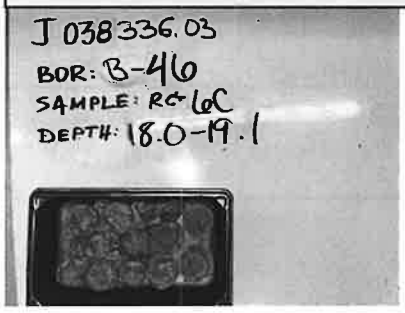
Durability Test	Cycle Nbr	Temperature (°F) (Beginning/End)	Dry Sample + Tare Wt. (g)	Tare WT (g)	Dry Sample Wt. (g)
		70.5 / 70.3	866.51	432.64	433.87
		68.2 / 68.5	785.32	432.64	352.68

Slake Durability Index:	**71.99**
Fragment Type/Description:	2, Retained materials consist of large and small pieces.
Jar Slake Test Category/Description (KM 64-514-08):	-,

Sample Before Test Image



Sample After Test Image



NOTES: Water content was determined by ASTM D2216; Specimens were dried to a constant mass in an oven at 110±5 °C.

Technician: Iva

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SLAKE DURABILITY OF SHALES AND SIMILAR WEAK ROCKS
ASTM D-4644

Client:	PRIME AE Group	**Report Date:**	12/10/2021
Project No.:	J038336.03		
Project:	LFUCG Merrick and West Hickman - Phase II		
Location:	Lexington, KY		

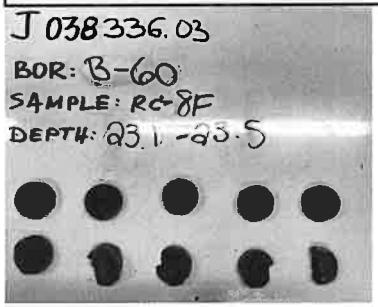
Boring No.:	B-60
Sample No.:	RC-8F
Depth:	23.1-23.5
Description:	Gray medium strong LIMESTONE with thin shale partings (bedrock).

Water Content	Wet S & T (g)	Dry S & T (g)	Tare Wt. (g)	W.C. (%)	Dry Sample Wt. (g)
	926.28	920.69	425.22	1.13	495.47

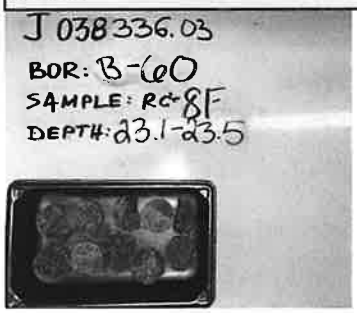
Durability Test	Cycle Nbr	Temperature (°F) (Beginning/End)	Dry Sample + Tare Wt. (g)	Tare WT (g)	Dry Sample Wt. (g)
	1	68.4 / 68.5	910.28	425.22	485.06
	2	67.8 / 67.8	902.06	425.22	476.84

Slake Durability Index:	**96.24**
Fragment Type/Description:	1, Retained pieces remain virtually unchanged.
Jar Slake Test Category/Description (KM 64-514-08):	-,

Sample Before Test Image



Sample After Test Image



NOTES: Water content was determined by ASTM D2216; Specimens were dried to a constant mass in an oven at 110±5 °C.

Technician:

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SLAKE DURABILITY OF SHALES AND SIMILAR WEAK ROCKS
ASTM D-4644

Client:	PRIME AE Group	**Report Date:**	12/10/2021
Project No.:	J038336.03		
Project:	LFUCG Merrick and West Hickman - Phase II		
Location:	Lexington, KY		

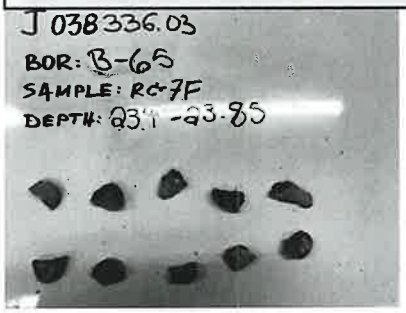
Boring No.:	B-65
Sample No.:	RC-7F
Depth:	23.4-23.85
Description:	Gray strong LIMESTONE marled with shale (bedrock).

	Wet S & T (g)	Dry S & T (g)	Tare Wt. (g)	W.C. (%)	Dry Sample Wt. (g)
Water Content	909.60	907.93	395.89	0.33	512.04

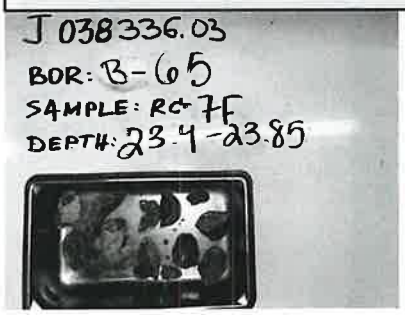
	Cycle Nbr	Temperature (°F) (Beginning/End)	Dry Sample + Tare Wt. (g)	Tare WT (g)	Dry Sample Wt. (g)
Durability Test	1	68.5 / 69.3	895.74	395.89	499.85
	2	67.5 / 67.3	890.60	395.89	494.71

Slake Durability Index:	**96.62**
Fragment Type/Description:	1, Retained pieces rema n virtually unchanged.
Jar Slake Test Category/Description (KM 64-514-08):	-,

Sample Before Test Image



Sample After Test Image



NOTES: Water content was determined by ASTM D2216; Specimens were dried to a constant mass in an oven at 110±5 °C.

Technician: Iva

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SLAKE DURABILITY OF SHALES AND SIMILAR WEAK ROCKS
ASTM D-4644

Client:	PRIME AE Group	**Report Date:**	12/10/2021
Project No.:	J038336.03		
Project:	LFUCG Merrick and West Hickman - Phase II		
Location:	Lexington, KY		

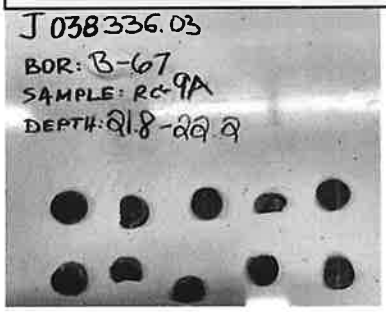
Boring No.:	B-67
Sample No.:	RC-9A
Depth:	21.8-22.2
Description:	Gray medium strong LIMESTONE with thin shale partings (bedrock).

	Wet S & T (g)	Dry S & T (g)	Tare Wt. (g)	W.C. (%)	Dry Sample Wt. (g)
Water Content	959.97	958.15	411.25	0.33	546.90

	Cycle Nbr	Temperature (°F) (Beginning/End)	Dry Sample + Tare Wt. (g)	Tare WT (g)	Dry Sample Wt. (g)
Durability Test	1	70.9 / 71.1	953.26	411.25	542.01
		68.4 / 68.0	950.88	411.25	539.63

Slake Durability Index:	**98.67**
Fragment Type/Description:	1, Retained pieces remain virtually unchanged.
Jar Slake Test Category/Description (KM 64-514-08):	-,

Sample Before Test Image



Sample After Test Image



NOTES: Water content was determined by ASTM D2216; Specimens were dried to a constant mass in an oven at 110±5 °C.

Technician: Iva

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SLAKE DURABILITY OF SHALES AND SIMILAR WEAK ROCKS
ASTM D-4644

Client:	PRIME AE Group	**Report Date:**	12/10/2021
Project No.:	J038336.03		
Project:	LFUCG Merrick and West Hickman - Phase II		
Location:	Lexington, KY		

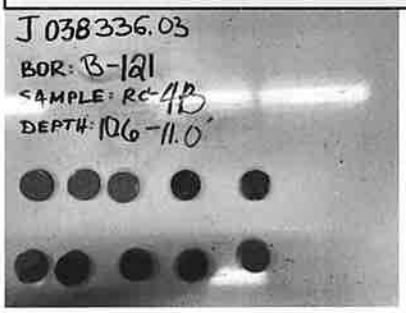
Boring No.:	B-121
Sample No.:	RC-4B
Depth:	10.6-11.0
Description:	Gray strong LIMESTONE marled with shale (bedrock).

	Wet S & T (g)	Dry S & T (g)	Tare Wt. (g)	W.C. (%)	Dry Sample Wt. (g)
Water Content	959.71	959.07	406.43	0.12	552.64

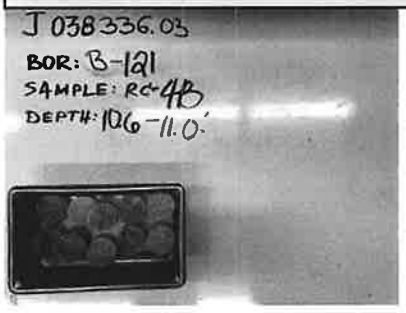
	Cycle Nbr	Temperature (°F) (Beginning/End)	Dry Sample + Tare Wt. (g)	Tare WT (g)	Dry Sample Wt. (g)
Durability Test	1	72.3 / 71.60	955.94	406.43	549.51
	2	70.0 / 68.9	953.75	406.43	547.32

Slake Durability Index:	**99.04**
Fragment Type/Description:	1, Retained pieces remain virtually unchanged.
Jar Slake Test Category/Description (KM 64-514-08):	-,

Sample Before Test Image



Sample After Test Image



NOTES: Water content was determined by ASTM D2216; Specimens were dried to a constant mass in an oven at 110±5 °C.

Technician: Iva

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GeoTesting EXPRESS

Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	---	Sample Type:	---	Tested By:	tlm
Sample ID:	---	Test Date:	12/10/21	Checked By:	smd
Depth :	---	Test Id:	645282		

Mohs Hardness Test

Boring ID	Sample ID	Depth	Scale of Hardness Number
B-46	RC-5A	9.9-10.0 ft	4
B-60	RC-8A	15.4-15.55 ft	3.5
B-65	RC-7C	19.4-19.6 ft	4.5
B-67	RC-9C	25.4-25.6 ft	5
B-121	RC-4C	11.0-11.1 ft	4

Notes: The value listed above is an estimate of the hardness of the rock sample provided using the Mohs Hardness method. This method is intended to represent the hardness of individual minerals not rock hardness

Tests performed on cut surface of rock core samples provided by client.

Mohs Table of Hardness Scale

1	Talc	6	Orthoclase
2	Gypsum	7	Quartz
3	Calcite	8	Topaz
4	Fluorite	9	Corundum
5	Apatite	10	Diamond

GeoTesting EXPRESS

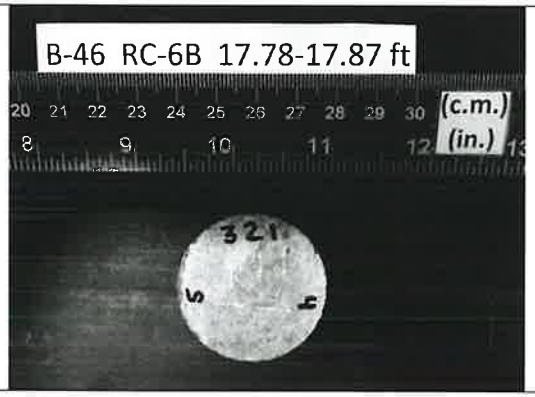
Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-46	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-6B	Test Date:	12/20/21	Checked By:	smd
Depth :	17.7-18.1 ft	Test Id:	645256		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625

Boring ID	Sample ID	Depth	Stylus No	Reading 1	Reading 2	Average	Comments
B-46	RC-6B	17.78-17.87 ft	1	1.4	1.1	1.25	
			2	0.7	0.9	0.80	
			3	0.6	0.8	0.70	
			4	1.2	1.6	1.40	
			5	0.5	0.9	0.70	
			Average CAIs			0.97	
			Average CAI *			1.44	
				CERCHAR Abrasiveness Index Classification		**Medium abrasiveness**	

Notes

Test Surface: Saw Cut
Moisture Condition: As Received
Apparatus Type: Original CERCHAR
Stylus Hardness: Rockwell Hardess 54/56 HRC
Stylus Displacement Relative to Rock Fabric:
Styli 1-3: Normal; Styli 4-5: Parallel
* CAI = (0.99 * CAIs) + 0.48
CAIs = CERCHAR index for smooth (saw cut) surface
CAI = CERCHAR index for natural surface
Comments:



GeoTesting EXPRESS

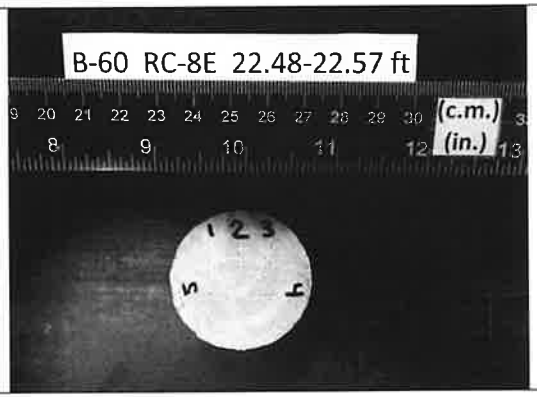
Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-60	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-8E	Test Date:	12/20/21	Checked By:	smd
Depth :	22.4-22.7 ft	Test Id:	645257		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625

Boring ID	Sample ID	Depth	Stylus No	Reading 1	Reading 2	Average	Comments
B-60	RC-8E	22.48-22.57 ft	1	0.7	0.3	0.50	
			2	1.1	1.3	1.20	
			3	1.1	0.6	0.85	
			4	1.0	1.0	1.00	
			5	0.7	0.6	0.65	
			Average CAIs			0.84	
			Average CAI *			1.31	
				CERCHAR Abrasiveness Index Classification		**Medium abrasiveness**	

Notes

Test Surface: Saw Cut
Moisture Condition: As Received
Apparatus Type: Original CERCHAR
Stylus Hardness: Rockwell Hardess 54/56 HRC
Stylus Displacement Relative to Rock Fabric:
Styli 1-3: Normal; Styli 4-5: Parallel
* CAI = (0.99 * CAIs) + 0.48
CAIs = CERCHAR index for smooth (saw cut) surface
CAI = CERCHAR index for natural surface
Comments:



GeoTesting EXPRESS

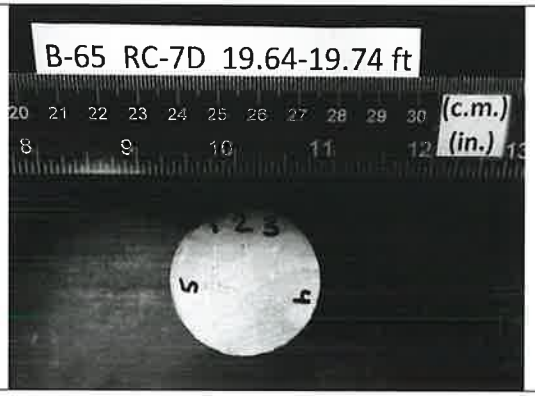
Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-65	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-7D	Test Date:	12/20/21	Checked By:	smd
Depth :	19.6-19.9 ft	Test Id:	645258		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625

Boring ID	Sample ID	Depth	Stylus No	Reading 1	Reading 2	Average	Comments
B-65	RC-7D	19.64-19.74 ft	1	1.4	1.1	1.25	
			2	1.2	1.0	1.10	
			3	1.2	1.4	1.30	
			4	1.1	0.7	0.90	
			5	0.7	0.8	0.75	
			Average CAIs			1.06	
			Average CAI *			1.53	
				CERCHAR Abrasiveness Index Classification		**Medium abrasiveness**	

Notes

Test Surface: Saw Cut
Moisture Condition: As Received
Apparatus Type: Original CERCHAR
Stylus Hardness: Rockwell Hardess 54/56 HRC
Stylus Displacement Relative to Rock Fabric:
Styli 1-3: Normal; Styli 4-5: Parallel
* CAI = (0.99 * CAIs) + 0.48
CAIs = CERCHAR index for smooth (saw cut) surface
CAI = CERCHAR index for natural surface
Comments:



GeoTesting EXPRESS

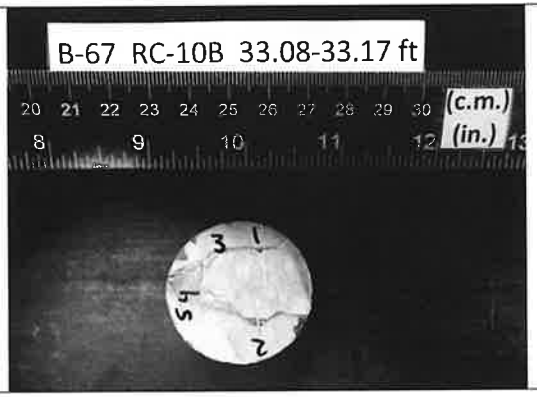
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Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-67	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-10B	Test Date:	12/20/21	Checked By:	smd
Depth :	33.0-33.3 ft	Test Id:	645259		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625

Boring ID	Sample ID	Depth	Stylus No	Reading 1	Reading 2	Average	Comments
B-67	RC-10B	33.08-33.17 ft	1	0.7	0.6	0.65	
			2	0.7	0.7	0.70	
			3	0.9	1.1	1.00	
			4	0.9	0.8	0.85	
			5	0.7	0.9	0.80	
			Average CAIs			0.8	
			Average CAI *			1.27	
				CERCHAR Abrasiveness Index Classification		**Medium abrasiveness**	

Notes

Test Surface: Saw Cut
Moisture Condition: As Received
Apparatus Type: Original CERCHAR
Stylus Hardness: Rockwell Hardess 54/56 HRC
Stylus Displacement Relative to Rock Fabric:
Styli 1-3: Normal; Styli 4-5: Parallel
* CAI = (0.99 * CAIs) + 0.48
CAIs = CERCHAR index for smooth (saw cut) surface
CAI = CERCHAR index for natural surface
Comments:



GeoTesting EXPRESS

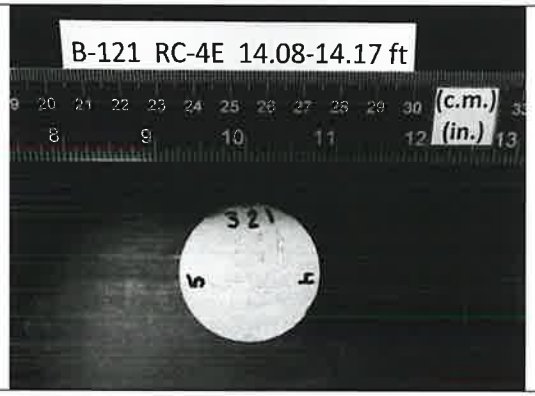
Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-121	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-4E	Test Date:	12/20/21	Checked By:	smd
Depth :	14.0-14.4 ft	Test Id:	645260		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625

Boring ID	Sample ID	Depth	Stylus No	Reading 1	Reading 2	Average	Comments
B-121	RC-4E	14.08-14.17 ft	1	1.2	1.1	1.15	
			2	0.7	0.8	0.75	
			3	0.9	0.8	0.85	
			4	0.8	0.5	0.65	
			5	1.0	0.9	0.95	
			Average CAIs			0.87	
			Average CAI *			1.34	
				CERCHAR Abrasiveness Index Classification		**Medium abrasiveness**	

Notes

Test Surface: Saw Cut
Moisture Condition: As Received
Apparatus Type: Original CERCHAR
Stylus Hardness: Rockwell Hardess 54/56 HRC
Stylus Displacement Relative to Rock Fabric:
Styli 1-3: Normal; Styli 4-5: Parallel
* CAI = (0.99 * CAIs) + 0.48
CAIs = CERCHAR index for smooth (saw cut) surface
CAI = CERCHAR index for natural surface
Comments:



GeoTesting EXPRESS

Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-46	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-6D	Test Date:	12/14/21	Checked By:	smd
Depth :	22.9-23.0 ft	Test Id:	645272		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Specimen Depth	Test No	Thickness (L), in	Diameter (D), in	Thickness to Diameter Ratio (L/D)	Failure Load (P), lbs	Splitting Tensile Strength, psi	Failure Type
22.90-23.00 ft	ST-1	1.05	1.87	0.56	4,261	1,380	1





Notes: Strain rate: 2.5%/min.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

GeoTesting EXPRESS

Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-60	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-8B	Test Date:	12/14/21	Checked By:	smd
Depth :	18.2-18.5 ft	Test Id:	645273		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Specimen Depth	Test No	Thickness (L), in	Diameter (D), in	Thickness to Diameter Ratio (L/D)	Failure Load (P), lbs	Splitting Tensile Strength, psi	Failure Type
18.23-18.32 ft	ST-2	1.02	1.87	0.54	1,063	357	1





Notes: Strain rate: 2.5%/min.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

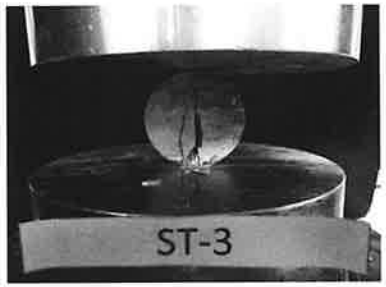
GeoTesting EXPRESS

Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-65	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-7A	Test Date:	12/14/21	Checked By:	smd
Depth :	15.3-15.6 ft	Test Id:	645274		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Specimen Depth	Test No	Thickness (L), in	Diameter (D), in	Thickness to Diameter Ratio (L/D)	Failure Load (P), lbs	Splitting Tensile Strength, psi	Failure Type
15.37-15.47 ft	ST-3	1.04	1.86	0.56	2,905	956	1





Notes: Strain rate: 2.5%/min.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

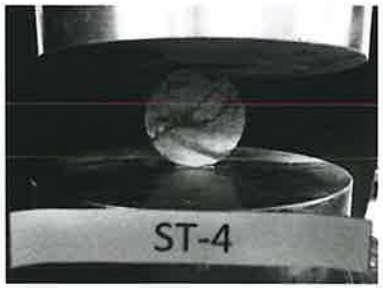
Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

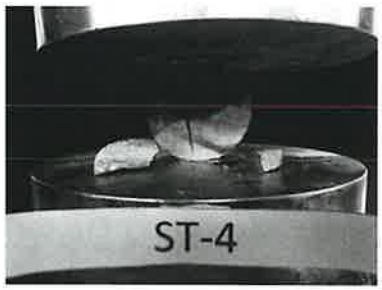
GeoTesting EXPRESS

Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-67	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-10D	Test Date:	12/14/21	Checked By:	smd
Depth :	39.0-39.3 ft	Test Id:	645277		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Specimen Depth	Test No	Thickness (L), in	Diameter (D), in	Thickness to Diameter Ratio (L/D)	Failure Load (P), lbs	Splitting Tensile Strength, psi	Failure Type
39.09-39.18 ft	ST-4	0.92	1.87	0.49	2,800	1,040	3





Notes: Strain rate: 2.5%/min.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

GeoTesting EXPRESS

Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-121	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-4F	Test Date:	12/14/21	Checked By:	smd
Depth :	14.7-15.1 ft	Test Id:	645276		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Specimen Depth	Test No	Thickness (L), in	Diameter (D), in	Thickness to Diameter Ratio (L/D)	Failure Load (P), lbs	Splitting Tensile Strength, psi	Failure Type
14.73-14.82 ft	ST-5	0.99	1.87	0.53	1,554	535	1





Notes: Strain rate: 2.5%/min.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

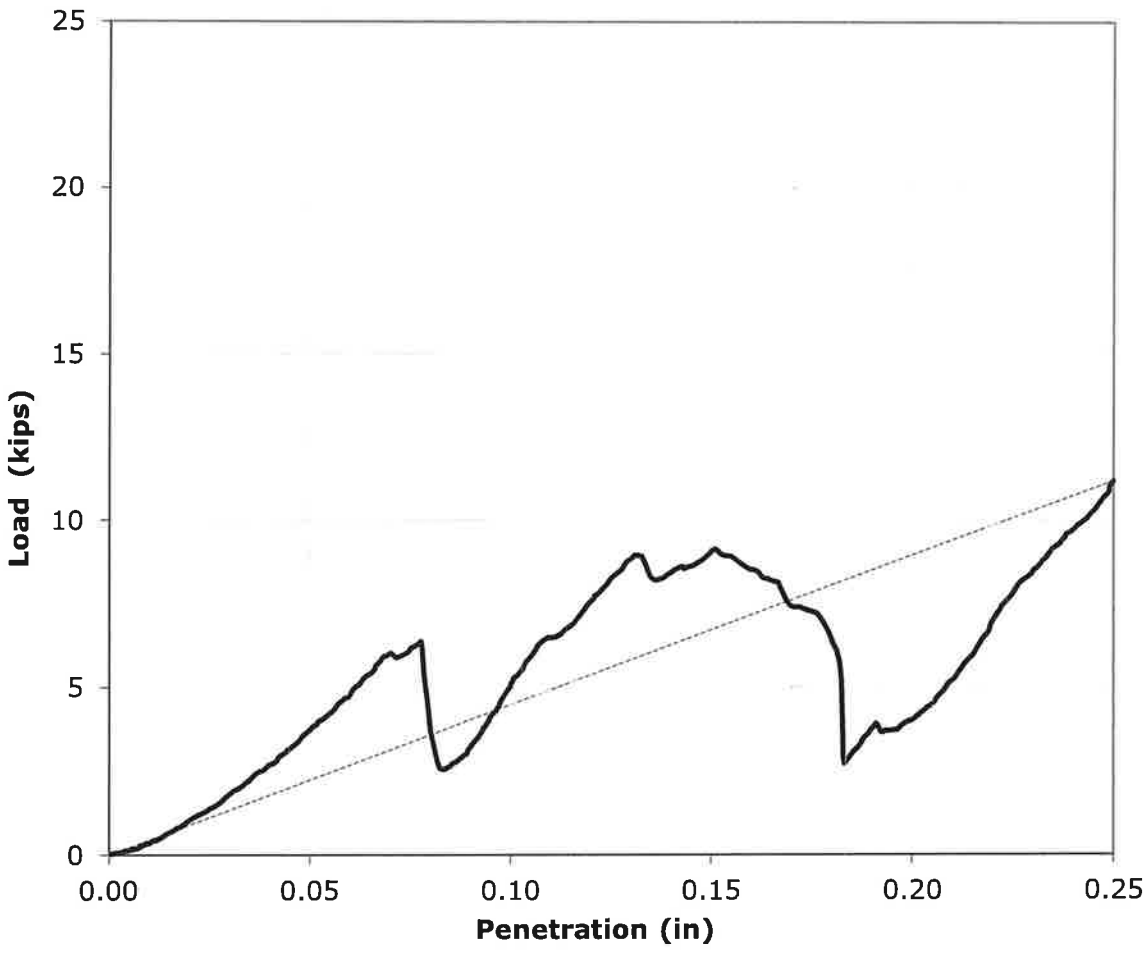
Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)

GeoTesting EXPRESS

Client:	Geotechnology, Inc.
Project Name:	LFUCG Merrick & W. Hickman Sewer Ph II
Project Location:	Lexington, KY
GTX #:	314752
Test Date:	12/16/2021
Tested By:	tlm
Checked By:	jsc
Boring ID:	B-46
Sample ID:	RC-5B
Depth, ft.:	15.06-15.20
Visual Description:	---

Punch Penetration Index Test

Moisture Condition:	as-received	Maximum Load, lbs:	11193
Penetration Rate, in/sec:	0.001	Peak Slope Index, kips/in:	44.8

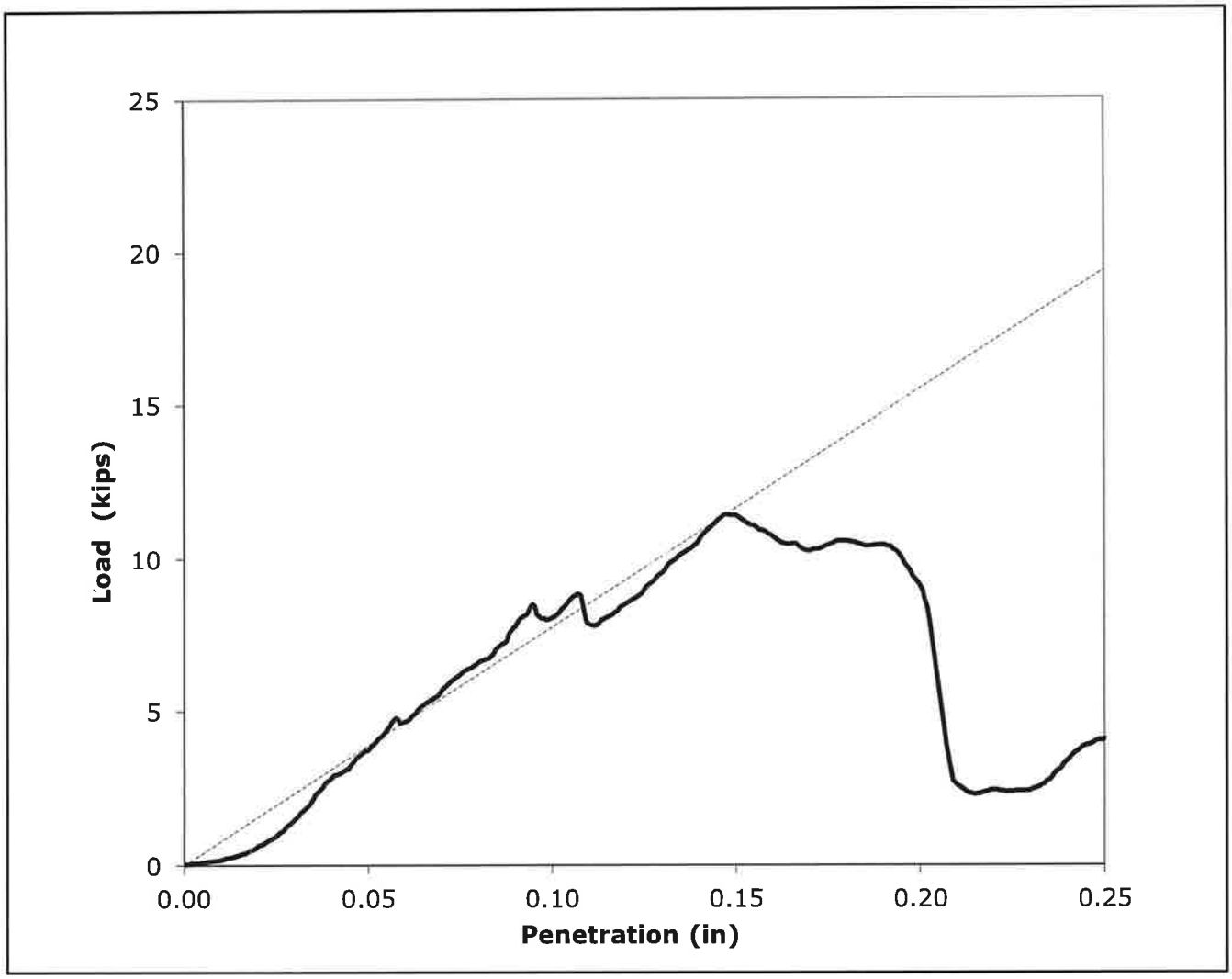


GeoTesting EXPRESS

Client:	Geotechnology, Inc.
Project Name:	LFUCG Merrick & W. Hickman Sewer Ph II
Project Location:	Lexington, KY
GTX #:	314752
Test Date:	12/16/2021
Tested By:	tlm
Checked By:	jsc
Boring ID:	B-60
Sample ID:	RC-8C
Depth, ft.:	21.52-21.66
Visual Description:	---

Punch Penetration Index Test

Moisture Condition:	as-received	Maximum Load, lbs:	11418
Penetration Rate, in/sec:	0.001	Peak Slope Index, kips/in:	77.5

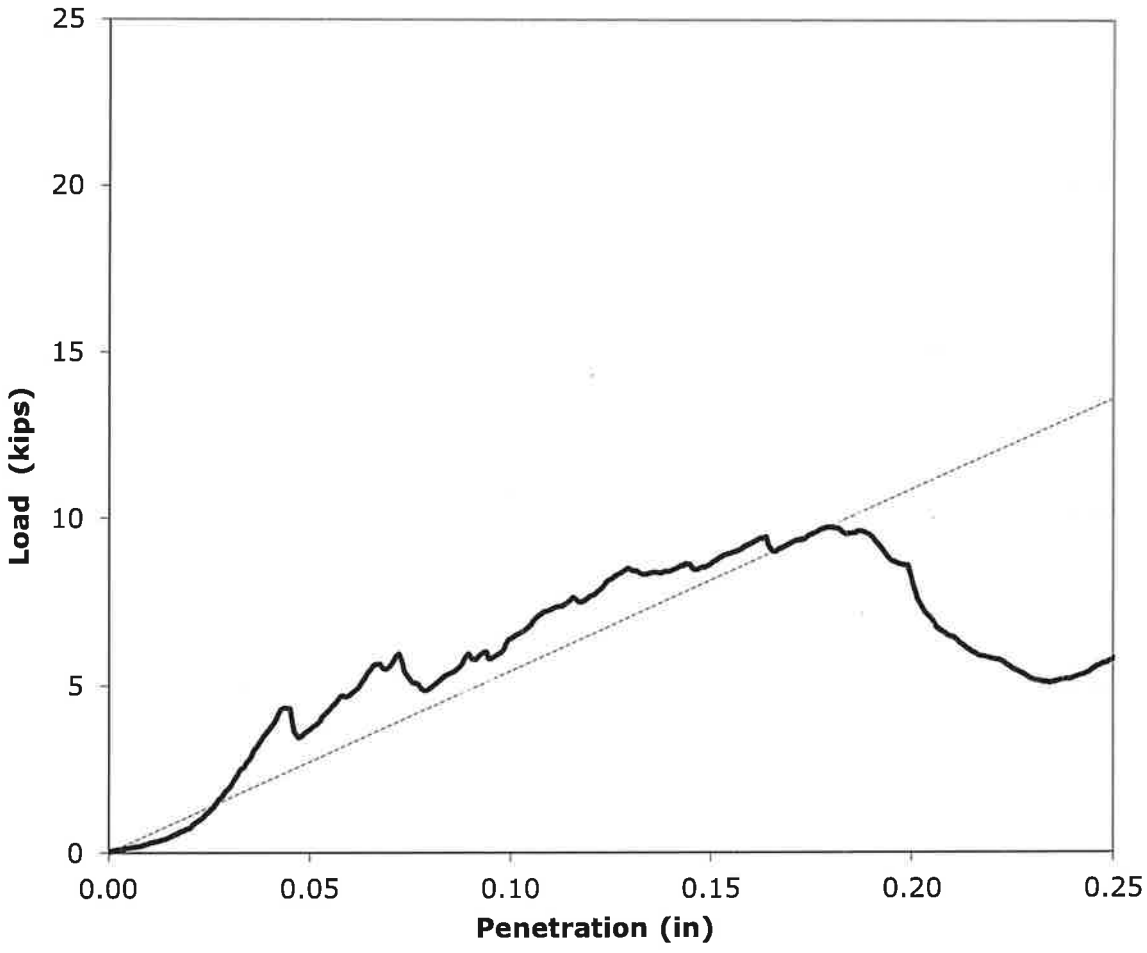


GeoTesting EXPRESS

Client:	Geotechnology, Inc.
Project Name:	LFUCG Merrick & W. Hickman Sewer Ph II
Project Location:	Lexington, KY
GTX #:	314752
Test Date:	12/16/2021
Tested By:	tlm
Checked By:	jsc
Boring ID:	B-65
Sample ID:	RC-7E
Depth, ft.:	21.47-21.61
Visual Description:	---

Punch Penetration Index Test

Moisture Condition:	as-received	Maximum Load, lbs:	9732
Penetration Rate, in/sec:	0.001	Peak Slope Index, kips/in:	54.4

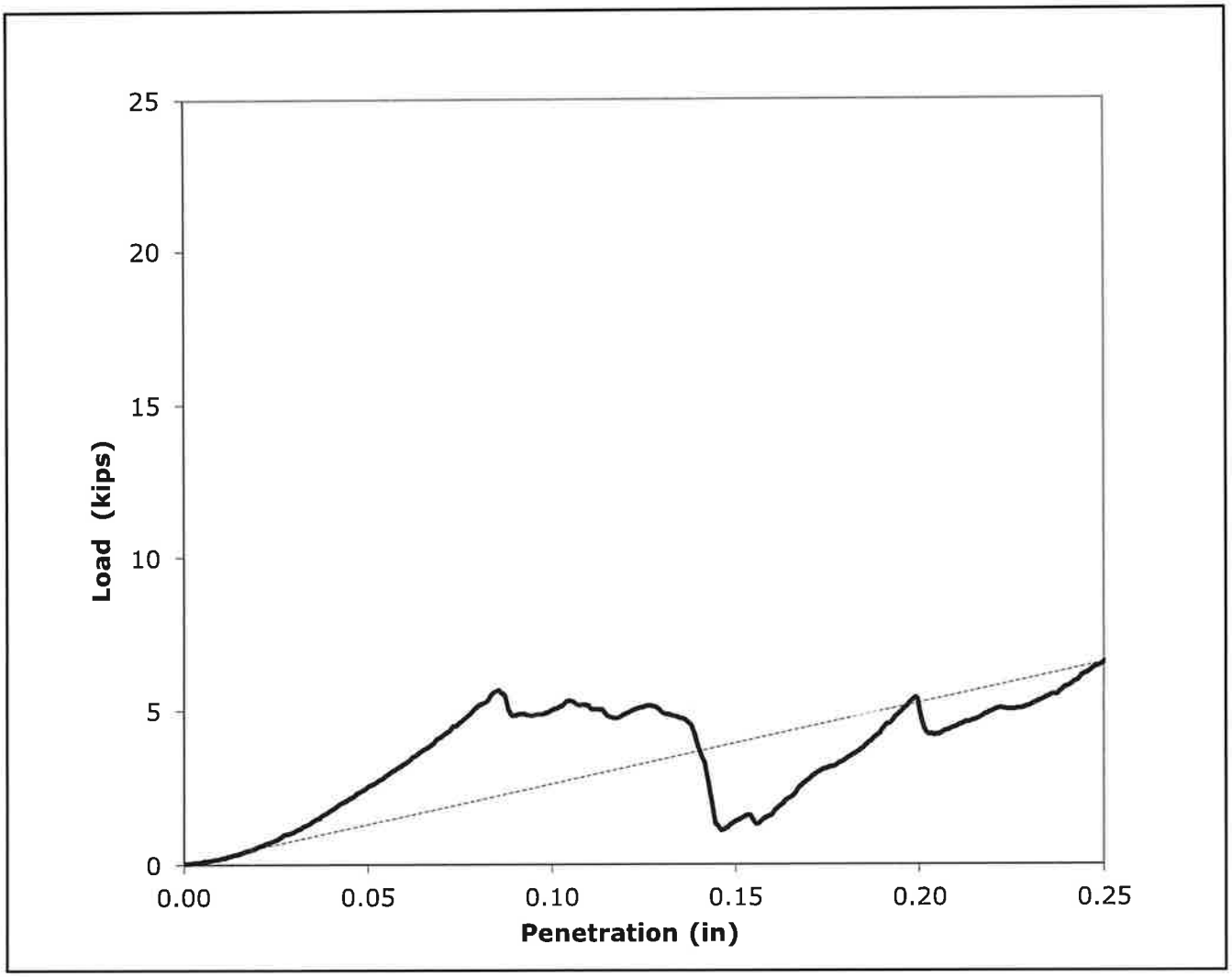


GeoTesting EXPRESS

Client:	Geotechnology, Inc.
Project Name:	LFUCG Merrick & W. Hickman Sewer Ph II
Project Location:	Lexington, KY
GTX #:	314752
Test Date:	12/16/2021
Tested By:	tlm
Checked By:	jsc
Boring ID:	B-67
Sample ID:	RC-9B
Depth, ft.:	23.87-24.00
Visual Description:	---

Punch Penetration Index Test

Moisture Condition:	as-received	Maximum Load, lbs:	6544
Penetration Rate, in/sec:	0.001	Peak Slope Index, kips/in:	26.2

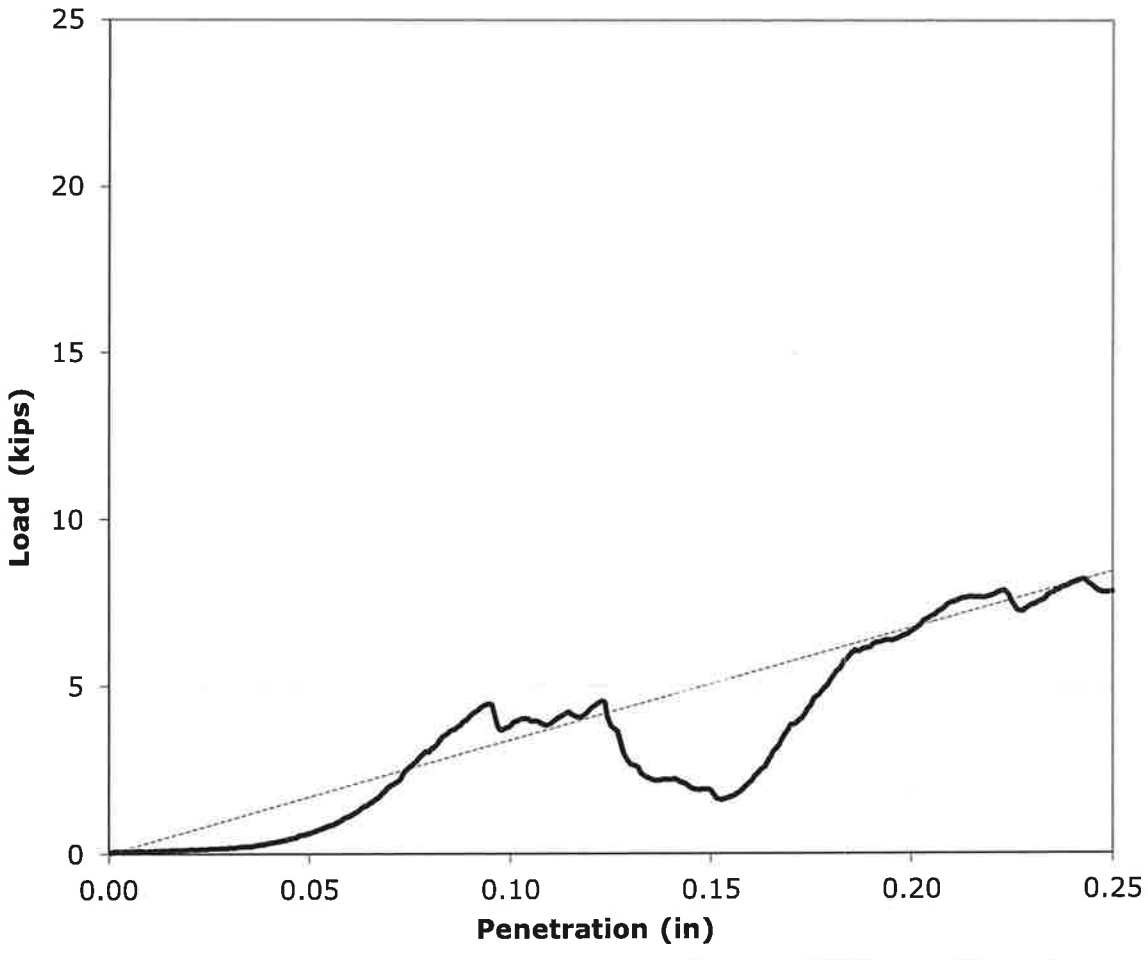


GeoTesting EXPRESS

Client:	Geotechnology, Inc.
Project Name:	LFUCG Merrick & W. Hickman Sewer Ph II
Project Location:	Lexington, KY
GTX #:	314752
Test Date:	12/16/2021
Tested By:	tlm
Checked By:	jsc
Boring ID:	B-121
Sample ID:	RC-4D
Depth, ft.:	12.87-13.00
Visual Description:	---

Punch Penetration Index Test

Moisture Condition:	as-received	Maximum Load, lbs:	8202
Penetration Rate, in/sec:	0.001	Peak Slope Index, kips/in:	33.7



GeoTesting EXPRESS

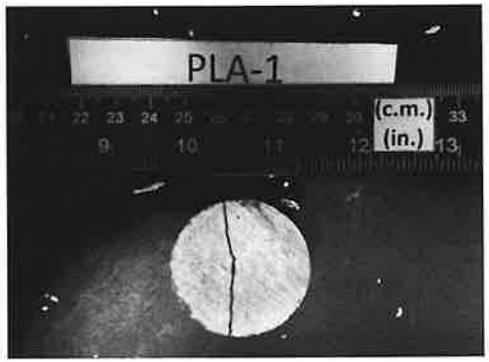
Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-46	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-6A	Test Date:	12/17/21	Checked By:	smd
Depth :	15.8-16.0 ft	Test Id:	645261		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm), psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-1	15.84-15.93 ft	1.87	1.01	1,852	2.40	1.55	773	0.898	694	18	13,900



Before



After

Intact Material Failure

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

Is = the uncorrected point load strength index

F = the size correction factor

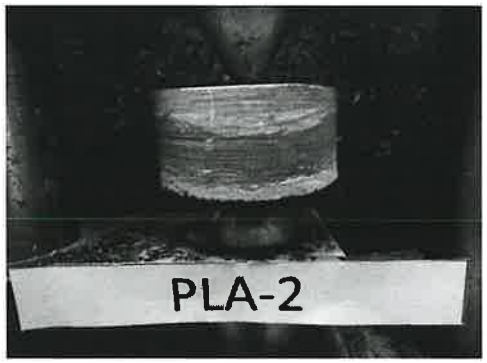
Is(50) = the size corrected point load strength index

GeoTesting EXPRESS

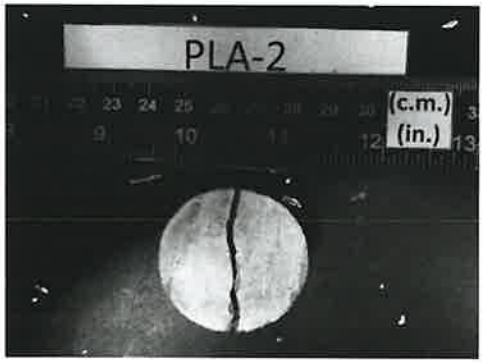
Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-60	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-8D	Test Date:	12/17/21	Checked By:	smd
Depth :	21.9-22.1 ft	Test Id:	645262		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm), psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-2	21.96-22.05 ft	1.87	0.99	879	2.35	1.53	374	0.893	335	18	6,740



Before



After

Intact material and Discontinuity Failure

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

Is = the uncorrected point load strength index

F = the size correction factor

Is(50) = the size corrected point load strength index

GeoTesting EXPRESS

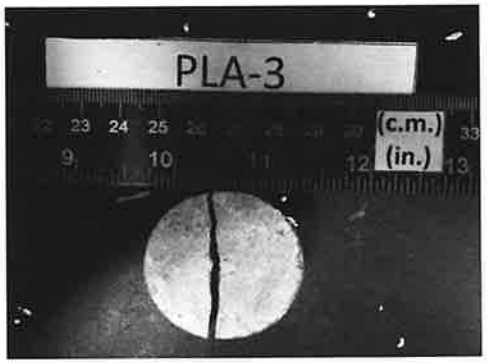
Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-65	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-7B	Test Date:	12/17/21	Checked By:	smd
Depth :	17.0-17.3 ft	Test Id:	645263		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm), psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-3	17.04-17.14 ft	1.86	1.00	1,913	2.36	1.53	812	0.894	726	18	14,600



Before



After

Intact Material Failure

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

Is = the uncorrected point load strength index

F = the size correction factor

Is(50) = the size corrected point load strength index

GeoTesting EXPRESS

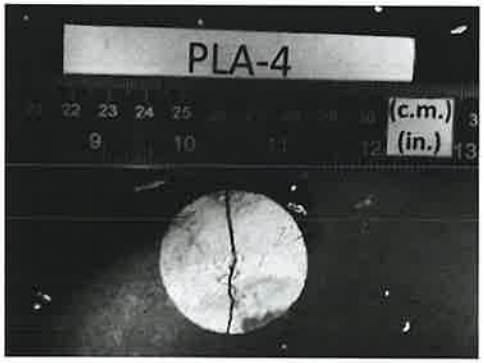
Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-67	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-10A	Test Date:	12/17/21	Checked By:	smd
Depth :	31.0-31.2 ft	Test Id:	645264		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm), psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-4	31.03-31.13 ft	1.86	1.01	1,960	2.39	1.55	819	0.897	735	18	14,700



Before



After

Intact Material Failure

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

Is = the uncorrected point load strength index

F = the size correction factor

Is(50) = the size corrected point load strength index

GeoTesting EXPRESS

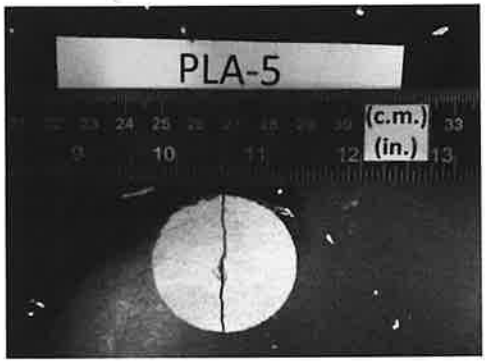
Client:	Geotechnology, Inc.				
Project:	LFUCG Merrick & W. Hickman Sewer Ph II				
Location:	Lexington, KY			Project No:	GTX-314752
Boring ID:	B-121	Sample Type:	cylinder	Tested By:	tlm
Sample ID:	RC-4G	Test Date:	12/17/21	Checked By:	smd
Depth :	15.9-16.1 ft	Test Id:	645265		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Axial Point Load Strength Index of Rock by ASTM D5731

Test No.	Specimen Depth	Diameter, in	Thickness, in	Failure Load (P), lbs	De, sq in	De, in	Is, psi	F	Is(50mm), psi	Generalized Correction Factor, K	Estimated Compressive Strength, psi
PLA-5	15.93-16.02 ft	1.87	0.92	1,873	2.19	1.48	856	0.879	753	18	15,400



Before



After

Intact Material Failure

Notes: Generalized correction factor, K, used to estimate the compressive strength based on the specimen depth and ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter(D) is the average of three measurements.

De = the equivalent core diameter

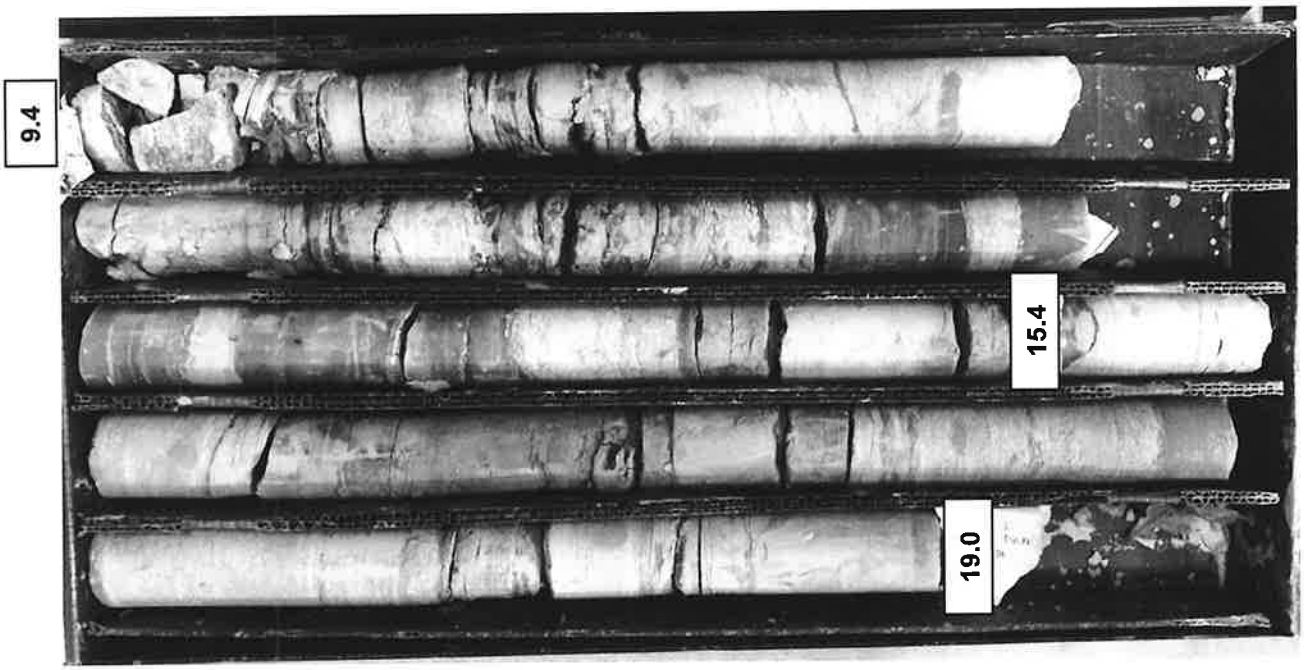
Is = the uncorrected point load strength index

F = the size correction factor

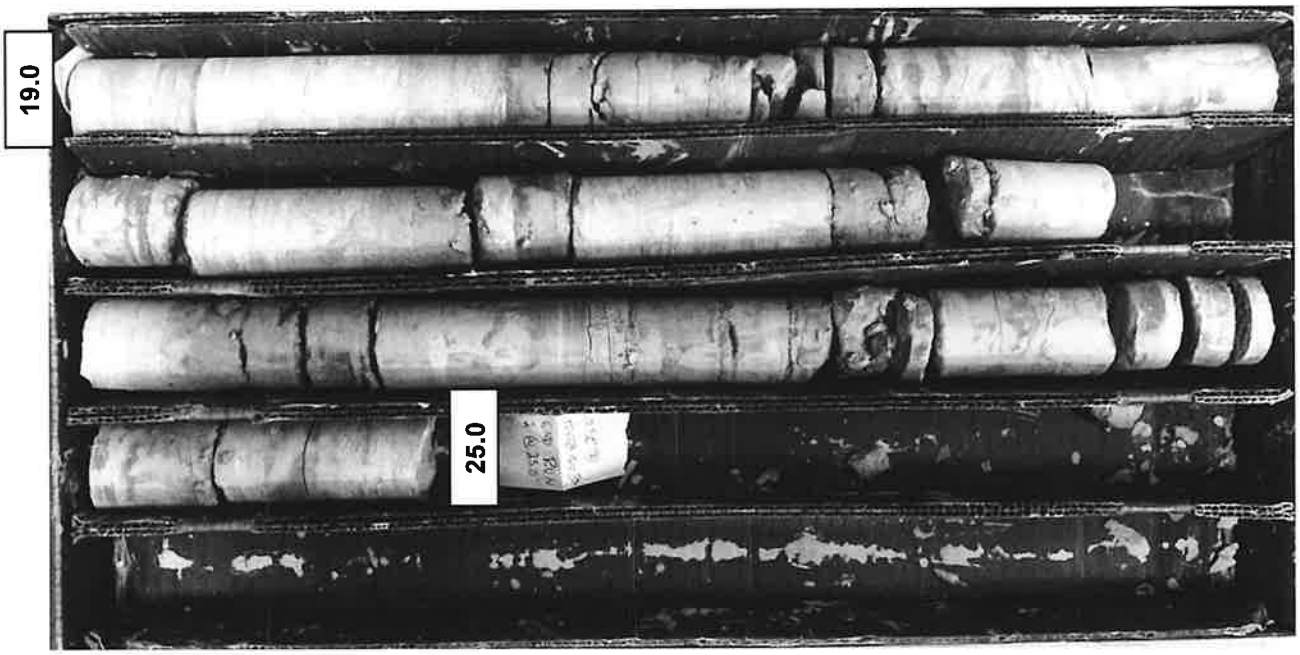
Is(50) = the size corrected point load strength index

APPENDIX D – ROCK CORE PHOTOGRAPHS

Rock Core Photographs



Rock Core Photograph 1. Boring B-46, Core Runs RC-5 and RC-6 (9.4 to 19.0 feet deep).



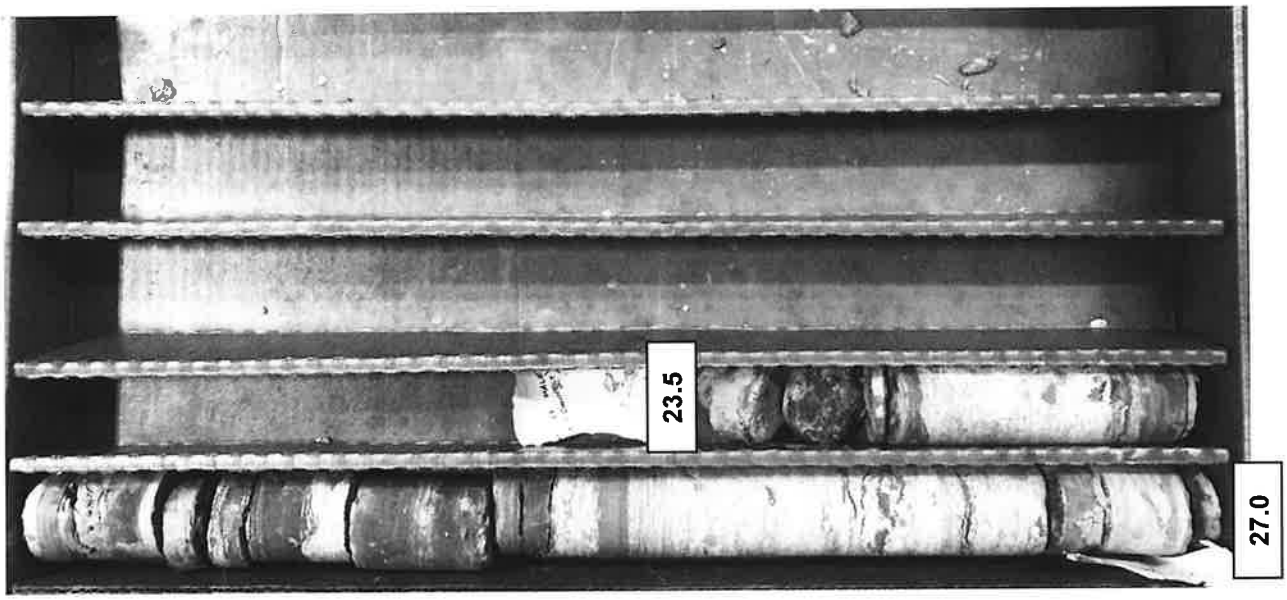
Rock Core Photograph 2. Boring B-2, Core Run RC-6 (19.0 to 25.0 feet deep).



Rock Core Photograph 3. Boring B-48, Core Runs RC-5 and RC-6 (13.6 to 24.3 feet deep).



Rock Core Photograph 4. Boring B-60, Core Run RC-8 (15.1 to 23.5 feet deep).



Rock Core Photograph 5. Boring B-60, Core Run RC-9 (23.5 to 27.0 feet deep).



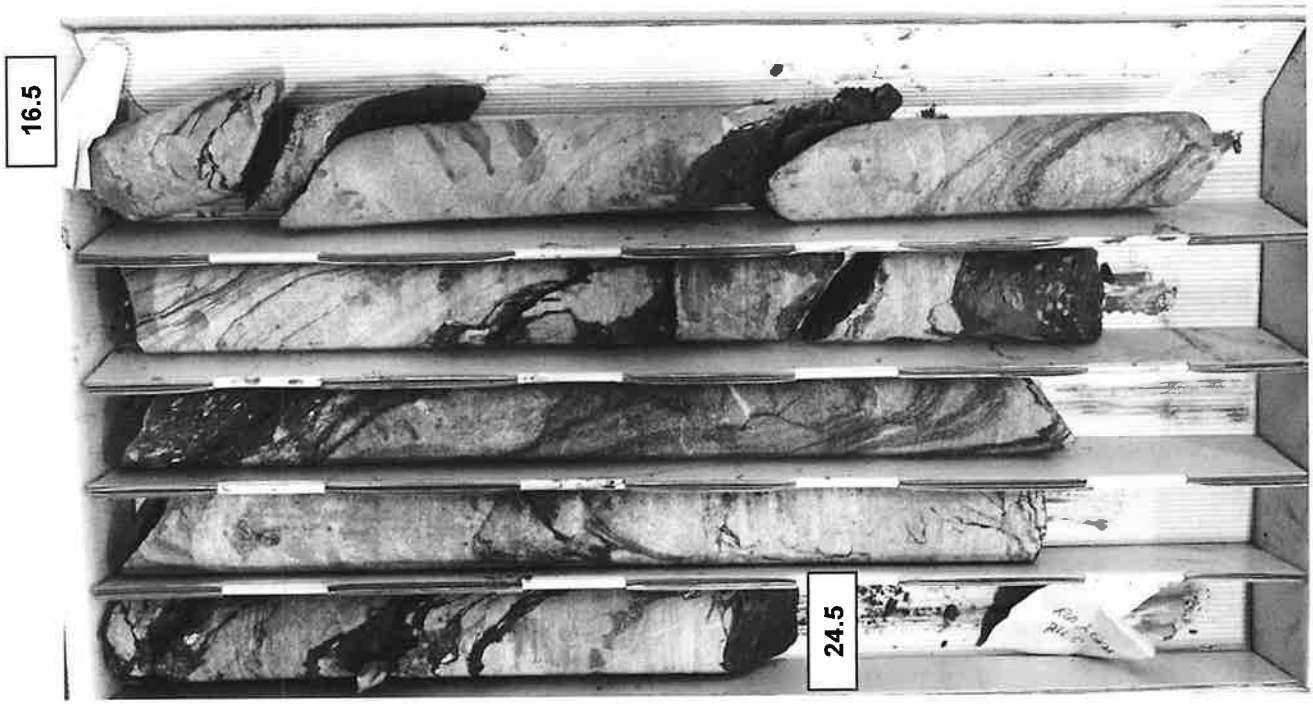
Rock Core Photograph 6. Boring B-61, Core Runs RC-8 and RC-9 (15.1 to 25.8 feet deep).



Rock Core Photograph 7. Boring B-61, Core Run RC-9 (25.8 to 28.0 feet deep).



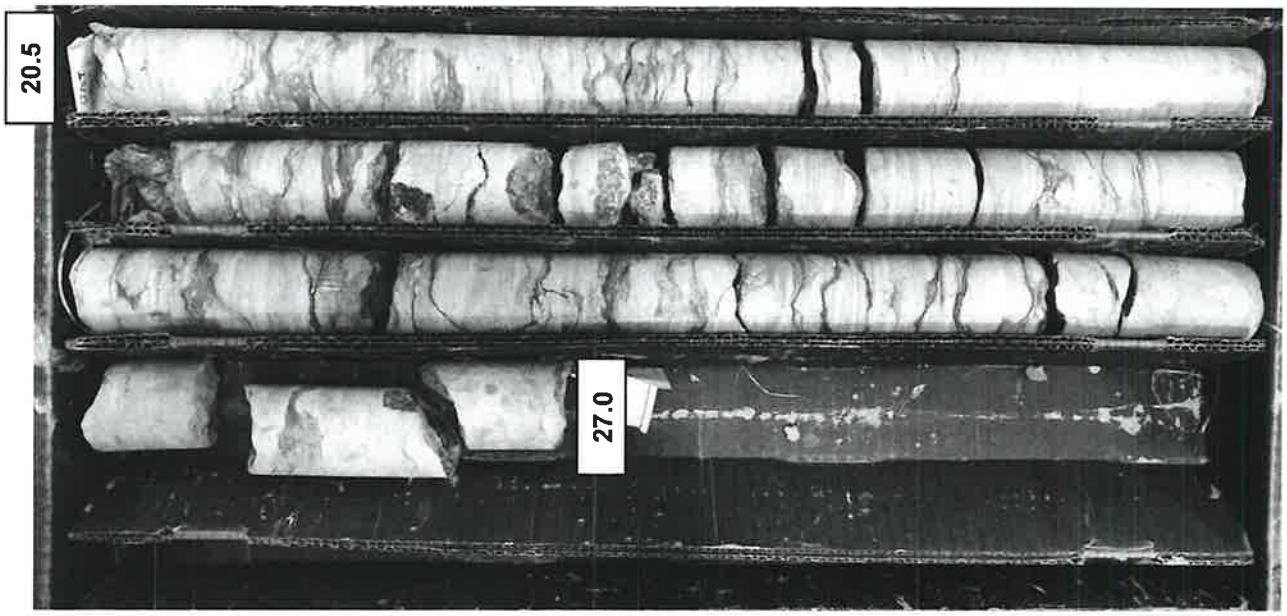
Rock Core Photograph 8. Boring B-65, Core Runs RC-6 and RC-7 (9.3 to 16.5 feet deep).



Rock Core Photograph 9. Boring B-65, Core Run RC-7 (16.5 to 24.5 feet deep).



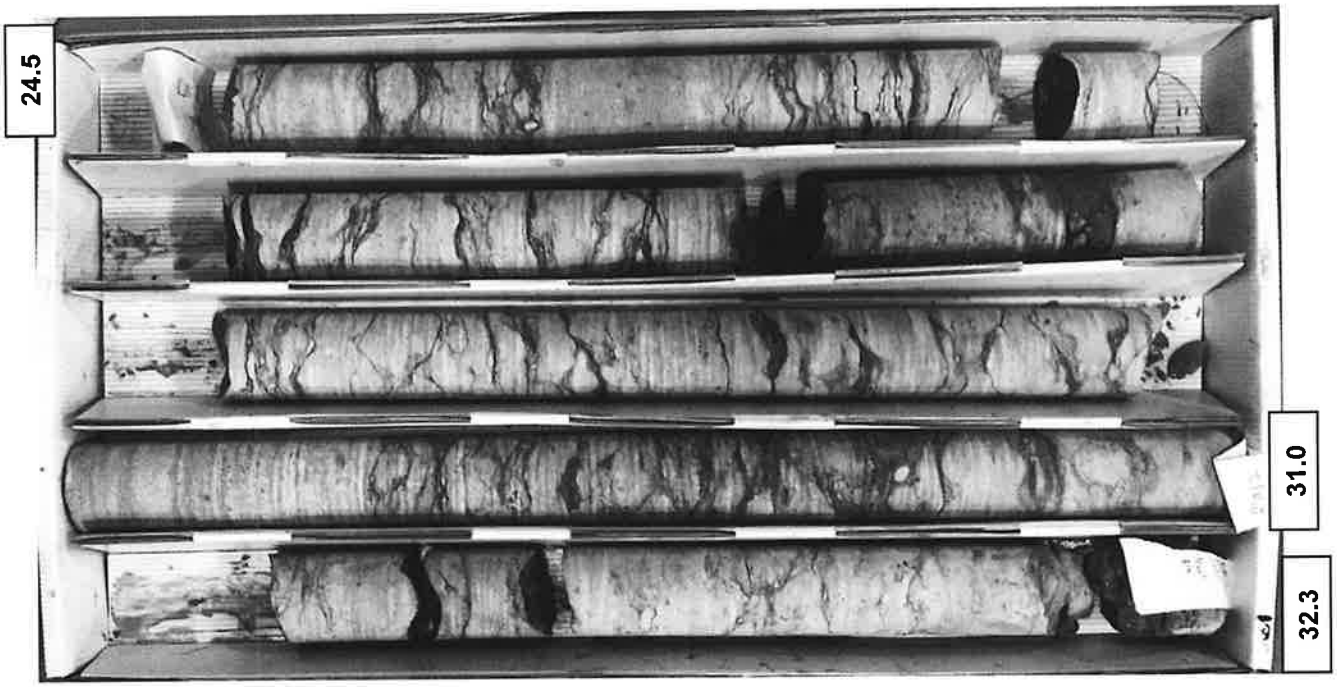
Rock Core Photograph 10. Boring B-66, Core Run RC-7 (14.2 to 20.5 feet deep).



Rock Core Photograph 11. Boring B-66, Core Run RC-8 (20.5 to 27.0 feet deep).



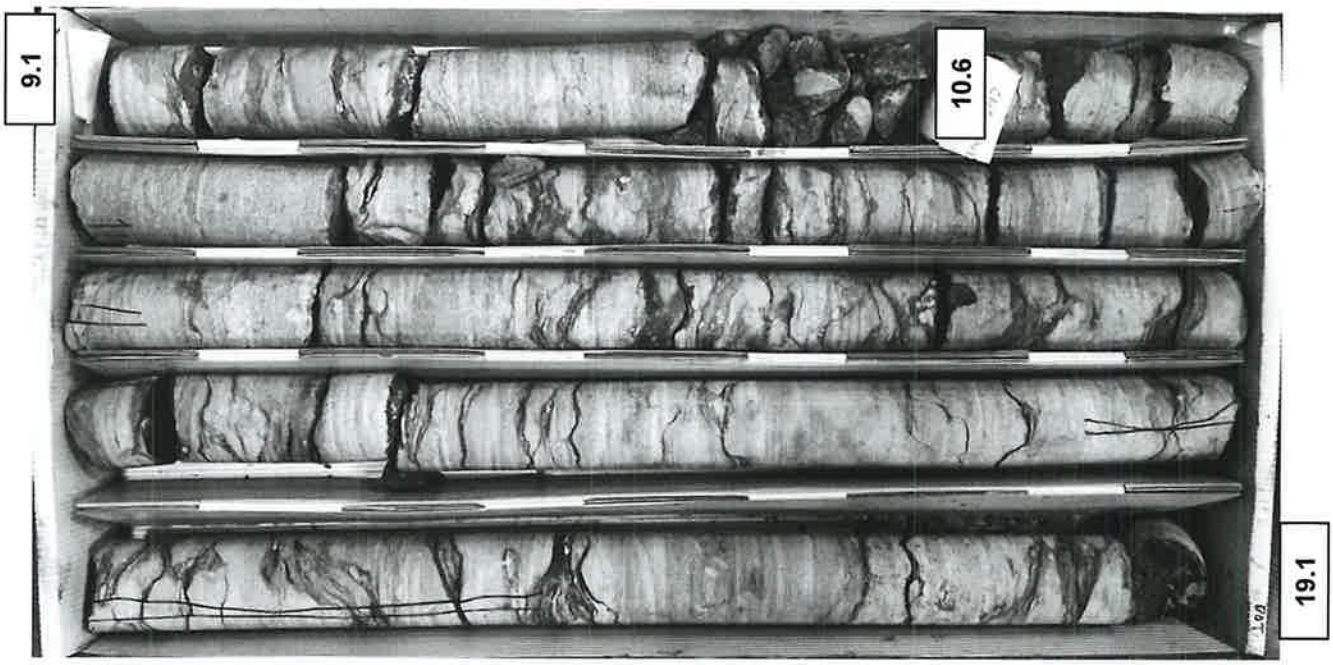
Rock Core Photograph 12. Boring B-67, Core Runs RC-7 and RC-9 (15.2 to 24.5 feet deep).



Rock Core Photograph 13. Boring B-67, Core Runs RC-9 and RC-10 (24.5 to 32.3 feet deep).



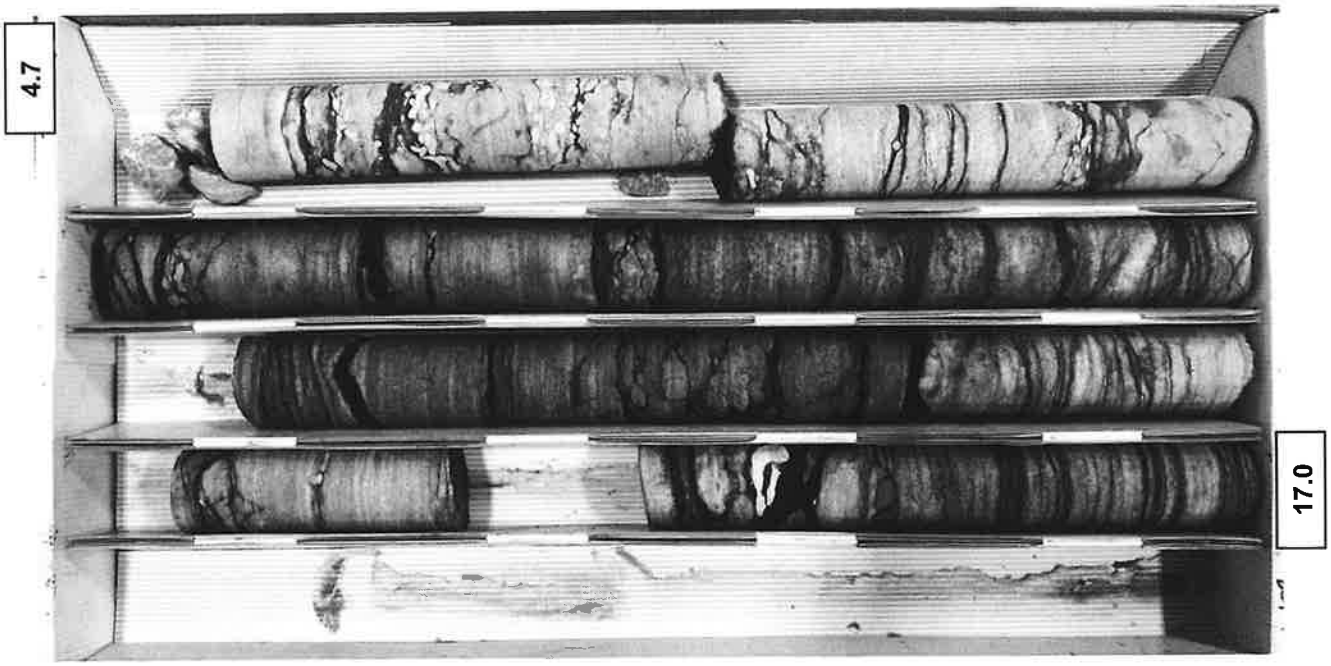
Rock Core Photograph 14. Boring B-67, Core Run RC-10 (32.3 to 40.8 feet deep).



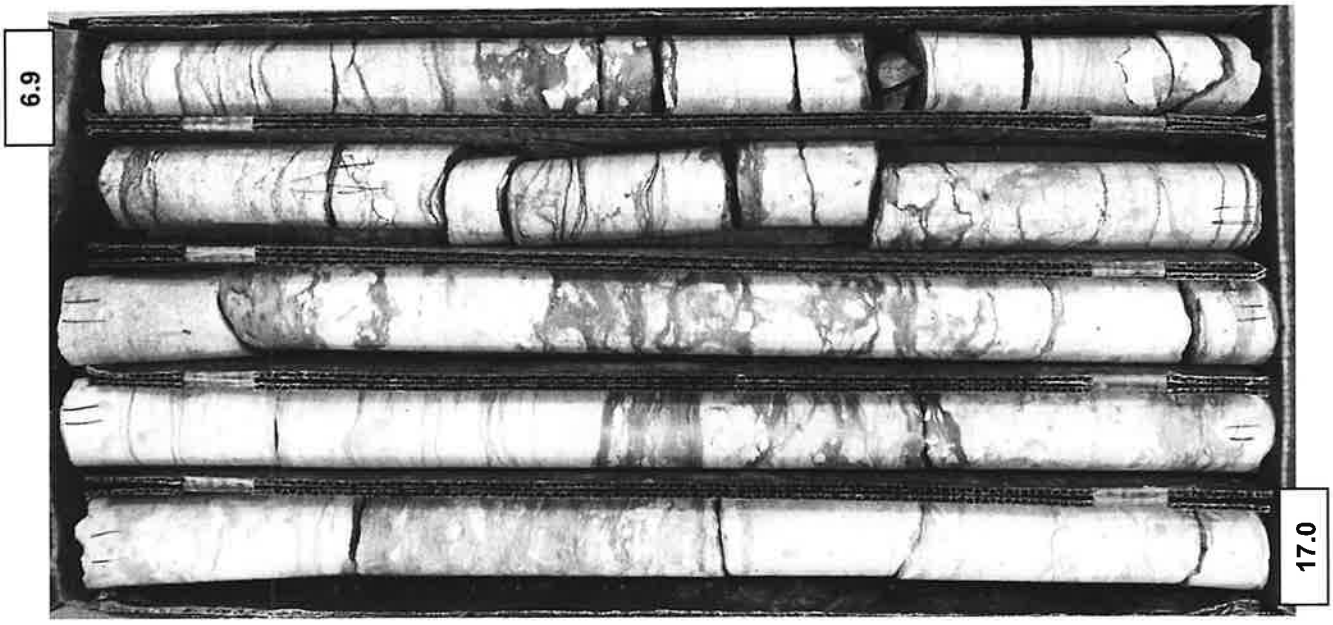
Rock Core Photograph 15. Boring B-69, Core Runs RC-5 and RC-6 (9.1 to 19.1 feet deep).



Rock Core Photograph 16. Boring B-69, Core Runs RC-6 and RC-7 (19.1 to 29.0 feet deep).



Rock Core Photograph 17. Boring B-119, Core Run RC-4 (9.7 to 17.0 feet deep).



Rock Core Photograph 18. Boring B-121, Core Run RC-4 (6.9 to 17.0 feet deep).

GEOTECHNOLOGY
A Universal Engineering Sciences Company

February 8, 2022

Mr. Eddie Mesta, PE
Integrated Engineering, PLLC
166 Prosperous Place
Suite 220
Lexington, Kentucky 40509

Re: Rockline Sounding Report
LFUCG West Hickman Main Trunk E & Merrick Trunk
Lexington, Kentucky
Geotechnology Project No. J038336.02

Dear Mr. Mesta:

Presented in this report are the results of our bedrock soundings completed for the West Hickman Main Trunk E and Merrick Trunk Sewer Project in Lexington, Kentucky. Our services were performed in general accordance with the Prime AE Subcontract Agreement for Professional Services, which was signed for authorization on April 28, 2021.

1.0 PROJECT CHARACTERISTICS

The West Hickman Trunk E (WHTE) sewer will have a total length of about 6,920 lineal feet, which will include the following:

- 5,371 lineal feet of 30-inch-diameter pipe;
- 1,086 lineal feet of 42-inch-diameter PVC pipe; and
- 463 lineal feet of 48-inch-diameter PVC pipe.

The WHTE sewer will begin at Station 0+00 on Greentree Road between the intersections with Armstrong Mill Road and Willowood Road. This proposed sewer will follow Greentree Road north until Greentree Circle. At Greentree Circle, the proposed sewer alignment will bend to the east and continue past the end of the cul-de-sac. The proposed alignment will turn to the north along the east boundary of 3374 Greentree Circle and will cross beneath New Circle Road. The proposed sewer will then bear east on the north side of New Circle towards the Chinoe Creek Apartments and continue along the south boundary of said apartments. The proposed sewer alignment will end at about Station 69+20, where it will tie into an existing sanitary sewer.

The proposed Merrick Trunk (MT) sewer will have a total length of 6,224 lineal feet and will consist of 24-inch-diameter PVC pipe. The MT sewer will begin at Station 0+00 near the intersection of Armstrong Mill Road and Greentree Road. The proposed alignment will extend north along the rear of the properties that front onto Willowood and Winding Drives. The proposed sewer will continue north towards Tates Creek Road, and will follow Tates Creek Road to the north until just south of Gainesway Road. From this point, the proposed alignment will cross to the west side of

Tates Creek Road until the north side of New Circle Road. After crossing New Circle Road, the MT sewer will cross back to the east side of Tates Creek Road, where it will continue north to Dove Run Road. The planned alignment follows Dove Run Road to Montavesta Road, where it will tie into the existing sewer at Station 62+24. It is our understanding that alternate alignments are being considered in the vicinity of Dove Run Road as well.

2.0 SCOPE OF WORK

The subsurface exploration for WHTE consisted of 130 rock-line soundings. The sounding locations were selected, staked (or marked) and surveyed in the field by Integrated Engineering, PLLC. Soundings S-1 through S-89 were located on Greentree Road; S-88 through S-91 were located on Greentree Circle; S-92 and S-93 were located on private property off of Greentree Circle; and Soundings S-94 through S-130 were located along the south boundary of the Chinoe Creek Apartments. It should be noted that Soundings S-50 through S-77 were not drilled due to a high concentration of existing utilities in the area. Also, Soundings S-92 and S-93 were not drilled to avoid property access and restoration issues with the private property owner.

The soundings were drilled between July 7 and July 9. Sampling was not performed at any location. As each boring was advanced, the Drilling Foreman kept a tabulation of the depths until auger refusal. It should be noted that "Auger Refusal" as determined in the rockline soundings is defined as rock-like resistance to the advancement of the augers using carbide steel cutting teeth. This may indicate the presence of weathered bedrock, boulders, or rock remnants.

The subsurface exploration for MT was originally planned to include 112 rockline soundings, numbered S-1 through S-45, S-47, S-49 through S-59, S-62 through S-64, S-68, S-70 through S-118, S-120, and S-122. The sounding locations were selected, staked and surveyed in the field by Integrated Engineering, PLLC as follows:

- Soundings S-1 through S-45 were located on private property east of the properties that front onto Willowood and Winding Drives, and extending along the proposed alignment towards Tates Creek Road;
- Sounding S-47 was located in the median strip on Tates Creek Road, where the alignment will cross the roadway;
- Soundings S-49 through S-59 and S-62 through S-64 were located to the east of and roughly parallel to Tates Creek Road, between Gainesway Drive and New Circle Road;
- Soundings S-68 and S-70 through S-91 followed along the west edge of Tates Creek Road from New Circle Road to Dove Run Road;
- S-92 through S-108 were located in the pavement along the northbound lane of Dove Run Road from Tates Creek Road to Montavesta Road;

- S-109 through S-113 were located in the pavement along Montavesta Road, extending northeast from the intersection with Dove Run Road; and

- S-114 through S-118 were located on private property along the east boundary of The Reserve at Merrick Apartments & Townhomes.

Of the 112 planned soundings for MT, 42 were not performed due to private property access issues, site access issues, conflicts with overhead utilities, and traffic control issues as noted in the Sounding Summary in Appendix B. In addition, two of the soundings were scheduled to be completed at a later date along with borings near several proposed roadway crossings. The 70 completed soundings were drilled by a Geotechnology drilling crew between November 1 and November 10, 2021 or performed with hand equipment by Geotechnology between December 20 and 21, 2021. Sampling was not performed at the sounding locations. As each boring was advanced, the Drilling Foreman kept a tabulation of the auger refusal depths. It should be noted that "Auger Refusal" as determined in the rockline soundings is defined as rock-like resistance to the advancement of the augers using carbide steel cutting teeth. This may indicate the presence of weathered bedrock, boulders, or rock remnants.

3.0 SOUNDING DEPTHS

According to the 1967 United States Geological Survey (USGS) Geologic Map of the Coletown Quadrangle, East-Central Kentucky, the bedrock along the proposed WHTE Sewer alignment, is a limestone bedrock belonging to the Tanglewood Limestone Member No. 2 in the Lexington Limestone Formation.

Bedrock was encountered in the completed soundings at depths ranging from 1.3 feet to 10.4 feet, with an average depth of 4.7 feet. Auger refusal occurred at depths ranging from 1.6 feet to 12.1 feet, with an average depth of 6.1 feet. A more accurate determination regarding the location of the top of rock cannot be made without performing rock coring. More detailed rockline sounding depths are provided in Appendix A.

According to the United States Geological Survey (USGS) Geologic Map of the Coletown Quadrangle, East-Central Kentucky (Black, 1967), two geologic fault lines, which extend in a northeast to southwest direction are shown to cross the proposed Merrick Trunk sewer alignment. The first fault line intersects the alignment near the Tates Creek Road and New Circle Road intersection, and the second intersects the alignment north of the Tates Creek Road and Armstrong Mill Road intersection. The referenced map shows that the bedrock underlying the overburden soils in the area between the faults along Tates Creek Road is from the Clays Ferry Formation and that the bedrock underlying the ground surface along the proposed Merrick Trunk north of New Circle Road is from the Grier and Curdsville Members of the Lower Part of the Lexington Limestone formation. South of the southern fault line, the map indicates that the bedrock belongs to the Tanglewood Limestone Member No. 2 formation.

Auger refusal was encountered in the completed soundings at depths ranging from 0.5 feet to 16.8 feet below ground surface, with an average depth of 4.8 feet. It should be noted that auger refusal and top of bedrock are not necessarily encountered at the same elevation in the soundings. Top of bedrock may be encountered before or after auger refusal. A more accurate determination regarding the location of the top of rock cannot be made without performing sampling and rock coring. More detailed rockline sounding depths are provided in the Sounding Summary in Appendix A.

4.0 CLOSURE

We appreciate the opportunity to provide drilling services for the proposed project. Should you have any questions concerning the information included in this report, please do not hesitate to contact us.

Respectfully submitted,
GEOTECHNOLOGY, LLC

Matthew K. Barker
Geotechnical Manager

MKB/MEC:tmk

Copy emailed: Integrated Engineering, PLLC

APPENDIX A – SEWER SOUNDING DEPTHS

SOUNDING DEPTHS

Sounding No.	Sounding Coordinates		Ground Surface Elevation (feet)	Depth to Top of Bedrock (feet)	Depth to Auger Refusal (feet)	Comments
	Northing	Easting				
S-1	175317.2987	1571212.258	912.53	8.2	8.5	Offset 5' South
S-2	175355.6584	1571246.981	912.56	5.4	6.1	Offset 6' East
S-3	175389.74	1571277.752	912.43	4.3	5.5	Offset 7' South
S-4	175424.1638	1571308.899	912.13	1.8	2.4	
S-5	175459.0109	1571340.435	912.21	4.3	4.6	Offset 10' South
S-6	175498.6006	1571364.087	912.53	4.2	5.0	Offset 5' East
S-7	175541.5231	1571389.759	912.80	3.3	6.6	
S-8	175581.3328	1571413.486	912.91	4.0	4.4	Offset 5' Southeast
S-9	175627.3637	1571441.056	913.16	4.1	5.8	
S-10	175672.3776	1571467.954	913.34	3.5	6.7	Offset 10' Northeast
S-11	175718.5929	1571494.844	913.65	4.4	7.1	Offset 5' Northeast
S-12	175754.4253	1571515.81	913.94	3.4	4.3	Offset 8' North
S-13	175797.6088	1571540.929	914.07	5.1	9.4	Offset 15' Norteast
S-14	175849.9111	1571571.477	914.42	4.2	7.3	Offset 5' South
S-15	175885.7947	1571592.45	914.84	5.3	7.1	Offset 8' South
S-16	175934.9705	1571613.989	914.91	7.0	8.3	
S-17	175974.7652	1571631.438	915.42	3.0	3.4	Offset 5' Northwest
S-18	176020.5228	1571651.478	915.39	3.7	6.5	Offset 5' Northwest
S-19	176079.0704	1571677.144	915.82	3.8	6.4	Offset 5' Northeast
S-20	176116.617	1571693.591	916.09	5.0	12.1	Offset 8' Northeast
S-21	176163.5693	1571710.328	916.18	4.3	5.8	
S-22	176210.6964	1571727.134	916.61	2.4	6.2	Offset 5' North
S-23	176257.8099	1571743.915	916.91	2.0	3.5	Offset 10' Northeast
S-24	176304.9175	1571760.723	917.13	3.2	8.5	Offset 10' Southwest
S-25	176359.6232	1571780.243	917.35	3.3	3.9	
S-26	176422.0818	1571802.375	917.59	3.6	7.2	
S-27	176465.4227	1571817.681	917.83	5.0	8.2	
S-28	176520.6925	1571837.331	918.11	3.1	8.5	
S-29	176576.1207	1571856.981	918.45	4.9	6.2	Offset 7' Northeast
S-30	176606.7991	1571867.782	918.59	5.2	6.2	
S-31	176672.1652	1571891.006	919.15	5.4	5.7	Offset 10' South
S-32	176703.389	1571925.059	919.24	6.2	7.4	
S-33	176737.2697	1571961.805	919.36	5.9	6.9	
S-34	176771.2082	1571998.555	919.29	6.3	6.5	
S-35	176805.16	1572035.33	919.21	5.4	7.5	Offset 10' East
S-36	176843.0411	1572076.077	918.84	4.3	5.2	
S-37	176869.9465	1572105.194	918.80	3.1	5.0	Offset 10' Northwest

GEOTECHNOLOGY
A Universal Engineering Sciences Company

WEST HICKMAN MAIN TRUNK E SEWER
LEXINGTON, KENTUCKY
J038336.02

SOUNDING DEPTHS

Sounding No.	Sounding Coordinates		Ground Surface Elevation (feet)	Depth to Top of Bedrock (feet)	Depth to Auger Refusal (feet)	Comments
	Northing	Easting				
S-38	176903.0612	1572140.937	919.26	5.0	5.3	
S-39	176937.1508	1572177.525	918.08	3.8	4.3	Offset 3' Southeast
S-40	176971.3224	1572214.066	917.98	4.0	4.4	Offset 5' Southeast
S-41	177039.7232	1572286.959	917.91	3.4	3.7	Offset 3' South
S-42	177073.6867	1572323.657	919.00	3.3	4.3	Offset 4' Southeast
S-43	177113.5447	1572366.038	918.63	3.1	3.3	Offset 4' Southeast
S-44	177139.8733	1572394.26	919.02	4.2	5.4	Offset 5' Northwest
S-45	177168.1146	1572421.403	919.36	3.3	4.4	Offset 5' Northeast
S-46	177212.7304	1572463.933	920.05	5.0	5.8	Offset 10' Southwest
S-47	177240.4379	1572490.499	920.38	5.0	5.6	Offset 12' Southwest
S-48	177266.17	1572515.035	920.82	5.2	10.3	Offset 12' Southwest
S-49	177305.291	1572552.798	921.22	10.4	10.9	Offset 15' Northeast
S-78	178451.6834	1573464.88	925.40	3.2	3.5	Offset 10' East
S-79	178501.4914	1573485.315	925.99	6.2	6.8	Offset 5' Southeast
S-80	178547.7372	1573504.199	926.39	7.7	8.6	
S-81	178594.3884	1573523.337	926.43	8.4	8.8	
S-82	178651.8148	1573545.794	926.42	9.3	9.8	
S-83	178717.037	1573562.797	926.52	8.3	8.7	Offset 4' Northwest
S-84	178764.2384	1573575.18	925.71	4.9	6.2	Offset 8' East
S-85	178812.6911	1573583.54	925.58	1.3	1.6	Offset 10' Southeast
S-86	178864.6388	1573591.393	927.01	2.0	2.3	Offset 10' East
S-87	178915.5383	1573599.027	927.14	2.3	3.1	Offset 8' South
S-88	178945.6342	1573638.403	927.39	3.8	4.3	Offset 10' West
S-89	178972.33	1573686.558	926.58	3.4	4.7	Offset 10' Northeast
S-90	178993.7941	1573727.139	925.92	3.9	4.2	
S-91	179022.4741	1573768.508	926.39	3.4	5.0	Offset 10' Southeast
S-94	179434.2731	1573852.02	926.19	3.3	3.5	
S-95	179453.2369	1573897.339	925.96	3.9	4.1	
S-96	179484.0007	1573939.843	927.29	5.9	6.1	Offset 10' East
S-97	179498.3655	1573986.607	927.88	5.5	5.9	
S-98	179515.9511	1574014.602	927.88	5.4	6.3	
S-99	179525.1991	1574051.867	927.83	5.1	5.8	
S-100	179554.5664	1574095.087	927.44	6.0	8.0	
S-101	179582.6217	1574136.448	927.73	5.2	6.4	
S-102	179610.7066	1574177.84	929.17	5.7	7.8	
S-103	179638.8289	1574219.237	928.74	7.7	8.3	
S-104	179668.9998	1574263.647	930.33	5.1	6.6	

SOUNDING DEPTHS

Sounding No.	Sounding Coordinates		Ground Surface Elevation (feet)	Depth to Top of Bedrock (feet)	Depth to Auger Refusal (feet)	Comments
	Northing	Easting				
S-105	179680.6204	1574314.149	927.44	4.3	4.6	
S-106	179692.276	1574362.752	928.88	3.3	6.2	
S-107	179703.9411	1574411.418	928.86	4.3	5.4	
S-108	179715.6147	1574460.011	928.38	3.4	4.0	
S-109	179729.133	1574513.885	928.73	4.3	5.2	
S-110	179739.0128	1574557.23	928.29	4.2	5.1	
S-111	179750.695	1574605.841	928.60	4.1	5.2	
S-112	179763.2141	1574655.6	928.26	3.1	4.1	
S-113	179813.1082	1574688.443	928.47	4.2	7.6	
S-114	179855.5883	1574714.954	929.01	6.4	8.5	
S-115	179897.999	1574741.42	928.48	4.2	7.3	
S-116	179940.3748	1574767.883	930.65	5.2	6.1	
S-117	179982.8745	1574794.336	929.25	6.0	8.4	
S-118	180031.0915	1574824.461	929.86	8.8	9.2	
S-119	180074.6729	1574869.875	930.84	5.2	6.8	
S-120	180109.4538	1574905.85	930.65	5.1	7.2	
S-121	180144.1553	1574941.802	930.33	4.9	5.2	
S-122	180178.9139	1574977.795	930.42	4.8	5.1	
S-123	180222.8423	1575023.063	929.29	4.1	4.3	
S-124	180272.2325	1575030.393	929.09	4.1	4.3	
S-125	180321.769	1575037.315	929.58	5.0	6.7	
S-126	180372.4588	1575032.338	929.79	4.4	7.0	
S-127	180422.524	1575038.872	929.96	4.6	4.9	
S-128	180472.0133	1575045.775	929.8	9.7	10.4	
S-129	180521.5266	1575052.675	932.63	5.4	7.2	
S-130	180568.7413	1575059.315	933.18	6.1	6.8	

SOUNDING SUMMARY

Sounding No.	Sounding Coordinates		Ground Surface Elevations		Depth to Top of Bedrock (ft.)	Comments
	Northing	Easting	As-Staked Elevation (ft.)	As-Drilled Ground Surface Elevation (ft.)		
S-1	175328.3795	1571099.988	911.49	911.49	-	See Note 1
S-2	175336.8467	1571070.087	909.01	909.01	5.0	"
S-3	175379.4920	1571016.105	910.38	910.38	-	"
S-4	175420.8608	1570988.023	910.70	910.70	-	"
S-5	175462.2296	1570959.940	910.44	910.44	-	"
S-6	175503.5985	1570931.858	911.17	911.17	6.6	"
S-7	175540.1179	1570907.067	911.09	911.09	-	"
S-8	175586.3361	1570875.693	911.25	911.25	-	"
S-9	175627.7049	1570847.611	910.89	910.89	-	"
S-10	175669.0737	1570819.528	910.16	910.16	4.0	"
S-11	175710.4425	1570791.446	911.04	911.04	-	"
S-12	175751.8114	1570763.363	911.72	911.72	-	"
S-13	175793.1802	1570735.281	912.62	912.62	-	"
S-14	175834.5490	1570707.199	913.21	913.21	3.5	"
S-15	175875.9178	1570679.116	913.01	913.01	-	"
S-16	175917.2866	1570651.034	912.72	912.72	-	"
S-17	175958.6554	1570622.951	913.00	913.00	4.0	"
S-18	175998.1740	1570575.089	-	-	-	See Notes 1 and 4
S-19	176014.5114	1570527.834	-	-	-	"
S-20	176034.1046	1570471.082	912.61	912.61	-	"
S-21	176051.3194	1570421.511	915.56	915.56	-	See Note 1
S-22	176083.4415	1570406.022	915.66	915.66	-	"
S-23	176130.0679	1570383.491	914.36	914.36	3.5	"
S-24	176175.1071	1570361.778	913.36	913.36	-	"
S-25	176217.1667	1570341.460	913.97	913.97	-	"
S-26	176278.3667	1570312.041	916.71	916.71	2.0	"
S-27	176312.7394	1570320.209	913.55	913.55	-	"
S-28	176361.3838	1570331.890	-	-	-	See Notes 1 and 2
S-29	176398.3915	1570340.710	913.64	913.64	-	See Note 1
S-30	176458.6310	1570355.192	914.22	914.22	3.5	"
S-31	176507.2546	1570366.843	915.05	915.05	-	"
S-32	176555.4766	1570378.397	915.80	915.80	-	"
S-33	176605.1595	1570369.849	916.07	916.07	-	"
S-34	176646.7056	1570362.700	915.82	915.82	2.0	"
S-35	176703.0549	1570349.692	-	-	-	"
S-36	176751.6898	1570338.088	-	-	-	See Notes 1 and 4
S-37	176803.0109	1570318.162	-	-	-	"
S-38	176852.4775	1570310.878	-	-	-	"
S-39	176901.9441	1570303.594	-	-	-	"
S-40	176951.4107	1570296.310	-	-	-	"
S-41	176997.1533	1570289.574	-	-	4.0	"
S-42	177050.3439	1570281.742	-	-	-	"
S-43	177097.5240	1570274.795	-	-	2.0	"
S-44	177129.5201	1570242.908	-	-	-	See Notes 1 and 4

SOUNDING SUMMARY

Sounding No.	Sounding Coordinates		Ground Surface Elevations		Depth to Top of Bedrock (ft.)	Comments
	Northing	Easting	As-Staked Elevation (ft.)	As-Drilled Ground Surface Elevation (ft.)		
S-45	177160.4236	1570203.602	-	-	6.8	"
S-47	177486.1737	1569995.241	924.21	924.21	12.5	-
S-49	177607.3527	1569917.526	923.34	923.34	-	See Note 2
S-50	177662.6310	1569911.112	923.98	923.98	-	"
S-51	177706.6864	1569906.001	924.58	926.18	2.5	Offset 23.9' East
S-52	177758.4309	1569899.998	927.14	927.54	2.3	Offset 1.5' East
S-53	177804.6845	1569887.515	926.65	928.05	2.1	Offset 15.2' East
S-54	177852.9574	1569874.487	927.88	929.88	13.9	Offset 21.4' East
S-55	177901.2303	1569861.459	928.03	930.33	4.2	Offset 27.4' East
S-56	177954.5936	1569847.057	927.93	928.43	13.6	Offset 26.5' East
S-57	178003.1075	1569832.575	930.11	931.11	16.8	Offset 34.7' East
S-58	178040.9615	1569810.274	930.42	931.62	15.5	Offset 51.5' East
S-59	178084.0417	1569784.895	930.32	931.92	1.1	Offset 70.3' East
S-62	178300.2044	1569684.217	927.93	927.93	11.8	Offset 18.8' West
S-63	178357.5394	1569678.297	927.43	927.43	11.1	Offset 5.5' East
S-64	178392.3681	1569674.700	927.33	927.33	3.7	-
S-68	179194.0927	1569823.044	941.44	941.44	7.6	-
S-70	179300.9294	1569877.808	938.79	938.79	4.0	-
S-71	179350.4647	1569871.007	938.43	938.43	3.9	-
S-72	179400.0000	1569864.206	936.57	936.57	2.1	-
S-73	179449.5353	1569857.405	936.71	938.21	3.4	Offset 5.8' West
S-74	179499.0706	1569850.604	936.34	937.94	4.1	Offset 5.0' West
S-75	179548.6059	1569843.803	935.72	937.12	5.9	Offset 6.3' West
S-76	179598.1412	1569837.002	936.02	937.02	8.2	Offset 4.9' West
S-77	179638.7962	1569831.578	937.08	937.08	6.4	-
S-78	179710.1778	1569822.247	938.13	938.13	2.9	-
S-79	179746.8613	1569817.451	938.58	938.58	3.3	-
S-80	179796.4395	1569810.970	939.15	939.15	2.9	-
S-81	179846.0176	1569804.489	940.03	940.03	2.9	-
S-82	179895.5958	1569798.008	940.35	940.35	14.2	-
S-83	179945.1740	1569791.526	941.20	941.20	9.2	-
S-84	180020.0035	1569781.744	943.17	943.17	11.3	-
S-85	180094.0067	1569772.867	944.88	944.88	2.3	-
S-86	180143.6508	1569766.912	945.80	944.80	3.3	Offset 2.6' West
S-87	180193.2949	1569760.957	946.19	946.19	4.4	-
S-88	180242.9390	1569755.001	947.45	946.15	0.5	Offset 3.2' West, 3.6' North
S-89	180292.5831	1569749.046	946.94	946.44	2.8	Offset 1.0' West
S-90	180342.2272	1569743.091	947.17	946.37	5.4	Offset 3.0' West
S-91	180410.4241	1569734.910	945.95	945.35	3.7	Offset 3.0' West
S-92	180484.6074	1569767.563	944.91	944.91	1.9	-
S-93	180500.1725	1569815.355	947.21	947.21	8.8	-
S-94	180524.6803	1569890.604	950.55	950.55	1.8	-
S-95	180557.7812	1569937.887	952.95	952.95	2.7	-
S-96	180595.6679	1569992.005	954.54	954.54	2.5	-

SOUNDING SUMMARY

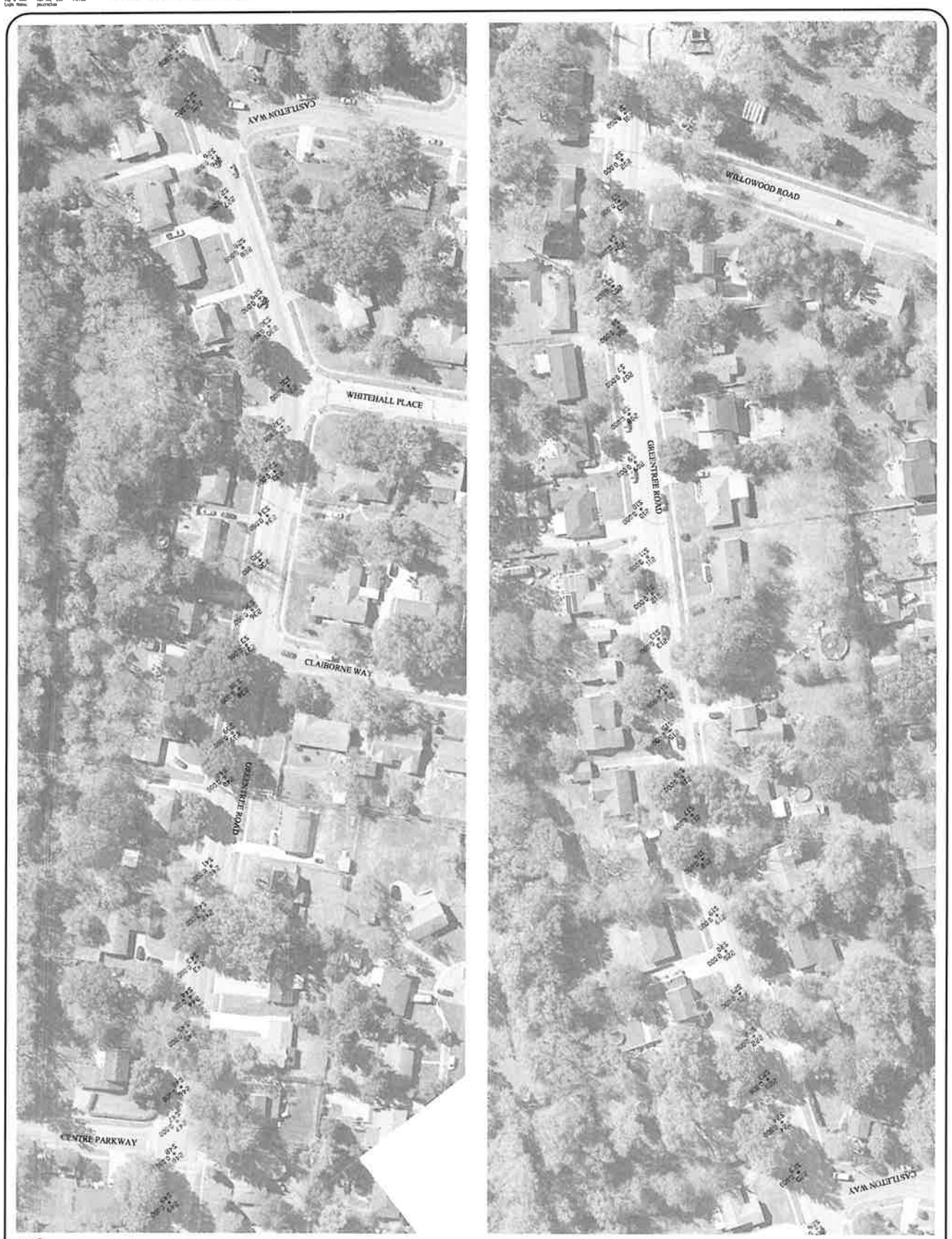
Sounding No.	Sounding Coordinates		Ground Surface Elevations		Depth to Top of Bedrock (ft.)	Comments
	Northing	Easting	As-Staked Elevation (ft.)	As-Drilled Ground Surface Elevation (ft.)		
S-97	180623.3728	1570031.579	955.33	955.33	2.8	Offset 3.0' North
S-98	180662.6646	1570060.474	956.50	956.50	1.6	-
S-99	180702.9454	1570090.096	957.12	957.12	6.5	-
S-100	180750.6239	1570125.158	957.35	957.35	1.3	-
S-101	180787.5996	1570142.445	957.34	957.34	1.5	-
S-102	180832.8937	1570163.622	957.01	957.01	3.2	-
S-103	180878.1878	1570184.798	956.58	956.58	2.9	-
S-104	180947.6532	1570217.276	955.79	955.79	1.6	-
S-105	181014.0814	1570248.304	955.50	955.50	1.3	-
S-106	181059.3833	1570269.463	955.19	955.19	3.0	-
S-107	181104.6851	1570290.623	954.68	954.68	2.7	-
S-108	181145.0791	1570309.491	955.03	955.03	-	See Note 3
S-109	181180.7063	1570267.044	953.02	953.02	2.3	Offset 7.2' Southeast
S-110	181212.8510	1570228.746	950.82	950.82	3.3	-
S-111	181244.9957	1570190.449	949.21	949.21	5.2	-
S-112	181279.7445	1570154.575	948.76	948.76	8.0	-
S-113	181317.2401	1570118.232	950.59	950.59	2.1	Offset 4.8' Southeast
S-114	181363.8879	1570137.356	944.37	944.37	-	See Note 8
S-115	181410.5859	1570156.500	944.15	944.15	-	"
S-116	181456.9087	1570175.491	945.01	945.01	-	"
S-117	181502.3459	1570194.119	943.03	943.03	-	"
S-118	181532.9948	1570206.684	945.32	945.32	-	"
S-120	179262.4045	1573832.988	954.47	954.47	-	See Note 5
S-122	178866.3615	1569631.963	957.99	957.99	-	"

Notes:

1) Soundings S-1 through S-45 were inaccessable by drill rig and data reported in this range was obtained by hand equipment.
2) Soundings S-28, S-49 and S-50 were not performed due to conflict with existing overhead utility lines.
3) Sounding S-108 was not performed due to traffic control issues.
4) Sounding locations S-35 through S-45 were not surveyed due to site and/or property access issues.
5) Soundings S-120 and S-122 are planned to be perfomed at a later date when the project borings are drilled.
6) Sounding coordinates and ground surface elevations represent as-staked survey locations. Refer to As-Drilled Elevation and Comments for approximate field-adjusted locations.
7) The As-Drilled Ground Surface Elevations were estimated by field measurements relative to the ground surface elevation at the staked locations.
8) Soundings S-114 through S-118 were not performed due to private property access issues

APPENDIX B – SOUNDINGS EXHIBIT PREPARED BY INTEGRATED ENGINEERING

X:\200126 - West Hickman Trunk Sewers\CADD\Current Drawings\Working Drawings\200126 West Hickman Soundings Exhibit.dwg
Day & Time: Jun 30, 2021 - 7:31am
Login Name: jmccrackin



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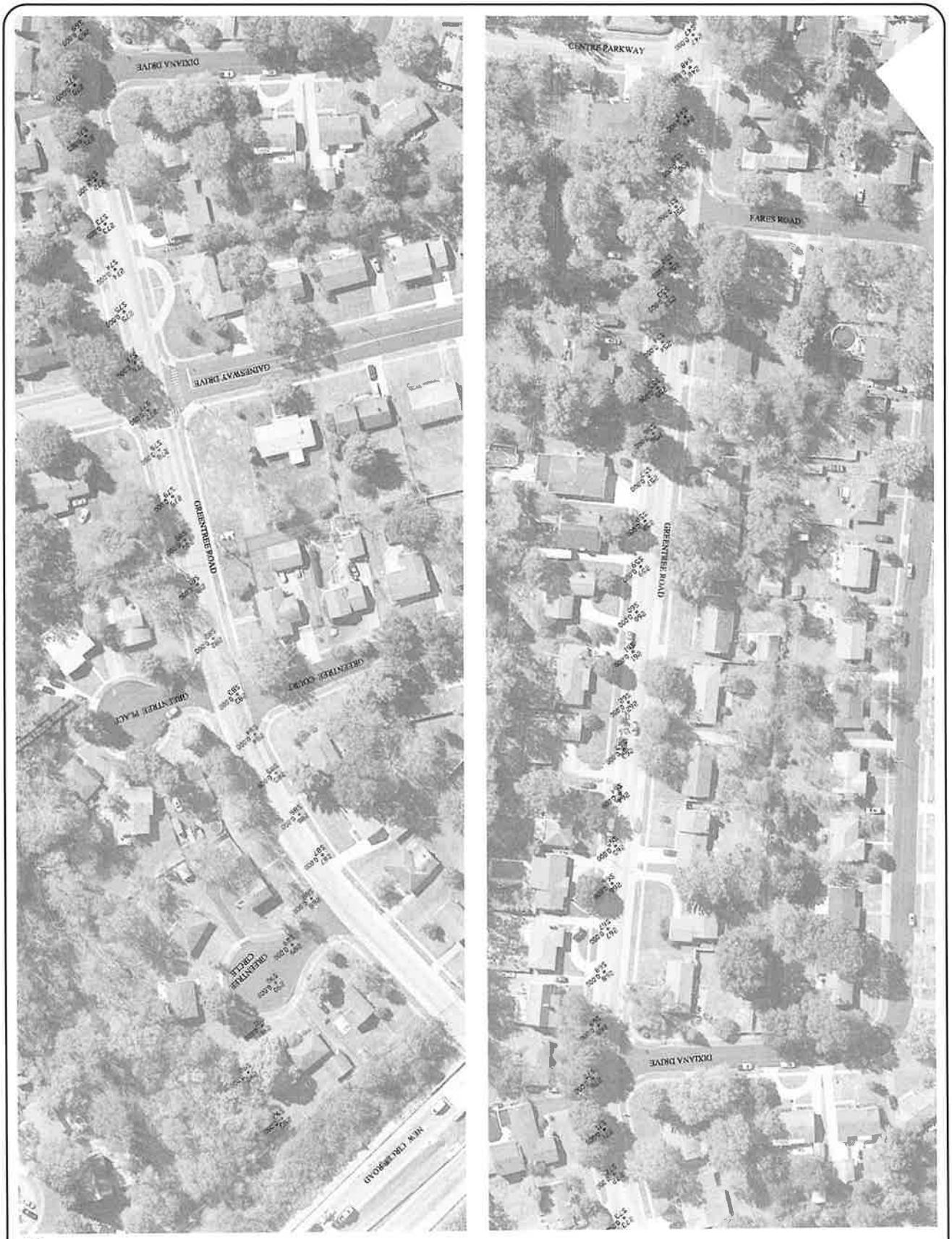
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DESCRIPTION OF REVISION	
PROJECT NO.:	200126
DATE:	JUNE 2021
DRAWN BY:	JFM
CHECKED BY:	

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
WEST HICKMAN DETAILED SOLUTIONS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH-07, WH-08, WH-10, WH-11
LFUCG BID NO. XX-2021

IE INTEGRATED ENGINEERING a PRIME AE COMPANY

SEAL

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Day & Time Jun 30, 2021 - 7:22am
Login Name: jmccracken



SHEET NO.: EX2	SOUNDINGS EXHIBIT	DESCRIPTION OF REVISION	PROJECT NO.: 200126 DATE: JUNE 2021 DRAWN BY: JFM CHECKED BY: -	LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT WEST HICKMAN DETAILED SOLUTIONS DIVISION OF WATER QUALITY REMEDIAL MEASURES PROJECT NO. WH-07, WH-08, WH-10, WH-11 LFUCG BID NO. XX-2021	INTEGRATED ENGINEERING, A PRIME COMPANY	SEAL

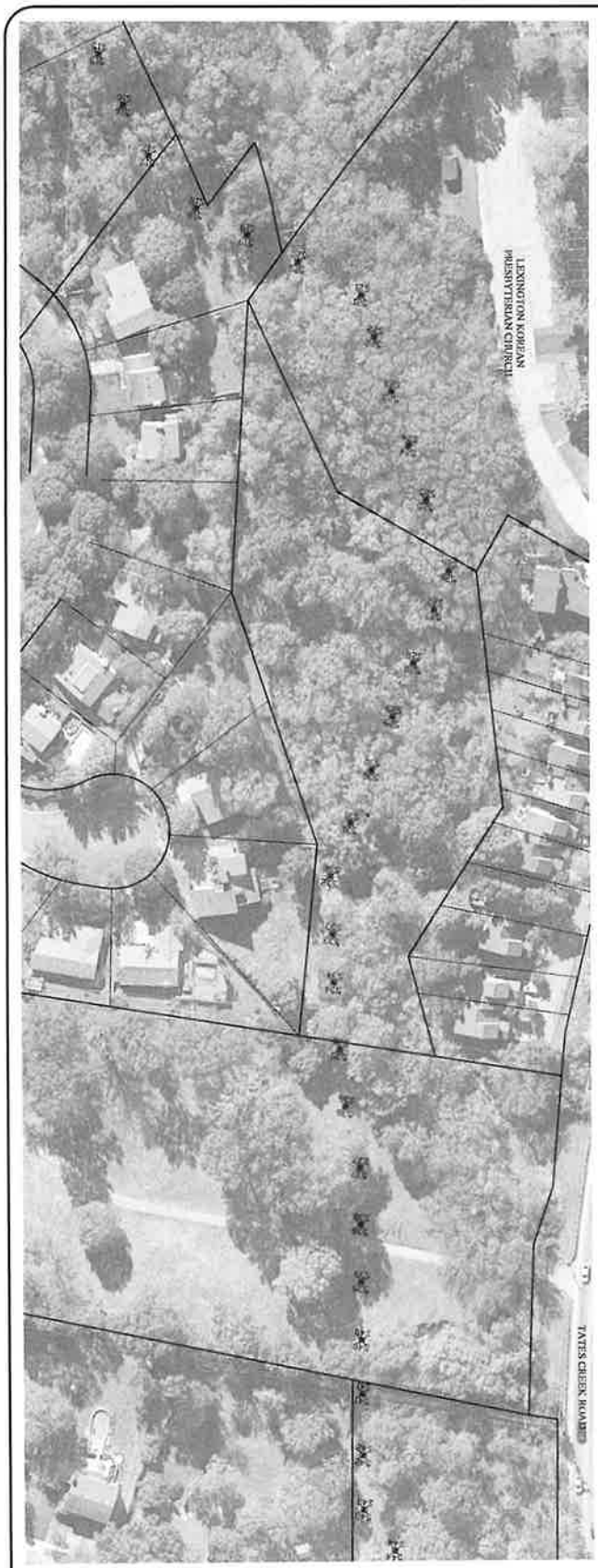
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Login Name jmccrisken

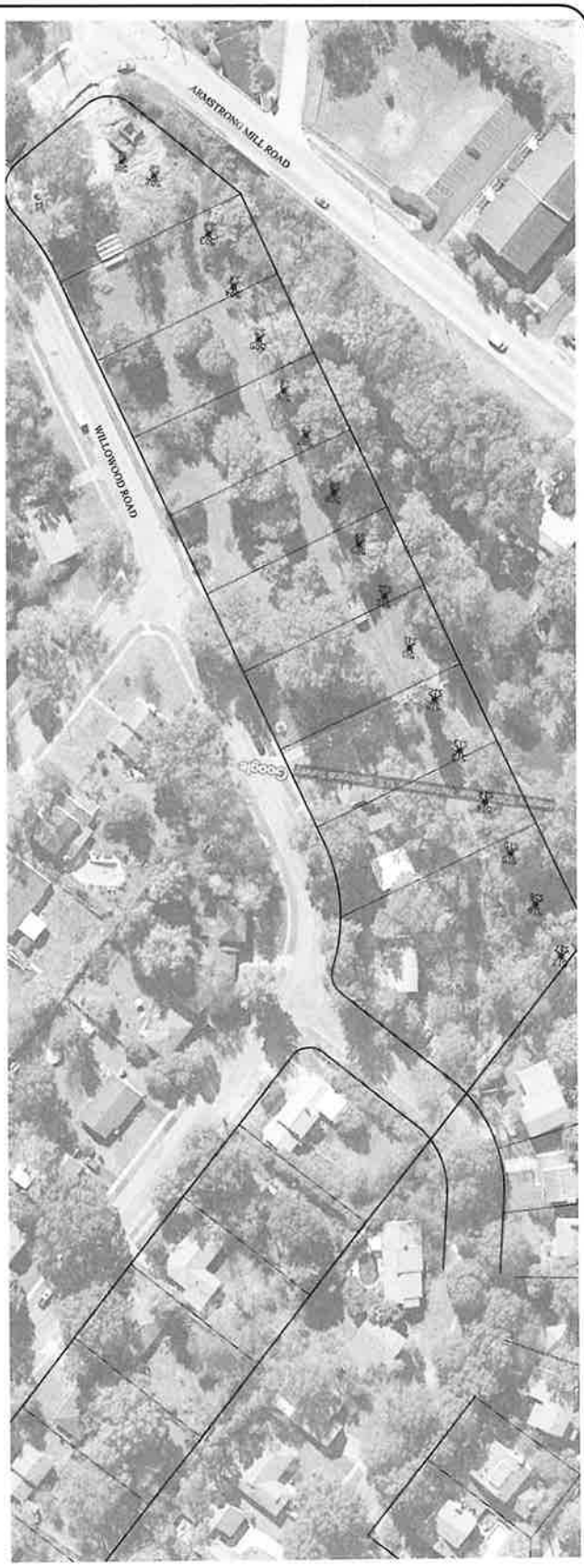


GRAPHIC SCALE: 1" = 40'

SHEET NO. EX3	SOUNDINGS EXHIBIT	DESCRIPTION OF REVISION	PROJECT NO.: 200126 DATE: June 2021 DRAWN BY: JFM CHECKED BY:	LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT WEST HICKMAN DETAILED SOLUTIONS DIVISION OF WATER QUALITY REMEDIAL MEASURES PROJECT NO. WHO7_, WH08, WH10, WH11 LFUCG BID NO. XX2021	IE INTEGRATED ENGINEERING | PRIME AE GROUP COMPANY	SEAL

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Day & Time Oct 26, 2021 - 2:41pm
Login Name: jmccracken





GRAPHIC SCALE: 1" = 50'

N

EX4
SHEET NO

GEOTECHNICAL EXHIBIT

DESCRIPTION OF REVISION

PROJECT NO.:
200126
DATE:
OCTOBER 2021
DRAWN BY:
JFM
CHECKED BY:

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
WEST HICKMAN DETAILED SOLUTIONS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH07, WH08, WH10, WH11
LFUCG BID NO. XX-2021

IE INTEGRATED ENGINEERING a PRIME AE COMPANY

SEAL

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Day & Time: Oct 04, 2021 - 2:49pm
Logo Name: pwcreclam



GRAPHIC SCALE 1" = 50'

N

EX5

SHEET NO.

Geotechnical Exhibit

Description of Revision

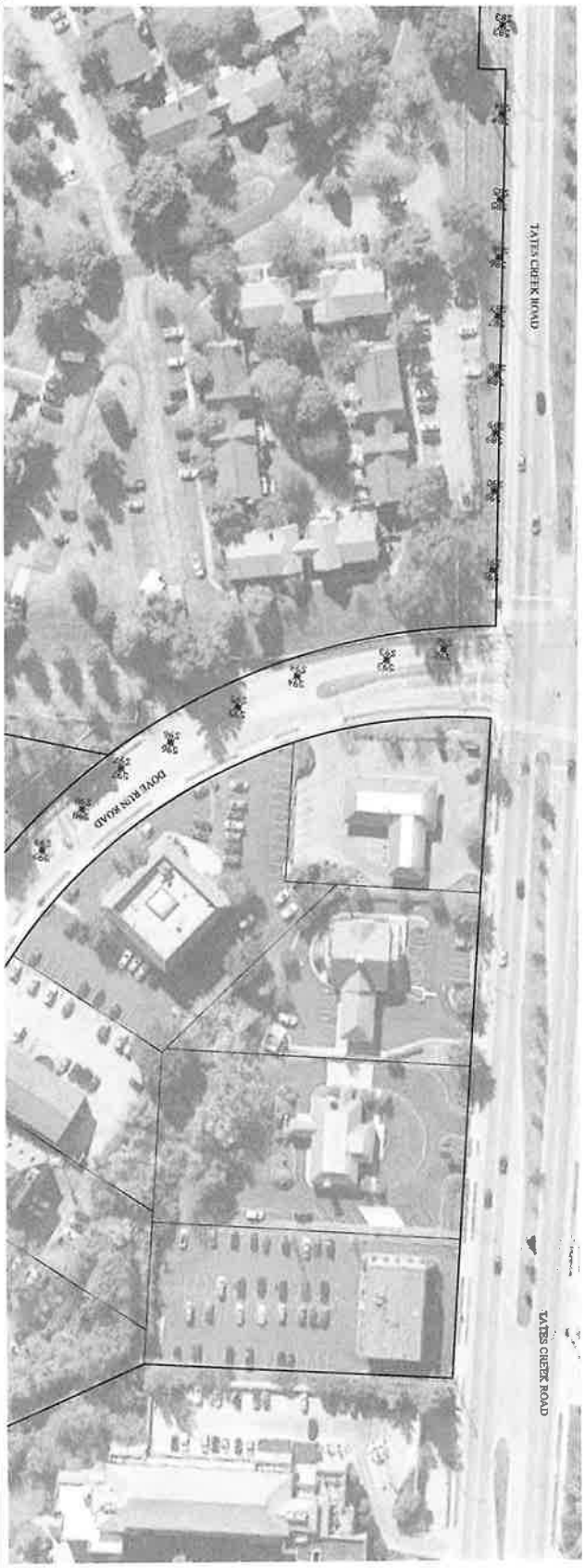
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Date: October 2021
Drawn By: JFM
Checked By:

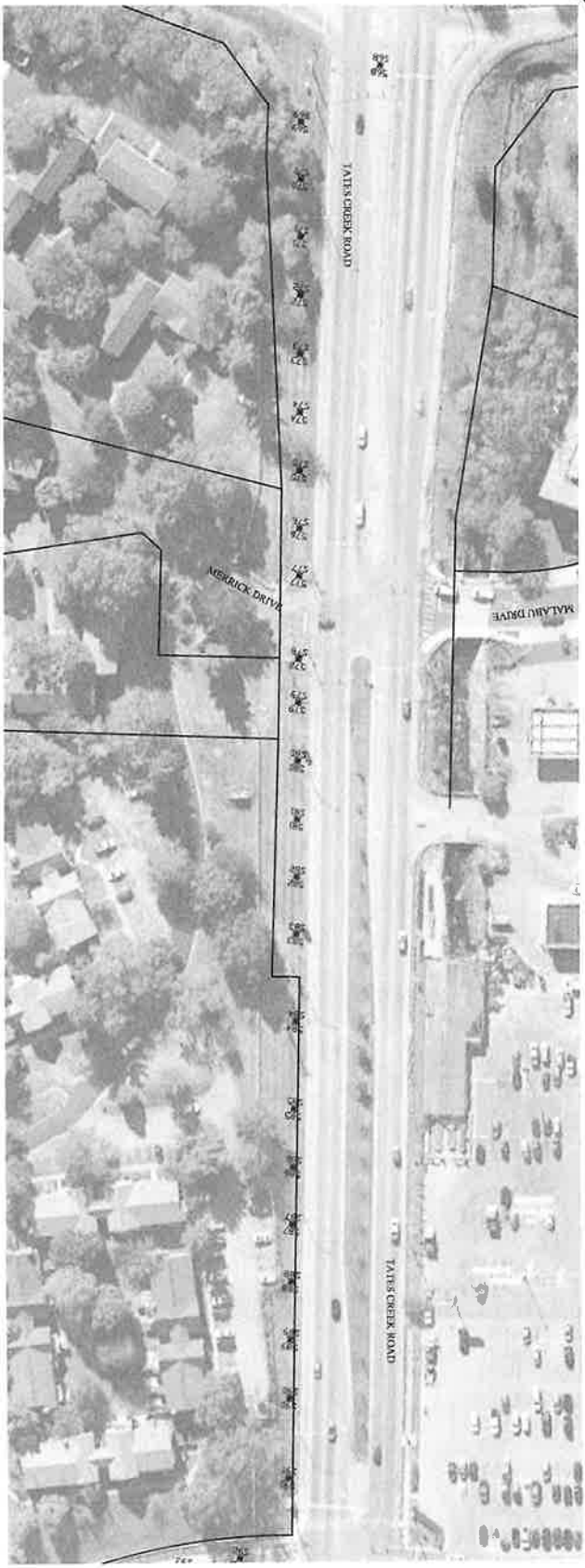
Lexington-Fayette Urban County Government
West Hickman Detailed Solutions
Division of Water Quality
Remedial Measures Project No. WH07, WH08, WH10, WH11
LFUCG Bid No. XX-2021

IE Integrated Engineering | A PRIME AE Company

Seal

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Dig. & Time: Oct 04, 2021 – 2:42pm
Login Name: jaccredolo





GRAPHIC SCALE: 1" = 50'
0
50'
100'
150'

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EX6
SHEET NO.

GEOTECHNICAL EXHIBIT

DESCRIPTION OF REVISION

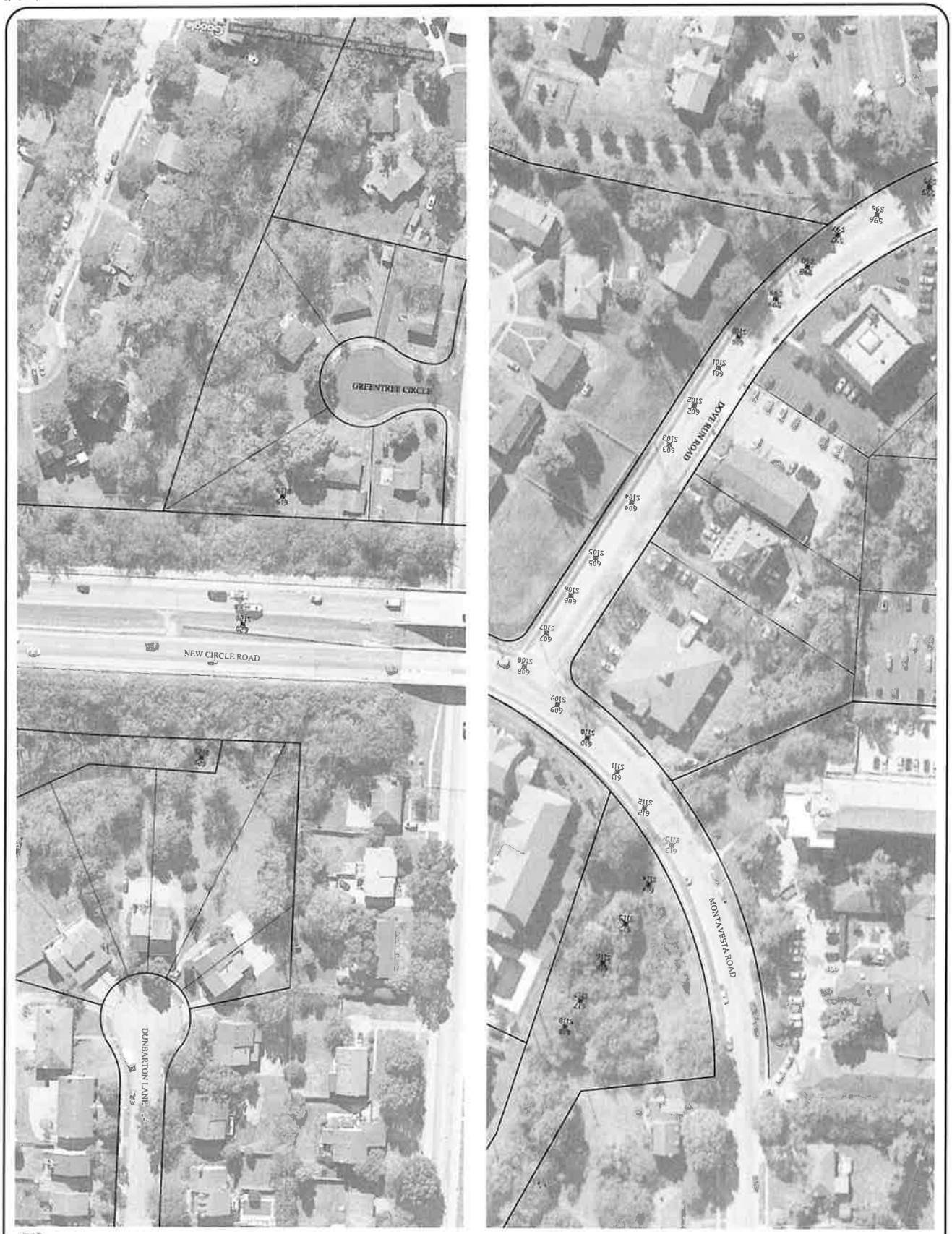
PROJECT NO.:
200126
DATE:
OCTOBER 2021
DRAWN BY:
JFM
CHECKED BY:

LEXINGTON FAYETTE URBAN COUNTY GOVERNMENT
WEST HICKMAN DETAILED SOLUTIONS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH-07, WH-08, WH-10, WH-11
LFUCG BID NO. XX-2021

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Day & Time Oct 04, 2021 - 2:41pm
Login Name jmccracken



0 50' 100' 200'

GRAPHIC SCALE: 1" = 100'

N

SHEET NO. EX7	GEOTECHNICAL EXHIBIT	DESCRIPTION OF REVISION	PROJECT NO.: 200126 DATE: OCTOBER 2021 DRAWN BY: JFM CHECKED BY:	LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT WEST HICKMAN DETAILED SOLUTIONS DIVISION OF WATER QUALITY REMEDIAL MEASURES PROJECT NO. WH07, WH08, WH10, WH11 LFUCG BID NO. XX-2021	IE INTEGRATED ENGINEERING A PRIME COMPANY	SEAL

GEOTECHNOLOGY
A Universal Engineering Sciences Company

March 18, 2022

Mr. Eddie Mesta, PE
Integrated Engineering, PLLC
166 Prosperous Place
Suite 220
Lexington, Kentucky 40509

Re: Rockline Sounding Report
LFUCG West Hickman Main Trunk E & Merrick Trunk
Lexington, Kentucky
Geotechnology Project No. J038336.02

Dear Mr. Mesta:

Presented in this report are the results of our bedrock soundings completed for the West Hickman Main Trunk E and Merrick Trunk Sewer Project in Lexington, Kentucky. Our services were performed in general accordance with the Prime AE Subcontract Agreement for Professional Services, which was signed for authorization on April 28, 2021.

1.0 PROJECT CHARACTERISTICS

The West Hickman Trunk E (WHTE) sewer will have a total length of about 6,920 lineal feet, which will include the following:

- 5,371 lineal feet of 30-inch-diameter pipe;
- 1,086 lineal feet of 42-inch-diameter PVC pipe; and
- 463 lineal feet of 48-inch-diameter PVC pipe.

The WHTE sewer will begin at Station 0+00 on Greentree Road between the intersections with Armstrong Mill Road and Willowood Road. This proposed sewer will follow Greentree Road north until Greentree Circle. At Greentree Circle, the proposed sewer alignment will bend to the east and continue past the end of the cul-de-sac. The proposed alignment will turn to the north along the east boundary of 3374 Greentree Circle and will cross beneath New Circle Road. The proposed sewer will then bear east on the north side of New Circle towards the Chinoe Creek Apartments and continue along the south boundary of said apartments. The proposed sewer alignment will end at about Station 69+20, where it will tie into an existing sanitary sewer.

The proposed Merrick Trunk (MT) sewer will have a total length of 6,224 lineal feet and will consist of 24-inch-diameter PVC pipe. The MT sewer will begin at Station 0+00 near the intersection of Armstrong Mill Road and Greentree Road. The proposed alignment will extend north along the rear of the properties that front onto Willowood and Winding Drives. The proposed sewer will continue north towards Tates Creek Road, and will follow Tates Creek Road to the north until just south of Gainesway Road. From this point, the proposed alignment will cross to the west side of

Tates Creek Road until the north side of New Circle Road. After crossing New Circle Road, the MT sewer will cross back to the east side of Tates Creek Road, where it will continue north to Dove Run Road. The planned alignment follows Dove Run Road to Montavesta Road, where it will tie into the existing sewer at Station 62+24. It is our understanding that alternate alignments are being considered in the vicinity of Dove Run Road as well.

2.0 SCOPE OF WORK

The subsurface exploration for WHTE consisted of 130 rock-line soundings. The sounding locations were selected, staked (or marked) and surveyed in the field by Integrated Engineering, PLLC. Soundings S-1 through S-89 were located on Greentree Road; S-88 through S-91 were located on Greentree Circle; S-92 and S-93 were located on private property off of Greentree Circle; and Soundings S-94 through S-130 were located along the south boundary of the Chinoe Creek Apartments. It should be noted that Soundings S-50 through S-77 were not drilled due to a high concentration of existing utilities in the area. Also, Soundings S-92 and S-93 were not drilled to avoid property access and restoration issues with the private property owner.

The soundings were drilled between July 7 and July 9. Sampling was not performed at any location. As each boring was advanced, the Drilling Foreman kept a tabulation of the depths until auger refusal. It should be noted that "Auger Refusal" as determined in the rockline soundings is defined as rock-like resistance to the advancement of the augers using carbide steel cutting teeth. This may indicate the presence of weathered bedrock, boulders, or rock remnants.

The subsurface exploration for MT was originally planned to include 112 rockline soundings, numbered S-1 through S-45, S-47, S-49 through S-59, S-62 through S-64, S-68, S-70 through S-118, S-120, and S-122. The sounding locations were selected, staked and surveyed in the field by Integrated Engineering, PLLC as follows:

- Soundings S-1 through S-45 were located on private property east of the properties that front onto Willowood and Winding Drives, and extending along the proposed alignment towards Tates Creek Road;
- Sounding S-47 was located in the median strip on Tates Creek Road, where the alignment will cross the roadway;
- Soundings S-49 through S-59 and S-62 through S-64 were located to the east of and roughly parallel to Tates Creek Road, between Gainesway Drive and New Circle Road;
- Soundings S-68 and S-70 through S-91 followed along the west edge of Tates Creek Road from New Circle Road to Dove Run Road;
- S-92 through S-108 were located in the pavement along the northbound lane of Dove Run Road from Tates Creek Road to Montavesta Road;

- S-109 through S-113 were located in the pavement along Montavesta Road, extending northeast from the intersection with Dove Run Road; and

- S-114 through S-118 were located on private property along the east boundary of The Reserve at Merrick Apartments & Townhomes.

Of the 112 planned soundings for MT, 42 were not performed due to private property access issues, site access issues, conflicts with overhead utilities, and traffic control issues as noted in the Sounding Summary in Appendix B. In addition, two of the soundings were scheduled to be completed at a later date along with borings near several proposed roadway crossings. The 70 completed soundings were drilled by a Geotechnology drilling crew between November 1 and November 10, 2021 or performed with hand equipment by Geotechnology between December 20 and 21, 2021. Sampling was not performed at the sounding locations. As each boring was advanced, the Drilling Foreman kept a tabulation of the auger refusal depths. It should be noted that "Auger Refusal" as determined in the rockline soundings is defined as rock-like resistance to the advancement of the augers using carbide steel cutting teeth. This may indicate the presence of weathered bedrock, boulders, or rock remnants.

3.0 SOUNDING DEPTHS

According to the 1967 United States Geological Survey (USGS) Geologic Map of the Coletown Quadrangle, East-Central Kentucky, the bedrock along the proposed WHTE Sewer alignment, is a limestone bedrock belonging to the Tanglewood Limestone Member No. 2 in the Lexington Limestone Formation.

Bedrock was encountered in the completed soundings at depths ranging from 1.3 feet to 10.4 feet, with an average depth of 4.7 feet. Auger refusal occurred at depths ranging from 1.6 feet to 12.1 feet, with an average depth of 6.1 feet. A more accurate determination regarding the location of the top of rock cannot be made without performing rock coring. More detailed rockline sounding depths are provided in Appendix A.

According to the United States Geological Survey (USGS) Geologic Map of the Coletown Quadrangle, East-Central Kentucky (Black, 1967), two geologic fault lines, which extend in a northeast to southwest direction are shown to cross the proposed Merrick Trunk sewer alignment. The first fault line intersects the alignment near the Tates Creek Road and New Circle Road intersection, and the second intersects the alignment north of the Tates Creek Road and Armstrong Mill Road intersection. The referenced map shows that the bedrock underlying the overburden soils in the area between the faults along Tates Creek Road is from the Clays Ferry Formation and that the bedrock underlying the ground surface along the proposed Merrick Trunk north of New Circle Road is from the Grier and Curdsville Members of the Lower Part of the Lexington Limestone formation. South of the southern fault line, the map indicates that the bedrock belongs to the Tanglewood Limestone Member No. 2 formation.

Auger refusal was encountered in the completed soundings at depths ranging from 0.5 feet to 16.8 feet below ground surface, with an average depth of 4.8 feet. It should be noted that auger refusal and top of bedrock are not necessarily encountered at the same elevation in the soundings. Top of bedrock may be encountered before or after auger refusal. A more accurate determination regarding the location of the top of rock cannot be made without performing sampling and rock coring. More detailed rockline sounding depths are provided in the Sounding Summary in Appendix A.

4.0 CLOSURE

We appreciate the opportunity to provide drilling services for the proposed project. Should you have any questions concerning the information included in this report, please do not hesitate to contact us.

Respectfully submitted,
GEOTECHNOLOGY, LLC

Matthew K. Barker
Geotechnical Manager

MKB/MEC:tmk

Copy emailed: Integrated Engineering, PLLC

APPENDIX A – SEWER SOUNDING DEPTHS

APPENDIX B – SOUNDINGS EXHIBIT PREPARED BY INTEGRATED ENGINEERING

SOUNDING DEPTHS

Sounding No.	Sounding Coordinates		Ground Surface Elevation (feet)	Depth to Top of Bedrock (feet)	Depth to Auger Refusal (feet)	Comments
	Northing	Easting				
S-1	175317.2987	1571212.258	912.53	8.2	8.5	Offset 5' South
S-2	175355.6584	1571246.981	912.56	5.4	6.1	Offset 6' East
S-3	175389.74	1571277.752	912.43	4.3	5.5	Offset 7' South
S-4	175424.1638	1571308.899	912.13	1.8	2.4	
S-5	175459.0109	1571340.435	912.21	4.3	4.6	Offset 10' South
S-6	175498.6006	1571364.087	912.53	4.2	5.0	Offset 5' East
S-7	175541.5231	1571389.759	912.80	3.3	6.6	
S-8	175581.3328	1571413.486	912.91	4.0	4.4	Offset 5' Southeast
S-9	175627.3637	1571441.056	913.16	4.1	5.8	
S-10	175672.3776	1571467.954	913.34	3.5	6.7	Offset 10' Northeast
S-11	175718.5929	1571494.844	913.65	4.4	7.1	Offset 5' Northeast
S-12	175754.4253	1571515.81	913.94	3.4	4.3	Offset 8' North
S-13	175797.6088	1571540.929	914.07	5.1	9.4	Offset 15' Norteast
S-14	175849.9111	1571571.477	914.42	4.2	7.3	Offset 5' South
S-15	175885.7947	1571592.45	914.84	5.3	7.1	Offset 8' South
S-16	175934.9705	1571613.989	914.91	7.0	8.3	
S-17	175974.7652	1571631.438	915.42	3.0	3.4	Offset 5' Northwest
S-18	176020.5228	1571651.478	915.39	3.7	6.5	Offset 5' Northwest
S-19	176079.0704	1571677.144	915.82	3.8	6.4	Offset 5' Northeast
S-20	176116.617	1571693.591	916.09	5.0	12.1	Offset 8' Northeast
S-21	176163.5693	1571710.328	916.18	4.3	5.8	
S-22	176210.6964	1571727.134	916.61	2.4	6.2	Offset 5' North
S-23	176257.8099	1571743.915	916.91	2.0	3.5	Offset 10' Northeast
S-24	176304.9175	1571760.723	917.13	3.2	8.5	Offset 10' Southwest
S-25	176359.6232	1571780.243	917.35	3.3	3.9	
S-26	176422.0818	1571802.375	917.59	3.6	7.2	
S-27	176465.4227	1571817.681	917.83	5.0	8.2	
S-28	176520.6925	1571837.331	918.11	3.1	8.5	
S-29	176576.1207	1571856.981	918.45	4.9	6.2	Offset 7' Northeast
S-30	176606.7991	1571867.782	918.59	5.2	6.2	
S-31	176672.1652	1571891.006	919.15	5.4	5.7	Offset 10' South
S-32	176703.389	1571925.059	919.24	6.2	7.4	
S-33	176737.2697	1571961.805	919.36	5.9	6.9	
S-34	176771.2082	1571998.555	919.29	6.3	6.5	
S-35	176805.16	1572035.33	919.21	5.4	7.5	Offset 10' East
S-36	176843.0411	1572076.077	918.84	4.3	5.2	
S-37	176869.9465	1572105.194	918.80	3.1	5.0	Offset 10' Northwest

SOUNDING DEPTHS

Sounding No.	Sounding Coordinates		Ground Surface Elevation (feet)	Depth to Top of Bedrock (feet)	Depth to Auger Refusal (feet)	Comments
	Northing	Easting				
S-38	176903.0612	1572140.937	919.26	5.0	5.3	
S-39	176937.1508	1572177.525	918.08	3.8	4.3	Offset 3' Southeast
S-40	176971.3224	1572214.066	917.98	4.0	4.4	Offset 5' Southeast
S-41	177039.7232	1572286.959	917.91	3.4	3.7	Offset 3' South
S-42	177073.6867	1572323.657	919.00	3.3	4.3	Offset 4' Southeast
S-43	177113.5447	1572366.038	918.63	3.1	3.3	Offset 4' Southeast
S-44	177139.8733	1572394.26	919.02	4.2	5.4	Offset 5' Northwest
S-45	177168.1146	1572421.403	919.36	3.3	4.4	Offset 5' Northeast
S-46	177212.7304	1572463.933	920.05	5.0	5.8	Offset 10' Southwest
S-47	177240.4379	1572490.499	920.38	5.0	5.6	Offset 12' Southwest
S-48	177266.17	1572515.035	920.82	5.2	10.3	Offset 12' Southwest
S-49	177305.291	1572552.798	921.22	10.4	10.9	Offset 15' Northeast
S-78	178451.6834	1573464.88	925.40	3.2	3.5	Offset 10' East
S-79	178501.4914	1573485.315	925.99	6.2	6.8	Offset 5' Southeast
S-80	178547.7372	1573504.199	926.39	7.7	8.6	
S-81	178594.3884	1573523.337	926.43	8.4	8.8	
S-82	178651.8148	1573545.794	926.42	9.3	9.8	
S-83	178717.037	1573562.797	926.52	8.3	8.7	Offset 4' Northwest
S-84	178764.2384	1573575.18	925.71	4.9	6.2	Offset 8' East
S-85	178812.6911	1573583.54	925.58	1.3	1.6	Offset 10' Southeast
S-86	178864.6388	1573591.393	927.01	2.0	2.3	Offset 10' East
S-87	178915.5383	1573599.027	927.14	2.3	3.1	Offset 8' South
S-88	178945.6342	1573638.403	927.39	3.8	4.3	Offset 10' West
S-89	178972.33	1573686.558	926.58	3.4	4.7	Offset 10' Northeast
S-90	178993.7941	1573727.139	925.92	3.9	4.2	
S-91	179022.4741	1573768.508	926.39	3.4	5.0	Offset 10' Southeast
S-94	179434.2731	1573852.02	926.19	3.3	3.5	
S-95	179453.2369	1573897.339	925.96	3.9	4.1	
S-96	179484.0007	1573939.843	927.29	5.9	6.1	Offset 10' East
S-97	179498.3655	1573986.607	927.88	5.5	5.9	
S-98	179515.9511	1574014.602	927.88	5.4	6.3	
S-99	179525.1991	1574051.867	927.83	5.1	5.8	
S-100	179554.5664	1574095.087	927.44	6.0	8.0	
S-101	179582.6217	1574136.448	927.73	5.2	6.4	
S-102	179610.7066	1574177.84	929.17	5.7	7.8	
S-103	179638.8289	1574219.237	928.74	7.7	8.3	
S-104	179668.9998	1574263.647	930.33	5.1	6.6	

SOUNDING DEPTHS

Sounding No.	Sounding Coordinates		Ground Surface Elevation (feet)	Depth to Top of Bedrock (feet)	Depth to Auger Refusal (feet)	Comments
	Northing	Easting				
S-105	179680.6204	1574314.149	927.44	4.3	4.6	
S-106	179692.276	1574362.752	928.88	3.3	6.2	
S-107	179703.9411	1574411.418	928.86	4.3	5.4	
S-108	179715.6147	1574460.011	928.38	3.4	4.0	
S-109	179729.133	1574513.885	928.73	4.3	5.2	
S-110	179739.0128	1574557.23	928.29	4.2	5.1	
S-111	179750.695	1574605.841	928.60	4.1	5.2	
S-112	179763.2141	1574655.6	928.26	3.1	4.1	
S-113	179813.1082	1574688.443	928.47	4.2	7.6	
S-114	179855.5883	1574714.954	929.01	6.4	8.5	
S-115	179897.999	1574741.42	928.48	4.2	7.3	
S-116	179940.3748	1574767.883	930.65	5.2	6.1	
S-117	179982.8745	1574794.336	929.25	6.0	8.4	
S-118	180031.0915	1574824.461	929.86	8.8	9.2	
S-119	180074.6729	1574869.875	930.84	5.2	6.8	
S-120	180109.4538	1574905.85	930.65	5.1	7.2	
S-121	180144.1553	1574941.802	930.33	4.9	5.2	
S-122	180178.9139	1574977.795	930.42	4.8	5.1	
S-123	180222.8423	1575023.063	929.29	4.1	4.3	
S-124	180272.2325	1575030.393	929.09	4.1	4.3	
S-125	180321.769	1575037.315	929.58	5.0	6.7	
S-126	180372.4588	1575032.338	929.79	4.4	7.0	
S-127	180422.524	1575038.872	929.96	4.6	4.9	
S-128	180472.0133	1575045.775	929.8	9.7	10.4	
S-129	180521.5266	1575052.675	932.63	5.4	7.2	
S-130	180568.7413	1575059.315	933.18	6.1	6.8	

SOUNDING SUMMARY

Sounding No.	Sounding Coordinates		Ground Surface Elevations		Depth to Top of Bedrock (ft.)	Comments
	Northing	Easting	As-Staked Elevation (ft.)	As-Drilled Ground Surface Elevation (ft.)		
S-1	175328.3795	1571099.988	911.49	911.49	-	See Note 1
S-2	175336.8467	1571070.087	909.01	909.01	5.0	"
S-3	175379.4920	1571016.105	910.38	910.38	-	"
S-4	175420.8608	1570988.023	910.70	910.70	-	"
S-5	175462.2296	1570959.940	910.44	910.44	-	"
S-6	175503.5985	1570931.858	911.17	911.17	6.6	"
S-7	175540.1179	1570907.067	911.09	911.09	-	"
S-8	175586.3361	1570875.693	911.25	911.25	-	"
S-9	175627.7049	1570847.611	910.89	910.89	-	"
S-10	175669.0737	1570819.528	910.16	910.16	4.0	"
S-11	175710.4425	1570791.446	911.04	911.04	-	"
S-12	175751.8114	1570763.363	911.72	911.72	-	"
S-13	175793.1802	1570735.281	912.62	912.62	-	"
S-14	175834.5490	1570707.199	913.21	913.21	3.5	"
S-15	175875.9178	1570679.116	913.01	913.01	-	"
S-16	175917.2866	1570651.034	912.72	912.72	-	"
S-17	175958.6554	1570622.951	913.00	913.00	4.0	"
S-18	175998.1740	1570575.089	-	-	-	See Notes 1 and 4
S-19	176014.5114	1570527.834	-	-	-	"
S-20	176034.1046	1570471.082	912.61	912.61	-	"
S-21	176051.3194	1570421.511	915.56	915.56	-	See Note 1
S-22	176083.4415	1570406.022	915.66	915.66	-	"
S-23	176130.0679	1570383.491	914.36	914.36	3.5	"
S-24	176175.1071	1570361.778	913.36	913.36	-	"
S-25	176217.1667	1570341.460	913.97	913.97	-	"
S-26	176278.3667	1570312.041	916.71	916.71	2.0	"
S-27	176312.7394	1570320.209	913.55	913.55	-	"
S-28	176361.3838	1570331.890	-	-	-	See Notes 1 and 2
S-29	176398.3915	1570340.710	913.64	913.64	-	See Note 1
S-30	176458.6310	1570355.192	914.22	914.22	3.5	"
S-31	176507.2546	1570366.843	915.05	915.05	-	"
S-32	176555.4766	1570378.397	915.80	915.80	-	"
S-33	176605.1595	1570369.849	916.07	916.07	-	"
S-34	176646.7056	1570362.700	915.82	915.82	2.0	"
S-35	176703.0549	1570349.692	-	-	-	"
S-36	176751.6898	1570338.088	-	-	-	See Notes 1 and 4
S-37	176803.0109	1570318.162	-	-	-	"
S-38	176852.4775	1570310.878	-	-	-	"
S-39	176901.9441	1570303.594	-	-	-	"
S-40	176951.4107	1570296.310	-	-	-	"
S-41	176997.1533	1570289.574	-	-	4.0	"
S-42	177050.3439	1570281.742	-	-	-	"
S-43	177097.5240	1570274.795	-	-	2.0	"
S-44	177129.5201	1570242.908	-	-	-	See Notes 1 and 4

SOUNDING SUMMARY

Sounding No.	Sounding Coordinates		Ground Surface Elevations		Depth to Top of Bedrock (ft.)	Comments
	Northing	Easting	As-Staked Elevation (ft.)	As-Drilled Ground Surface Elevation (ft.)		
S-45	177160.4236	1570203.602	-	-	6.8	"
S-47	177486.1737	1569995.241	924.21	924.21	12.5	-
S-49	177607.3527	1569917.526	923.34	923.34	-	See Note 2
S-50	177662.6310	1569911.112	923.98	923.98	-	"
S-51	177706.6864	1569906.001	924.58	926.18	2.5	Offset 23.9' East
S-52	177758.4309	1569899.998	927.14	927.54	2.3	Offset 1.5' East
S-53	177804.6845	1569887.515	926.65	928.05	2.1	Offset 15.2' East
S-54	177852.9574	1569874.487	927.88	929.88	13.9	Offset 21.4' East
S-55	177901.2303	1569861.459	928.03	930.33	4.2	Offset 27.4' East
S-56	177954.5936	1569847.057	927.93	928.43	13.6	Offset 26.5' East
S-57	178003.1075	1569832.575	930.11	931.11	16.8	Offset 34.7' East
S-58	178040.9615	1569810.274	930.42	931.62	15.5	Offset 51.5' East
S-59	178084.0417	1569784.895	930.32	931.92	1.1	Offset 70.3' East
S-62	178300.2044	1569684.217	927.93	927.93	11.8	Offset 18.8' West
S-63	178357.5394	1569678.297	927.43	927.43	11.1	Offset 5.5' East
S-64	178392.3681	1569674.700	927.33	927.33	3.7	-
S-68	179194.0927	1569823.044	941.44	941.44	7.6	-
S-70	179300.9294	1569877.808	938.79	938.79	4.0	-
S-71	179350.4647	1569871.007	938.43	938.43	3.9	-
S-72	179400.0000	1569864.206	936.57	936.57	2.1	-
S-73	179449.5353	1569857.405	936.71	938.21	3.4	Offset 5.8' West
S-74	179499.0706	1569850.604	936.34	937.94	4.1	Offset 5.0' West
S-75	179548.6059	1569843.803	935.72	937.12	5.9	Offset 6.3' West
S-76	179598.1412	1569837.002	936.02	937.02	8.2	Offset 4.9' West
S-77	179638.7962	1569831.578	937.08	937.08	6.4	-
S-78	179710.1778	1569822.247	938.13	938.13	2.9	-
S-79	179746.8613	1569817.451	938.58	938.58	3.3	-
S-80	179796.4395	1569810.970	939.15	939.15	2.9	-
S-81	179846.0176	1569804.489	940.03	940.03	2.9	-
S-82	179895.5958	1569798.008	940.35	940.35	14.2	-
S-83	179945.1740	1569791.526	941.20	941.20	9.2	-
S-84	180020.0035	1569781.744	943.17	943.17	11.3	-
S-85	180094.0067	1569772.867	944.88	944.88	2.3	-
S-86	180143.6508	1569766.912	945.80	944.80	3.3	Offset 2.6' West
S-87	180193.2949	1569760.957	946.19	946.19	4.4	-
S-88	180242.9390	1569755.001	947.45	946.15	0.5	Offset 3.2' West, 3.6' North
S-89	180292.5831	1569749.046	946.94	946.44	2.8	Offset 1.0' West
S-90	180342.2272	1569743.091	947.17	946.37	5.4	Offset 3.0' West
S-91	180410.4241	1569734.910	945.95	945.35	3.7	Offset 3.0' West
S-92	180484.6074	1569767.563	944.91	944.91	1.9	-
S-93	180500.1725	1569815.355	947.21	947.21	8.8	-
S-94	180524.6803	1569890.604	950.55	950.55	1.8	-
S-95	180557.7812	1569937.887	952.95	952.95	2.7	-
S-96	180595.6679	1569992.005	954.54	954.54	2.5	-

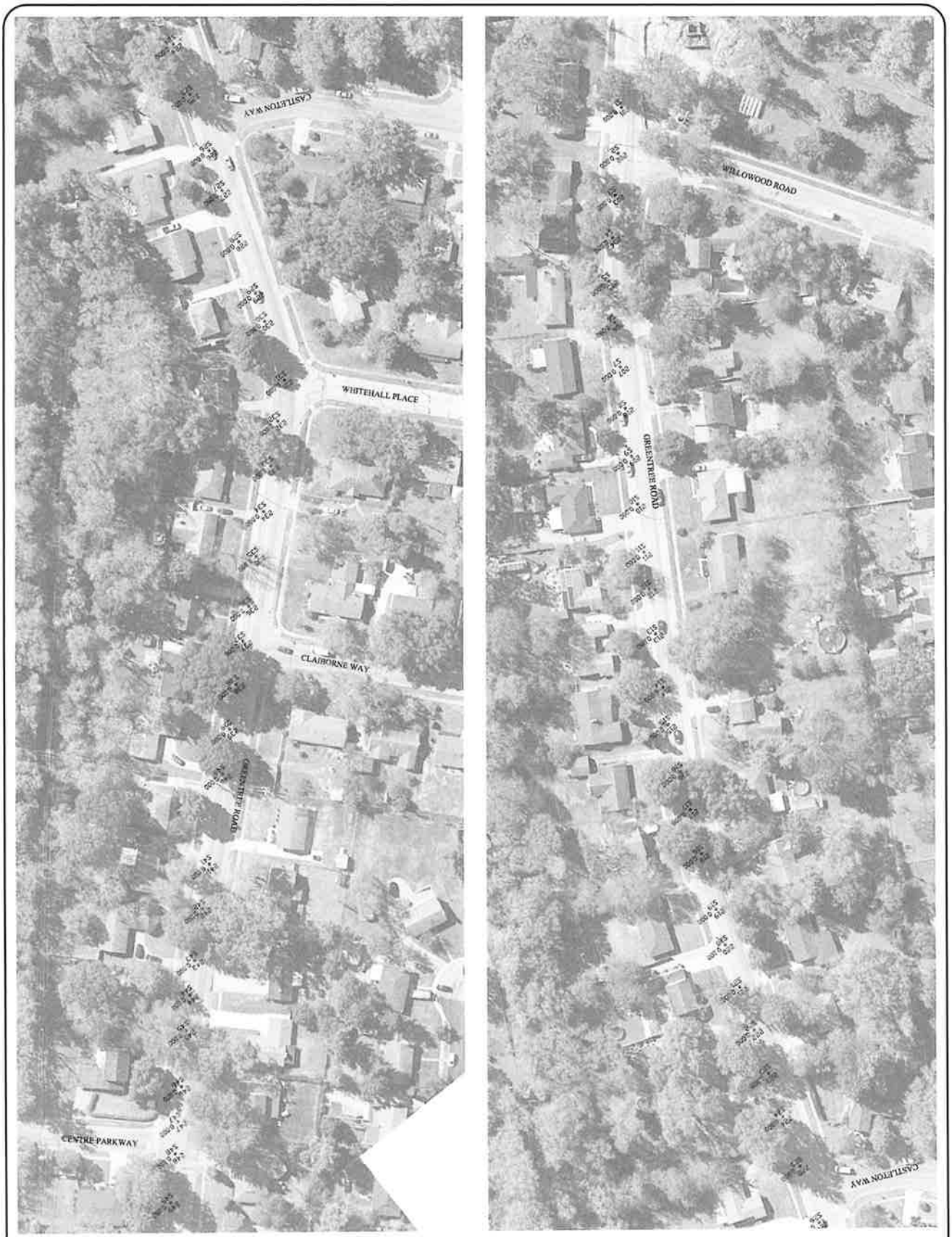
SOUNDING SUMMARY

Sounding No.	Sounding Coordinates		Ground Surface Elevations		Depth to Top of Bedrock (ft.)	Comments
	Northing	Easting	As-Staked Elevation (ft.)	As-Drilled Ground Surface Elevation (ft.)		
S-97	180623.3728	1570031.579	955.33	955.33	2.8	Offset 3.0' North
S-98	180662.6646	1570060.474	956.50	956.50	1.6	-
S-99	180702.9454	1570090.096	957.12	957.12	6.5	-
S-100	180750.6239	1570125.158	957.35	957.35	1.3	-
S-101	180787.5996	1570142.445	957.34	957.34	1.5	-
S-102	180832.8937	1570163.622	957.01	957.01	3.2	-
S-103	180878.1878	1570184.798	956.58	956.58	2.9	-
S-104	180947.6532	1570217.276	955.79	955.79	1.6	-
S-105	181014.0814	1570248.304	955.50	955.50	1.3	-
S-106	181059.3833	1570269.463	955.19	955.19	3.0	-
S-107	181104.6851	1570290.623	954.68	954.68	2.7	-
S-108	181145.0791	1570309.491	955.03	955.03	-	See Note 3
S-109	181180.7063	1570267.044	953.02	953.02	2.3	Offset 7.2' Southeast
S-110	181212.8510	1570228.746	950.82	950.82	3.3	-
S-111	181244.9957	1570190.449	949.21	949.21	5.2	-
S-112	181279.7445	1570154.575	948.76	948.76	8.0	-
S-113	181317.2401	1570118.232	950.59	950.59	2.1	Offset 4.8' Southeast
S-114	181363.8879	1570137.356	944.37	944.37	-	See Note 8
S-115	181410.5859	1570156.500	944.15	944.15	-	"
S-116	181456.9087	1570175.491	945.01	945.01	-	"
S-117	181502.3459	1570194.119	943.03	943.03	-	"
S-118	181532.9948	1570206.684	945.32	945.32	-	"
S-120	179262.4045	1573832.988	954.47	954.47	40.9	
S-122	178866.3615	1569631.963	957.99	957.99	23.2	

Notes:

1) Soundings S-1 through S-45 were inaccessable by drill rig and data reported in this range was obtained by hand equipment.
2) Soundings S-28, S-49 and S-50 were not performed due to conflict with existing overhead utility lines.
3) Sounding S-108 was not performed due to traffic control issues.
4) Sounding locations S-35 through S-45 were not surveyed due to site and/or property access issues.
5) N/A
6) Sounding coordinates and ground surface elevations represent as-staked survey locations. Refer to As-Drilled Elevation and Comments for approximate field-adjusted locations.
7) The As-Drilled Ground Surface Elevations were estimated by field measurements relative to the ground surface elevation at the staked locations.
8) Soundings S-114 through S-118 were not performed due to private property access issues.

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Login Name: jdavis



GRAPHIC SCALE - 1" = 50'

SOUNDINGS EXHIBIT

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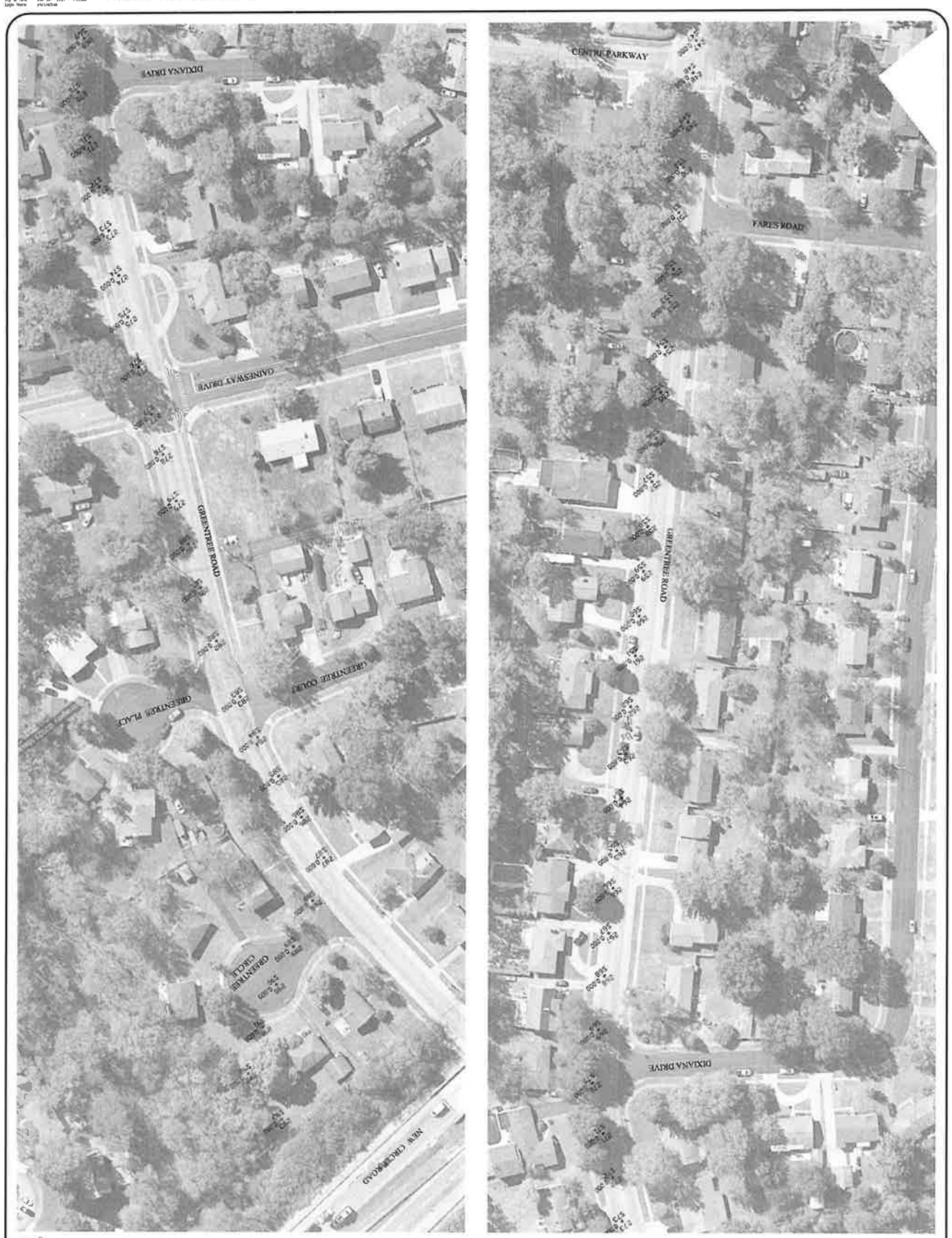
DESCRIPTION OF REVISION

PROJECT NO.:
200126
DATE:
JUNE 2021
DRAWN BY:
JFM
CHECKED BY:

LEXINGTON FAYETTE URBAN COUNTY GOVERNMENT
WEST HICKMAN DETAILED SOLUTIONS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH-07, WH-08, WH-10, WH-11
LFUCG BID NO. XX-2021

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SHEET NO. EX2	SOUNDINGS EXHIBIT	DESCRIPTION OF REVISION	PROJECT NO.: 20016 DATE: JUNE 2021 DRAWN BY: JFM CHECKED BY:	LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT WEST HICKMAN DETAILED SOLUTIONS DIVISION OF WATER QUALITY REMEDIAL MEASURES PROJECT NO. WH-07, WH-08, WH-10, WH-11 LFUCG BID NO. XX-2021	INTEGRATED ENGINEERING a PRIME COMPANY	SEAL

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Login Name jaycmclain









SHEET NO. EX3

SOUNDINGS EXHIBIT

DESCRIPTION OF REVISION

PROJECT NO.: 200126
DATE: JUNE 2021
DRAWN BY: JFM
CHECKED BY:

LEXINGTON FAYETTE URBAN COUNTY GOVERNMENT
WEST HICKMAN DETAILED SOLUTIONS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH-07, WH-08, WH-10, WH-11
LFUCG BID NO. XX-2021

INTEGRATED ENGINEERING a PRIME COMPANY

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Sheet No.	EX4
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DESCRIPTION OF REVISION	
PROJECT NO.:	200126
DATE:	OCTOBER 2021
DRAWN BY:	JPM
CHECKED BY:	

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
WEST HICKMAN DETAILED SOLUTIONS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH-07,
WH-08, WH-10, WH-11
LFUCG BID NO. XX-2021

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SEAL

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SHEET NO. EX3

GEOTECHNICAL EXHIBIT

DESCRIPTION OF REVISION

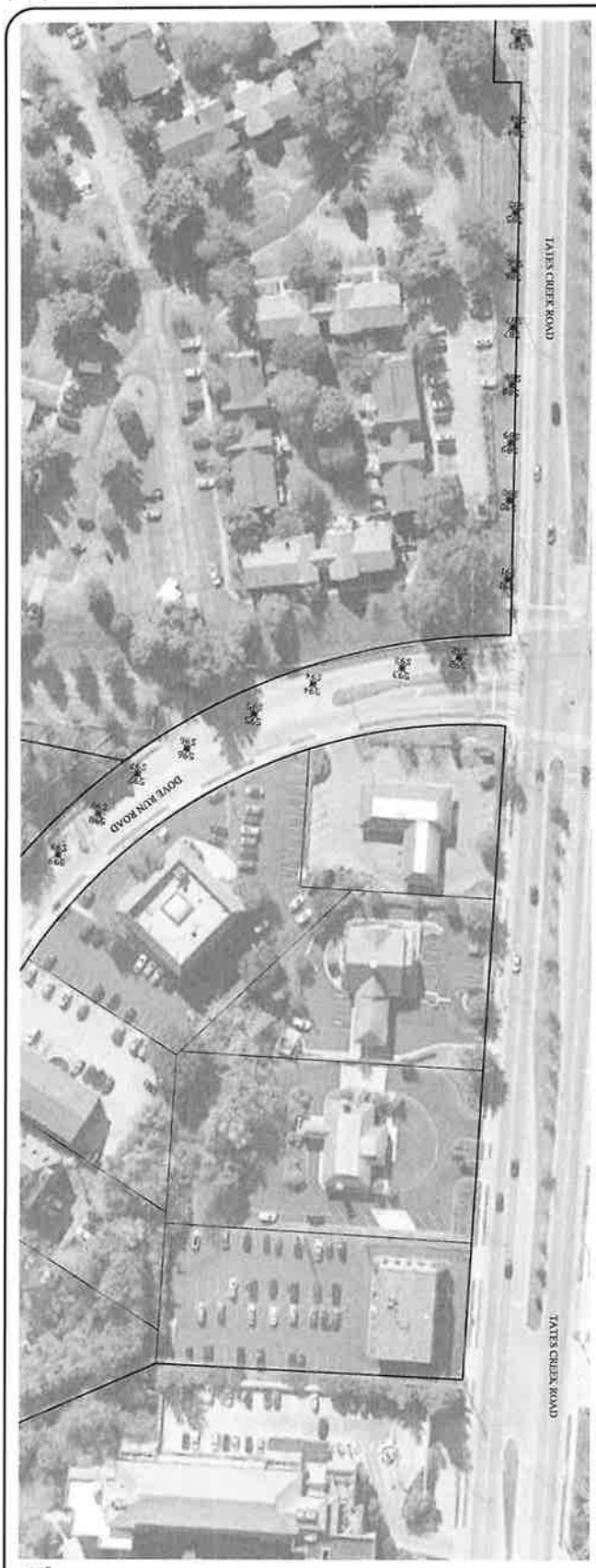
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DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH-07, WH-08, WH-10, WH-11
LFUCG BID NO. XX-2021

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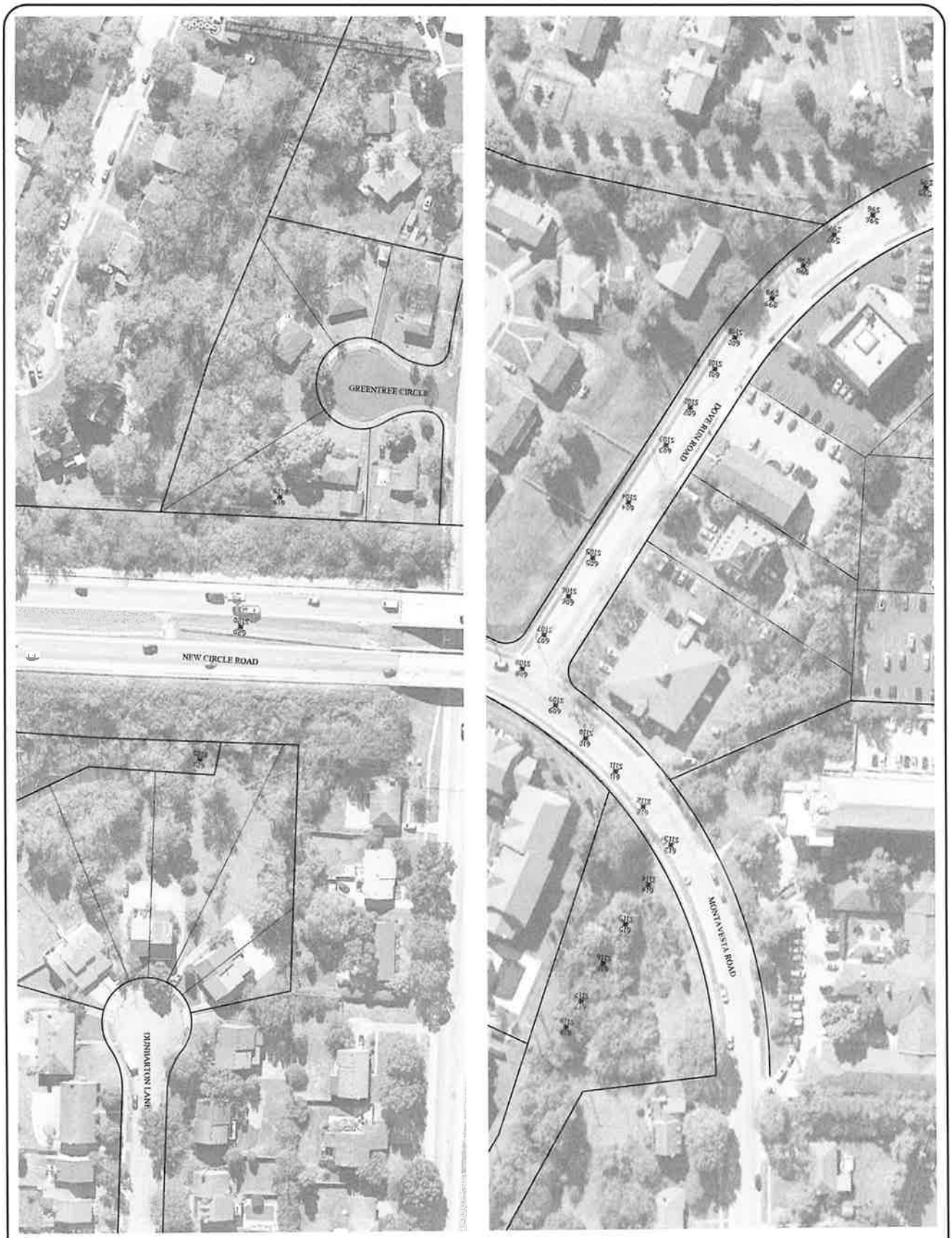


GRAPHIC SCALE - 1" = 40'

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Login Name: jmcmahan



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50'
100'
150'

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EX7

SHEET NO.

GEOTECHNICAL EXHIBIT

DESCRIPTION OF REVISION

PROJECT NO.: 200126
DATE: OCTOBER 2021
DRAWN BY: JFM
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LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
WEST HICKMAN DETAILED SOLUTIONS
DIVISION OF WATER QUALITY
REMEDIAL MEASURES PROJECT NO. WH07, WH08, WH10, WH11
LFUCG BID NO. XX-2021

IE INTEGRATED ENGINEERING | A PRIME AE COMPANY

SEAL

LE Gregg ASSOCIATES

Geotechnical Engineers and Geologists

Geotechnical Engineering Exploration

Project:

Merrick Trunk Sewer
Lexington, Kentucky

Prepared for:

Lexington Fayette Urban County Government
And
Prime AE, Inc.

August 2, 2024

August 2, 2024

Katie Beard, P.E.
Prime AE, Inc.
651 Perimeter Drive, Suite 300
Lexington, KY 40517

RE: Report of Geotechnical Exploration
Merrick Trunk Sewer
Lexington, Kentucky
L.E. Gregg Project Number: 2024008

Ms. Beard,

L.E. Gregg Associates is pleased to present our report for the geotechnical exploration performed at the above referenced site. The attached report presents a review of the project information provided to us, a description of the site and subsurface conditions encountered, as well as any foundation and earthwork recommendations for the proposed project.

Unless prior arrangements are made, any remaining soil samples will be discarded shortly after the issue date of this report. Rock cores will be retained for a period of 12 months and then discarded.

We appreciate the opportunity to assist you on this project. If we can be of further service on this or other projects, please contact us.

Respectfully,

L.E. GREGG ASSOCIATES

Steven Mortimer, P.E.
Senior Engineer

Jason Ainslie, P.E.
President

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Key to Symbols and Descriptions

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Appendix D – Seismic Site Class/Design Information

1.0 INTRODUCTION

1.1 PURPOSE OF EXPLORATION

The purpose of this exploration was to determine the general subsurface conditions existing at the project site through a program of controlled drilling, sampling, and testing; and to evaluate these findings with respect to the foundation concept, design, and currently accepted engineering practices. The purpose and scope of services were based on plans and information provided by Prime AE, Inc. and outlined in L.E. Gregg Proposals P23-087A, dated December 6, 2023. More specifically, the objectives are:

1. Determine the textures, thicknesses, consistencies and general physical properties of the soil strata encountered at the boring locations, along with the depths to and elevations of the underlying bedrock surface beneath the proposed structure.

2. Determine the general geologic conditions existing at the site.

3. Determine the detailed characteristics of the underlying bedrock if rock is encountered at a depth where it may be considered an economical choice as the bearing medium.

4. Determine the existing surface and subsurface water conditions at the site and their relation to design, construction, and service of the proposed project.

2.0 PROJECT INFORMATION

2.1 BACKGROUND INFORMATION

Project information was provided in a request for proposal to L.E. Gregg Associates from Prime AE, Inc. on behalf of the Lexington Fayette Urban County Government (LFUGC) Division of Water Quality. The proposed project is for the construction piping for the Merrick Trunk Sewer project.

2.2 SITE SURFACE CONDITIONS

The Merrick Trunk Sewer is part of the West Hickman Watershed project and the proposed alignment runs near the Tates Creek corridor from Armstrong Mill Road and Tates Creek Road to Old Mt. Tabor Road and Tates Creek Road. The alignment runs roughly north/south through residential/business areas along and/or near Tates Creek Road.

2.3 SITE GEOLOGY

Geologic information was referenced from the *Geologic map of the Coletown quadrangle, east-central Kentucky, 1967.* The underlying bedrock in the area is of Lower to Middle Ordovician Age and consists of several different members listed below.

Quaternary Alluvium consists of silty clay, silt, sand, and gravel. The silty clay and silt are generally medium dark reddish brown to yellowish brown. The sand is generally yellowish brown, fine to medium, and quartzose. The gravel is composed of pebble to boulder size limestone fragments and dark reddish brown limonite pebbles and granules.

The Upper Part of the Lexington Limestone consists of the Millersburg Member and the Devils Hollow Member. The Millersburg Member consists of limestone and shale. The limestone is generally medium-gray and occurs in very thin irregular beds and as discrete nodules in shale with abundant fossils. The shale is generally medium gray and occurs as interbeds and as a matrix of limestone nodules. The Devils Hollow consists of limestone which is pale green to grayish brown, micrograined to cryptograined, and occurs in thin beds, generally less than 6 in. thick.

The Lower Part of the Lexington Limestone consists of the Cane Run Bed, the Grier Limestone Member, the Logana Limestone Member, and the Curdsville Limestone Member. The Cane Run Bed consists of limestone and chert. The limestone is generally medium light gray, micrograined and occurs in very thin tabular beds, commonly with included lenticles of dense chert. The Grier Limestone Member consists of limestone which is medium light gray to medium gray, cryptograined to coarse-grained, and fossiliferous throughout. These zones are interbedded with thin resistant beds of medium to coarse grained coquinoid limestone. The Logana Limestone Member consists of light gray micrograined limestone and medium to dark gray shale. The Curdsville Limestone Member consists of limestone which is medium light gray to brownish gray, partly fossiliferous, fine to coarse grained, and commonly contains very thin beds of micrograined limestone and lenticular bodies of dense chert.

The Tanglewood Limestone Members No.1, 2, and 3 consists of limestone which is medium light gray to brownish gray, fossil-fragmental, fine to coarse grained, sparry calcite cemented, partly phosphatic, and occurs in very thin to thin planar beds.

The Clays Ferry Formation consists of limestone, shale, and siltstone. The limestone is medium light gray to medium brownish gray, micrograined to coarse grained, fossil -fragmental, and occurs in tabular beds generally less than 0.5 ft. thick.

The Brannon Member consists of interbedded limestone and shale. The limestone (50 percent) is medium to dark gray, micrograined, some medium grained, locally siliceous or cherty, and occurs in tabular beds less than ½ ft. thick. The shale is generally medium to dark gray, locally brownish gray, limy, and thin bedded. The unit is sparingly fossiliferous except for locally abundant trilobite carapace fragments or brachiopods.

The Garrard Siltstone consists of siltstone which is greenish gray, weathers yellowish brown gray, quartzose with calcite cement, in even beds a few inches to several feet thick, with very thin limestone and shale interbeds throughout.

The karst potential in the vicinity of the site is characterized as non-karst (siltstone) to intense. There are several mapped potential sinks in the area. It should be noted that sinkholes are common in this region and that caverns can extend laterally and may be unobserved from the ground surface.

Faults from the Lexington Fault System cross the area of New Circle Road and Tates Creek Road. Faults are common geologic structures across the Commonwealth of Kentucky and have been mapped in many counties. These faults represent seismic activity that has occurred several million years ago at the latest and there has been no activity along these faults in recorded history. Seismic risk associated with these faults is considered to be very low.

2.4 LABORATORY TESTING

The recovered soil samples were transported to L.E. Gregg's laboratory. Natural moisture content determinations (ASTM D2216) were conducted in general accordance with the American Society of Testing and Materials (ASTM) practices and standards.

3.0 EXPLORATION FINDINGS

3.1 SUBSURFACE CONDITIONS

General

Field testing procedures were performed in general accordance with ASTM practices, procedures, and standards. The borings were advanced using 4 in. solid flight augers. Samples were recovered in the undisturbed material below the tip of the auger using the standard drive sample technique in accordance with ASTM D 1586. A 2 in. O.D. (outside diameter) by 1 3/8 in. I.D. split-spoon sampler was driven a total of 18 in. with the number of blows of a 140 lb. hammer falling 30 in. recorded for each 6 in. of penetration. The sum of the blows for the final 12 in. of penetration is referred to as the Standard Penetration Test (SPT) result, also known as the N-value, or blow count, which is recorded in blows per foot (bpf). Split spoon samples were generally recovered at 0.0, 1.5, 4.0, 6.5, 9.0 ft., and at 5.0 ft. intervals thereafter. These intervals may be adjusted in the field if gravel, boulders, shot rock, asphalt, or concrete surfaces are encountered. The boreholes were backfilled immediately with auger cuttings and/or granular material for safety considerations.

Soil Conditions

The geotechnical exploration consisted of (4) soil test borings and eight (8) rock line soundings. Several rock line soundings were omitted due to access issues. These locations were discussed with the client and design team before the completion of the field exploration. The approximate boring locations are shown on the boring layout in Appendix B.

The following subsurface descriptions are of a generalized nature in order to highlight the subsurface stratification features and material characteristics at the boring locations. The boring logs included in Appendix B of this report should be reviewed for specific information at each boring location. Information on actual subsurface conditions exists only at the specific boring

locations and is relevant only to the time period that this exploration was performed. Variations may occur and should be expected at the site. All measurements listed below are approximate.

The subsurface conditions are described as follows:

Topsoil was generally encountered from the surface to depths of 4-6 in.

Undocumented Fill materials were encountered in borings B-129, B-130, and B-131 from below the topsoil to depths of 2.8 to 6.5 ft. The fill consisted of lean clay with gravel and/or rock fragments and gravel with clay. The materials were generally silty and/or sandy, brown to tan, very stiff to hard or dense, and dry to slightly moist. The Standard Penetration Test (SPT) "N"-values ranged from 16 to 50+ bpf and the natural moisture contents ranged from 5.3 to 17.6%

Natural Soil materials were encountered in borings B-127, B-129, and B-130 either from below the topsoil materials or fill to refusal depths. The natural materials consisted of lean clay. Weathered rock was generally encountered approaching refusal depths. The materials were generally silty and/or sandy, brown, tan, and/or gray, firm to stiff, and dry to moist. The Standard Penetration Test (SPT) "N"-values ranged from 7 to 11 bpf and the natural moisture contents ranged from 11.9 to 33.2%

Table 1 – Summary of Drilling Depths

Location	*Elevation (ft.)	Refusal Depth (ft.)	Refusal Elevation (ft.)	Notes
B-127	923.7	10.0	913.7	Offset 10 ft. SSE
B-129	925.6	13.3	912.3	
B-130	928.2	13.0	915.2	Offset 14.5 ft. NNE
B-131	928.2	2.8	925.4	Offset 8 ft. South
S-114	944.8	5.5	939.3	Offset 22 ft. NE
S-115	944.2	4.1	940.1	Offset 12.9 ft. NW
S-116	945.0	4.0	941.0	Offset 21 ft. SW
S-123	923.1	11.0	912.1	Offset 6 ft. NW
S-124	922.9	10.5	912.4	Offset 17.5 ft. W
S-125	921.4	10.2	911.2	
S-126	922.5	9.5	913.0	
S-128	924.0	9.9	914.1	

Elevations were established by Prime AE, Inc. and are not adjusted for the noted offsets.

Rock Conditions

Refusal was encountered between 2.8 to 13.3 ft. Weathered rock was generally encountered before refusal. Refusal generally indicates materials that cannot be penetrated with typical soil drilling methods. Therefore, refusal can indicate one or more of the following: coarse gravel, boulders, shot rock fill, buried concrete, weathered rock, thin rock seams, or the upper surface of sound, continuous bedrock. Core drilling is then required to determine the characteristics and soundness of the refusal materials. The refusal materials at were cored according to ASTM D 2113, which utilizes a diamond studded bit fastened to the end of a hollow double tube core barrel. The assembly is lowered to refusal depth and the boring is flooded with water to control

overheating and to bring the cuttings to the surface. As the drill is rotated at high speeds, the core bit advances into the refusal material and core samples are retained within the inner core barrel. These samples are removed after core runs of up to ten feet and placed in boxes for storage. The core samples were taken back to the laboratory where they were classified as to type of rock, percent recovery, and rock quality designation by an L.E. Gregg geologist or engineer. The percent core recovery (REC) is a ratio of the recovered sample length versus the total length attempted and is expressed as a percentage. The REC is used to assess the continuity of the refusal material. The rock quality designation (RQD) is obtained by summing up the length of core recovered, including only the portions that are greater than or equal to 4 inches, and dividing by the total length attempted. This is also expressed as a percentage and is used to assess the quality of the refusal material.

Boring B-127 was cored from the refusal depth of 10 ft. to the termination depth of 15 ft. The core generally indicated interbedded limestone and shale material which was light to dark gray and fractured. The core had a REC of 75% and a RQD of 14%, indicating fairly continuous bedrock of very poor quality.

Boring B-130 was cored from the refusal depth of 13 ft. to the termination depth of 17 ft. The core generally indicated interbedded limestone and shale material which was light to dark gray and fractured. The core had a REC of 75% and a RQD of 24%, indicating fairly continuous bedrock of very poor quality.

Boring B-131 was cored from the refusal depth of 2.8 ft. to the termination depth of 18.8 ft. The core generally indicated limestone, which was gray, crystalline, fractured and weathered. While coring the first run from 2.8 to 12.8 ft., there were 6 drops in the tool string. These are likely voids and/or solution enlarged bedding planes in the rock layers ranging in size from 4 in. to 14 in. The second run from 12.8 to 18.8 ft. indicated limestone interbedded with thin mud seams and dark gray shale. The core had REC's of 26 to 96% and RQD's of 13 to 16%, indicating incompetent to continuous bedrock of very poor quality.

Water Conditions

Water was encountered in boring B-130 at approximately 5 ft. Water is generally expected to be encountered below the bedrock levels; however, depending on the time of year, it can possibly be found within the soil mass. Groundwater refers to any water that percolates through the soil and can refer to isolated or perched water pockets or water that occurs below the "water table", which is a zone that remains saturated and water-bearing. The groundwater levels encountered during drilling may fluctuate significantly over time due to weather influences and should not be considered a true static groundwater level.

3.2 SEISMIC SITE CLASSIFICATION

The Kentucky Building Code, Chapter 20 of ASCE 7-16, and the ASCE 7 Hazard Tool website were reviewed to determine the Seismic Site Classification for the project sites. Based on review of geologic data, previous experience with similar projects, and subsurface conditions encountered, a **SEISMIC SITE CLASS "B"** is recommended for rock bearing foundations. We have assumed a Seismic Risk Category of II.

Furthermore, using a Site Classification of **B**, we recommend the use of spectral response acceleration coefficients as follows:

0.2 second period: $\mathbf{S_S}$ = 0.172g and Soil Factor = 0.9

1.0 second period: $\mathbf{S_I}$ = 0.083g and Soil Factor = 0.8

The design spectral response acceleration factors are as follows:

$\mathbf{S_{DS}}$ = 0.103

$\mathbf{S_{DI}}$ = 0.044

4.0 GEOTECHNICAL RECOMMENDATIONS

4.1 GEOTECHNICAL CONSIDERATIONS

General

Based on the provided information, the subsurface conditions encountered and past experience with similar projects, the site is suitable for the proposed development provided the following considerations are addressed. These considerations are briefly summarized below.

Shallow Bedrock

Refusal depths ranged from 2.8 to 13.3 ft. Rock removal will be required in certain areas in order to install the required structures and piping. The cored obtained indicated limestone bedrock materials. Based on the proposed design and similar projects completed in the past, we have assumed that a caisson type drill rig will be required to install the structures or a large pit will be excavated from the underlying bedrock. The bedrock materials will require pneumatic ramming for trenching or isolated areas of removal. Blasting will be required for mass removal of bedrock material.

Silty and/or Sandy Clays

Soil materials consisting of silty and/or sandy clays were encountered. These materials can be sensitive to changing moisture conditions and can degrade under repetitive loading and unloading. Heavy equipment traffic during construction can cause these materials to break down. Care will need to be taken to consider traffic across the construction site and the contractor will

need to consider changing moisture conditions during construction. The owner and contractor should consider seasonal weather patterns for construction scheduling.

Karst Potential

Karst potential in the location of the site is classified as non-karst to intense, depending on location. It should be noted that sinkholes and caverns can extend laterally and may be unobserved from the ground surface and may go unnoticed for long periods of time. There is a moderate potential for karst features such as solution channels, rock pinnacles, or sinkholes to be encountered during construction.

Excavation Sloping and/or Benching

All excavation work must be performed in accordance with OSHA and local building code requirements. The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

Utility Trench Backfill

All trench excavations should be completed with sufficient working space to permit construction as well as proper backfill placement and compaction. If utility trenches are backfilled with relatively clean granular material, they should be capped with at least 18 in. of lean clay fill in order to reduce the infiltration and conveyance of surface water through the trench backfill.

Ground Water or Free Water

All of the borings were advanced to auger refusal which ranged from 2.8 to 13.3 ft. Water was encountered at B-130 at 5 ft. at the time of drilling. The rock coring process requires water to be injected into the boring to provide cooling for the tooling string. Upon the completion of rock coring, water was present in the borings from the coring process. Due to the karstic nature of the bedrock in the area, water levels are generally expected to flow near or below the soil and bedrock interface. These levels will also fluctuate significantly over time due to weather influences and seasonal patterns.

It should be expected that water could be present below bedrock levels and plans should be made for dewatering any wells or pits that will be required during the construction process. Ground water and/or free water encroaching upon construction excavations should be removed by placing a

sump near the source of seepage and then pumping from the sump. Should heavy seepage or ponding of water occur, then L.E. Gregg should be contacted.

Site Drainage

Site drainage and adequate subgrade drainage are critical for performance of foundations. A surface drainage plan should be designed by a Civil Engineer or Landscape Architect. During construction, large quantities of water should not be allowed to accumulate on the site.

4.2 FOUNDATIONS

General

It is our understanding that the proposed structures will bear approximately 10 to 20 ft. below the existing surface. Due to this and the refusal depths encountered, we would recommend that the structures bear on the underlying bedrock. It is expected that wells or pits will be required during construction. These may either be drilled with a large caisson rig or "cut" from the bedrock using pneumatic ramming or blasting. Several voids were encountered in boring B-131, the majority of which should be removed during construction. The bottom of the excavations should be checked as noted below for any voids or clay seams that may be present below bearing elevations.

Design Considerations

Rock bearing foundations should be placed within unweathered competent bedrock materials and should be designed for a maximum allowable bearing capacity of 10,000 pounds per square foot (psf). The bearing materials used should be uniform.

We recommend that isolated spread footings be a minimum of 24 in. by 24 in. The minimum thickness of both continuous and spread footings should be 12 in. As an alternative to bearing on competent bedrock, the foundation excavations may be trenched down to bedrock and backfilled with lean concrete to the bearing elevation. If this option is chosen, widen footing excavations by a minimum of six (6) inches on each side and backfill the foundation excavation from bedrock to the bearing elevation with lean concrete.

Excavate foundations down to competent bedrock. L.E. Gregg should observe the bearing surface once foundation excavations have been completed. Please note that foundation excavations may need to be deepened if the weathered bedrock is observed to be unsuitable as a bearing surface.

In order to check the continuity of the bedrock, a 2 to 3 in. diameter air hole should be drilled in the footprint of each structure. The hole should then be "probed" by a qualified geotechnical technician to check for any soft compressible seams, coal or other discontinuities. If this check indicates a discontinuous or compressible seam in the rock, the drilled hole should be excavated deeper. Significant deviations from the specified or anticipated conditions should be reported to the owner's representative and to the foundation designer.

Construction Considerations

All vegetation, topsoil, unsuitable fill soil (if required), loose rock fragments greater than 6 in., construction debris, water, and other debris should be removed from the proposed construction areas before concrete placement. Any trench excavations should have adequate shoring per OSHA requirements. The foundation support and/or foundation side walls should be protected from freezing weather, severe drying, and water ponding. Positive drainage should be provided to direct surface runoff away from excavations. The foundation elements should not be formed so that concrete completely fills the opened excavations. Any areas that require rock removal to achieve bearing elevations should be cut a minimum of 24 in. below bearing elevations and backfilled with engineered fill.

4.3 SITE PREPARATION AND GRADING

All vegetation, topsoil, unsuitable fill soil (if required), loose rock fragments greater than 6 in., construction debris, and other debris should be removed from the proposed construction areas. After completion of stripping operations, we recommend that the subgrade be proofrolled with a fully-loaded, tandem-axle dump truck or other pneumatic-tired construction equipment of similar weight. The geotechnical engineer or their representative should observe proofrolling. Areas judged to perform unsatisfactorily should be undercut and replaced with structural soil fill or remediated at the geotechnical engineer's recommendation.

4.4 FILL PLACEMENT

Material considered suitable for use as structural fill should be clean soil free of organics, trash, or other deleterious materials, and contain no rock fragments greater than 6 in. in any one dimension. Preferably, structural soil fill material should have a standard Proctor maximum dry density of 90 pounds per cubic foot (pcf) or greater and a plasticity index (PI) of 25 percent or less. All material to be used as structural fill should be tested by the geotechnical engineer to confirm that it meets the project requirements before being placed.

Structural fill should be placed in loose, horizontal lifts not exceeding 8 in. thick. Each lift should be compacted per Table 2 below and within the range of minus (-) 2 percent to plus (+) 2 percent of the optimum moisture content. Each lift should be tested by geotechnical personnel to confirm that the contractors' method is capable of achieving the project requirements before placing any subsequent lifts. Any areas which have become soft or frozen should be removed before additional structural fill is placed. One in place density test should be performed a minimum of every 5,000 ft^2 for each 8 in. lift. Adequate surface drainage should be provided during all site grading and fill placement operations.

Please note that compaction efforts can be difficult to achieve using conventional construction methods during wet weather.

Table 2 – Fill Placement (ASTM D 698)

Location	Maximum Dry Density (%)
Footings and Floor Slabs	98.0
Pavement Areas	95.0
Landscape Areas	85.0

4.5 DRAINAGE

To reduce the potential for undercut and construction induced sinkholes, water should not be allowed to collect in the foundation excavations, on floor slab areas, or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, subsurface water, or surface runoff. Engineered fill or concrete should not be placed in excavations containing standing water or over-softened soils. Positive site surface drainage should be provided to reduce infiltration of surface water around the perimeter of structures and beneath floor slabs. The grades should be sloped away from structures and surface drainage should be collected and discharged such that water infiltration is not permitted.

4.6 BELOW GRADE WALLS

The following parameters are recommended for below grade wall design and construction:

Material Backfill

- Plasticity Index of any soil material should be less than 25;
- Provide temporary bracing if the walls cannot accommodate construction phase stresses;
- Provide adequate drainage at the rear of the wall;

Table 3 – Lateral Earth Pressures

Description of Backfill	φ (°)	Moist Unit Weight, γ (pcf)	Active Coefficient, K_a	At-Rest Coefficient, K_o	Passive Coefficient, K_p
Low to Medium Plasticity Clay (CL)	28	120	0.36	0.53	2.80
Well Graded Gravel-Sand Mix (GW/SW)	36	130	0.26	0.41	3.90
Poorly Graded Clean Gravel or sand (GP/SP)	34	120	0.28	0.44	3.55

- The data presented in Table 3 are based on the following assumptions:
  - Soil Backfill material exhibits an angle of shear resistance of 28 degrees or greater;
  - Retaining wall analysis assumes a level backfill slope;
  - Retaining wall analysis assumes that the wall will be designed as a vertical wall with respect to the retained material;

Retaining wall analysis assumes the wall will be designed as a smooth wall with no friction.

4.7 LATERAL BEARING PRESSURES

The Kentucky Building Code (KBC), current edition, Table 1806.2, provides guidelines for allowable lateral pressure for use in foundation design. The following table summarizes the allowable lateral pressures.

Table 4 – Presumptive Load-Bearing Values (KBC/IBC Table 1806.2)

Type of Material	Vertical Foundation Pressure (psf)	Lateral Bearing Pressure (psf/ft below natural grade)	Lateral Sliding Resistance	
			Coefficient of friction[a]	Cohesion (psf)[b]
Crystalline bedrock	12,000	1,200	0.70	-
Sedimentary and foliated rock	4,000	400	0.35	-
Sandy gravel and/or gravel (GW and GP)	3,000	200	0.35	-
Sand, silty sand, clayey sand, silty gravel, and clayey gravel (SW, SP, SM, SC, GM, and GC)	2,000	150	0.25	-
Clay, sandy clay, silty clay, clayey silt, silt, and sandy silt (CL, ML, MH, and CH)	1,500	100	-	130

a. Coefficient to be multiplied by the dead load
b. Cohesion value to be multiplied by the contact area, as limited by Section 1806.3.2

The values for lateral bearing pressure located above in Table 4, may be adjusted when considering load combinations, including wind or earthquake loads as permitted by Section 1605.3.2 of the KYBC.

4.8 BEDROCK EXCAVATION

We have assumed that this project will require the excavation of 5 to 15 ft. of soil and 5 to 20 ft. of rock. The soil material generally consists of firm to very stiff soil materials and limestone bedrock.

The following excavation recommendations are provided as a guide to assist the contractor in complying with the requirements of the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1926, Subpart P. It is not intended to supersede the requirements of the standard. This plan should be used to protect the client from the inherent safety hazards present during excavation activities. All persons involved in the excavation process should receive the proper training in the performance of this type of work.

Excavation Requirements

- OSHA standards require, before any worker entry, that employers have a competent person

inspect trenches daily and as conditions change to ensure elimination of excavation hazards. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to workers, soil types and protective systems required, and who is authorized to take prompt corrective measures to eliminate these hazards and conditions.

- Before site clearing has commenced, all underground utilities should be located and marked by KY 811 and/or a private utility locator. Any utilities within the project limits should be shut down, removed, and/or relocated before any excavations begin.
- Barricade all holes, pits, shafts, and all similar hazardous excavations to prevent unauthorized access. Post warning signs.
- Maintain a minimum of 2 ft. of free space around the top edge of excavations. Keep all tools, equipment, spoil piles, etc... away from the edge to safeguard from objects falling into the excavation.
- In excavations deeper than 4 ft., keep ladders, steps, or ramps within 25 ft. of workers to ensure a safe entry and exit.
- Provide employees working at the edge of excavations 6 ft. or deeper with fall protection. Fall protection may include guardrail systems, fences, barricades, covers, or a tie-back system meeting OSHA requirements.
- Groundwater should be controlled or prevented from collecting using water removal equipment, the water removal equipment and operation shall be monitored by a person trained in the use of that equipment.
- After precipitation events, all excavations should be inspected by the contractor's responsible person in order to determine the stability of the excavations.
- We would recommend that L.E. Gregg examine the excavation immediately after completion in order to verify the rock conditions.

Requirements for Protective Systems

- Protect employees from cave-ins by using either an adequate sloping and benching system, support system, or protective system. The only exceptions are when:
    - Excavations are entirely in stable rock
    - Excavations are less than 5 ft. deep and indicate no hazard after inspection
- Ensure protective systems are capable of resisting all loads that could reasonably be expected to be applied to the system.

Proposed Excavation

Based on the information contained in the geotechnical report for this project, we have assumed the existing soil materials to be considered Type B soils per 29 CFR 1926, Subpart P, Appendix A and B. Type B soils are cohesive soils composed of silt, silty loam, sandy loam, silty clay loam, sandy clay loam, and granular cohesive solids including crushed rock (angular gravel). It has an unconfined

compressive strength greater than 0.5 t/sf but less than 1.5 t/sf. We have also assumed the underlying bedrock to be considered stable rock. This natural solid mineral material can be excavated with vertical sides and remain intact while exposed. L.E. Gregg should be contacted to observe the completed excavations to verify the recommendations.

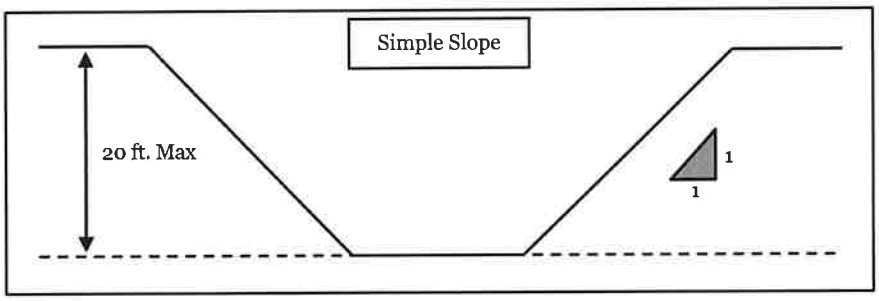
Table 5 – Maximum Allowable Slopes (29 CFR 1926, Subpart P)

Soil or Rock Type	Maximum Allowable Slopes (H:V) for excavations less than 20 ft. deep
Stable Rock	Vertical (90°)
Type A	¾:1 (53°)
Type B	1:1 (45°)

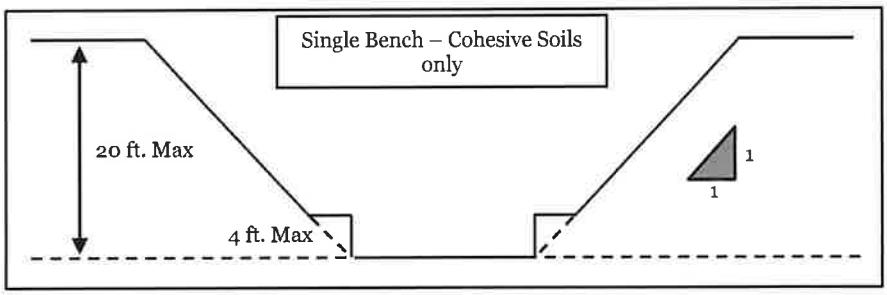
Notes: A short-term maximum allowable slope of ½H:1V (63°) is allowed in excavations in Type A soil that is 12 ft. or less in depth. Short-term maximum allowable slopes for excavations greater than 12 ft. in depth shall be ¾H:1V (53°). Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

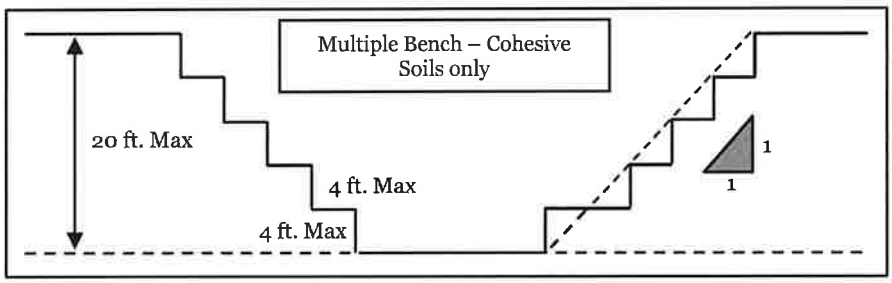
Excavations made in Type B soil

All simple slope excavations 20 ft. or less in depth shall have a maximum allowable slope of 1:1.

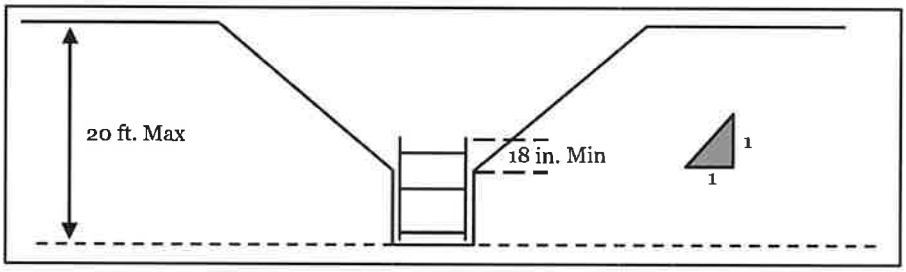


All benched excavations 20 ft. or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:

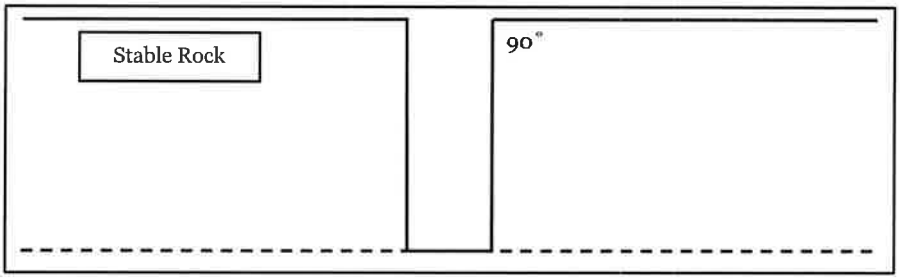




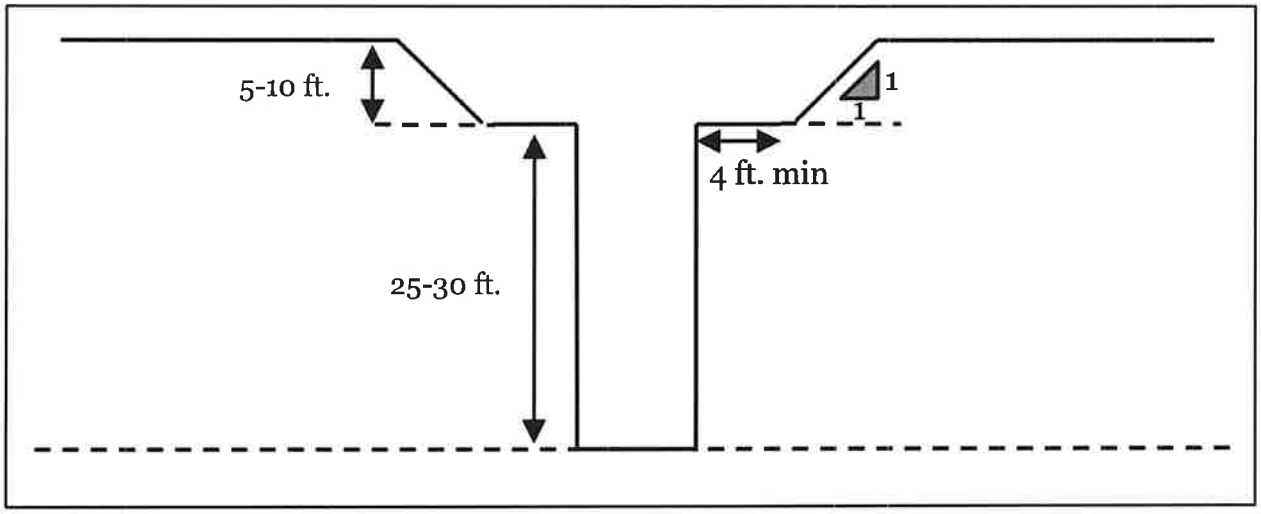
All excavations 20 ft. or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 in. above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.



Excavations made in stable rock may have vertical sides. If the rock layers exhibit fracturing and/or weathering, the sides may require sloping or benching. Extensive issues may require shielding or stabilization. This will be determined after a field observation.



Based on the anticipated conditions, we are assuming a layered excavation of Type B soils over stable rock. The excavations should be completed as indicated below and drawings of each excavation, Section A and Section B are included at the end of this report.



5.0 BASIS FOR RECOMMENDATIONS

VARIATIONS

Since any general foundation or subsurface exploration can examine and report only that information which is obtained from the borings and samples taken there from, and since uniformity of subsurface conditions does not always exist, the following is recommended. If, during construction, any latent soil, bedrock, or water conditions are encountered that were not observed in the borings, contact L.E. Gregg so that the site may be inspected to identify any necessary modifications in the design or construction of the foundation.

OTHER INTERPRETATIONS

The conclusions and recommendations submitted in this report apply to the proposed project only. They are not applicable to on-site, subsequent construction, adjacent or nearby projects. In the event that conclusions or recommendations based on this report and relating to any other projects are made by others, such conclusions and recommendations are not the responsibility of L. E. Gregg Associates. The recommendations provided are based in part on project information provided to L.E. Gregg and only apply to the specific project and site discussed in this report. If the project information section in this report contains incorrect information or if additional information is available, the correct or additional information should be conveyed to L.E. Gregg for review.

It is recommended that this complete report be provided to the various design team members, the contractors, and the project owner. Potential contractors should be informed of this report in the "instructions to bidders" section of the bid documents. The report should not be included or referenced in the actual contract documents.

STANDARD OF CARE

The services provided by L. E. Gregg Associates for this exploration have been performed in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances.

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
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KEY TO SYMBOLS AND DESCRIPTIONS

	GW	Well graded gravels, little or no fines
	GP	Poorly graded gravels, little or no fines
	GM	Silty gravels, sand and silt mixtures
	GC	Clayey gravels, sand and clay mixtures
	SW	Well graded sand, little or no fines
	SP	Poorly graded sand, little or no fines
	SM	Silty sands, sand and silt mixtures
	SC	Clayey sands, sand and clay mixtures
	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands silts and with slight plasticity
	CL	Inorganic clays with low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clay of low plasticity
	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silt soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
	Topsoil	Usually top few inches of soil deposits and contains considerable amounts of organic matter
	Asphalt	Usually a black solid or semisolid mixture of bitumens mostly used in paving
	Fill	Soils that have been transported by man to their present location
	Limestone	Sedimentary rock consisting of predominantly of calcium carbonate
	Sandstone	Sedimentary rock consisting of sand with some cementitious material
	Siltstone	Fine grained rock of consolidated silt
	Shale	Fine grained sedimentary rock consisting of compacted clay, silt, or mud
	Coal	Natural black graphite like material formed from fossilized plants
	Limestone interbedded with Shale	Predominantly limestone interbedded with shale layers
	Weathered	Weathered rock

CONSISTANCY AND RELATIVE DENSITY CORRELATED WITH STANDARD PENETRATION TEST (SPT)

SILT AND CLAY		SAND AND GRAVEL	
Relative Density	Blows Per Foot (BPF)	Relative Density	Blows Per Foot (BPF)
Very Soft	0 to 1	Very Loose	0 to 4
Soft	2 to 4	Loose	5 to 10
Firm	5 to 8	Firm	11 to 20
Stiff	9 to 15	Very Firm	21 to 30
Very Stiff	16 to 30	Dense	31 to 50

ROCK PROPERTIES

RELATIVE HARDNESS OF ROCK

Very Soft	Can be scratched by fingernail
Soft	May be broken by fingers
Medium	Corner and edges may be broken by fingers
Moderately Hard	Moderate blow of hammer required to break sample
Hard	Hard blow of hammer required to break sample
Very Hard	Several hard blows of hammer required to break sample

Rock Continuity (REC)		Rock Quality Designation (RQD)	
Core Recovery (%)	Description	RQD (%)	Classification
0 – 40	Incompetent	<25	Very Poor
40 – 70	Competent	25 – 50	Poor
70 – 90	Fairly Continuous	50 – 75	Fair
90 – 100	Continuous	75 – 90	Good
		90 – 100	Very Good

Estimated Moisture Condition Relative to Optimum	
Dry	Under 5% of Optimum
Slightly Moist	Minus 2% of Optimum
Moist	± 2% of Optimum
Very Moist	Plus 2% of Optimum
Wet	Over 5% of Optimum

Misc. and Soil Sampler Symbols

N	Blows Per Foot (BPF)		Undisturbed Sample
% W	Percent Water		Standard Penetration Test (SPT)
RQD	Rock Quality Designation		Boring Location
REC	Rock Core Recovery		Water Table while Drilling
CLA	Classification of Combined Samples		Water Table after Drilling
	Rock Core (RC)		Bulk Sample (BK)

LE Gregg ASSOCIATES

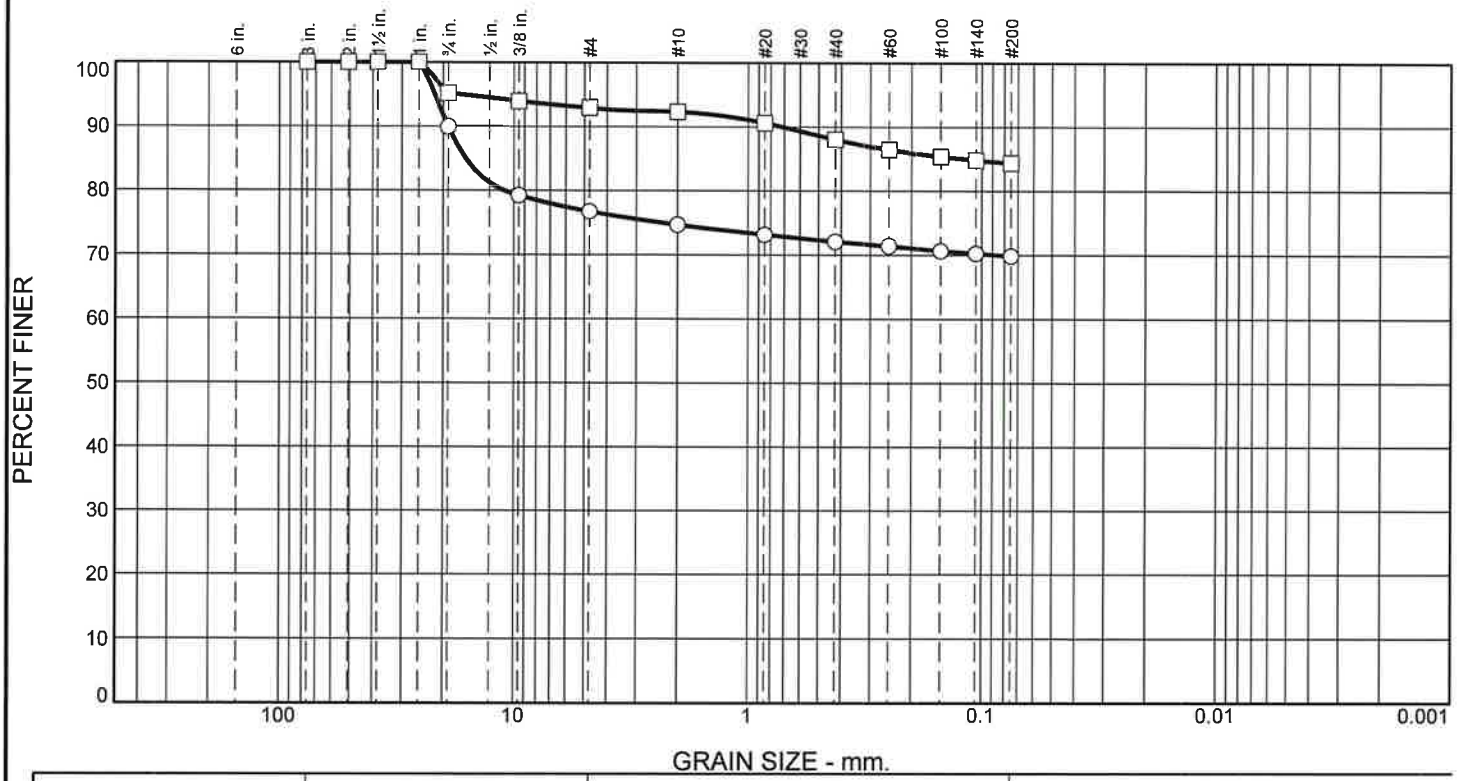
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APPENDIX A

Summary of Laboratory and Drilling Data

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	10.1	13.2	2.0	2.6	2.3	69.8	
□	0.0	4.9	2.2	0.6	4.3	3.6	84.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	45	22	16.1056							
□	47	25	0.1258							

Material Description	USCS	AASHTO
○ Gravelly Lean Clay (CL)	CL	A-7-6(15)
□ Lean Clay with Sand (CL)	CL	A-7-6(20)

Project No. 2024008 **Client:** Prime AE, Inc. and LFUCG

Project: Merrick Trunk Sewer

○ **Location:** B- 127 **Depth:** 6.5-8.0' **Sample Number:** 24702

□ **Location:** B-130 **Depth:** 9.0-10.5 **Sample Number:** 24703

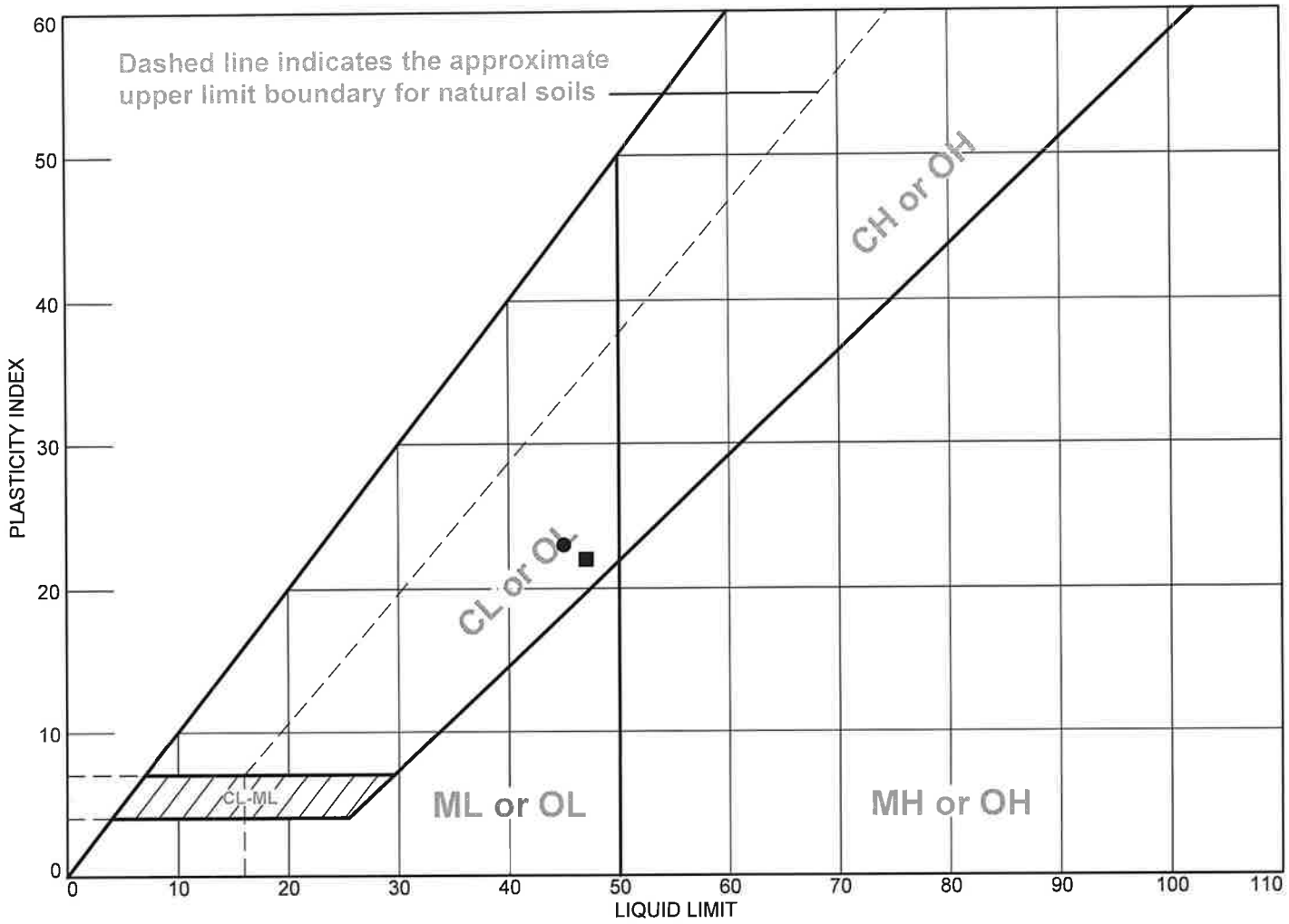
Remarks:

L.E. Gregg Associates, Inc.
2456 Fortune Dr, Ste 155, Lexington, KY 40509
Phone: 859-252-7558

Figure

Tested By: KH **Checked By:** AH

LIQUID AND PLASTIC LIMITS TEST REPORT



	Material Description	Sampled	Tested	Technician	LL	PL	PI	%<#40	USCS
●	Gravelly Lean Clay (CL)	6/28/2024	7/3/2024	KH, FS	45	22	23	72.1	CL
■	Lean Clay with Sand (CL)	6/28/2024	7/3/2024	KH, FS	47	25	22	88.0	CL

Project No. 2024008 **Client:** Prime AE, Inc. and LFUCG

Project: Merrick Trunk Sewer

○ **Location:** B- 127 **Depth:** 6.5-8.0' **Sample Number:** 24702

□ **Location:** B-130 **Depth:** 9.0-10.5 **Sample Number:** 24703

L.E. Gregg Associates, Inc.
2456 Fortune Dr, Ste 155, Lexington, KY 40509
Phone: 859-252-7558

Checked by: AH
Title: Lab Manager

Figure

Tested By: KH, FS **Checked By:** AH

APPENDIX B

Logs of Borings

PROJECT: Merrick Trunk Sewer | **PROJECT NO.:** 2024008
CLIENT: Prime AE, Inc. and LFUCG | **DATE:** 6/27/24
LOCATION: 3052 Tates Creek Road | **ELEVATION:** 923.70
DRILLER: Strata Group, LLC | **LOGGED BY:** F Shirkey
DRILLING METHOD: 4" SFA
DEPTH TO WATER> INITIAL: dry **AFTER 24 HOURS:** _____ **CAVING>** _____

BORING No. B-127

ELEVATION (feet)	DEPTH (feet)	Description	Soil and Sampler Symbols, Blows	Sample No.	TEST RESULTS: Plastic Limit / Liquid Limit / Water Content / Penetration (10 20 30 40 50)	NM	PL	LL	N	Rock Comp. Strength (psi)
923.7	0	Topsoil (0.0-0.5) Lean clay, silty, brown and tan, firm to stiff, moist	2 3 4	1		22.4			7	
			4 4 4	2		24.3			8	
918.7	5		4 5 5	3		22.5			10	
		Lean clay with weathered rock fragments, silty, brown and gray, firm, slightly moist to moist	2 3 5	4		24.4			8	
913.7	10	Weathered rock	50/2	5		11.9			50+	
		Auger refusal at 10.0 ft. Begin core recovery. Limestone interbedded with shale, light gray to gray, fractured	REC= 75% RQD= 14%							
908.7	15	Core recovery terminated at 15.0 ft.								
903.7	20									
898.7	25									
893.7	30									
888.7	35									

Offset 10 ft. south/southeast

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

LE Gregg ASSOCIATES

BORING No. B-129

PROJECT: Merrick Trunk Sewer | **PROJECT NO.:** 2024008
CLIENT: Prime AE, Inc. and LFUCG | **DATE:** 6/27/24
LOCATION: Gainesway Drive and Tates Creek Road | **ELEVATION:** 925.59
DRILLER: Strata Group, LLC | **LOGGED BY:** F Shirkey
DRILLING METHOD: 4" SFA
DEPTH TO WATER> INITIAL: ▽ dry **AFTER 24 HOURS:** ▽ _____ **CAVING>** C _____

ELEVATION (feet)	DEPTH (feet)	Description	Soil and Sampler Symbols, Blows	Sample No.	TEST RESULTS: Plastic Limit ⊢ Liquid Limit; Water Content - ●; Penetration - ▨ (10 20 30 40 50)	NM	PL	LL	N	Rock Comp. Strength (psi)
925.59	0	Topsoil (0.0-0.3)								
		Fill - gravel with clay, brown, dry, dense	9 13 17	1		7.7			30	
			50/3	2		5.3			50+	
920.59	5	Fill - lean clay with gravel, brown, dry, very stiff	4 10 12	3		10.8			22	
		Lean clay, sandy, brown and gray, firm, moist	2 3 4	4		23.2			7	
915.59	10		3 4 4	5		25.9			8	
		Auger refusal at 13.3 ft.								
910.59	15									
905.59	20									
900.59	25									
895.59	30									
890.59	35									

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Figure

LE Gregg ASSOCIATES

BORING No. B-130

PROJECT: Merrick Trunk Sewer
CLIENT: Prime AE, Inc. and LFUCG
LOCATION: 3050 Kirklevington Drive
DRILLER: Strata Group, LLC
DRILLING METHOD: 4" SFA
DEPTH TO WATER> INITIAL: ▽ 5.0 **AFTER 24 HOURS:** ▽ _____ **CAVING>** ⊏ _____

PROJECT NO.: 2024008
DATE: 6/27/24
ELEVATION: 928.19
LOGGED BY: F Shirkey

ELEVATION (feet)	DEPTH (feet)	Description	Soil and Sampler Symbols, Blows	Sample No.	TEST RESULTS: Plastic Limit ⊢⊣ Liquid Limit; Water Content - •; Penetration - ▨ (10 20 30 40 50)	NM	PL	LL	N	Rock Comp. Strength (psi)
928.19	0	Topsoil (0.0-0.3) Fill - lean clay with rock fragments, tan and brown, slightly moist, very stiff to hard	3 7 9	1		17.3			16	
			11 21 15	2		17.6			36	
923.19	5 ▽	Lean clay, silty, brown and gray, weathered rock fragments, firm to stiff	7 7 4	3		18.1			11	
			3 2 3	4		32.0			5	
918.19	10		1 2 7	5		33.2			9	
		Weathered rock								
913.19	15	Auger refusal at 13.0 ft. Begin core recovery. Gray limestone interbedded with dark gray shale, fractured	REC= 75% RQD= 24%							
		Core recovery terminated at 17.0 ft.								
908.19	20									
903.19	25									
898.19	30									
893.19	35									

Offset 14.5 ft. NNE

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

LE Gregg ASSOCIATES

BORING No. B-131

PROJECT: Merrick Trunk Sewer | **PROJECT NO.:** 2024008
CLIENT: Prime AE, Inc. and LFUCG | **DATE:** 6/27/24
LOCATION: 3051 Kirklevington Drive | **ELEVATION:** 928.22
DRILLER: Strata Group, LLC | **LOGGED BY:** F Shirkey
DRILLING METHOD: 4" SFA
DEPTH TO WATER> INITIAL: ▽ dry **AFTER 24 HOURS:** ▽ _____ **CAVING>** C _____

ELEVATION (feet)	DEPTH (feet)	Description	Soil and Sampler Symbols, Blows	Sample No.	TEST RESULTS: Plastic Limit ⊢⊣ Liquid Limit; Water Content - ●; Penetration - ▨ (10 20 30 40 50)	NM	PL	LL	N	Rock Comp. Strength (psi)
928.22	0	Topsoil (0.0-0.5)								
		Fill - lean clay with rock fragments, silty, tan and brown, very stiff, dry to slightly moist	8 7 11	1		20.5			18	
			10 50/3	2		9.2			50+	
		Weathered rock								
		Auger refusal at 2.8 ft. Begin core recovery. Run 1 - 2.8-12.8 - Limestone, gray, crystalline, fractured and weathered. While coring, there were 6 drops in the tool string. These are likley voids and/or solution enlarged bedding planes in the rock layers ranging in size from 4 in. to 14 in.	REC= 26% RQD= 13%							
923.22	5									
918.22	10									
		Run 2 - 12.8-18.8 - Limestone interbedded with thin mud seams and shale, gray to dark gray, fractured	REC= 96% RQD= 16%							
913.22	15									
		Core recovery terminated at 18.8 ft.								
908.22	20									
903.22	25									
898.22	30									
893.22	35									

Offset 8 ft. South

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

APPENDIX C

Site Location Map
Drawings



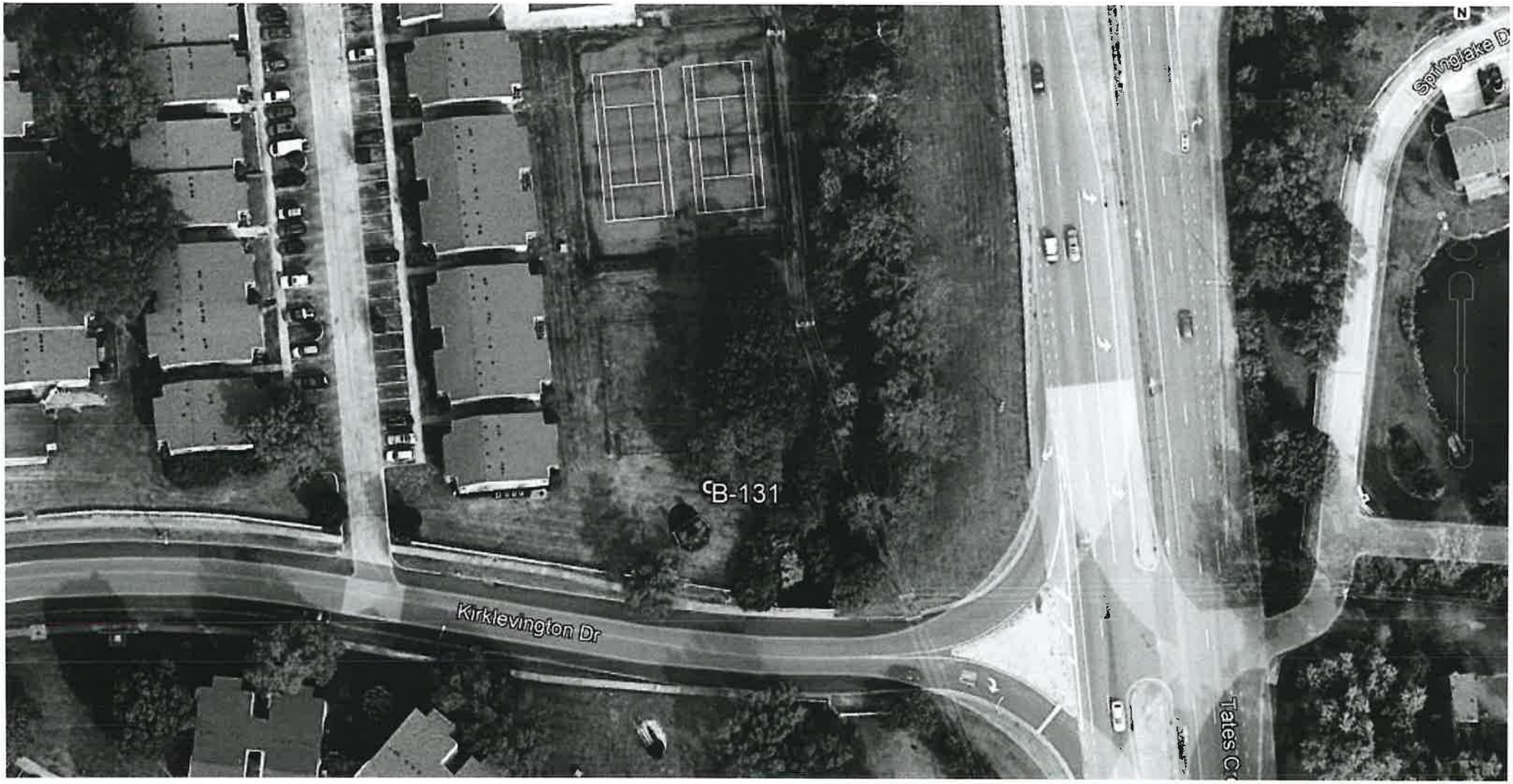
L.E. Gregg Associates, Inc. 2456 Fortune Drive, Suite 155 Lexington, Kentucky 40509	Merrick Trunk Sewer Lexington, Kentucky B-129	
	Project #2024008	Boring Layout



L.E. Gregg Associates, Inc.
2456 Fortune Drive, Suite 155
Lexington, Kentucky 40509

Merrick Trunk Sewer
Lexington, Kentucky
B-130

Project #2024008	Boring Layout



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Lexington, Kentucky
B-131

Project #2024008	Boring Layout



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Merrick Trunk Sewer
Lexington, Kentucky
S-114 thru S-118

Project #2024008

Boring Layout



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Merrick Trunk Sewer
Lexington, Kentucky
S-123 thru S-127

Project #2024008	Boring Layout



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2456 Fortune Drive, Suite 155
Lexington, Kentucky 40509

Merrick Trunk Sewer
Lexington, Kentucky
S-128

Project #2024008	Boring Layout

APPENDIX D

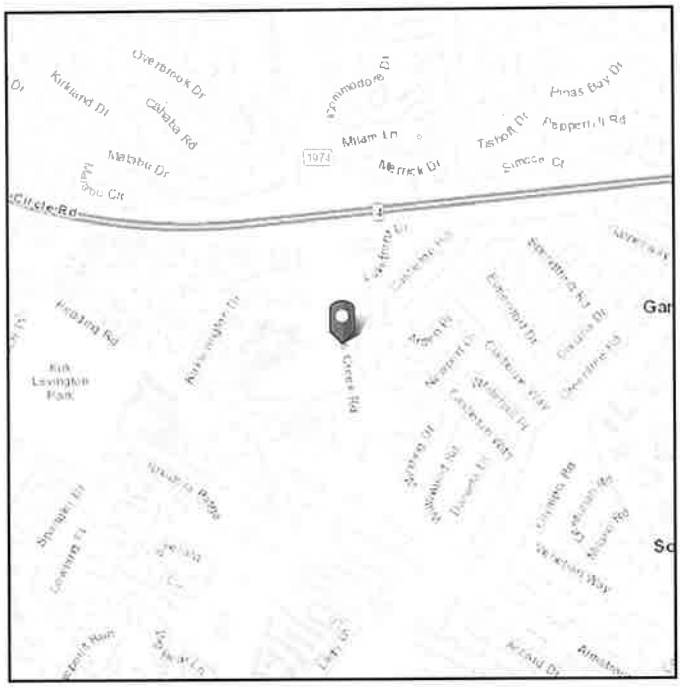
Seismic Design Information

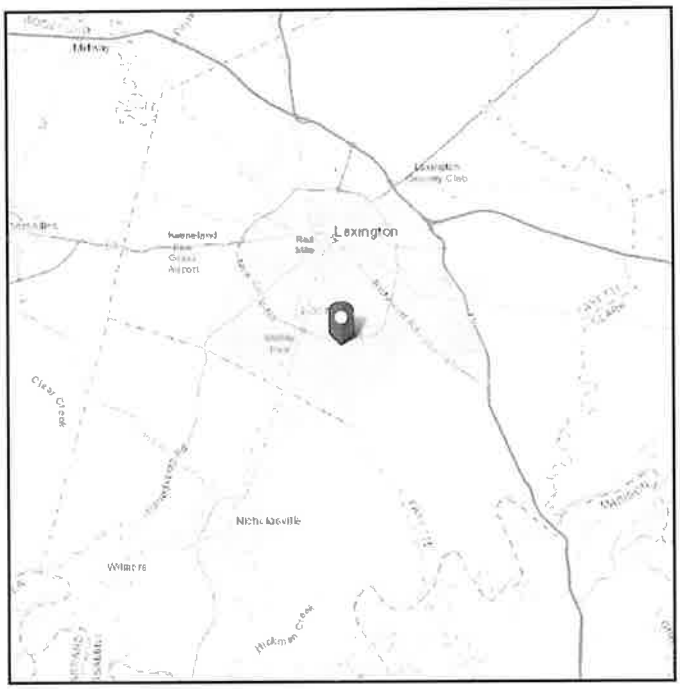
ASCE Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: B - Rock

Latitude: 37.987335
Longitude: -84.49439
Elevation: 924.0183287418139 ft (NAVD 88)





ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

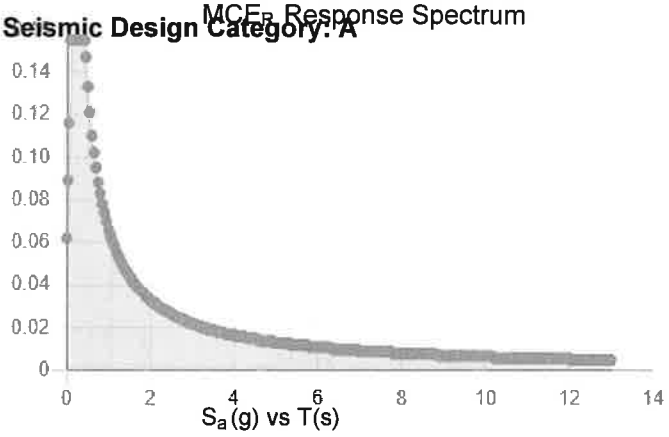
Site Soil Class: B - Rock

Results:

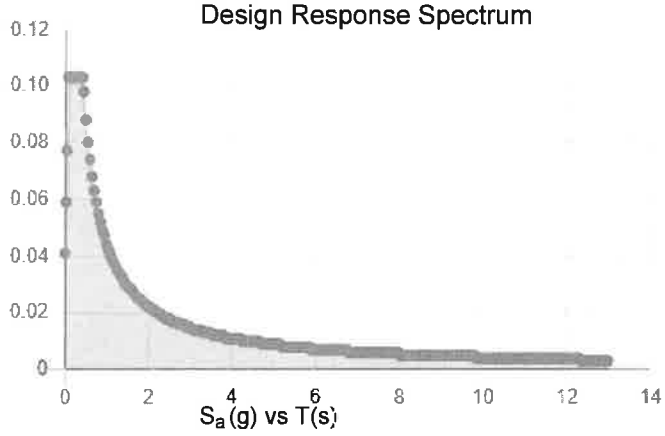
S_S :	0.172	S_{D1} :	0.044
S_1 :	0.083	T_L :	12
F_a :	0.9	PGA :	0.086
F_v :	0.8	PGA_M :	0.077
S_{MS} :	0.155	F_{PGA} :	0.9
S_{M1} :	0.066	I_e :	1
S_{DS} :	0.103	C_v :	0.7

Seismic Design Category: A

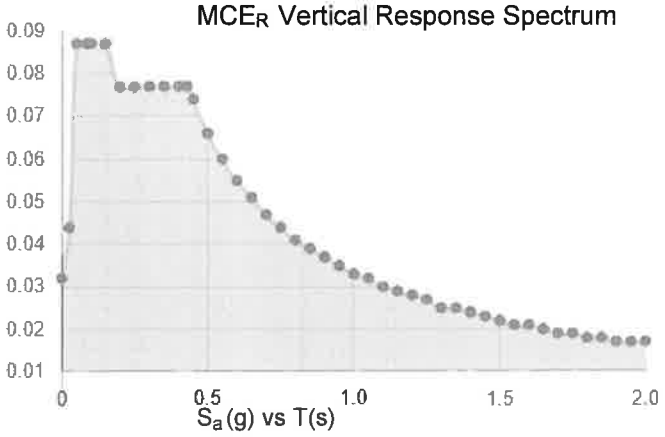
MCE_R Response Spectrum



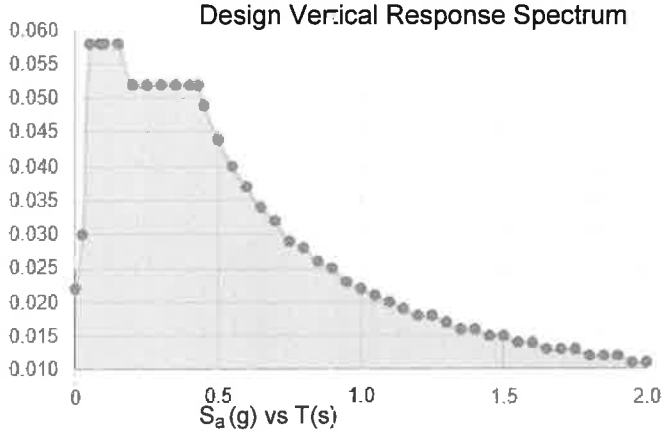
Design Response Spectrum



MCE_R Vertical Response Spectrum



Design Vertical Response Spectrum



Data Accessed: **Fri Aug 02 2024**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

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