R-558-2019
Contract # 225-2019

CONTRACT DOCUMENTS AND SPECIFICATIONS

FOR

Sanitary Sewer Improvements
Manchester Street and Willard Street

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

LFUCG Bid No. 79-2019

Date: August 26, 2019

PREPARED BY:

Stantec Consulting Services Inc.
3052 Beaumont Centre Circle
Lexington, KY 40513

Edition: Bid Document

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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) until 2:00 p.m., local time, Friday, September 13 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). Immediately following the scheduled closing time for reception of Bids, all proposals which have been submitted in accordance with the above will be publicly opened and read aloud.

1.02 DESCRIPTION OF WORK

The project includes providing all construction supervision, labor, materials, tools, test equipment necessary for the **Sanitary Sewer Improvements along Manchester Street and Willard Street.**

1.03 OBTAINING PLANS, SPECIFICATIONS, AND BID DOCUMENTS

Plans, Specifications, and Contract Documents may be obtained from https://lexingtonky.ionwave.net.

1.04 METHOD OF RECEIVING BIDS

Bids will be received from Prime contracting firms on a **Lump Sum** 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. Sealed Bids shall be clearly marked on the outside of the envelope as follows: Company Name and Address, Bid Invitation Number, and the Project Name. Bids are to remain sealed until official Bid closure time.

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. 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. Bids may be withdrawn in person prior to the closing date of receipt of Bids.

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

For assistance in locating MWDBE Subcontractors contact:

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

1.11 PRE-BID MEETING

A **non-mandatory** pre-Bid meeting will be held at **10:00AM local time, [Tuesday September 3, 2019** at the **Division of Water Quality, 125 Lisle Industrial Avenue**.

1.12 CONSENT DECREE REQUIREMENTS

Not Applicable

END OF SECTION

SECTION 00300 – INFORMATION AVAILABLE TO BIDDERS

1.01 RECEIPT AND OPENING OF BIDS

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 at the Division of Purchasing, at the time and in the manner set forth in the Advertisement for Bids, and the Bids will then be publicly opened and read aloud. 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 (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.

The Lexington-Fayette Urban County Government assumes no responsibility for Bids that are not addressed and delivered as indicated above. Bids that are not delivered to the Division of Central Purchasing by the stated time and date will be rejected.

1.02 PREPARATION OF BID

Each Bid must be submitted on the prescribed Bid Form. All blank spaces for the Bid prices must be filled in, either in ink or typewritten, for both unit prices and extensions. Totals for each Bid item must be added to show the total amount of the Bid. Each Bid must be submitted in a sealed envelope bearing on the outside the name of the Bidder, the Bidder's address, the name of the project, the invitation number and time and date for which the Bid is submitted. Bids must be addressed to the Director of Purchasing, Lexington-Fayette Urban County Government, Third Floor, 200 East Main Street, Lexington, Kentucky 40507. If forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope addressed as specified above.

1.03 SUBCONTRACTS

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

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.

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.

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 Lexington-Fayette Urban County Government of the above listed elements.

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

No interpretation of the meaning of the Contract Documents will be made to any Bidder orally. Every request for such interpretation should be in writing addressed to the Director of Central Purchasing, who in turn will have an addendum issued for the Lexington-Fayette Urban County Government, and to be given consideration must be received prior to the date fixed for the opening of Bids. 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.

1.15 PREVAILING WAGE LAW AND MINIMUM HOURLY RATES

Federal or State wage rates and regulations, if required for this Project, will be as described in the **Section 00820** herein.

1.16 AFFIRMATIVE ACTION PLAN

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

A. Affirmative Action Plan of the firm
B. Current Work Force Analysis Form
C. Good Faith Effort Documentation to meet the MWDBE goals.
D. List of Disadvantaged Business Enterprise Subcontractors and the Dollar Value of each Subcontract

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.

All submissions should be directed to:

Director, Division of Central Purchasing
Lexington-Fayette Urban County Government
200 East Main Street, Third Floor
Lexington, KY 40507

1.17 CONTRACT TIME

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

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

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.

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 ALTERNATE BIDS

Bidders shall submit alternate Bids/proposals only if and when such alternate Bids/proposals have been specifically requested in an Advertisement for Bids. If alternate Bids/proposals are requested in an

Lexington, Kentucky 40507
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 10% minimum MWDBE 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
smiller@lexingtonky.gov

1.23 MWDBE PARTICIPATION GOALS

GENERAL

1) The LFUCG request all potential contractors to make a concerted effort to include Minority-Owned (MBE), Woman-Owned (WBE), Disadvantaged (DBE) Business Enterprises and Veteran-Owned Small Businesses (VOSB) as subcontractors or suppliers in their bids.
2) Toward that end, the LFUCG has established 10% of total procurement costs as a Goal for participation of Minority-Owned, Woman-Owned and Disadvantaged Businesses on this contract.
3) **It is therefore a request of each Bidder to include in its bid, the same goal (10%) for MWDBE participation and other requirements as outlined in this section.**
4) The LFUCG has also established a 3% of total procurement costs as a Goal for participation for of Veteran-Owned Businesses.
5) **It is therefore a request of each Bidder to include in its bid, the same goal (3%) for Veteran-Owned participation and other requirements as outlined in this section.**

B. PROCEDURES

1) The successful bidder will be required to report to the LFUCG, the dollar amounts of all payments submitted to Minority-Owned, Woman-Owned or Veteran-Owned subcontractors and suppliers for work done or materials purchased for this contract. (See Subcontractor Monthly Payment Report)
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) The Lexington-Fayette Urban County Government, Division of Central Purchasing (859-258-3320)
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

f. Requested a list of MWDBE and/or Veteran subcontractors or suppliers from LFUCG and showed evidence of contacting the companies on the list(s).

g. Contacted organizations that work with MWDBE companies for assistance in finding certified MWBDE firms and Veteran-Owned businesses to work on this project. Those contacted and their responses should be a part of the bidder's good faith efforts documentation.

g. Sent written notices, by certified mail, email or facsimile, to qualified, certified MWDBEs and/or Veteran-Owned businesses 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 MWDBEs and Veteran-Owned Businesses to determine their level of interest.

j. Provided the interested MWBDE firm and/or Veteran-Owned business with adequate and timely information about the plans, specifications, and requirements of the contract.

k. Selected portions of the work to be performed by MWDBE firms and/or Veteran-Owned businesses in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate MWDBE and Veteran participation, even when the prime contractor may otherwise perform these work items with its own workforce

l. Negotiated in good faith with interested MWDBE firms and Veteran-Owned businesses not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.

m. Included documentation of quotations received from interested MWDBE firms and Veteran-Owned businesses which 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.

n. 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 MWDBE and/or Veteran-Owned business's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy MWDBE and Veteran goals.

o. Made an effort to offer assistance to or refer interested MWDBE firms and Veteran-Owned businesses to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal

p. Made efforts to expand the search for MWBE firms and Veteran-Owned businesses beyond the usual geographic boundaries.

q. Other--any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include MWDBE and Veteran participation.

Note: Failure to submit any of 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 Efforts must be submitted with the Bid, if the participation Goal is not met.

We have compiled the list below to help you locate certified MBE, WBE and DBE certified businesses. Below is a listing of contacts for LFUCG Certified MWDBEs and Veteran-Owned Small Businesses in (https://lexingtonky.ionwave.net)

Business	Contact	Email Address	Phone
LFUCG	Sherita Miller	smiller@lexingtonky.gov	859-258-3323
Commerce Lexington – Minority Business Development	Tyrone Tyra	ttyra@commercelexington.com	859-226-1625
Tri-State Minority Supplier Diversity Council	Susan Marston	smarston@tsmsdc.com	502-365-9762
Small Business Development Council	Shawn Rogers UK SBDC	shawn.rogers@uky.edu	859-257-7666
Community Ventures Corporation	Phyllis Alcorn	palcorn@cvky.org	859-231-0054
KY Transportation Cabinet (KYTC)	Melvin Bynes	Melvin.bynes2@ky.gov	502-564-3601
KYTC Pre-Qualification	Shella Eagle	Shella.Eagle@ky.gov	502-782-4815
Ohio River Valley Women's Business Council (WBENC)	Sheila Mixon	smixon@orvwbc.org	513-487-6537
Kentucky MWBE Certification Program	Yvette Smith, Kentucky Finance Cabinet	Yvette.Smith@ky.gov	502-564-8099
National Women Business Owner's Council (NWBOC)	Janet Harris-Lange	janet@nwboc.org	800-675-5066
Small Business Administration	Robert Coffey	robertcoffey@sba.gov	502-582-5971
LaVoz de Kentucky	Andres Cruz	lavozdeky@yahoo.com	859-621-2106
The Key News Journal	Patrice Muhammad	production@keynewsjournal.com	859-685-8488

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 Central Purchasing 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.

SUBSTITUTED MWDBE Company Name, Address, Phone, Email	MWDBE 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**

LFUCG SUBCONTRACTOR MONTHLY PAYMENT REPORT

The LFUCG has a 10% goal plan adopted by city council to increase the participation of minority and women owned businesses in the procurement process. The LFUCG also has a 3% goal plan adopted by cited council to increase the participation of veteran owned businesses in the procurement process. In order to measure that goal LFUCG will track spending with MWDBE and Veteran contractors on a monthly basis. By the signature below of an authorized company representative, you certify that the information is correct, and that each of the representations set forth below is true. Any misrepresentation may result in termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims. Please submit this form monthly to the Division of Central Purchasing/ 200 East Main Street / Room 338 / Lexington, KY 40507.

Bid/RFP/Quote #_____

Total Contract Amount Awarded to Prime Contractor for this Project_____

Project Name/ Contract #	**Work Period/ From: To:**
Company Name:	**Address:**
Federal Tax ID:	**Contact Person:**

Subcontractor Vendor ID (name, address, phone, email	Description of Work	Total Subcontract Amount	% of Total Contract Awarded to Prime for this Project	Total Amount Paid for this Period	Purchase Order number for subcontractor work (please attach PO)	Scheduled Project Start Date	Scheduled Project End Date

By the signature below of an authorized company representative, you certify that the information is correct, and that each of the representations set forth below is true. Any misrepresentations may result in the termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims.

_____ _____

Company **Company Representative**

_____ _____

Date **Title**

even when the prime contractor may otherwise perform these work items with its own workforce

_____ Negotiated in good faith with interested MWDBE firms and Veteran-Owned businesses not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.

_____ Included documentation of quotations received from interested MWDBE firms and Veteran-Owned businesses which 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.

_____ 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 MWDBE and/or Veteran-Owned business's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy MWDBE and Veteran goals.

_____ Made an effort to offer assistance to or refer interested MWDBE firms and Veteran-Owned businesses to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal

_____Made efforts to expand the search for MWBE firms and Veteran-Owned businesses beyond the usual geographic boundaries.

_____ Other--any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include MWDBE **and Veteran participation.**

NOTE: Failure to submit any of 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 approval by the MBE Liaison. Documentation of Good Faith Efforts must be submitted with the Bid, if the participation Goal is not met.

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**

[INSERT GEOTECHNICAL REPORT AND/OR ROCK SOUNDINGS]

END OF SECTION

Report of Geotechnical Exploration

Manchester and CSX/RJ Corman
Railroad Sanitary Sewer
Improvements
Lexington, Kentucky

Stantec

Prepared for:
Lexington-Fayette Urban County
Government
Lexington, Kentucky

Prepared by:
Stantec Consulting Services Inc.
Lexington, Kentucky

April 9, 2019

Stantec Consulting Services Inc.
3052 Beaumont Centre Circle, Lexington KY 40513-1703

April 9, 2019
File: let_001_175668041

Attention: Mr. Craig Prater
LFUCG Division of Water Quality
125 Lisle Industrial Avenue
Lexington, Kentucky 405 11

Reference: Report of Geotechnical Exploration
Manchester and GSX/RJ Corman Railroad Sanatory Sewer Improvements
Lexington, Kentucky

Dear Mr. Prater,

Our Geotechnical data report for the referenced project is being submitted with this letter. The field exploration was performed in general accordance with our proposal dated August 29, 2018.

Results of the field borings and laboratory testing program, are presented in this report. We have enjoyed working with your staff again in support of the design of this project. If we can be of further assistance, please call our office.

Regards,

Stantec Consulting Services Inc.

Donald Blanton
Senior Associate
Phone: 859 422 3033
Fax: 859 422 3100
Donald.Blanton@stantec.com

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REPORT OF GEOTECHNICAL EXPLORATION

April 9, 2019

1.0 INTRODUCTION

The Division of Water Quality is planning improvements to the existing sewer system along Manchester Street and relocation of the existing sewer east of the CSX/RJ Corman Railroad yard. Two possible alignments have been identified for the relocation of the existing sewer west of the CSX/RJ Corman Railroad yard, referred to in this report as alignments A and B. Alignments A and B are located in a similar area northwest of Lee Street between Newtown Pike and West Main Street along the Lexington Cemetery property. The proposed alignment along Manchester Street is referred to as alignment C in this report. Alignment C is located on Manchester Street from the intersection of Oliver Lewis Way west to the railroad tracks. Stantec drilled sample borings along all three alignments in order to determine the soil and bedrock conditions, which are described in detail in the following sections of this report.

2.0 SITE GEOLOGY

Available geologic mapping (Geologic Map of the Lexington West Quadrangle, U.S. Geological Survey, 1967) shows the site to be underlain by the Lower part of Lexington Limestone formation of the Middle Ordovician Age. The Lower part of Lexington Limestone formation is described as consisting of irregularly bedded limestone and shale. The limestone (80%) is mostly blue-gray in fresh outcrops to brownish-gray where weathered, thin to medium bedded, and fossiliferous. The shale (20%) is described as medium- to dark-gray and in thin irregular laminae separating nodular limestone beds. According to the Kentucky Geologic Map Information Service online viewer (http://kgs.uky.edu/kgsmap/kgsgeoserver/viewer.asp), karst potential for the Lexington Limestone formation is considered "high". A couple of large sinkholes have been mapped to the west of the project site.

3.0 SCOPE OF SERVICES

Prior to mobilizing to the site, the boring locations were staked by Integrated Engineering. Stantec then contacted Kentucky 811, the statewide utility locating service, to locate and mark buried utilities in the area.

One hundred twenty-three soil sample borings and soundings were proposed to be advanced at 50-foot intervals along each alignment at the locations shown on the Boring Layout drawings included in Appendix A. A total of 47 rockline soundings were proposed for alignment A; Two sample borings with rock core and 38 rockline soundings were proposed for alignment B; and a total of 38 borings (6 sample boring and 32 rockline soundings) were proposed for the Manchester Street alignment. Three borings (A-39, C-1 and C-2) were not drilled during the field exploration because of utility concerns or drill rig access. The borings were advanced using a

April 9, 2019

Boring	Northing	Easting	Surface Elevation (ft)	Top of Rock(1)/Refusal Depth (ft)	Top of Rock(1)/Refusal Elevation (ft)	Bottom of Hole Depth (ft)
A-13	203131.34	1567218.97	946.2	8.6	937.6	8.6
A-14	203109.53	1567173.34	946.4	8.5	937.9	8.5
A-15	203084.28	1567130.67	946.0	9.0	937.0	9.0
A-16	203060.77	1567086.62	945.5	8.3	937.2	8.3
A-17	203037.31	1567042.41	945.1	7.9	937.2	7.9
A-18	203008.40	1566987.77	945.4	7.8	937.6	7.8
A-19	202959.15	1566945.30	943.7	6.8	936.9	6.8
A-20	202917.80	1566967.07	943.2	8.2	935.0	8.2
A-21	202879.24	1566935.18	942.7	7.9	934.8	7.9
A-22	202840.68	1566903.36	941.5	7.1	934.4	7.1
A-23	202802.13	1566871.53	940.8	7.0	933.8	7.0
A-24	202763.58	1566839.70	939.9	7.3	932.6	7.3
A-25	202724.52	1566809.06	939.1	7.3	931.8	7.3
A-26	202685.53	1566777.63	938.5	6.6	931.9	6.6
A-27	202646.76	1566746.03	938.4	7.5	930.9	7.5
A-28	202607.73	1566714.89	938.9	8.9	930.0	8.9
A-29	202568.82	1566683.51	938.5	9.5	929.0	9.5
A-30	202529.87	1566652.10	938.3	10.7	927.6	10.7
A-31	202490.92	1566620.69	938.2	10.3	927.9	10.3
A-32	202460.91	1566596.65	937.2	8.8	928.4	8.8
A-33	202426.87	1566560.01	936.8	8.2	928.6	8.2
A-34	202392.80	1566523.47	935.5	7.2	928.3	7.2
A-35	202358.71	1566486.83	935.0	6.6	928.4	6.6
A-36	202324.61	1566450.28	936.3	8.1	928.2	8.1
A-37	202292.26	1566415.80	935.2	12.0	923.2	12.0
A-38	202269.28	1566410.70	934.1	1.8	932.3	1.8
A-39	Boring Not Drilled					
A-40	202217.48	1566279.94	935.6	10.5	925.1	10.5
A-41	202206.20	1566231.25	935.8	7.0	928.8	7.0
A-42	202194.90	1566182.53	935.7	1.2	934.5	1.2
A-43	202183.59	1566133.79	935.2	13.2	922.0	13.2
A-44	202169.82	1566074.53	930.7	16.4	914.3	16.4
A-45	202179.49	1566025.49	930.5	4.8	925.7	4.8
A-46	202189.28	1565976.42	931.6	5.5	926.1	5.5
A-47	202197.53	1565934.52	927.7	2.7	925.0	2.7

(1) Top of Rock in this case indicates a rock-like resistance to augering. An exact determination cannot be made without performing rock coring.

April 9, 2019

Boring	Northing	Easting	Surface Elevation (ft)	Top of Rock(1)/Refusal Depth (ft)	Top of Rock(1)/Refusal Elevation (ft)	Bottom of Hole Depth (ft)
B-38	202030.45	1566396.50	953.0	2.8	950.2	2.8
B-39	202057.21	1566354.24	942.1	2.7	939.4	2.7
B-40	202093.79	1566296.61	931.1	12.2	918.9	12.2

(1) Top of Rock in this case indicates a rock-like resistance to augering. An exact determination cannot be made without performing rock coring.

(2) Rock coring was performed in borings B-15 and B-16.

Table 3. Summary of Borings - Manchester Street

Boring	Northing	Easting	Surface Elevation (ft)	Top of Rock(1)/Refusal Depth (ft)	Top of Rock(1)/Refusal Elevation (ft)	Bottom of Hole Depth (ft)
C-1	Boring Not Drilled					
C-2	Boring Not Drilled					
C-3	201362.41	1565683.61	935.3	6.8	928.5	6.8
C-4	201395.55	1565639.52	935.0	8.4	926.6	8.4
C-5	201417.45	1565600.93	934.9	9.4	925.5	9.4
C-6	201446.37	1565548.26	934.9	6.3	928.6	6.3
C-7	201468.60	1565503.67	935.1	8.0	927.1	8.0
C-8	201532.03	1565485.97	934.9	9.3	925.6	9.3
C-9	201570.21	1565428.00	935.6	12.0	923.6	12.0
C-10	201599.27	1565375.46	935.5	11.0	924.5	11.0
C-11	201617.39	1565340.39	935.8	15.2	920.6	15.2
C-12	201644.08	1565291.02	935.9	15.7	920.2	15.7
C-13	201671.98	1565247.69	935.6	13.9	921.7	13.9
C-14	201690.37	1565201.50	935.9	13.8	922.1	13.8
C-15	201672.78	1565242.89	935.8	13.2	922.6	13.2
C-16	201733.50	1565117.92	934.7	12.8	921.9	12.8
C-17	201759.25	1565069.95	933.8	7.2	926.6	7.2
C-18	201780.00	1565027.67	933.0	8.2	924.8	8.2
C-19	201803.35	1564984.12	932.3	8.0	924.3	8.0
C-20	201827.44	1564938.32	931.3	8.9	922.4	8.9
C-21	201880.57	1564840.43	928.6	8.5	920.1	8.5
C-22	201876.10	1564850.29	929.1	8.1	921.0	8.1
C-23	201896.85	1564803.95	928.1	8.4	919.7	8.4
C-24	201925.24	1564752.87	927.3	8.0	919.3	8.0
C-25	201945.63	1564713.92	925.9	6.3	919.6	6.3
C-26	201965.16	1564677.33	925.0	6.0	919.0	6.0
C-27	201970.37	1564626.63	923.4	6.8	916.6	6.8

5.0 LABORATORY TESTING AND RESULTS

5.1 GENERAL

All laboratory tests were performed by Stantec in accordance with applicable ASTM soil and rock testing specifications. The results of the laboratory tests are presented in Appendix C.

5.2 UNDISTURBED SOIL TESTING

Undisturbed (Shelby) tube samples were obtained from selected locations. Soil samples were extruded from the tubes, trimmed into six-inch specimens, and described visually. Unit weights (wet and dry) and natural moisture contents were determined for each six-inch specimen. Selected specimens were subjected to engineering classification, unconfined compressive strength and consolidated-undrained triaxial testing. The results of these tests are presented on the appropriate sections in Appendix B and are discussed in the following paragraphs.

5.2.1 Engineering Classification Testing

Classification testing was performed on selected six-inch specimens extruded from two Shelby tubes obtained during the field exploration. The majority of the tube samples represent residual soils derived from the physical and chemical in-place weathering of the parent bedrock. Table 4 summarizes the results of laboratory classification testing of undisturbed (Shelby) tube specimens.

Table 4. Summary of Laboratory Classification of Shelby Tube Specimens

USCS Classification	Percentage of Specimens Tested	AASHTO Classification	Percentage of Specimens Tested
CL	42	A-6	8
CH	50	A-7-6	84
ML	8	A-7-5	8

5.2.2 Unconfined Compressive Strength Testing

Unconfined compressive strength test was performed by Stantec to obtain information used in estimating total stress strength parameters representative of the cohesive soil horizons. Table 5 summarizes the data obtained from this testing.

5.3 LATERAL EARTH PRESSURE COEFFICIENT

The lateral coefficient of active earth pressure (K_a) was calculated in order to determine the other pressures that would be on the temporary wall. The equation for K_a using Rankine equation which is expressed as follows:

$$Ka = \frac{1 - \sin(\varphi)}{1 + \sin(\varphi)} \quad (5.1)$$

Where:

φ = effective angle of internal friction angle of retained material

Using the stress parameters as outlined above Stantec calculated the K_a along the proposed alignment to range from 0..28 to 0.47 for a level backfill.

The at rest lateral earth pressure (K_o) is represented by the following equation:

$$Ko = 1 - \sin(\varphi') \quad (5.2)$$

K_o was estimated to range from 0.44 to 0.63.

5.4 BEDROCK TESTING

Bedrock strength and hardness testing on rock core specimens from borings B-15 and B-16.

Table 7. Summary of Unconfined Compressive Strength Testing

Hole No.	Test Interval (ft)	Wet Unit Weight (pcf)	Unconfined Compressive Strength (psi)
B-15	13.9-14.3	166.7	13,160
B-15	23.7-24.1	166.0	7,260
B-16	27.7-28.1	167.2	16,920
B-16	40.6-41.0	166.5	17,340

APPENDIX A
BORING LAYOUT

ALIGNMENT A

LEXINGTON

Stantec

- Pipe A Manhole (proposed)
- Pipe A Alignment (proposed)
- Rock Sounding/Boring Location
- Existing Sanitary Manhole
- Sanitary Collector
- Sanitary Trunk
- Force Main
- PS Pump Station
- WTP Wastewater Treatment Plant
- Stormwater Manhole
- Stormwater Pipe
- Stream
- Parcel Boundary

Map Key

Notes

200 0 200 Feet

1:2,400 (At Original document size of 11x17)

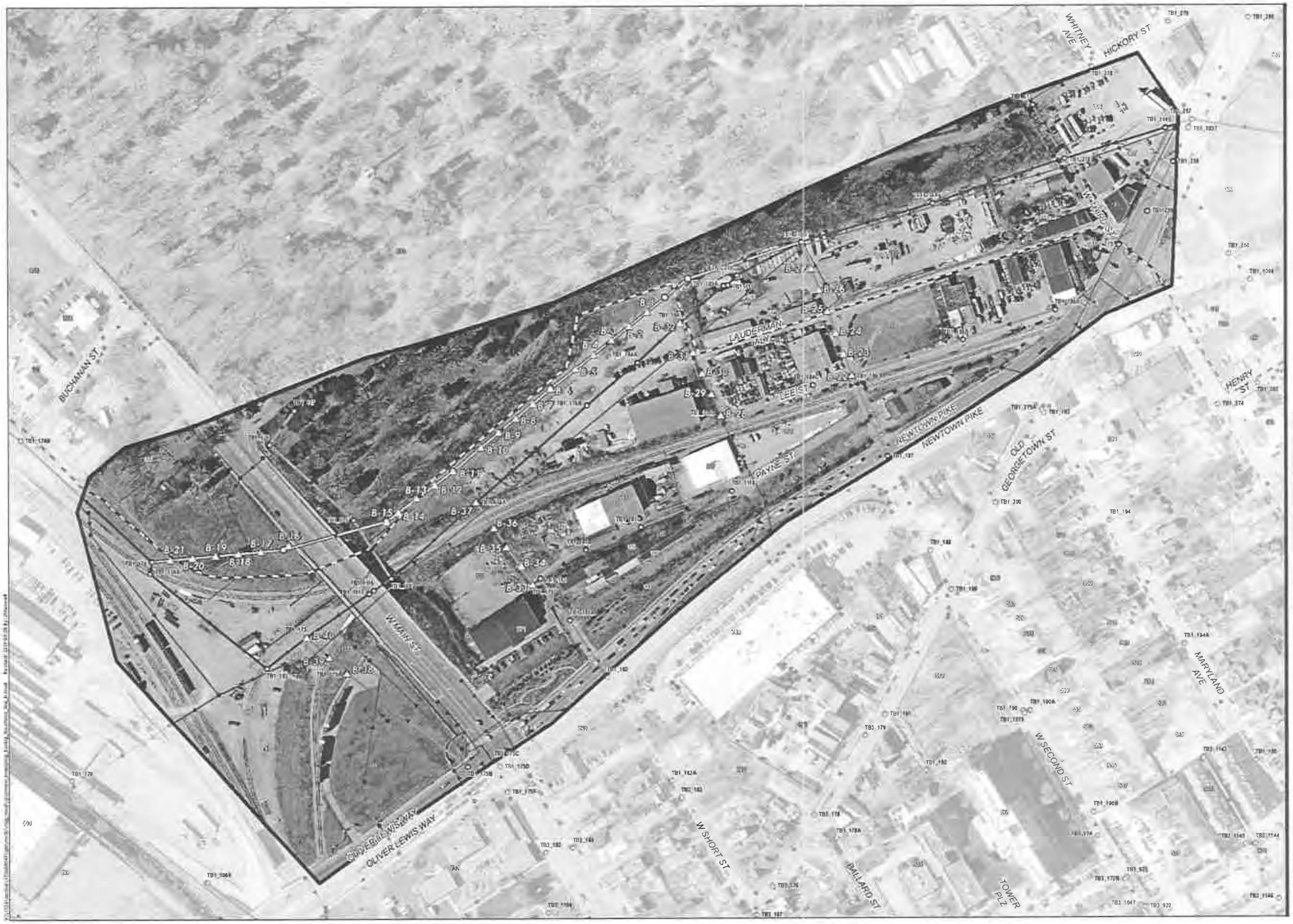
City of Lexington
Fayette County,
Kentucky

LFUCG Division of Water Quality
Sanitary Sewer Design MSA

R.J. Corman/CSX Railroad Project Area

Rock Sounding/Boring Locations
Alignment A (proposed)

ALIGNMENT B



LEXINGTON

Stantec

- Pipe B Manhole (proposed)
- Pipe B Alignment (proposed)
- Rock Sounding/Boring Location
- Existing Sanitary Manhole
- Sanitary Collector
- Sanitary Trunk
- Force Main
- PS Pump Station
- WTP Wastewater Treatment Plant
- Stormwater Manhole
- Stormwater Pipe
- Stream
- Parcel Boundary

Map Key

Notes

200 0 200 Feet

1:2,400 (At Original document size of 11x17)

Stantec Project No.175668041

City of Lexington
Fayette County
Kentucky

LFUCG Division of Water Quality
Sanitary Sewer Design MSA

R.J. Corman/CSX Railroad Project Area

Rock Sounding/Boring Locations
Alignment B (proposed)

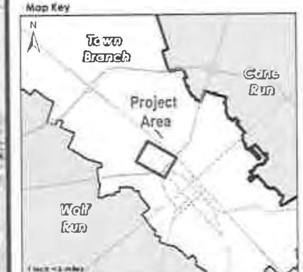
ALIGNMENT C

LEXINGTON

Stantec

- Pipe C Manhole (proposed)
- Pipe C Alignment (proposed)
- Rock Sounding/Boring Location
- Existing Sanitary Manhole
- Sanitary Collector
- Sanitary Trunk
- Force Main
- Pump Station
- Wastewater Treatment Plant
- Stormwater Manhole
- Stormwater Pipe
- Stream
- Parcel Boundary

Map Key



Notes

200 0 200 Feet

1:2,400 (At Original document size of 11x17)

Stantec Project No. 175660841

City of Lexington, Fayette County, Kentucky

LFUCG Division of Water Quality
Sanitary Sewer Design MSA

Manchester Street Project Area

Rock Sounding/Boring Locations Alignment C (proposed)

APPENDIX B
TYPED BORING LOGS

ALIGNMENT A

Stantec

Summary of Rockline Soundings

Job Name: LFUCG Sewer Project
County: Fayette
Project No. 175668041

Date: 3/21/2019

Boring	Northing	Easting	Surface Elevation (ft)	Top of Rock[(1)]/ Refusal Depth (ft)	Top of Rock[(1)]/ Refusal Elevation (ft)	Bottom of Hole Depth (ft)	Bottom of Hole Elevation (ft)
A-1	203410.01	1567756.82	951.3	14.7	936.6	14.7	936.6
A-2	203385.98	1567712.87	949.8	12.1	937.7	12.1	937.7
A-3	203362.19	1567668.98	949.3	13.5	935.8	13.5	935.8
A-4	203338.30	1567625.02	948.7	12.2	936.5	12.2	936.5
A-5	203316.57	1567578.63	949.3	12.8	936.5	12.8	936.5
A-6	203290.54	1567537.17	949.2	14.7	934.5	14.7	934.5
A-7	203263.88	1567488.14	948.9	12.9	936.0	12.9	936.0
A-8	203241.71	1567443.34	948.7	16.0	932.7	16.0	932.7
A-9	203219.47	1567398.55	948.9	12.0	936.9	12.0	936.9
A-10	203197.28	1567353.76	948.1	16.0	932.1	16.0	932.1
A-11	203175.03	1567308.93	947.1	10.1	937.0	10.1	937.0
A-12	203152.72	1567260.04	946.7	9.1	937.6	9.1	937.6
A-13	203131.34	1567218.97	946.2	8.6	937.6	8.6	937.6
A-14	203109.53	1567173.34	946.4	8.5	937.9	8.5	937.9
A-15	203084.28	1567130.67	946.0	9.0	937.0	9.0	937.0
A-16	203060.77	1567086.62	945.5	8.3	937.2	8.3	937.2
A-17	203037.31	1567042.41	945.1	7.9	937.2	7.9	937.2
A-18	203008.40	1566987.77	945.4	7.8	937.6	7.8	937.6
A-19	202959.15	1566945.30	943.7	6.8	936.9	6.8	936.9
A-20	202917.80	1566967.07	943.2	8.2	935.0	8.2	935.0
A-21	202879.24	1566935.18	942.7	7.9	934.8	7.9	934.8
A-22	202840.68	1566903.36	941.5	7.1	934.4	7.1	934.4
A-23	202802.13	1566871.53	940.8	7.0	933.8	7.0	933.8
A-24	202763.58	1566839.70	939.9	7.3	932.6	7.3	932.6
A-25	202724.52	1566809.06	939.1	7.3	931.8	7.3	931.8
A-26	202685.53	1566777.63	938.5	6.6	931.9	6.6	931.9
A-27	202646.76	1566746.03	938.4	7.5	930.9	7.5	930.9
A-28	202607.73	1566714.89	938.9	8.9	930.0	8.9	930.0
A-29	202568.82	1566683.51	938.5	9.5	929.0	9.5	929.0
A-30	202529.87	1566652.10	938.3	10.7	927.6	10.7	927.6
A-31	202490.92	1566620.69	938.2	10.3	927.9	10.3	927.9
A-32	202460.91	1566596.65	937.2	8.8	928.4	8.8	928.4

ALIGNMENT B

Stantec

SUBSURFACE LOG

Project Number	175668041	Location	Station ,
Project Name	LFUCG Sanitary Sewer Improvement	Boring No.	**B-15**
County	Fayette	Surface Elevation	936.5 ft
Project Type	Sewer Alignment	Date Started	10/3/18
Supervisor	D. Blanton	Driller	
Logged By		Depth to Water	N/A

Total Depth	28.9 ft										
Completed	10/3/18										
Depth to Water	Dry	Date/Time	10/3/18								
Date/Time	N/A										

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
936.5	0.0	Top of Hole							
936.3	0.2	Topsoil							No additional ST's attemped due to boulders.
		Lean Clay With Silt And Limestone Gravel, brown to dark brown, damp to moist, Limestone is gray/white calcareous and friable		ST-1	4.5 - 6.5	1.1		--	
926.5	10.0								Began Core
		Limestone, gray, fine to medium crystalline grained, hard. Argillaceous zones, irregular bedded, nodular fossiliferous zones, with shale stringers and partings. Vug located at 11.7' and calcite crystallization from 12.6' to 12.7'.		60/60	1.5	1.5	100	11.5	
				60/60	5.0	4.4	88	16.5	Weathered bedding planes
				58/58	5.0	5.0	100	21.5	
				68/68	5.0	5.0	100	26.5	Vertical fracture and highly weathered, buggy, pitted, calcite solutioning from 26.2' to 28.9'
907.6	28.9			0/0	2.4	2.4	100	28.9	
		Bottom of Hole							

Top of Rock = 10.0
Elevation (926.5)

UC samples taken at 13.9' to 14.4' (1) and 23.3' to 24.1' (2)

Abrasivity Samples taken at 10.9' to 11.5' (1) and 24.4' to 25.0' (2).

STANTECFRM_LEGACY STANDARD DNT DATABASE.GPJ FNSM GRAPHIC LOG.GDT 3/21/19

3/21/19

Stantec

SUBSURFACE LOG

Project Number	175668041	Location	Station ,
Project Name	LFUCG Sanitary Sewer Improvement	Boring No.	**B-16** Total Depth 51.7 ft
County	Fayette	Surface Elevation	959.3 ft
Project Type	Sewer Alignment	Date Started	10/23/18 Completed 10/24/18
Supervisor	D. Blanton Driller	Depth to Water	Dry Date/Time 10/24/18
Logged By		Depth to Water	N/A Date/Time N/A

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
959.3	0.0	Top of Hole							
		Clay, brown to dark brown, moist, stiff, silty		ST-1	2.0 - 4.0	0.9		--	
				ST-2	7.0 - 9.0	1.4		--	
				ST-3	12.0 - 13.8	0.9		--	
				ST-4	17.0 - 19.0	1.0		--	
				ST-5	22.0 - 24.0	1.1		--	
932.6	26.7								Began Core
		Limestone, gray, fine to medium crystalline grained, hard. Argillaceous zones, irregular bedded, nodular with fossilferrous zones and shale stringers and partings		66/66	5.0	4.8	96	31.7	Weathered bedding planes from 26.7' to 29.0' and 34.1'

Stantec

Summary of Rockline Soundings

Job Name: LFUCG Sewer Project
County: Fayette
Project No. 175668041
Date: 3/21/2019

Boring	Northing	Easting	Surface Elevation (ft)	Top of Rock(1)/ Refusal Depth (ft)	Top of Rock(1)/ Refusal Elevation (ft)	Bottom of Hole Depth (ft)	Bottom of Hole Elevation (ft)
B-1	202921.87	1566911.89	943.1	6.9	936.2	6.9	936.2
B-2	202884.65	1566878.57	942.1	6.7	935.4	6.7	935.4
B-3	202847.39	1566845.25	941.3	6.4	934.9	6.4	934.9
B-4	202810.12	1566811.86	940.9	6.9	934.0	6.9	934.0
B-5	202772.89	1566778.57	940.4	6.8	933.6	6.8	933.6
B-6	202720.11	1566731.31	940.1	7.0	933.1	7.0	933.1
B-7	202681.78	1566699.20	940.2	6.5	933.7	6.5	933.7
B-8	202643.46	1566667.10	939.0	7.1	931.9	7.1	931.9
B-9	202605.10	1566635.00	937.8	5.8	932.0	5.8	932.0
B-10	202566.79	1566602.89	937.0	5.9	931.1	5.9	931.1
B-11	202505.12	1566551.24	936.7	5.4	931.3	5.4	931.3
B-12	202468.60	1566517.15	936.4	3.5	932.9	3.5	932.9
B-13	202432.08	1566482.97	936.1	8.2	927.9	8.2	927.9
B-14	202395.55	1566448.78	936.1	5.5	930.6	5.5	930.6
B-17	202259.88	1566166.30	941.1	6.0	935.1	6.0	935.1
B-18	202246.89	1566118.01	938.0	5.5	932.5	5.5	932.5
B-19	202233.89	1566069.75	938.1	15.5	922.6	15.5	922.6
B-20	202220.91	1566021.46	937.7	14.5	923.2	14.5	923.2
B-21	202207.98	1565973.19	935.2	8.2	927.0	8.2	927.0
B-22	202862.44	1567379.07	948.9	10.0	938.9	10.0	938.9
B-23	202905.43	1567353.44	948.2	11.4	936.8	11.4	936.8
B-24	202948.36	1567327.85	947.7	11.4	936.3	11.4	936.3
B-25	202991.29	1567302.18	947.4	11.2	936.2	11.2	936.2
B-26	203034.24	1567276.59	946.4	10.5	935.9	10.5	935.9
B-27	203077.15	1567250.99	946.4	11.0	935.4	11.0	935.4
B-28	202727.00	1567109.91	944.2	2.8	941.4	2.8	941.4
B-29	202768.56	1567082.05	943.0	10.5	932.5	10.5	932.5
B-30	202810.08	1567054.21	943.1	9.2	933.9	9.2	933.9
B-31	202851.61	1567026.45	942.6	9.4	933.2	9.4	933.2
B-32	202910.48	1566986.98	943.0	8.0	935.0	8.0	935.0
B-33	202290.56	1566766.09	941.2	6.0	935.2	6.0	935.2
B-34	202326.73	1566734.60	942.7	8.1	934.6	8.1	934.6

ALIGNMENT C

Stantec

SUBSURFACE LOG

Project Number	175668041	Location	Station ,		
Project Name	LFUCG Sanitary Sewer Improvement	Boring No.	C-3	Total Depth	6.8 ft
County	Fayette	Surface Elevation	935.3 ft		
Project Type	Sewer Alignment	Date Started	12/6/18	Completed	12/6/18
Supervisor	D. Blanton Driller T. Caudill	Depth to Water	Dry	Date/Time	12/6/18
Logged By	E. Sweet	Depth to Water	N/A	Date/Time	N/A

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
935.3	0.0	Top of Hole							
934.9	0.4	Topsoil							
		Lean Clay With Sand, reddish brown, moist, medium		ST-1	2.0 - 4.0	1.2		--	
				BAG-1	1.0 - 6.9			--	
				ST-2	5.0 - 6.5	1.5		--	
928.5	6.8	Auger Refusal / Bottom of Hole							
		Top of Rock = 6.9 Elevation (928.4)							

STANTEC-FMSM_LEGACY STANDARD GINT DATABASE.GPJ FMSM-GRAPHIC LOG.GDT 3/21/19

3/21/19

Stantec

SUBSURFACE LOG

Project Number	175668041	Location	Station ,		
Project Name	LFUCG Sanitary Sewer Improvement	Boring No.	**C-10**	Total Depth	11.0 ft
County	Fayette	Surface Elevation	935.5 ft		
Project Type	Sewer Alignment	Date Started	12/10/18	Completed	12/10/18
Supervisor	D. Blanton Driller T. Caudill	Depth to Water	Dry	Date/Time	12/10/18
Logged By	E. Sweet	Depth to Water	N/A	Date/Time	N/A

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
935.5	0.0	Top of Hole							
935.3	0.2	Topsoil							
		Lean Clay, brown to dark brown, damp to moist, medium, silty		ST-1	2.0 - 4.0	1.9		--	Boring advanced with solid stone augers, string removed prior to pushing ST.
		Fine gravel percent from 5.0' (angular limestone)		ST-2	5.0 - 7.0	1.6		--	
924.5	11.0	Gravel increases in size to >1" (angular limestone) from 10'		ST-3	10.0 - 11.0	0.9		--	
923.5	12.0	Auger Refusal / Bottom of Hole Top of Rock = 11.0 Elevation (924.5)							

Stantec

SUBSURFACE LOG

Project Number	175668041	Location	Station ,		
Project Name	LFUCG Sanitary Sewer Improvement	Boring No.	**C-15**	Total Depth	13.2 ft
County	Fayette	Surface Elevation	935.7 ft		
Project Type	Sewer Alignment	Date Started	12/10/18	Completed	12/10/18
Supervisor	D. Blanton Driller T. Caudill	Depth to Water	Dry	Date/Time	12/10/18
Logged By	E. Sweet	Depth to Water	N/A	Date/Time	N/A

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
935.7	0.0	Top of Hole							
934.7	1.0	Concrete							
		Silty Lean Clay, brown to dark brown, damp to moist, with 1/4" limestone gravel, abundant manganese and nodules		ST-1	2.0 - 4.0	1.9		--	
		Color from 10.0' to 12.0' slightly lighter, consistant lithology		ST-2	5.0 - 7.0	1.8		--	
				ST-3	10.0 - 12.0	1.4		--	
922.5	13.2								

Auger Refusal /
Bottom of Hole

Top of Rock = 13.2
Elevation (922.5)

Boring relocated due to access 5.0' west and 1.0' south of C-13. Boring backfilled with auger cuttings with additional sand.

Stantec

SUBSURFACE LOG

Project Number	175668041	Location	Station ,		
Project Name	LFUCG Sanitary Sewer Improvement	Boring No.	**C-21**	Total Depth	8.5 ft
County	Fayette	Surface Elevation	928.6 ft		
Project Type	Sewer Alignment	Date Started	12/10/18	Completed	12/10/18
Supervisor	D. Blanton Driller D. Jessie	Depth to Water	Dry	Date/Time	12/10/18
Logged By	M. Lucas	Depth to Water	N/A	Date/Time	N/A

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
928.6	0.0	Top of Hole							
~~928.4~~	~~0.2~~	Topsoil							Bulk sample from 0.0' - 5.0'.
		Lean Clay, brown to dark brown, damp to moist, moderately silty 1/2" gravel present from 5.0' (angular limestone)		ST-1	2.0 - 4.0	1.5		--	Boring advanced with solid stem augers.
				ST-2	5.0 - 7.0	1.6		--	
920.1	8.5	Auger Refusal / Bottom of Hole							

Top of Rock = 8.5
Elevation (920.1)

Boring backfilled with auger cutting and additional sand.

Stantec

SUBSURFACE LOG

Project Number	175668041	Location	Station ,		
Project Name	LFUCG Sanitary Sewer Improvement	Boring No.	**C-27**	Total Depth	6.8 ft
County	Fayette	Surface Elevation	924.3 ft		
Project Type	Sewer Alignment	Date Started	12/6/18	Completed	12/6/18
Supervisor	D. Blanton Driller T. Caudill	Depth to Water	Dry	Date/Time	12/6/18
Logged By	E. Sweet	Depth to Water	N/A	Date/Time	N/A

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
924.3	0.0	Top of Hole							
923.9	0.4	Topsoil							
		Lean Clay With Sand, reddish brown, moist, medium		ST-1 BAG-2	2.0 - 4.0 0.4 - 6.8	0.3		-- --	
917.5	6.8	Auger Refusal / Bottom of Hole Top of Rock = 6.8 Elevation (917.5)							

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Stantec

SUBSURFACE LOG

Project Number	175668041	Location	Station ,		
Project Name	LFUCG Sanitary Sewer Improvement	Boring No.	**C-33**	Total Depth	4.8 ft
County	Fayette	Surface Elevation	916.5 ft		
Project Type	Sewer Alignment	Date Started	12/6/18	Completed	12/6/18
Supervisor	D. Blanton Driller T. Caudill	Depth to Water	Dry	Date/Time	12/6/18
Logged By	E. Sweet	Depth to Water	N/A	Date/Time	N/A

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
916.5	0.0	Top of Hole							
916.1	0.4	Topsoil							
		Lean Clay With Sand, reddish brown, moist, medium		ST-1	2.0 - 4.0	0.6		--	
911.7	4.8	Auger Refusal / Bottom of Hole Top of Rock = 4.8 Elevation (911.7)							

Stantec

Summary of Rockline Soundings

Job Name: LFUCG Sewer Project
County: Fayette
Date: 3/21/2019
Project No. 175668041

Boring	Northing	Easting	Surface Elevation (ft)	Top of Rock(1)/ Refusal Depth (ft)	Top of Rock(1)/ Refusal Elevation (ft)	Bottom of Hole Depth (ft)	Bottom of Hole Elevation (ft)
C-1	Boring Not Drilled						
C-2	Boring Not Drilled						
C-4	201395.55	1565639.52	935.0	8.4	926.6	8.4	926.6
C-5	201417.45	1565600.93	934.9	9.4	925.5	9.4	925.5
C-6	201446.37	1565548.26	934.9	6.3	928.6	6.3	928.6
C-7	201468.60	1565503.67	935.1	8.0	927.1	8.0	927.1
C-8	201532.03	1565485.97	934.9	9.3	925.6	9.3	925.6
C-9	201570.21	1565428.00	935.6	12.0	923.6	12.0	923.6
C-11	201617.39	1565340.39	935.8	15.2	920.6	15.2	920.6
C-12	201644.08	1565291.02	935.9	15.7	920.2	15.7	920.2
C-13	201671.98	1565247.69	935.6	13.9	921.7	13.9	921.7
C-14	201690.37	1565201.50	935.9	13.8	922.1	13.8	922.1
C-16	201733.50	1565117.92	934.7	12.8	921.9	12.8	921.9
C-17	201759.25	1565069.95	933.8	7.2	926.6	7.2	926.6
C-18	201780.00	1565027.67	933.0	8.2	924.8	8.2	924.8
C-19	201803.35	1564984.12	932.3	8.0	924.3	8.0	924.3
C-20	201827.44	1564938.32	931.3	8.9	922.4	8.9	922.4
C-22	201876.10	1564850.29	929.1	8.1	921.0	8.1	921.0
C-23	201896.85	1564803.95	928.1	8.4	919.7	8.4	919.7
C-24	201925.24	1564752.87	927.3	8.0	919.3	8.0	919.3
C-25	201945.63	1564713.92	925.9	6.3	919.6	6.3	919.6
C-26	201965.16	1564677.33	925.0	6.0	919.0	6.0	919.0
C-28	202010.65	1564591.16	923.0	5.2	917.8	5.2	917.8
C-29	202030.52	1564549.18	922.3	4.2	918.1	4.2	918.1
C-30	202056.88	1564501.73	920.6	4.0	916.6	4.0	916.6
C-31	202078.98	1564457.43	919.5	5.5	914.0	5.5	914.0
C-32	202102.96	1564410.85	917.9	4.9	913.0	4.9	913.0
C-34	201364.88	1565250.24	938.3	16.1	922.2	16.1	922.2
C-35	201400.34	1565269.76	937.9	14.6	923.3	14.6	923.3
C-36	201445.66	1565295.60	937.3	13.4	923.9	13.4	923.9
C-37	201488.89	1565318.79	936.5	14.2	922.3	14.2	922.3
C-38	201532.82	1565343.31	935.7	9.2	926.5	9.2	926.5

APPENDIX C
LABORATORY TEST RESULTS

SOIL CLASSIFICATION TESTING

Stantec

Summary of Soil Tests

Project Name: LFUCG Sewer
Project Number: 175668041
Source: B-15, 4.9'-5.4'
Lab ID: 1
Sample Type: ST
Date Received: 10-31-18
Date Reported: 11-7-18

Test Results

Natural Moisture Content

Test Method: ASTM D 2216
Moisture Content (%): 25.5

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
3/4"	19	100.0
3/8"	9.5	97.5
No. 4	4.75	97.4
No. 10	2	84.6
No. 40	0.425	58.3
No. 200	0.075	50.7
	0.02	36.5
	0.005	21.8
	0.002	15.7
estimated	0.001	12.1

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	2.6	15.4
Coarse Sand	12.8	26.3
Medium Sand	26.3	---
Fine Sand	7.6	7.6
Silt	28.9	35.0
Clay	21.8	15.7

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry
Liquid Limit: 42
Plastic Limit: 22
Plasticity Index: 20
Activity Index: 1.3

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.85

Classification

Unified Group Symbol: CL
Group Name: Sandy lean clay
AASHTO Classification: A-7-6 (7)

Comments:

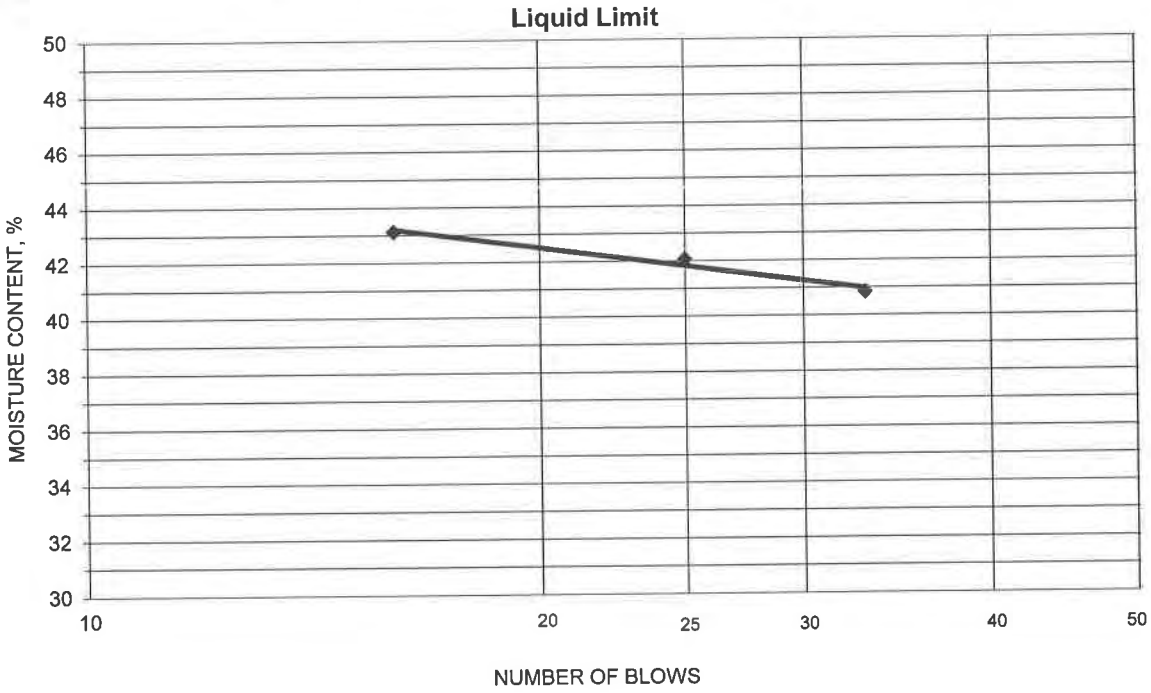
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer	Project No.	175668041
Source	B-15, 4.9'-5.4'	Lab ID	1
		% + No. 40	42
Tested By	KG	Test Method	ASTM D 4318 Method A
Test Date	11-05-2018	Prepared	Dry
		Date Received	10-31-2018

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
20.90	18.07	11.14	33	40.8	42
20.84	17.93	11.01	25	42.1	
19.73	17.10	11.00	16	43.1	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.73	18.21	11.20	21.7	22	20
19.76	18.31	11.56	21.5		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name	LFUCG Sewer	Project Number	175668041
Source	B-16, 7.0'-7.5'	Lab ID	3
Sample Type	ST	Date Received	10-31-18
		Date Reported	11-7-18

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 30.5

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
2"	50	100.0
1"	25	95.7
3/4"	19	95.7
3/8"	9.5	95.7
No. 4	4.75	94.7
No. 10	2	90.8
No. 40	0.425	85.9
No. 200	0.075	79.9
	0.02	64.0
	0.005	52.0
	0.002	45.7
estimated	0.001	40.6

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	5.3	9.2
Coarse Sand	3.9	4.9
Medium Sand	4.9	---
Fine Sand	6.0	6.0
Silt	27.9	34.2
Clay	52.0	45.7

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	70
Plastic Limit:	26
Plasticity Index:	44
Activity Index:	1.0

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.83

Classification

Unified Group Symbol: CH

Group Name: Fat clay with sand

AASHTO Classification: A-7-6 (38)

Comments:

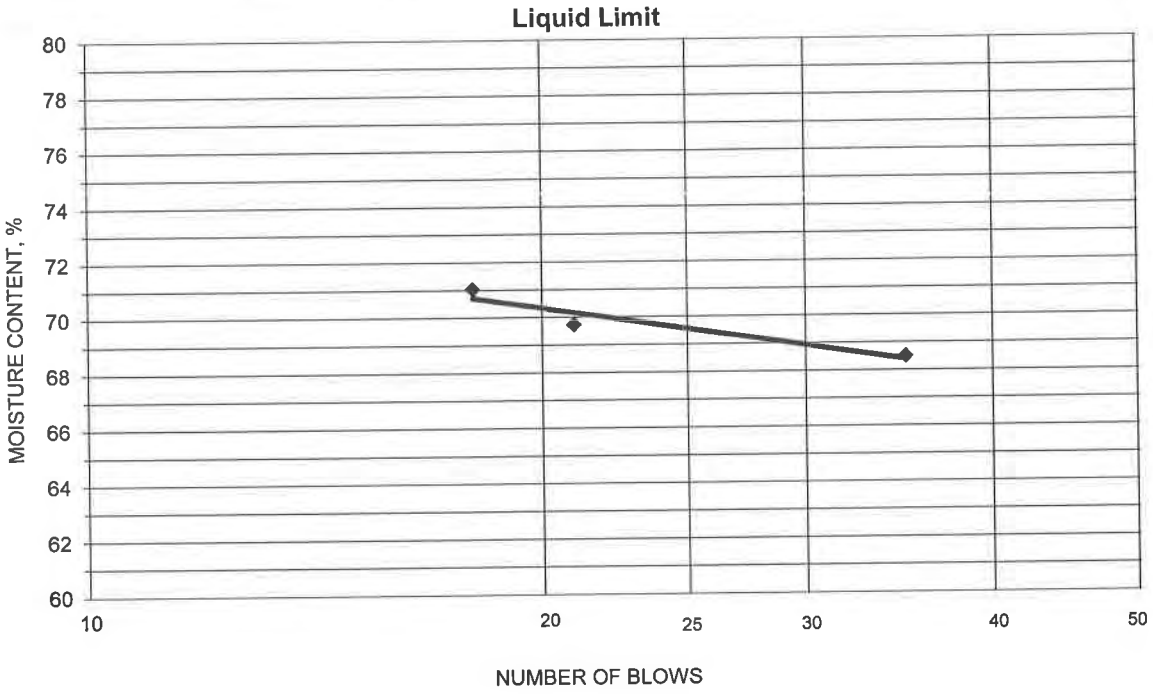
Reviewed By RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer	Project No.	175668041
Source	B-16, 7.0'-7.5'	Lab ID	3
		% + No. 40	14
Tested By	KG	Test Method	ASTM D 4318 Method A
Test Date	11-05-2018	Prepared	Dry
		Date Received	10-31-2018

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
19.33	15.85	10.77	35	68.5	70
19.64	16.16	11.17	21	69.7	
19.20	15.84	11.11	18	71.0	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.19	16.65	10.81	26.4	26	44
17.35	15.98	10.83	26.6		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name	LFUCG Sewer	Project Number	175668041
Source	B-16, 12.0'-12.6'	Lab ID	4
Sample Type	ST	Date Received	10-31-18
		Date Reported	11-7-18

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 40.8

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
1"	25	100.0
3/4"	19	96.6
3/8"	9.5	96.6
No. 4	4.75	96.5
No. 10	2	95.4
No. 40	0.425	87.9
No. 200	0.075	81.2
	0.02	67.4
	0.005	54.1
	0.002	49.0
estimated	0.001	45.8

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	3.5	4.6
Coarse Sand	1.1	7.5
Medium Sand	7.5	---
Fine Sand	6.7	6.7
Silt	27.1	32.2
Clay	54.1	49.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	77
Plastic Limit:	31
Plasticity Index:	46
Activity Index:	0.9

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.77

Classification

Unified Group Symbol: CH

Group Name: Fat clay with sand

AASHTO Classification: A-7-5 (41)

Comments:

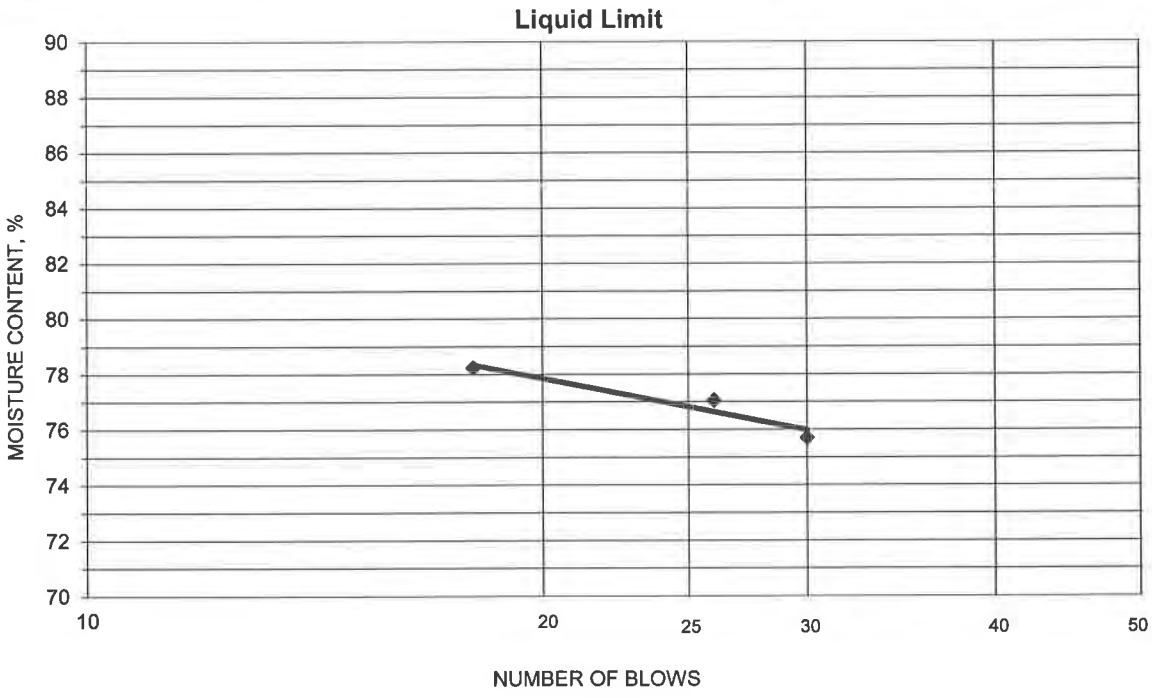
Reviewed By RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer	Project No.	175668041
Source	B-16, 12.0'-12.6'	Lab ID	4
		% + No. 40	12
Tested By	CM	Test Method	ASTM D 4318 Method A
Test Date	11-05-2018	Prepared	Dry
		Date Received	10-31-2018

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
21.33	16.97	11.21	30	75.7	
21.08	16.82	11.29	26	77.0	
20.75	16.51	11.09	18	78.2	77



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
20.19	18.06	11.20	31.0	31	46
18.67	16.81	10.95	31.7		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name	LFUCG Sewer	Project Number	175668041
Source	B-16, 22.0'-22.5'	Lab ID	6
Sample Type	ST	Date Received	10-31-18
		Date Reported	11-7-18

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 28.0

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
1"	25	100.0
3/4"	19	98.7
3/8"	9.5	98.1
No. 4	4.75	98.0
No. 10	2	96.3
No. 40	0.425	89.3
No. 200	0.075	85.4
	0.02	66.9
	0.005	46.7
	0.002	39.9
estimated	0.001	36.2

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	2.0	3.7
Coarse Sand	1.7	7.0
Medium Sand	7.0	---
Fine Sand	3.9	3.9
Silt	38.7	45.5
Clay	46.7	39.9

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	56
Plastic Limit:	23
Plasticity Index:	33
Activity Index:	0.8

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.78

Classification

Unified Group Symbol: CH

Group Name: Fat clay

AASHTO Classification: A-7-6 (30)

Comments:

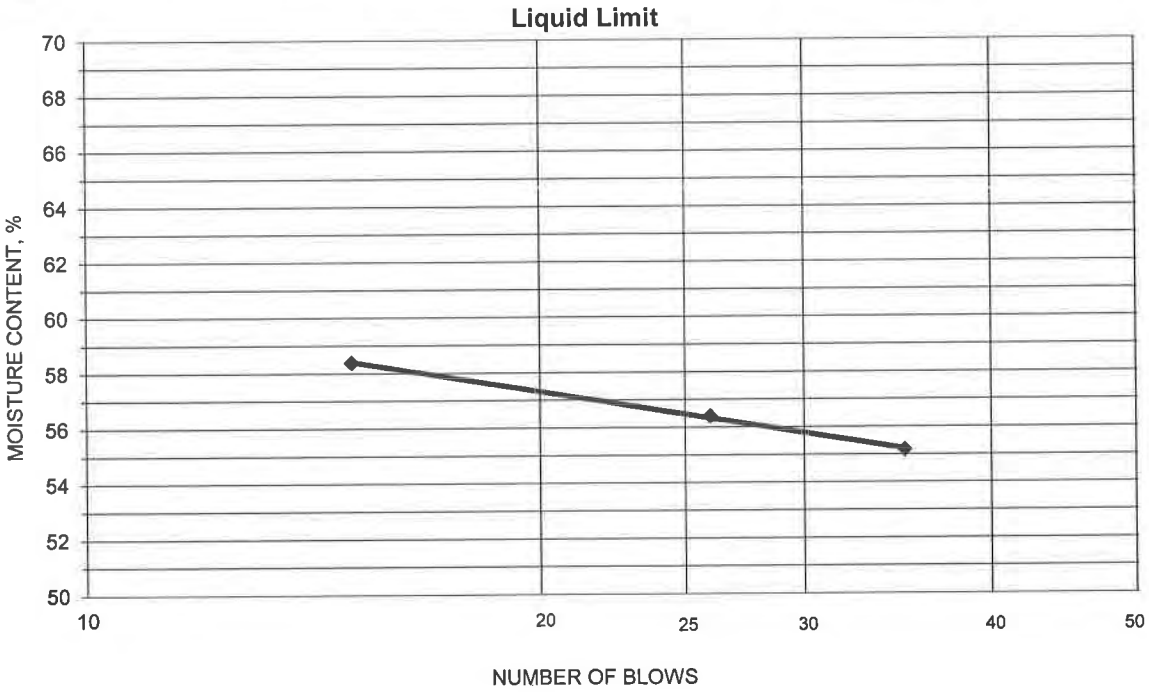
Reviewed By RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer	Project No.	175668041
Source	B-16, 22.0'-22.5'	Lab ID	6
		% + No. 40	11
Tested By	CM	Test Method	ASTM D 4318 Method A
Test Date	11-05-2018	Prepared	Dry
		Date Received	10-31-2018

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
22.36	18.41	11.25	35	55.2	56
22.36	18.35	11.24	26	56.4	
21.56	17.66	10.98	15	58.4	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
21.34	19.39	10.96	23.1	23	33
20.37	18.59	10.94	23.3		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name	LFUCG Sewer	Project Number	175668041
Source	C-3, 1.0'-6.9'	Lab ID	15
Sample Type	Bag	Date Received	12-12-18
		Date Reported	1-22-19

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
1 1/2"	37.5	100.0
3/4"	19	99.4
3/8"	9.5	98.1
No. 4	4.75	97.5
No. 10	2	91.0
No. 40	0.425	79.6
No. 200	0.075	74.9
	0.02	62.8
	0.005	45.6
	0.002	39.0
estimated	0.001	35.2

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	2.5	9.0
Coarse Sand	6.5	11.4
Medium Sand	11.4	---
Fine Sand	4.7	4.7
Silt	29.3	35.9
Clay	45.6	39.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	54
Plastic Limit:	25
Plasticity Index:	29
Activity Index:	0.7

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.73

Classification

Unified Group Symbol: CH
Group Name: Fat clay with sand

AASHTO Classification: A-7-6 (22)

Comments:

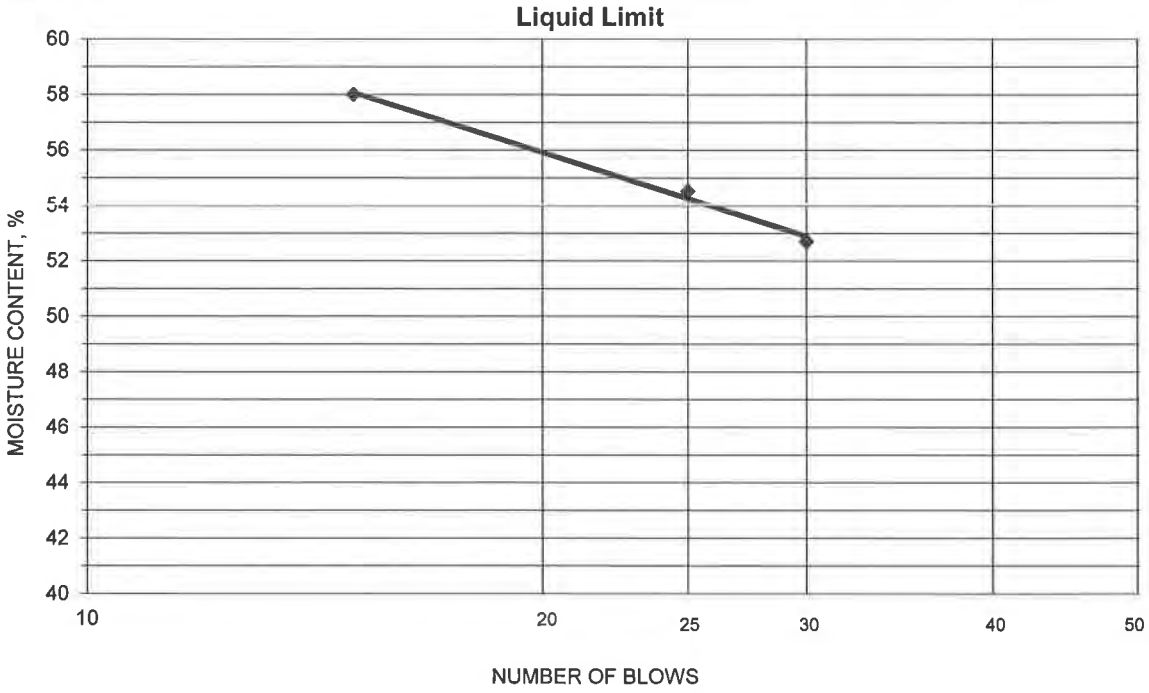
Reviewed By RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer			Project No.	175668041
Source	C-3, 1.0'-6.9'			Lab ID	15
				% + No. 40	20
Tested By	CM	Test Method	ASTM D 4318 Method A	Date Received	12-12-2018
Test Date	01-07-2019	Prepared	Dry		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
21.35	17.84	11.18	30	52.7	
21.31	17.69	11.05	25	54.5	
21.17	17.40	10.90	15	58.0	54



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
20.15	18.33	11.08	25.1	25	29
20.65	18.82	11.46	24.9		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name	LFUCG Sewer	Project Number	175668041
Source	C-10, 2.0'-2.5'	Lab ID	16
Sample Type	ST	Date Received	12-12-18
		Date Reported	1-22-19

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 29.1

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
3/4"	19	100.0
3/8"	9.5	98.8
No. 4	4.75	98.7
No. 10	2	97.8
No. 40	0.425	91.2
No. 200	0.075	88.4
	0.02	68.0
	0.005	28.6
	0.002	19.1
estimated	0.001	11.9

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	1.3	2.2
Coarse Sand	0.9	6.6
Medium Sand	6.6	---
Fine Sand	2.8	2.8
Silt	59.8	69.3
Clay	28.6	19.1

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	38
Plastic Limit:	25
Plasticity Index:	13
Activity Index:	0.7

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: ML

Group Name: Silt

AASHTO Classification: A-6 (12)

Comments:

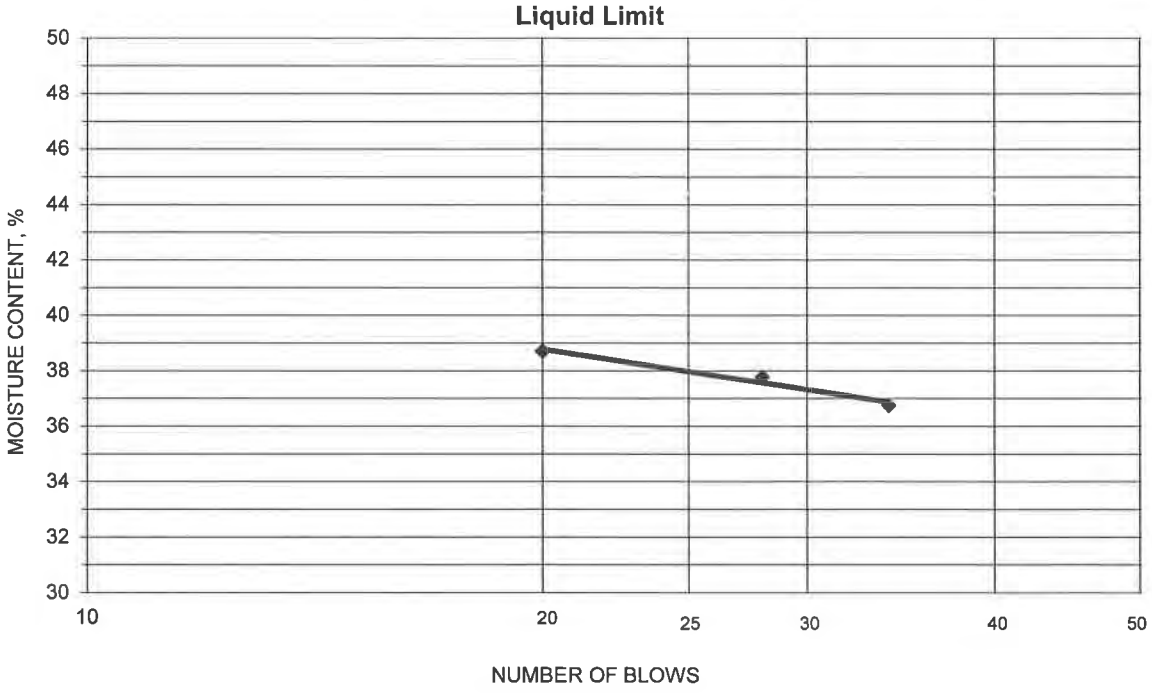
Reviewed By RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer	Project No.	175668041
Source	C-10, 2.0'-2.5'	Lab ID	16
		% + No. 40	9
Tested By	CM	Test Method	ASTM D 4318 Method A
Test Date	01-10-2019	Prepared	Dry
		Date Received	12-12-2018

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
21.08	18.42	11.18	34	36.7	
20.67	17.92	10.64	28	37.8	
21.09	18.37	11.34	20	38.7	38



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.97	18.21	10.99	24.4	25	13
19.18	17.55	10.96	24.7		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name	LFUCG Sewer	Project Number	175668041
Source	C-10, 5.0'-5.5'	Lab ID	17
Sample Type	ST	Date Received	12-12-18
		Date Reported	1-23-19

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 24.5

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 4	4.75	100.0
No. 10	2	95.8
No. 40	0.425	87.4
No. 200	0.075	84.9
	0.02	68.7
	0.005	38.1
	0.002	29.0
estimated	0.001	25.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	4.2
Coarse Sand	4.2	8.4
Medium Sand	8.4	---
Fine Sand	2.5	2.5
Silt	46.8	55.9
Clay	38.1	29.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	43
Plastic Limit:	19
Plasticity Index:	24
Activity Index:	0.8

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay with sand

AASHTO Classification: A-7-6 (21)

Comments:

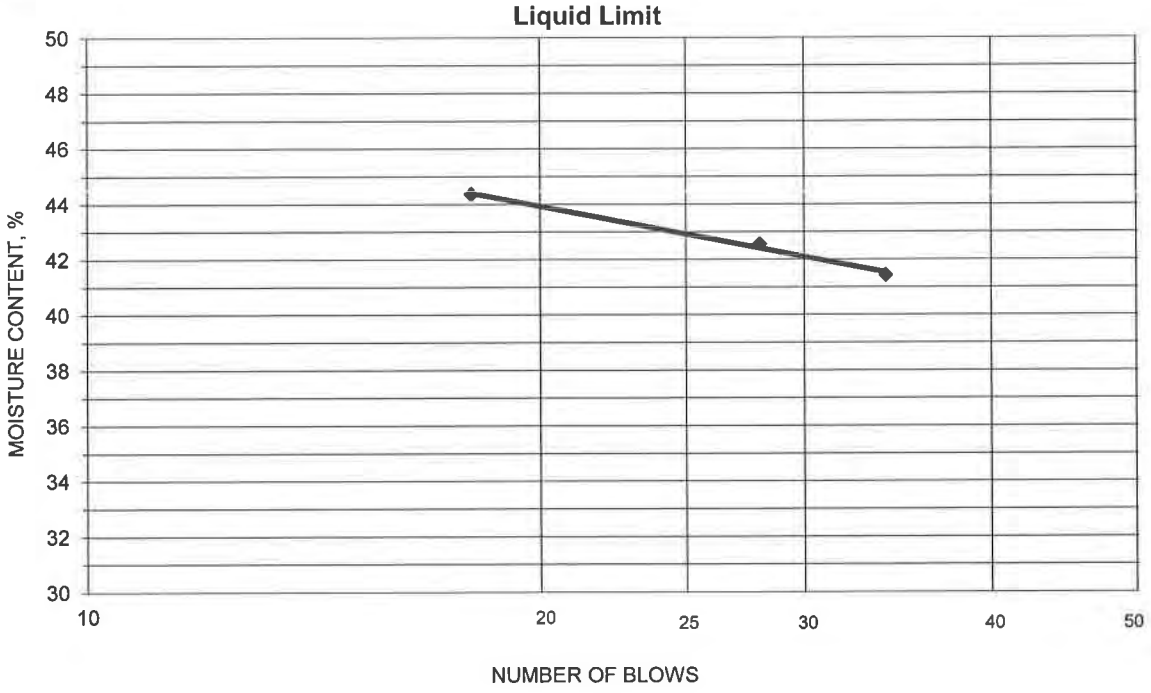
Reviewed By RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer	Project No.	175668041
Source	C-10, 5.0'-5.5'	Lab ID	17
		% + No. 40	13
Tested By	KG	Test Method	ASTM D 4318 Method A
Test Date	01-22-2019	Prepared	Dry
		Date Received	12-12-2018

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
19.71	17.22	11.21	34	41.4	
18.28	16.11	11.01	28	42.5	
18.36	16.08	10.94	18	44.4	43



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
20.13	18.66	10.96	19.1	19	24
20.11	18.65	10.99	19.1		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name	LFUCG Sewer	Project Number	175668041
Source	C-15, 2.0'-2.5'	Lab ID	19
Sample Type	ST	Date Received	12-12-18
		Date Reported	1-22-19

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 25.2

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 4	4.75	100.0
No. 10	2	99.2
No. 40	0.425	93.3
No. 200	0.075	90.9
	0.02	73.5
	0.005	43.0
	0.002	35.2
estimated	0.001	29.4

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.8
Coarse Sand	0.8	5.9
Medium Sand	5.9	---
Fine Sand	2.4	2.4
Silt	47.9	55.7
Clay	43.0	35.2

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	50
Plastic Limit:	20
Plasticity Index:	30
Activity Index:	0.9

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CH

Group Name: Fat clay

AASHTO Classification: A-7-6 (29)

Comments:

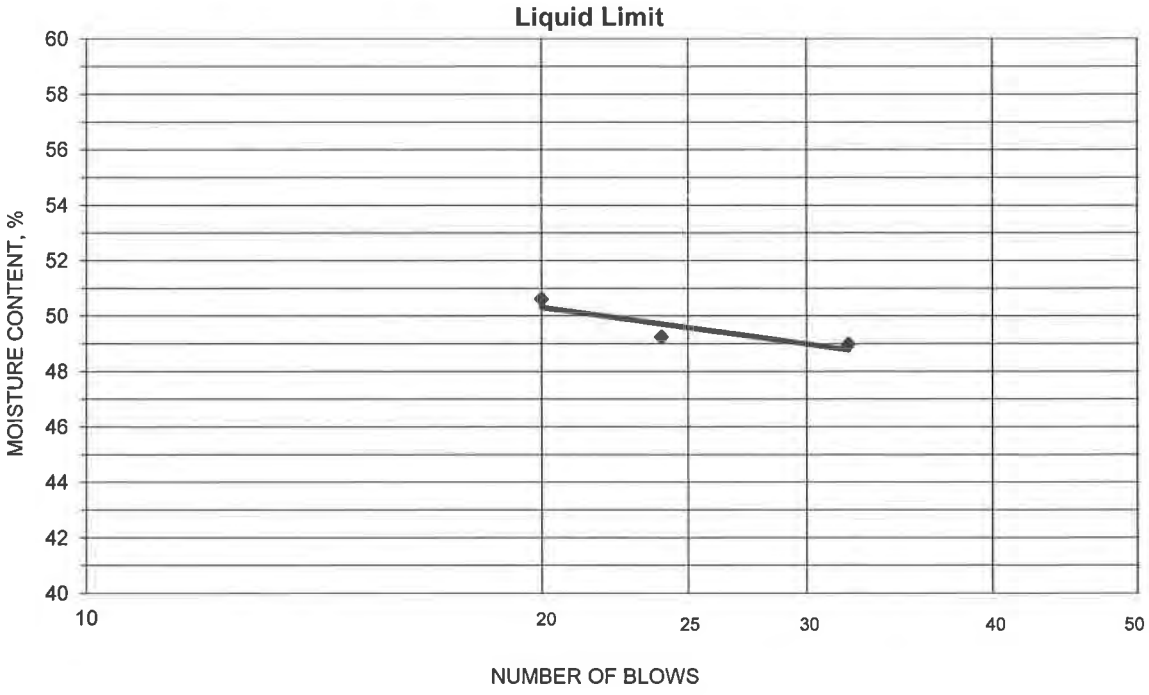
Reviewed By RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer			Project No.	175668041
Source	C-15, 2.0'-2.5'			Lab ID	19
				% + No. 40	7
Tested By	CM	Test Method	ASTM D 4318 Method A	Date Received	12-12-2018
Test Date	01-10-2019	Prepared	Dry		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
21.82	18.28	11.05	32	49.0	
21.77	18.24	11.07	24	49.2	
21.01	17.66	11.04	20	50.6	50



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
22.01	20.23	11.54	20.5	20	30
20.63	19.00	11.01	20.4		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name: LFUCG Sewer
Source: C-21, 2.0'-2.5'
Sample Type: ST

Project Number: 175668041
Lab ID: 22
Date Received: 12-12-18
Date Reported: 1-22-19

Test Results

Natural Moisture Content

Test Method: ASTM D 2216
Moisture Content (%): 24.7

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
3/8"	9.5	100.0
No. 4	4.75	99.8
No. 10	2	98.3
No. 40	0.425	86.8
No. 200	0.075	82.9
	0.02	66.4
	0.005	39.4
	0.002	32.2
estimated	0.001	27.7

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.2	1.7
Coarse Sand	1.5	11.5
Medium Sand	11.5	---
Fine Sand	3.9	3.9
Silt	43.5	50.7
Clay	39.4	32.2

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 48
Plastic Limit: 21
Plasticity Index: 27
Activity Index: 0.8

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay with sand

AASHTO Classification: A-7-6 (23)

Comments:

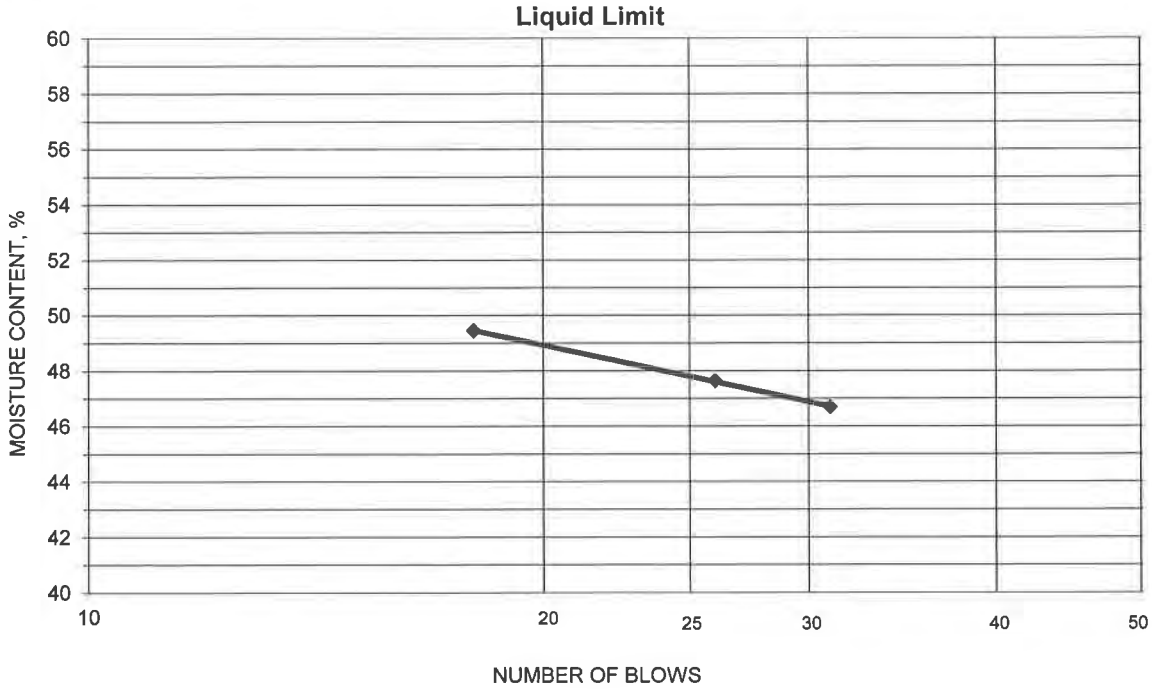
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer	Project No.	175668041
Source	C-21, 2.0'-2.5'	Lab ID	22
		% + No. 40	13
Tested By	CM	Test Method	ASTM D 4318 Method A
Test Date	01-10-2019	Prepared	Dry
		Date Received	12-12-2018

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
21.98	18.60	11.36	31	46.7	
21.57	18.24	11.25	26	47.6	
21.91	18.35	11.15	18	49.4	48



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
20.75	19.07	11.15	21.2	21	27
22.61	20.71	11.50	20.6		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name: LFUCG Sewer
Project Number: 175668041
Source: C-21, 0.0'-5.0'
Lab ID: 24
Sample Type: Bag
Date Received: 12-12-18
Date Reported: 1-22-19

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
3/4"	19	100.0
3/8"	9.5	98.3
No. 4	4.75	97.3
No. 10	2	81.4
No. 40	0.425	69.9
No. 200	0.075	64.7
	0.02	52.9
	0.005	33.5
	0.002	27.6
estimated	0.001	24.2

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	2.7	18.6
Coarse Sand	15.9	11.5
Medium Sand	11.5	---
Fine Sand	5.2	5.2
Silt	31.2	37.1
Clay	33.5	27.6

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry
Liquid Limit: 48
Plastic Limit: 23
Plasticity Index: 25
Activity Index: 0.9

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.67

Classification

Unified Group Symbol: CL
Group Name: Sandy lean clay
AASHTO Classification: A-7-6 (15)

Comments:

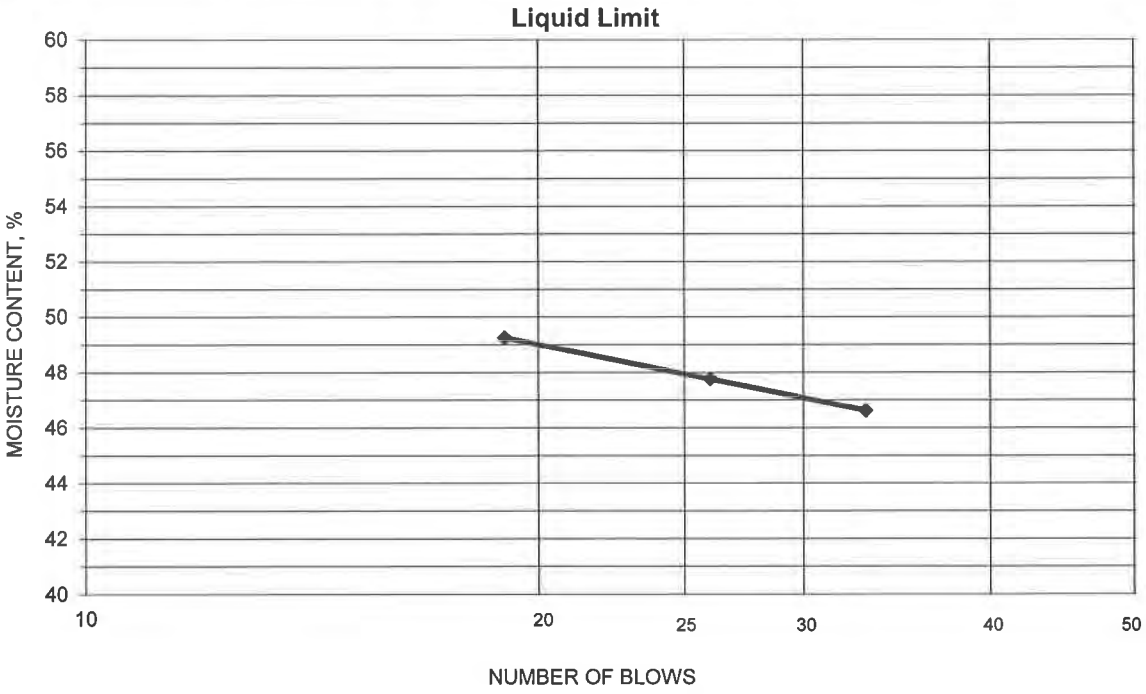
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer	Project No.	175668041
Source	C-21, 0.0'-5.0'	Lab ID	24
		% + No. 40	30
Tested By	CM	Test Method	ASTM D 4318 Method A
Test Date	01-07-2019	Prepared	Dry
		Date Received	12-12-2018

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
21.94	18.50	11.12	33	46.6	
21.76	18.24	10.87	26	47.8	
21.97	18.40	11.15	19	49.2	48



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
20.33	18.65	11.47	23.4	23	25
19.54	17.91	10.91	23.3		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name	LFUCG Sewer	Project Number	175668041
Source	C-27, 0.0'-6.8'	Lab ID	25
Sample Type	Bag	Date Received	12-12-18
		Date Reported	1-22-19

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
3/4"	19	100.0
3/8"	9.5	99.4
No. 4	4.75	97.0
No. 10	2	83.3
No. 40	0.425	71.3
No. 200	0.075	67.4
	0.02	54.9
	0.005	33.7
	0.002	27.0
estimated	0.001	23.2

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	3.0	16.7
Coarse Sand	13.7	12.0
Medium Sand	12.0	---
Fine Sand	3.9	3.9
Silt	33.7	40.4
Clay	33.7	27.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	47
Plastic Limit:	22
Plasticity Index:	25
Activity Index:	0.9

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.68

Classification

Unified Group Symbol:	CL
Group Name:	Sandy lean clay
AASHTO Classification:	A-7-6 (15)

Comments:

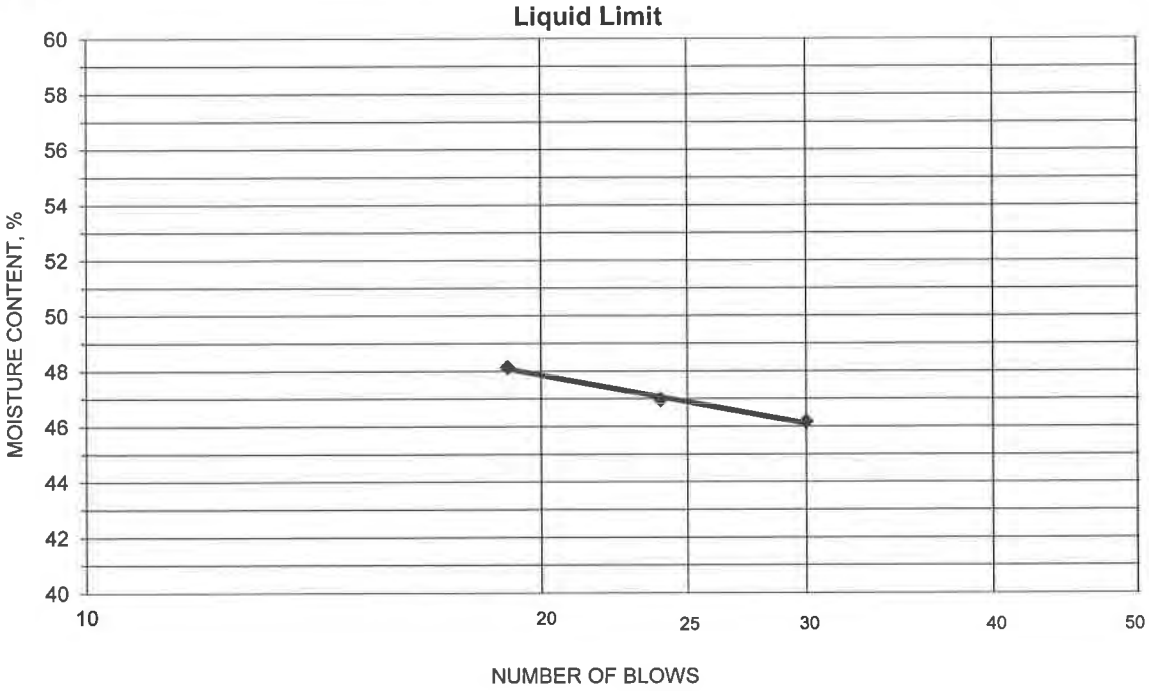
Reviewed By RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer	Project No.	175668041
Source	C-27, 0.0'-6.8'	Lab ID	25
		% + No. 40	29
Tested By	CM	Test Method	ASTM D 4318 Method A
Test Date	01-07-2019	Prepared	Dry
		Date Received	12-12-2018

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
22.63	18.97	11.04	30	46.2	
22.64	19.00	11.25	24	47.0	
22.18	18.58	11.10	19	48.1	47



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.82	17.48	11.46	22.3	22	25
19.63	18.19	11.59	21.8		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name: LFUCG Sewer
Project Number: 175668041
Source: C-3, 5.0'-5.5'
Lab ID: 29A
Sample Type: ST
Date Received: 12-12-18
Date Reported: 1-22-19

Test Results

Natural Moisture Content

Test Method: ASTM D 2216
Moisture Content (%): 30.2

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 4	4.75	100.0
No. 10	2	91.4
No. 40	0.425	84.1
No. 200	0.075	76.2
	0.02	63.5
	0.005	49.9
	0.002	43.3
estimated	0.001	39.5

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	8.6
Coarse Sand	8.6	7.3
Medium Sand	7.3	---
Fine Sand	7.9	7.9
Silt	26.3	32.9
Clay	49.9	43.3

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 60
Plastic Limit: 25
Plasticity Index: 35
Activity Index: 0.8

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CH
Group Name: Fat clay with sand

AASHTO Classification: A-7-6 (28)

Comments:

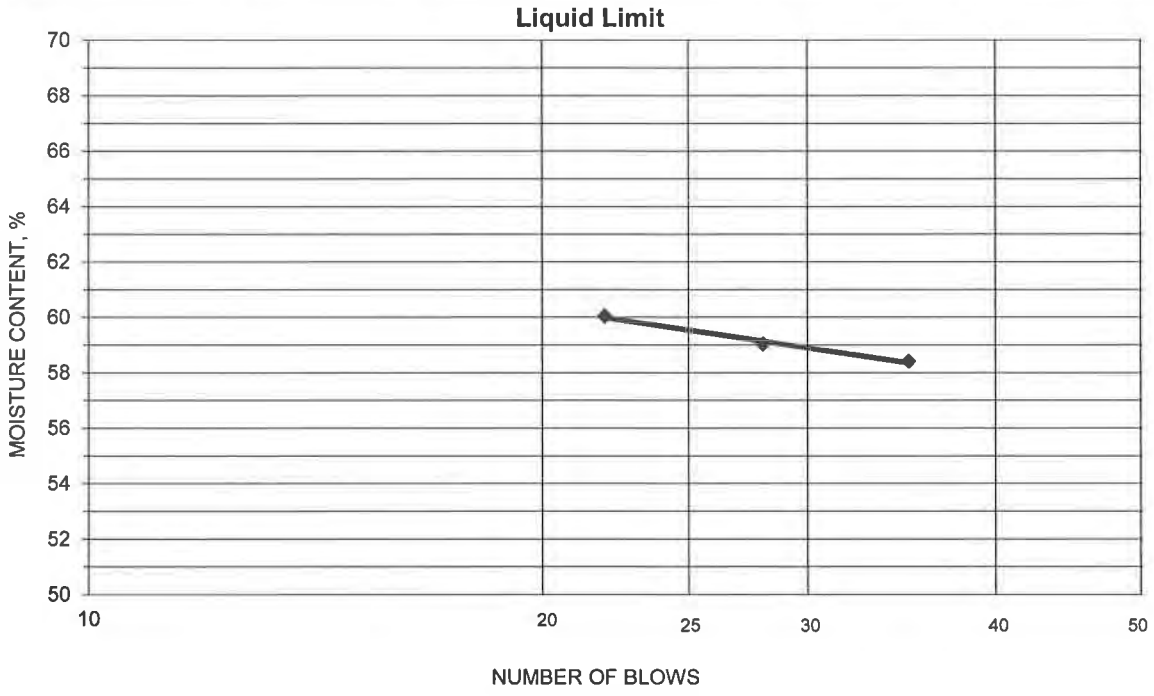
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	LFUCG Sewer	Project No.	175668041
Source	C-3, 5.0'-5.5'	Lab ID	29A
		% + No. 40	16
Tested By	KG	Test Method	ASTM D 4318 Method A
Test Date	01-22-2019	Prepared	Dry
		Date Received	12-12-2018

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
18.38	15.60	10.84	35	58.4	
18.37	15.69	11.15	28	59.0	
19.73	16.53	11.20	22	60.0	60



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
20.47	18.67	11.46	25.0	25	35
19.88	18.19	11.38	24.8		

Remarks: _____

Reviewed By RJ

UNCONFINED COMPRESSIVE STRENGTH TESTING - SOIL

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name LFUCG Sewer
Project Number 175668041
Source B-15, 4.5'-6.5'
Lab ID 1
Visual Description Sandy Lean Clay (CL), dark brown, moist, firm

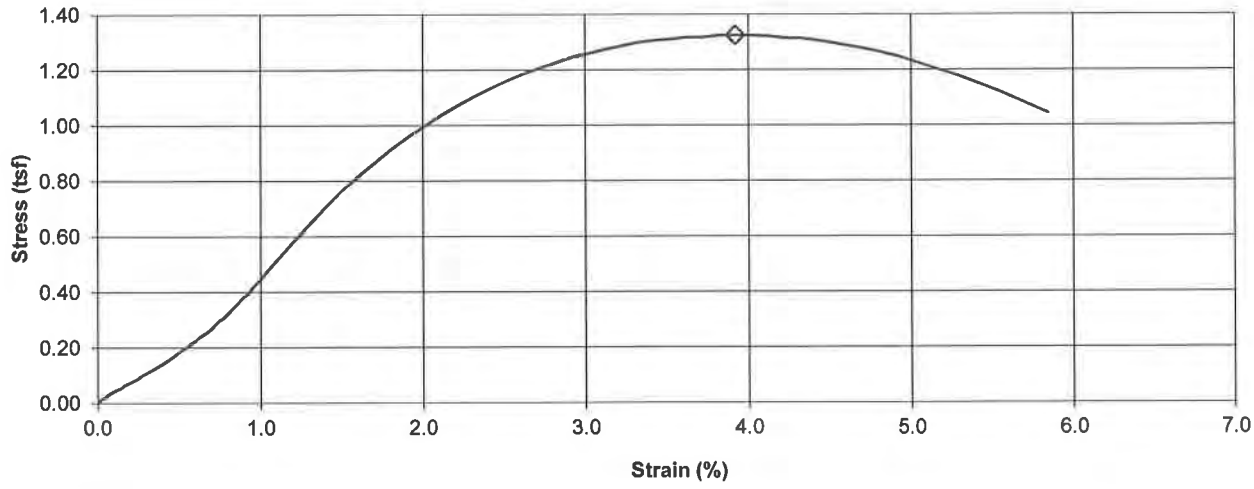
Recovered 0.9'
Test Interval 4.9' - 5.4'

Specimen Type: Undisturbed
LL 42
PL 22
PI 20

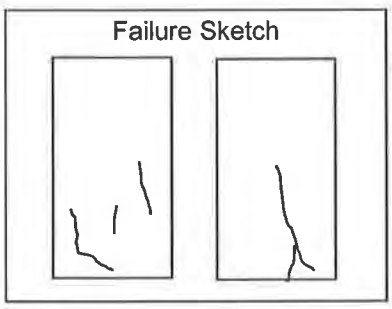
Date Extruded 10/31/2018
Date Tested 10/31/2018

Initial Wet Density (pcf)	125.8	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	25.5		
Initial Dry Density (pcf)	100.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.85		
Degree of Saturation (%)	93.8	Unconfined Compressive Strength (tsf)	1.32
Average Height (in)	6.083	Undrained Shear Strength (tsf)	0.66
Average Diameter (in)	2.882	Strain at Maximum Stress (%)	3.9
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A
Torvane Reading (kg/cm^2) N/A

Comments
4.5'-4.9' - Saved in bag. Large rock gouge.

Reviewed By RJ

Template: tmp_uc_input.xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/08/2018

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name LFUCG Sewer
Project Number 175668041
Source B-16, 2.0'-4.0'
Lab ID 2
Visual Description Fat Clay (CH), dark brown, moist, firm
Recovered 0.6'
Test Interval 2.0' - 2.5'

Specimen Type: Undisturbed LL N/A PL N/A PI N/A

Date Extruded 10/31/2018
Date Tested 10/31/2018

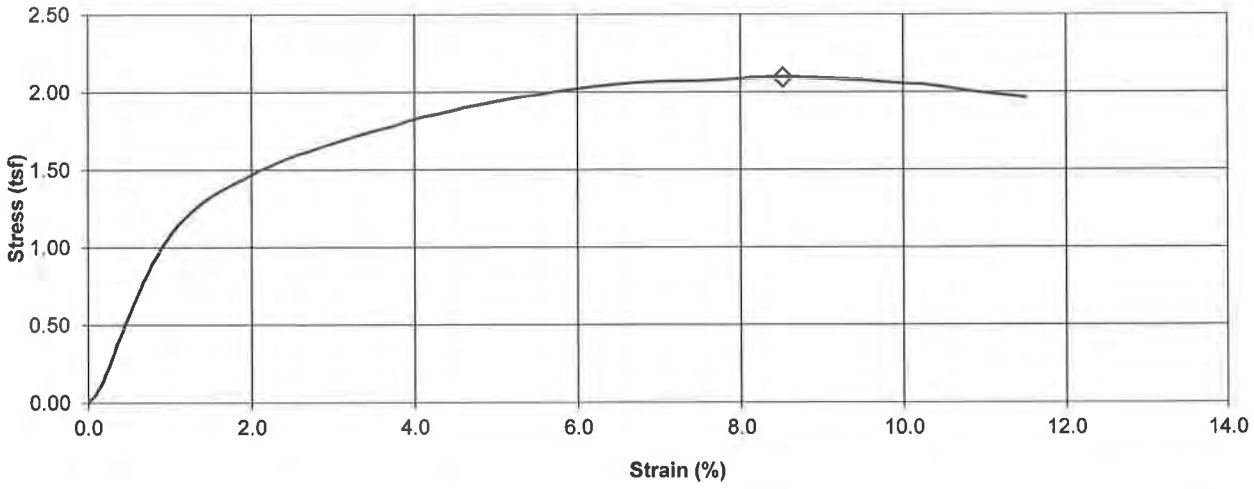
Initial Wet Density (pcf)	117.4
Initial Moisture Content (%)	30.9
Initial Dry Density (pcf)	89.7
At Test Moisture Content (%)	N/A
At Test Dry Density (pcf)	N/A
Specific Gravity	N/A
Degree of Saturation (%)	N/A
Average Height (in)	6.031
Average Diameter (in)	2.872
Height to Diameter Ratio	2.1

Initial MC Taken Before Test, From Trimmings

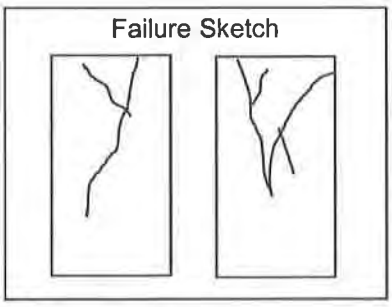
At Test MC Taken N/A

Unconfined Compressive Strength (tsf)	2.09
Undrained Shear Strength (tsf)	1.05
Strain at Maximum Stress (%)	8.5
Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A
Torvane Reading (kg/cm^2) N/A

Comments

Reviewed By RJ

Template: tmp_uc_input.xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 03/15/2019

Stantec

Unconfined Compressive Strength of Cohesive Soil

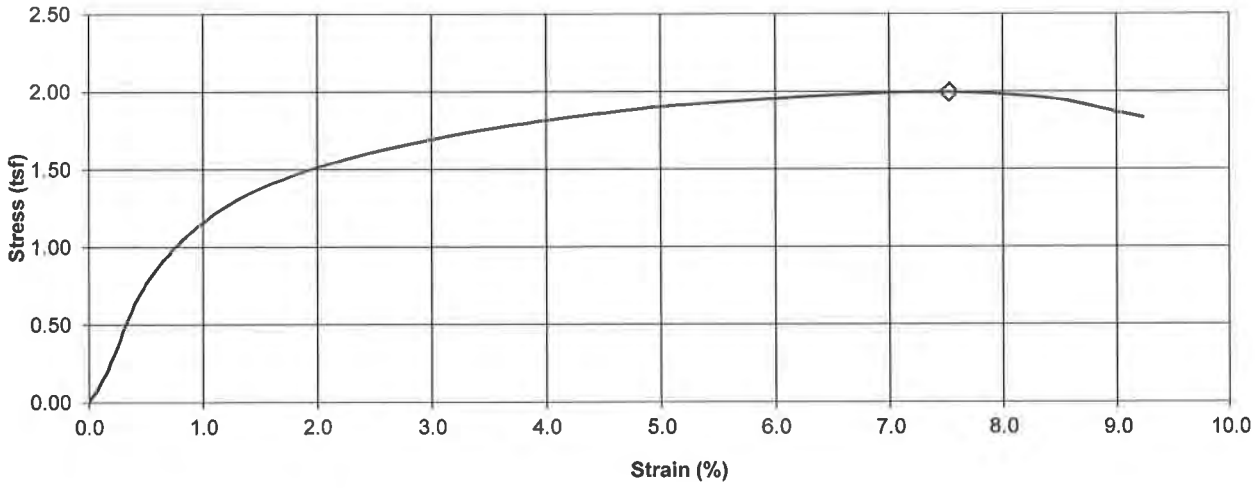
ASTM D 2166

Project Name LFUCG Sewer
Project Number 175668041
Source B-16, 7.0'-9.0'
Lab ID 3
Visual Description Fat Clay with Sand (CH), brown, moist, firm
Recovered 0.8'
Test Interval 7.0' - 7.5'

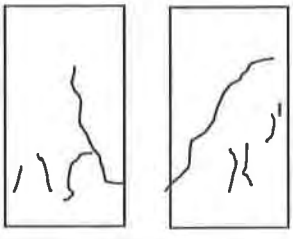
Specimen Type: Undisturbed
LL 70
PL 26
PI 44
Date Extruded 10/31/2018
Date Tested 10/31/2018

Initial Wet Density (pcf)	118.0		
Initial Moisture Content (%)	30.5	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	90.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.83		
Degree of Saturation (%)	90.5	Unconfined Compressive Strength (tsf)	2.00
Average Height (in)	6.004	Undrained Shear Strength (tsf)	1.00
Average Diameter (in)	2.880	Strain at Maximum Stress (%)	7.5
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A
Torvane Reading (kg/cm^2) N/A

Comments

Reviewed By RJ

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

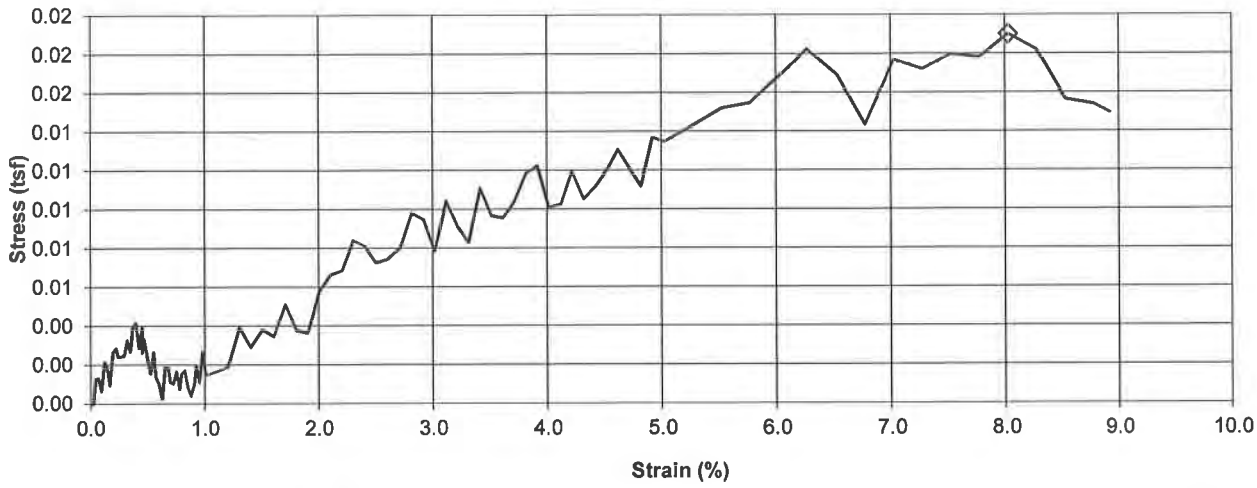
Project Name LFUCG Sewer
Project Number 175668041
Source B-16, 17.0'-19.0'
Lab ID 5
Visual Description Lean Clay with Gravel (CL), brown, wet, soft
Recovered 0.6'
Test Interval 17.0' - 17.5'

Specimen Type: Undisturbed
LL N/A
PL N/A
PI N/A
Date Extruded 10/31/2018
Date Tested 10/31/2018

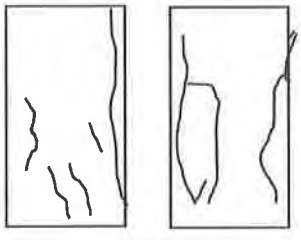
Initial Wet Density (pcf)	123.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	31.7		
Initial Dry Density (pcf)	93.6		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A		
Average Height (in)	5.993		
Average Diameter (in)	2.868		
Height to Diameter Ratio	2.1		

Unconfined Compressive Strength (tsf)	0.02
Undrained Shear Strength (tsf)	0.01
Strain at Maximum Stress (%)	8.0
Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A
Torvane Reading (kg/cm^2) N/A

Comments

Reviewed By RJ

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name LFUCG Sewer
Project Number 175668041
Source B-16, 22.0'-24.0'
Lab ID 6
Visual Description Fat Clay (CH), dark brown, moist, firm
Recovered 0.8'
Test Interval 22.0' - 22.5'

Specimen Type: Undisturbed
LL 56
PL 23
PI 33
Date Extruded 10/31/2018
Date Tested 10/31/2018

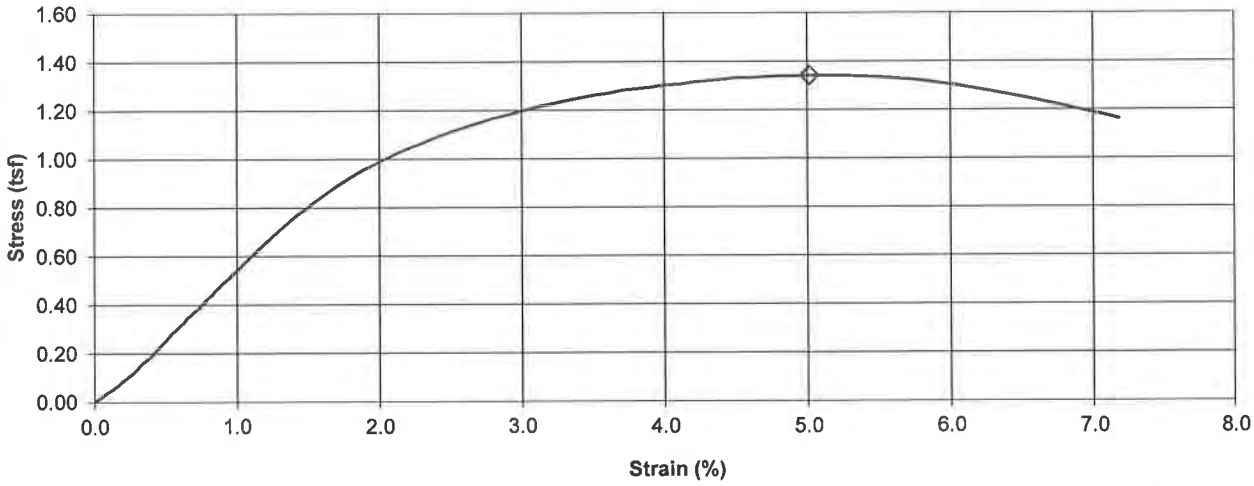
Initial Wet Density (pcf)	118.4
Initial Moisture Content (%)	28.0
Initial Dry Density (pcf)	92.5
At Test Moisture Content (%)	N/A
At Test Dry Density (pcf)	N/A
Specific Gravity	2.78
Degree of Saturation (%)	88.9
Average Height (in)	6.039
Average Diameter (in)	2.888
Height to Diameter Ratio	2.1

Initial MC Taken Before Test, From Trimmings

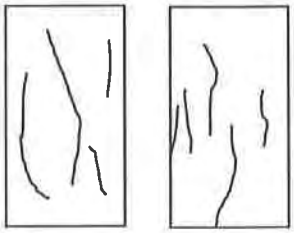
At Test MC Taken N/A

Unconfined Compressive Strength (tsf)	1.34
Undrained Shear Strength (tsf)	0.67
Strain at Maximum Stress (%)	5.0
Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A
Torvane Reading (kg/cm^2) N/A

Comments
22.5'-22.8' - Saved in bag

Reviewed By RJ

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name LFUCG Sewer
Project Number 175668041
Source C-10, 2.0'-4.0'
Lab ID 16
Visual Description Silt (ML), dark brown, moist, firm
Recovered 0.9'
Test Interval 2.0' - 2.5'

Specimen Type: Undisturbed LL 38 PL 25 PI 13

Date Extruded 01/02/2019
Date Tested 01/08/2019

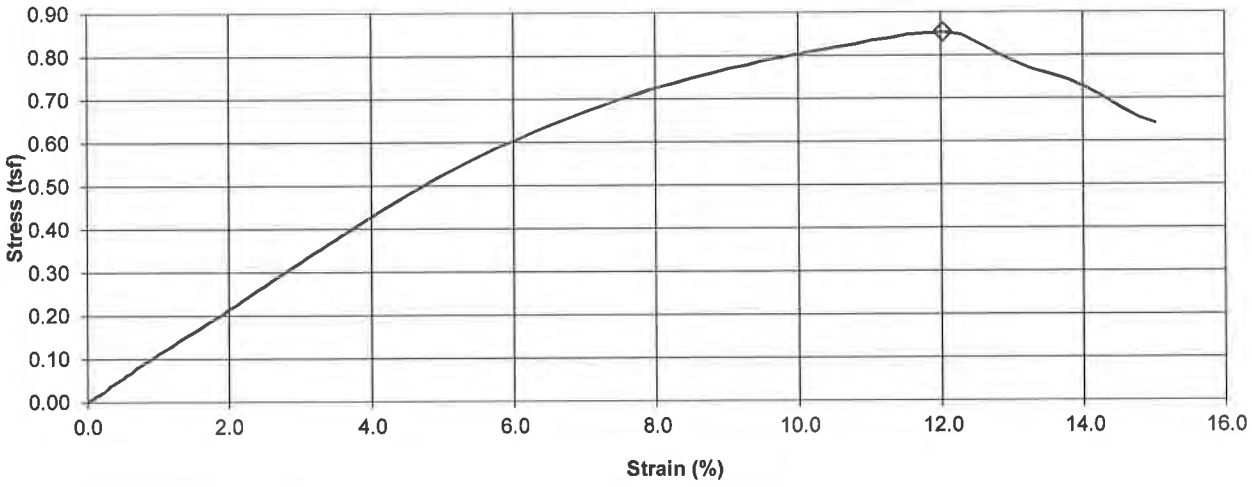
Initial Wet Density (pcf)	120.6
Initial Moisture Content (%)	29.1
Initial Dry Density (pcf)	93.4
At Test Moisture Content (%)	27.6
At Test Dry Density (pcf)	94.5
Specific Gravity	N/A
Degree of Saturation (%)	N/A
Average Height (in)	6.064
Average Diameter (in)	2.864
Height to Diameter Ratio	2.1

Initial MC Taken Before Test, From Trimmings

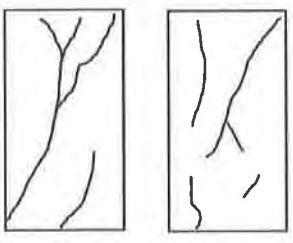
At Test MC Taken After Test, From Center of Specimen

Unconfined Compressive Strength (tsf)	0.85
Undrained Shear Strength (tsf)	0.43
Strain at Maximum Stress (%)	12.0
Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A
Torvane Reading (kg/cm^2) N/A

Comments

Reviewed By RJ

Template: tmp_uc_input.xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 01/22/2019

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name LFUCG Sewer | Project Number 175668041
Source C-10, 10.0'-11.0' | Lab ID 18
Visual Description Fat Clay with Gravel (CH), brown, moist, firm

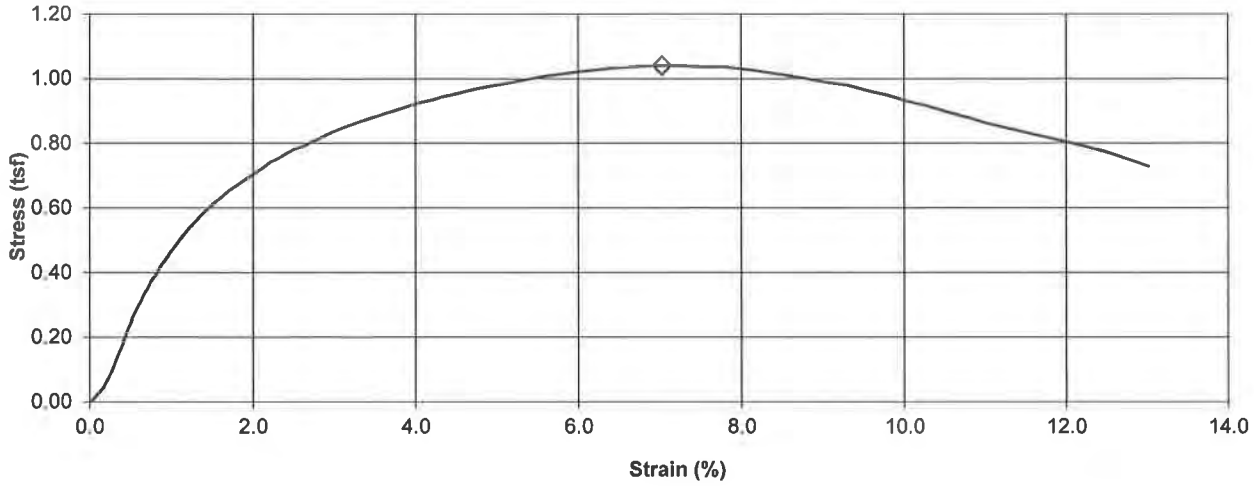
Recovered 0.6'
Test Interval 10' - 10.5'

Specimen Type: Undisturbed | LL N/A | PL N/A | PI N/A

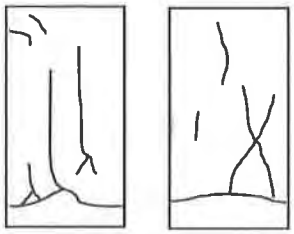
Date Extruded 01/02/2019
Date Tested 01/08/2019

Initial Wet Density (pcf)	117.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	31.1		
Initial Dry Density (pcf)	89.4		
At Test Moisture Content (%)	28.7	At Test MC Taken	After Test, From Center of Specimen
At Test Dry Density (pcf)	91.1		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	1.04
Average Height (in)	6.054	Undrained Shear Strength (tsf)	0.52
Average Diameter (in)	2.872	Strain at Maximum Stress (%)	7.0
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A
Torvane Reading (kg/cm^2) N/A

Comments

Reviewed By RJ

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name LFUCG Sewer
Project Number 175668041
Source C-15, 10.0'-12.0'
Lab ID 21
Visual Description Fat Clay with Gravel (CH), brown, moist, firm

Recovered 0.8'
Test Interval 10.0' - 10.5'

Specimen Type: Undisturbed LL N/A PL N/A PI N/A

Date Extruded 01/02/2019
Date Tested 01/08/2019

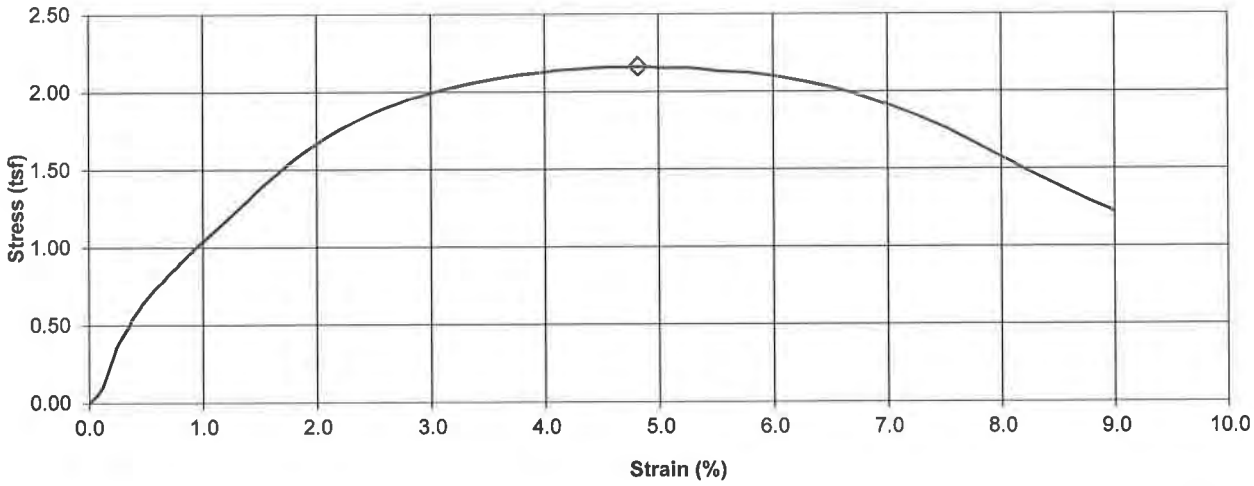
Initial Wet Density (pcf)	127.7
Initial Moisture Content (%)	28.2
Initial Dry Density (pcf)	99.6
At Test Moisture Content (%)	26.1
At Test Dry Density (pcf)	101.3
Specific Gravity	N/A
Degree of Saturation (%)	N/A
Average Height (in)	6.102
Average Diameter (in)	2.872
Height to Diameter Ratio	2.1

Initial MC Taken Before Test, From Trimmings

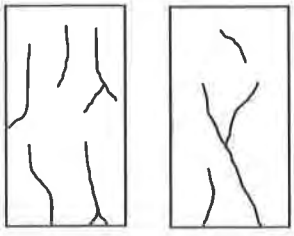
At Test MC Taken Before Test, From Center of Specimen

Unconfined Compressive Strength (tsf)	2.16
Undrained Shear Strength (tsf)	1.08
Strain at Maximum Stress (%)	4.8
Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A
Torvane Reading (kg/cm^2) N/A

Comments

Reviewed By RJ

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name LFUCG Sewer
Project Number 175668041
Source C-27, 2.0'-4.0'
Lab ID 26
Visual Description Fat Clay (CH), brown, moist, firm
Recovered 0.9'
Test Interval 2.0' - 2.5'
Specimen Type: Undisturbed
LL N/A
PL N/A
PI N/A
Date Extruded 01/02/2019
Date Tested 01/08/2019

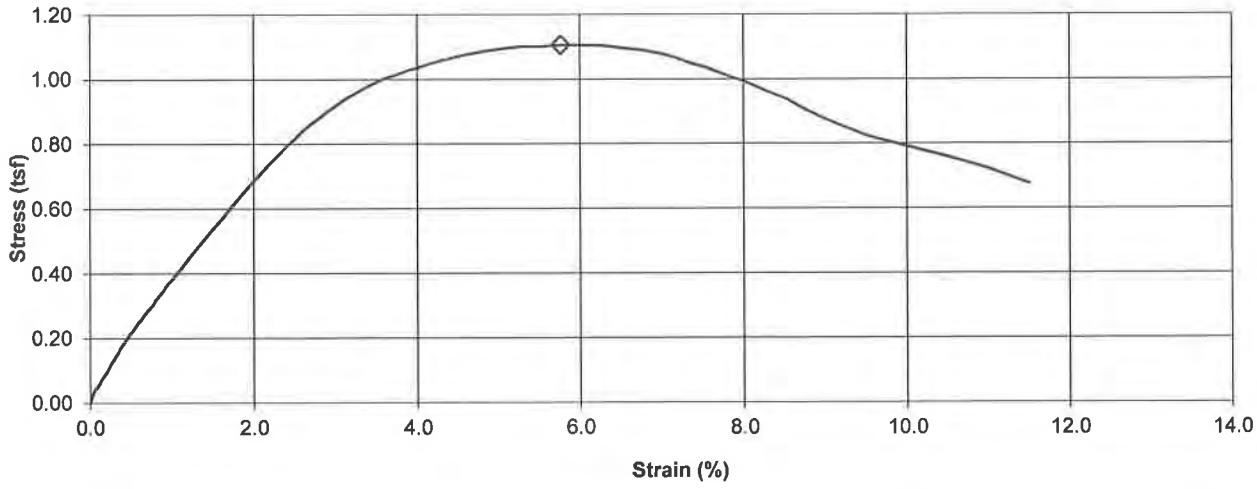
Initial Wet Density (pcf)	124.4
Initial Moisture Content (%)	26.8
Initial Dry Density (pcf)	98.1
At Test Moisture Content (%)	23.3
At Test Dry Density (pcf)	100.9
Specific Gravity	N/A
Degree of Saturation (%)	N/A
Average Height (in)	6.060
Average Diameter (in)	2.881
Height to Diameter Ratio	2.1

Initial MC Taken Before Test, From Trimmings

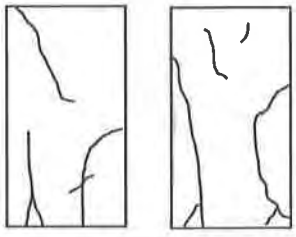
At Test MC Taken After Test, From Center of Specimen

Unconfined Compressive Strength (tsf)	1.11
Undrained Shear Strength (tsf)	0.55
Strain at Maximum Stress (%)	5.8
Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A
Torvane Reading (kg/cm^2) N/A

Comments

Reviewed By RJ

Template: tmp_uc_Input xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 01/22/2019

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name LFUCG Sewer
Project Number 175668041
Source C-3, 2.0'-4.0'
Lab ID 28
Visual Description Fat Clay with Gravel (CH), brown, moist, firm

Recovered 0.7'
Test Interval 2.0' - 2.5'

Specimen Type: Undisturbed LL N/A PL N/A PI N/A

Date Extruded 01/03/2019
Date Tested 01/08/2019

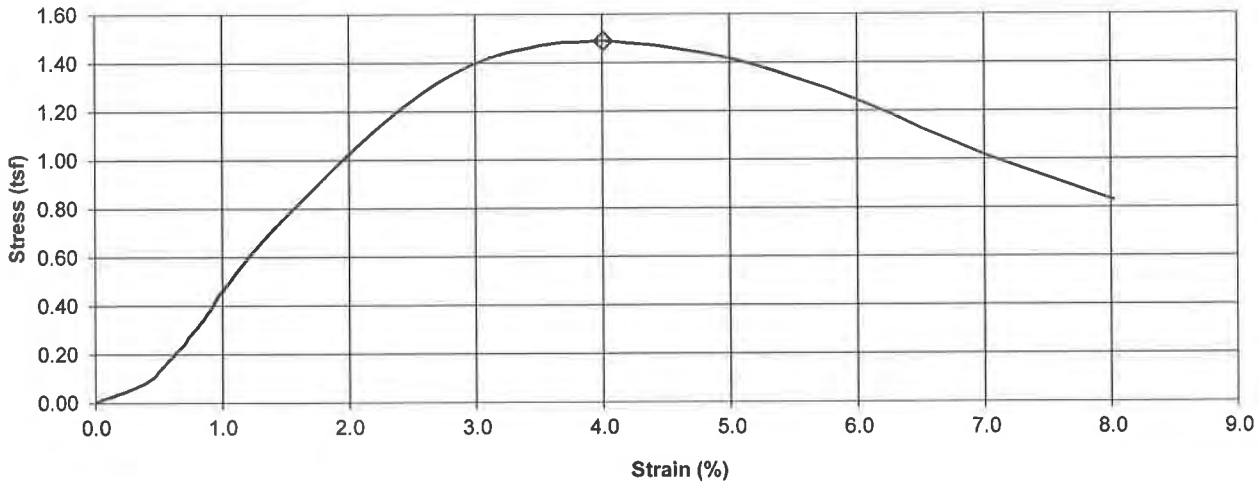
Initial Wet Density (pcf)	119.9
Initial Moisture Content (%)	27.3
Initial Dry Density (pcf)	94.2
At Test Moisture Content (%)	27.6
At Test Dry Density (pcf)	94.0
Specific Gravity	N/A
Degree of Saturation (%)	N/A
Average Height (in)	6.145
Average Diameter (in)	2.877
Height to Diameter Ratio	2.1

Initial MC Taken Before Test, From Trimmings

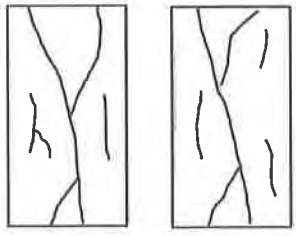
At Test MC Taken After Test, From Center of Specimen

Unconfined Compressive Strength (tsf)	1.49
Undrained Shear Strength (tsf)	0.75
Strain at Maximum Stress (%)	4.0
Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A
Torvane Reading (kg/cm^2) N/A

Comments

Reviewed By RJ

Template: tmp_uc_input.xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 01/22/2019

CONSOLIDATED – UNDRAINED TRIAXIAL TESTING

Stantec

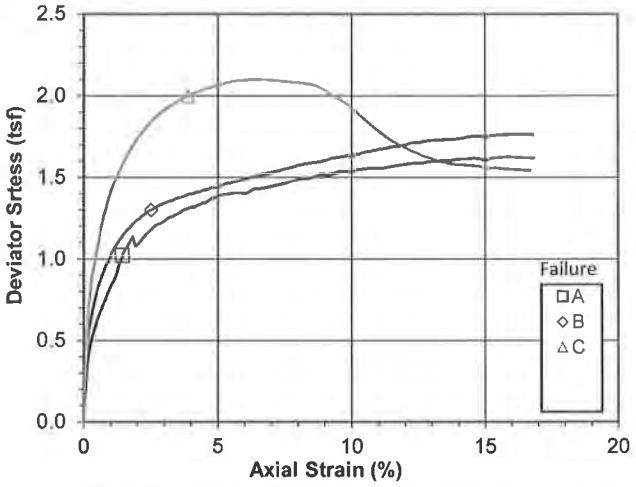
Consolidated Undrained Triaxial Compression

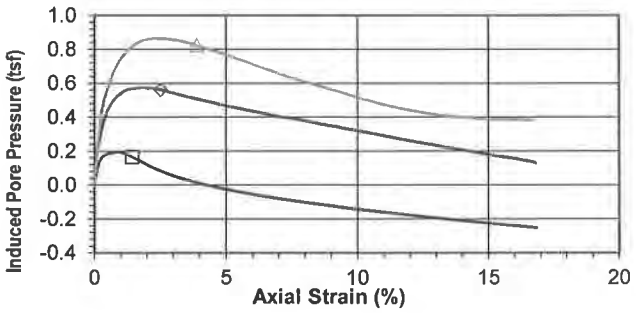
ASTM D 4767

Project Name LFUCG Sewer

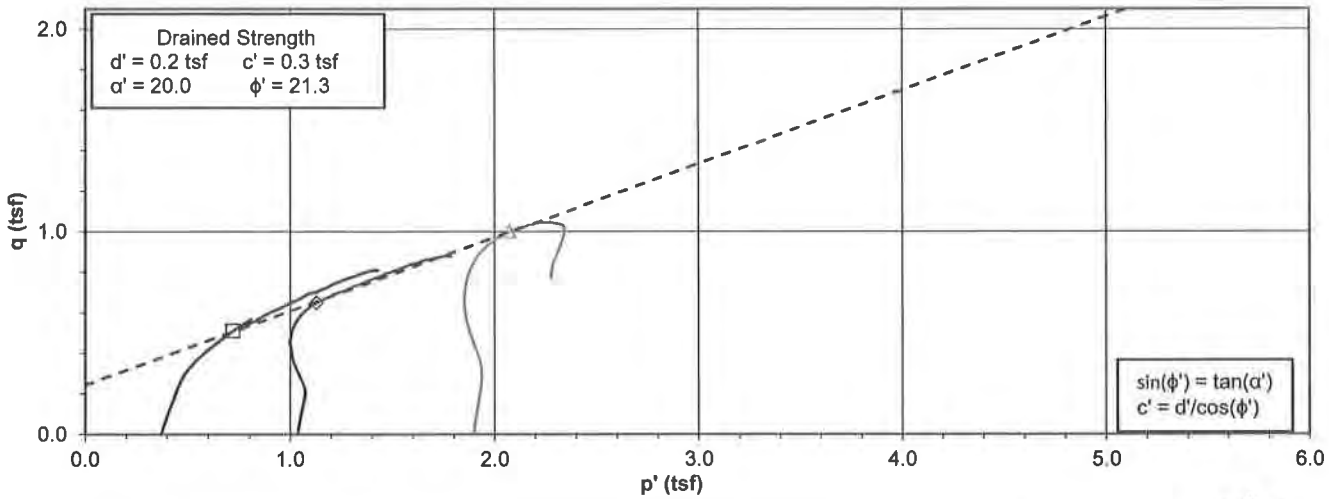
Project 175668041
Set ID 1

Test	Lab ID	Source	Description	Gs	LL	PL	PI
A	17	C-10, 5.0'-5.5'	Lean Clay with Sand (CL), brown, moist, firm	2.66	43	19	24
B	29A	C-3, 5.0'-5.5'	Fat Clay with Sand (CH), brown, moist, firm	2.78	60	25	35
C	29B	C-3, 5.5'-6.0'	Fat Clay with Sand (CH), brown, moist, firm	2.78	60	25	35





Specimen	A	B	C		
	Initial Specimen Conditions				
Average Height (in)	6.095	6.089	6.084		
Average Diameter (in)	2.876	2.702	2.857		
Moist Unit Weight (pcf)	125.1	128.0	117.7		
Moisture Content (%)	24.2	31.8	31.9		
Dry Unit Weight (pcf)	100.7	97.1	89.2		
Void Ratio	0.646	0.784	0.942		
Degree of Saturation (%)	99.5	112.7	94.2		
	Consolidated Specimen Conditions				
Moist Unit Weight (pcf)	123.9	120.1	122.0		
Moisture Content (%)	25.5	33.1	30.9		
Dry Unit Weight (pcf)	98.7	90.3	93.2		
Void Ratio	0.679	0.919	0.858		
Degree of Saturation (%)	100.0	100.0	100.0		
Eff. Con. Stress, σ_3' (tsf)	0.371	1.037	1.897		
	At Drained Failure				
Failure Criterion	Max. Eff. Prin. Stress Ratio				
Axial Strain (%)	1.441	2.533	3.893		
Deviator Stress (tsf)	1.019	1.297	1.999		
Induced Pore Press. (tsf)	0.165	0.560	0.824		
Minor Eff. Stress, σ_3' (tsf)	0.209	0.479	1.072		
Major Eff. Stress, σ_1' (tsf)	1.228	1.777	3.071		
Eff. Stress Ratio, σ_1'/σ_3'	5.865	3.705	2.864		
p' (tsf)	0.719	1.128	2.072		
q (tsf)	0.509	0.649	0.999		



Comments

Reviewed By KG

Stantec

Consolidated Undrained Triaxial Compression
ASTM D 4767

Project Name: LFUCG Sewer
Source: C-10, 5.0'-5.5'
Description: Lean Clay with Sand (CL), brown, moist, firm
Specimen Type: Intact
Preparation: Wet Mounting

Project No.: 175668041
Lab ID: 17
Test ID: 1-A

Date Received: 12/12/2018
Date Tested: 01/11/2019

Specific Gravity: 2.66
ASTM D 854, Dry

Liquid Limit: 43
Plastic Limit: 19
Plasticity Index: 24
ASTM D 4318

Target Test Parameters

Nominal Chamber Pressure (psi)	90
Nominal Back Pressure (psi)	85
Nominal Consolidation Pressure (psi)	5

Saturation / Consolidation Results

Pore Pressure Parameter B	0.99
Measured Effective Consol. Stress (tsf)	0.370
Time to 50% Consolidation (min)	5.70
Actual Axial Strain Rate of Test (%/min)	0.053

Consolidated Specimen Conditions

Moist Unit Weight (pcf)	123.9
Moisture Content (%)	25.5
Dry Unit Weight (pcf)	98.7
Void Ratio	0.679
Degree of Saturation (%)	100.0

At Drained Failure

Failure Criterion: Max. Eff. Prin. Stress Ratio

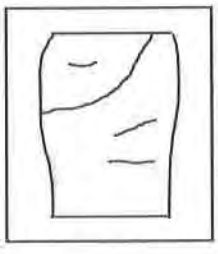
Axial Strain (%)	1.441
Deviator Stress (tsf)	1.019
Induced Pore Pressure (tsf)	0.165
Minor Effective Stress, σ_3' (tsf)	0.209
Major Effective Stress, σ_1' (tsf)	1.228
Eff. Principal Stress Ratio, σ_1'/σ_3'	5.865
p' (tsf)	0.719
q (tsf)	0.509

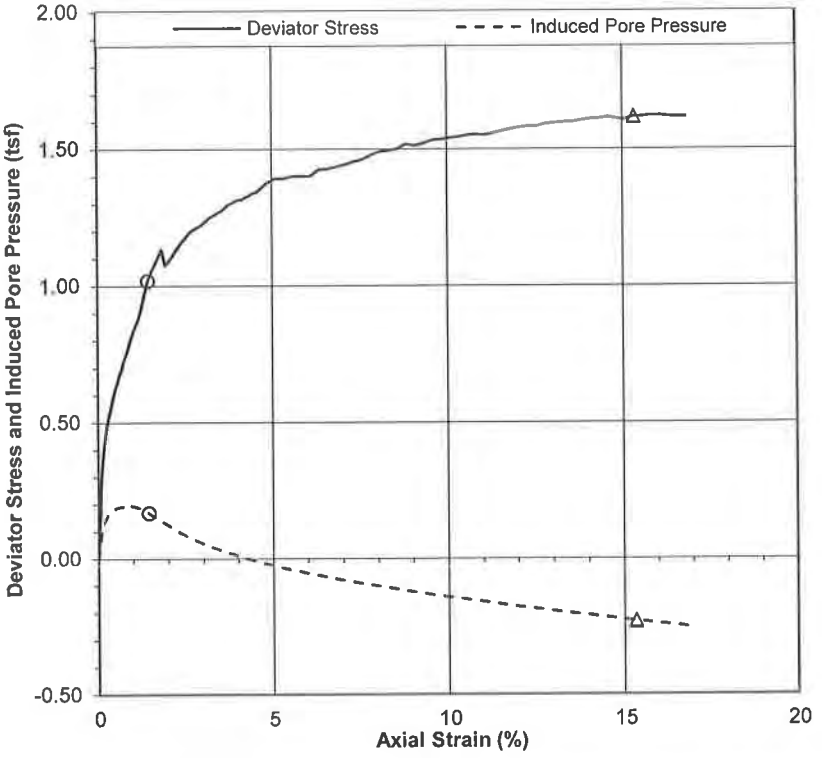
At Consolidated Undrained Failure

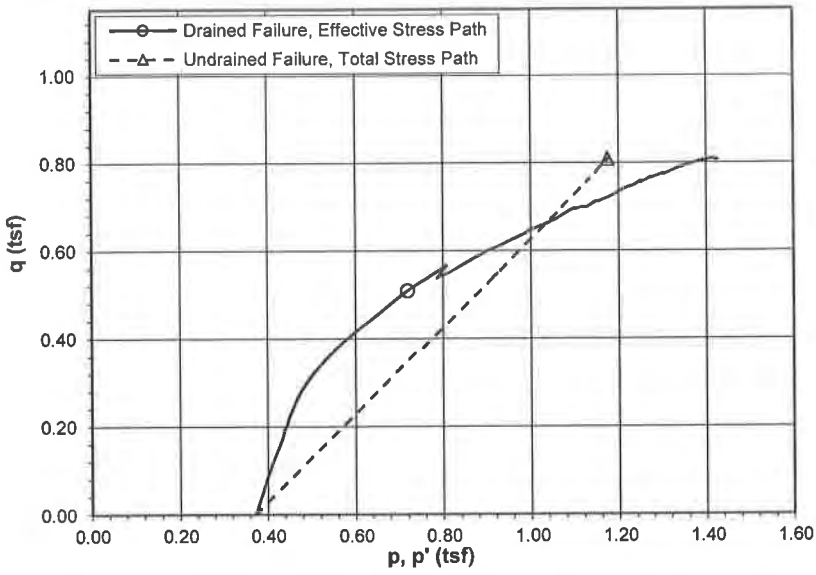
Failure Criterion: 15% Axial Strain

Axial Strain (%)	15.324
Deviator Stress (tsf)	1.616
Minor Principal Stress, σ_3 (tsf)	0.367
Major Principal Stress, σ_1 (tsf)	1.982
p (tsf)	1.175
q (tsf)	0.808

Failure Sketch







Comments

Reviewed KG

Template: tmp_cu_input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: KG
Report Date: 01/23/2019

Project: 175668041			Source: C-10, 5.0'-5.5'								Lab ID: 17		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
25.6	91.0	0.082	1.34	6.717	0.976	0.973	6.284	0.173	1.347	1.174	0.202	0.861	0.688	0.486	5.822
27.5	95.5	0.088	1.44	6.724	1.022	1.019	6.277	0.165	1.394	1.228	0.209	0.884	0.719	0.509	5.865
29.5	98.5	0.093	1.53	6.730	1.054	1.050	6.269	0.158	1.425	1.267	0.217	0.900	0.742	0.525	5.844
31.3	100.8	0.099	1.63	6.737	1.077	1.073	6.261	0.150	1.448	1.298	0.225	0.911	0.761	0.537	5.780
33.2	103.9	0.106	1.74	6.744	1.109	1.105	6.254	0.142	1.479	1.337	0.232	0.927	0.785	0.552	5.760
35.2	106.7	0.112	1.84	6.751	1.138	1.133	6.245	0.134	1.508	1.374	0.241	0.941	0.807	0.567	5.708
37.1	101.4	0.118	1.94	6.758	1.080	1.075	6.237	0.126	1.449	1.324	0.248	0.911	0.786	0.538	5.336
39.0	102.8	0.124	2.04	6.765	1.094	1.089	6.229	0.117	1.463	1.346	0.256	0.918	0.801	0.545	5.253
40.9	104.4	0.130	2.13	6.772	1.110	1.105	6.221	0.110	1.479	1.369	0.264	0.926	0.816	0.553	5.195
42.8	106.7	0.136	2.23	6.779	1.133	1.128	6.214	0.103	1.502	1.399	0.271	0.938	0.835	0.564	5.160
44.7	108.6	0.142	2.33	6.786	1.152	1.146	6.207	0.095	1.520	1.424	0.278	0.947	0.851	0.573	5.122
46.6	110.4	0.149	2.44	6.793	1.170	1.164	6.200	0.089	1.537	1.449	0.285	0.955	0.867	0.582	5.090
48.5	111.9	0.155	2.54	6.800	1.185	1.179	6.194	0.082	1.553	1.470	0.291	0.963	0.881	0.590	5.048
50.4	113.6	0.160	2.63	6.806	1.201	1.195	6.187	0.076	1.568	1.493	0.298	0.971	0.895	0.598	5.016
52.3	114.6	0.166	2.73	6.813	1.211	1.205	6.181	0.070	1.578	1.508	0.303	0.975	0.906	0.602	4.973
54.2	115.5	0.172	2.83	6.820	1.219	1.212	6.175	0.064	1.585	1.522	0.309	0.979	0.915	0.606	4.921
56.1	116.3	0.179	2.94	6.828	1.227	1.220	6.170	0.058	1.593	1.535	0.315	0.983	0.925	0.610	4.872
58.0	117.5	0.185	3.04	6.835	1.238	1.231	6.164	0.053	1.604	1.551	0.320	0.988	0.936	0.615	4.843
59.9	118.7	0.191	3.14	6.842	1.249	1.242	6.159	0.047	1.615	1.567	0.325	0.994	0.946	0.621	4.817
61.8	119.8	0.197	3.23	6.848	1.260	1.252	6.154	0.043	1.625	1.582	0.330	0.999	0.956	0.626	4.790
63.7	120.4	0.203	3.34	6.856	1.265	1.257	6.149	0.038	1.629	1.592	0.335	1.001	0.963	0.628	4.757
65.6	121.6	0.209	3.44	6.863	1.276	1.268	6.145	0.033	1.641	1.607	0.339	1.007	0.973	0.634	4.737
67.5	122.4	0.215	3.53	6.870	1.282	1.274	6.140	0.029	1.646	1.617	0.343	1.009	0.980	0.637	4.711
69.4	123.6	0.222	3.64	6.878	1.294	1.285	6.136	0.024	1.657	1.633	0.348	1.015	0.990	0.642	4.693
71.3	124.9	0.228	3.74	6.885	1.306	1.297	6.131	0.020	1.669	1.649	0.352	1.020	1.001	0.649	4.683
73.2	125.5	0.234	3.84	6.892	1.311	1.302	6.128	0.016	1.674	1.658	0.356	1.023	1.007	0.651	4.653
75.1	126.3	0.240	3.94	6.899	1.318	1.309	6.123	0.012	1.681	1.669	0.360	1.026	1.014	0.654	4.634
77.0	127.2	0.246	4.04	6.906	1.326	1.316	6.120	0.008	1.688	1.680	0.364	1.030	1.022	0.658	4.617
78.9	127.2	0.252	4.14	6.913	1.324	1.314	6.116	0.004	1.687	1.683	0.368	1.030	1.025	0.657	4.569
80.8	128.3	0.258	4.24	6.921	1.335	1.325	6.112	0.000	1.697	1.696	0.371	1.034	1.034	0.662	4.567
82.7	128.8	0.264	4.33	6.927	1.339	1.328	6.108	-0.003	1.700	1.703	0.375	1.036	1.039	0.664	4.542
84.6	130.0	0.270	4.44	6.935	1.350	1.339	6.105	-0.007	1.711	1.717	0.378	1.041	1.048	0.670	4.542
86.5	130.3	0.277	4.54	6.943	1.352	1.341	6.101	-0.010	1.713	1.723	0.382	1.043	1.053	0.670	4.509
88.4	131.6	0.283	4.64	6.950	1.363	1.352	6.098	-0.013	1.724	1.737	0.385	1.048	1.061	0.676	4.513
90.3	132.7	0.289	4.74	6.957	1.374	1.363	6.094	-0.017	1.734	1.751	0.388	1.053	1.070	0.681	4.508
92.2	134.0	0.295	4.84	6.964	1.386	1.374	6.091	-0.020	1.746	1.766	0.392	1.059	1.079	0.687	4.506
96.9	136.3	0.310	5.09	6.983	1.406	1.393	6.083	-0.028	1.765	1.793	0.400	1.068	1.096	0.697	4.487
101.7	136.6	0.325	5.34	7.001	1.405	1.392	6.075	-0.036	1.763	1.799	0.407	1.067	1.103	0.696	4.422
106.4	137.9	0.341	5.59	7.020	1.415	1.401	6.068	-0.044	1.772	1.816	0.415	1.072	1.115	0.701	4.379
111.2	138.3	0.356	5.84	7.038	1.414	1.400	6.061	-0.050	1.771	1.821	0.421	1.071	1.121	0.700	4.328
115.9	138.7	0.371	6.09	7.057	1.415	1.400	6.055	-0.057	1.771	1.828	0.427	1.071	1.128	0.700	4.277
120.7	141.5	0.386	6.34	7.076	1.440	1.425	6.048	-0.063	1.795	1.858	0.434	1.083	1.146	0.712	4.285
125.4	142.1	0.401	6.58	7.094	1.443	1.427	6.041	-0.070	1.797	1.867	0.440	1.084	1.154	0.713	4.241
130.2	143.4	0.417	6.84	7.114	1.451	1.435	6.035	-0.076	1.805	1.881	0.446	1.088	1.164	0.718	4.217
134.9	144.7	0.432	7.09	7.133	1.461	1.444	6.029	-0.082	1.814	1.896	0.452	1.092	1.174	0.722	4.195
139.7	146.1	0.447	7.34	7.152	1.471	1.453	6.024	-0.088	1.823	1.911	0.457	1.096	1.184	0.727	4.177
144.4	147.4	0.462	7.59	7.171	1.480	1.462	6.018	-0.093	1.832	1.925	0.463	1.101	1.194	0.731	4.156
149.2	149.5	0.478	7.84	7.191	1.497	1.479	6.013	-0.099	1.848	1.947	0.468	1.109	1.208	0.739	4.157
153.9	151.1	0.493	8.09	7.210	1.509	1.490	6.007	-0.104	1.860	1.964	0.474	1.115	1.219	0.745	4.142
158.7	152.0	0.508	8.34	7.230	1.513	1.493	6.002	-0.109	1.863	1.972	0.479	1.116	1.225	0.747	4.120
163.4	153.0	0.523	8.58	7.249	1.520	1.499	5.997	-0.115	1.869	1.983	0.484	1.119	1.234	0.750	4.099
168.1	155.4	0.538	8.83	7.269	1.540	1.519	5.991	-0.120	1.888	2.008	0.489	1.128	1.249	0.759	4.104
172.9	155.3	0.554	9.09	7.290	1.534	1.512	5.987	-0.125	1.881	2.006	0.494	1.125	1.250	0.756	4.063
177.6	156.6	0.568	9.33	7.309	1.543	1.521	5.982	-0.130	1.890	2.019	0.498	1.129	1.259	0.760	4.051
182.4	158.4	0.584	9.59	7.330	1.556	1.533	5.977	-0.135	1.902	2.036	0.503	1.135	1.270	0.767	4.047
187.1	159.0	0.599	9.83	7.350	1.557	1.534	5.972	-0.139	1.902	2.041	0.508	1.136	1.274	0.767	4.022
191.9	160.1	0.615	10.08	7.370	1.564	1.540	5.968	-0.144	1.909	2.052	0.513	1.139	1.282	0.770	4.004
196.6	161.0	0.629	10.32	7.390	1.568	1.544	5.963	-0.148	1.912	2.060	0.517	1.140	1.288	0.772	3.988
201.4	162.1	0.645	10.58	7.412	1.575	1.550	5.959	-0.152	1.918	2.070	0.521	1.143	1.296	0.775	3.976
206.1	162.9	0.660	10.83	7.432	1.578	1.553	5.954	-0.157	1.921	2.078	0.525	1.144	1.302	0.776	3.956
210.9	163.3	0.675	11.08	7.453	1.577	1.551	5.949	-0.162	1.919	2.081	0.530	1.143	1.305	0.775	3.927
215.6	164.5	0.691	11.33	7.474	1.585	1.558	5.945	-0.166	1.926	2.092	0.534	1.147	1.313	0.779	3.916
220.4	165.8	0.706	11.59	7.496	1.592	1.565	5.941	-0.170	1.933	2.103	0.538	1.150	1.321	0.782	3.906
225.1	167.0	0.721	11.83	7.517	1.600	1.571	5.936	-0.175	1.939	2.114	0.543	1.154	1.329	0.786	3.894
229.9	168.2	0.736	12.08	7.538	1.606	1.577	5.932	-0.180	1.945	2.124	0.547	1.156	1.336	0.789	3.885
234.6	169.3	0.752	12.33	7.559	1.612	1.583	5.928	-0.184	1.950	2.134	0.551	1.159	1.342	0.791	3.873
239.4	169.7	0.766	12.58	7.581	1.612	1.582	5.924	-0.187	1.949	2.136	0.555	1.158	1.346	0.791	3.851
244.1	171.2	0.782	12.84	7.603	1.621	1.590	5.920	-0.192	1.958	2.149	0.559	1.162	1.354	0.795	3.847
248.9	172.1	0.797	13.07	7.624	1.625	1.594	5.915	-0.196	1.962	2.158	0.564	1.165	1.361	0.797	3.828

Stantec

Consolidated Undrained Triaxial Compression

ASTM D 4767

Project Name LFUCG Sewer
Source C-3, 5.0'-5.5'
Description Fat Clay with Sand (CH), brown, moist, firm
Specimen Type Intact
Preparation Wet Mounting

Project No. 175668041
Lab ID 29A
Test ID 1-B

Date Received 12/12/2018
Date Tested 01/11/2019

Specific Gravity 2.78
ASTM D 854, Dry

Liquid Limit 60
Plastic Limit 25
Plasticity Index 35
ASTM D 4318

Target Test Parameters

Nominal Chamber Pressure (psi) 90
Nominal Back Pressure (psi) 75
Nominal Consolidation Pressure (psi) 15

Saturation / Consolidation Results

Pore Pressure Parameter B 0.98
Measured Effective Consol. Stress (tsf) 1.038
Time to 50% Consolidation (min) 6.25
Actual Axial Strain Rate of Test (%/min) 0.048

Consolidated Specimen Conditions

Moist Unit Weight (pcf) 120.1
Moisture Content (%) 33.1
Dry Unit Weight (pcf) 90.3
Void Ratio 0.919
Degree of Saturation (%) 100.0

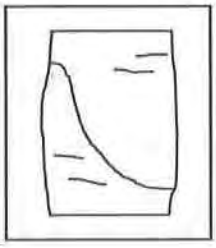
At Drained Failure

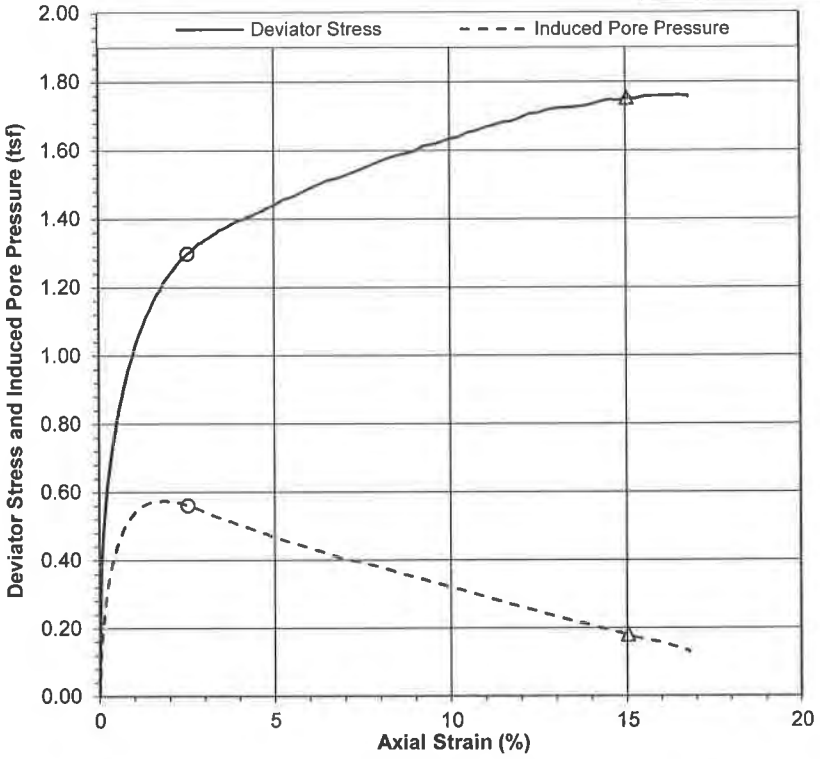
Failure Criteria: Max. Eff. Prin. Stress Ratio
Axial Strain (%) 2.533
Deviator Stress (tsf) 1.297
Induced Pore Pressure (tsf) 0.560
Minor Effective Stress, σ_3' (tsf) 0.479
Major Effective Stress, σ_1' (tsf) 1.777
Eff. Principal Stress Ratio, σ_1'/σ_3' 3.705
p' (tsf) 1.128
q (tsf) 0.649

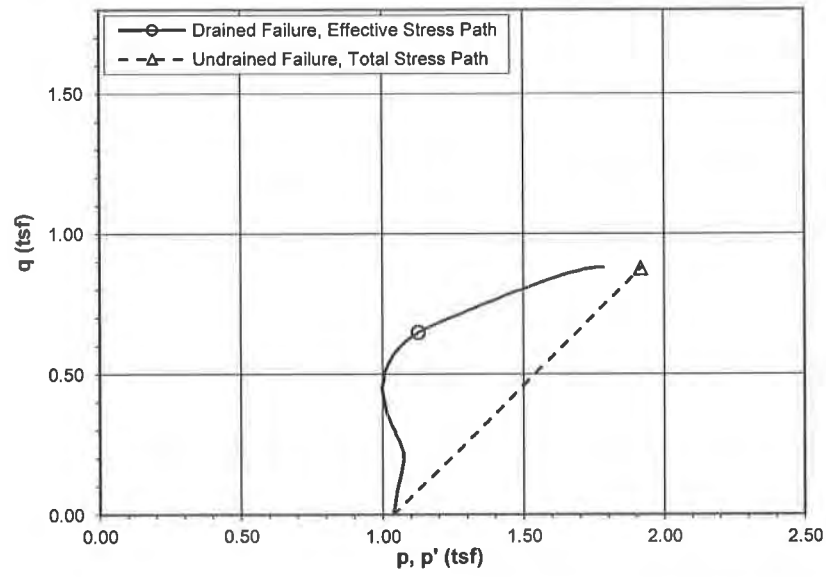
At Consolidated Undrained Failure

Failure Criterion: 15% Axial Strain
Axial Strain (%) 15.025
Deviator Stress (tsf) 1.753
Minor Principal Stress, σ_3 (tsf) 1.037
Major Principal Stress, σ_1 (tsf) 2.789
p (tsf) 1.913
q (tsf) 0.876

Failure Sketch







Comments

Reviewed KG

Template: tmp_cu_input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: KG
Report Date: 01/23/2019

Project: 175668041			Source: C-3, 5.0'-5.5'								Lab ID: 29A		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in^2)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
34.4	104.0	0.099	1.65	6.338	1.182	1.178	6.014	0.572	2.216	1.644	0.466	1.627	1.055	0.589	3.529
36.5	105.3	0.105	1.74	6.344	1.196	1.191	6.014	0.572	2.229	1.657	0.466	1.633	1.061	0.596	3.559
38.6	107.2	0.111	1.84	6.350	1.216	1.211	6.016	0.574	2.249	1.675	0.464	1.643	1.070	0.606	3.610
40.7	108.7	0.117	1.94	6.357	1.231	1.226	6.015	0.573	2.264	1.691	0.465	1.651	1.078	0.613	3.636
42.8	110.1	0.123	2.05	6.364	1.246	1.241	6.012	0.570	2.278	1.708	0.467	1.657	1.088	0.621	3.656
44.8	111.2	0.129	2.14	6.370	1.257	1.252	6.013	0.571	2.292	1.720	0.468	1.666	1.094	0.626	3.674
46.9	112.6	0.135	2.24	6.376	1.272	1.266	6.011	0.569	2.306	1.737	0.471	1.673	1.104	0.633	3.689
49.0	113.8	0.141	2.33	6.382	1.283	1.278	6.008	0.566	2.317	1.751	0.473	1.678	1.112	0.639	3.699
51.1	114.8	0.147	2.44	6.389	1.294	1.288	6.004	0.562	2.328	1.765	0.477	1.683	1.121	0.644	3.701
53.2	115.8	0.153	2.53	6.395	1.303	1.297	6.002	0.560	2.336	1.777	0.479	1.688	1.128	0.649	3.705
55.3	116.6	0.159	2.64	6.402	1.311	1.305	5.998	0.556	2.344	1.788	0.483	1.692	1.135	0.652	3.700
57.3	117.7	0.165	2.73	6.408	1.322	1.315	5.994	0.552	2.355	1.803	0.487	1.697	1.145	0.658	3.699
59.5	118.8	0.171	2.84	6.415	1.333	1.326	5.991	0.549	2.366	1.817	0.491	1.703	1.154	0.663	3.704
61.5	119.2	0.177	2.93	6.422	1.337	1.329	5.987	0.545	2.369	1.824	0.495	1.704	1.159	0.665	3.688
63.6	120.1	0.183	3.04	6.429	1.345	1.338	5.983	0.540	2.377	1.836	0.498	1.708	1.167	0.669	3.684
65.7	120.8	0.190	3.15	6.436	1.352	1.344	5.977	0.535	2.382	1.847	0.503	1.710	1.175	0.672	3.670
67.8	121.6	0.195	3.24	6.442	1.359	1.351	5.973	0.530	2.389	1.859	0.508	1.714	1.183	0.676	3.662
69.9	122.2	0.201	3.34	6.449	1.364	1.356	5.969	0.527	2.394	1.867	0.511	1.716	1.189	0.678	3.655
72.0	123.2	0.207	3.44	6.455	1.374	1.365	5.965	0.523	2.403	1.880	0.514	1.720	1.197	0.683	3.654
74.0	123.7	0.214	3.54	6.462	1.378	1.369	5.961	0.519	2.407	1.888	0.519	1.723	1.204	0.685	3.639
76.1	124.3	0.220	3.65	6.469	1.384	1.375	5.956	0.514	2.413	1.898	0.523	1.725	1.211	0.687	3.626
78.2	125.0	0.226	3.75	6.476	1.390	1.381	5.955	0.512	2.419	1.906	0.525	1.728	1.216	0.691	3.629
80.3	125.8	0.232	3.85	6.483	1.397	1.388	5.950	0.508	2.425	1.917	0.530	1.732	1.223	0.694	3.620
82.4	126.4	0.238	3.94	6.489	1.403	1.393	5.947	0.505	2.431	1.926	0.533	1.735	1.230	0.697	3.614
84.5	126.9	0.244	4.05	6.496	1.407	1.397	5.944	0.501	2.435	1.934	0.537	1.737	1.235	0.698	3.601
86.6	127.3	0.250	4.15	6.503	1.409	1.399	5.939	0.497	2.437	1.940	0.542	1.738	1.241	0.699	3.583
88.6	128.2	0.256	4.25	6.510	1.418	1.407	5.937	0.494	2.445	1.951	0.543	1.741	1.247	0.704	3.589
90.7	128.5	0.262	4.35	6.517	1.419	1.409	5.932	0.490	2.446	1.956	0.548	1.742	1.252	0.704	3.572
92.8	129.3	0.268	4.45	6.524	1.427	1.416	5.929	0.486	2.453	1.967	0.551	1.746	1.259	0.708	3.568
94.9	129.7	0.274	4.55	6.530	1.431	1.419	5.925	0.483	2.457	1.974	0.555	1.747	1.265	0.710	3.558
97.0	130.2	0.280	4.65	6.537	1.434	1.423	5.921	0.479	2.460	1.981	0.558	1.749	1.270	0.712	3.549
99.0	131.0	0.286	4.74	6.544	1.442	1.430	5.918	0.476	2.468	1.992	0.562	1.753	1.277	0.715	3.547
104.3	132.4	0.301	4.99	6.561	1.453	1.440	5.908	0.466	2.477	2.011	0.571	1.757	1.291	0.720	3.523
109.5	134.2	0.316	5.24	6.578	1.469	1.456	5.900	0.458	2.493	2.035	0.579	1.765	1.307	0.728	3.515
114.7	135.3	0.332	5.50	6.596	1.477	1.464	5.892	0.450	2.500	2.050	0.587	1.768	1.319	0.732	3.494
119.9	136.9	0.347	5.76	6.614	1.490	1.476	5.884	0.442	2.513	2.071	0.594	1.775	1.332	0.738	3.484
125.1	138.5	0.362	6.01	6.631	1.504	1.489	5.876	0.434	2.526	2.091	0.602	1.781	1.347	0.744	3.471
130.3	140.0	0.377	6.25	6.648	1.516	1.500	5.868	0.426	2.537	2.111	0.610	1.787	1.360	0.750	3.458
135.5	141.5	0.392	6.51	6.667	1.528	1.512	5.860	0.418	2.548	2.130	0.619	1.793	1.374	0.756	3.444
140.8	142.4	0.407	6.75	6.685	1.534	1.517	5.852	0.410	2.553	2.143	0.626	1.795	1.385	0.759	3.424
146.0	143.7	0.422	7.00	6.702	1.543	1.526	5.845	0.403	2.562	2.159	0.633	1.799	1.396	0.763	3.411
151.2	145.0	0.437	7.25	6.720	1.554	1.536	5.840	0.398	2.574	2.176	0.640	1.806	1.408	0.768	3.398
156.4	146.5	0.452	7.50	6.738	1.565	1.547	5.835	0.393	2.585	2.193	0.646	1.812	1.420	0.773	3.394
161.6	147.9	0.467	7.75	6.757	1.575	1.556	5.827	0.385	2.595	2.210	0.654	1.817	1.432	0.778	3.381
166.8	149.5	0.482	8.00	6.775	1.588	1.569	5.820	0.377	2.607	2.230	0.661	1.823	1.445	0.784	3.374
172.0	150.8	0.498	8.26	6.794	1.598	1.578	5.812	0.370	2.617	2.246	0.669	1.828	1.458	0.789	3.360
177.2	152.0	0.512	8.50	6.812	1.606	1.585	5.804	0.362	2.623	2.262	0.676	1.831	1.469	0.793	3.344
182.4	153.0	0.528	8.76	6.831	1.613	1.591	5.796	0.354	2.630	2.275	0.684	1.834	1.480	0.796	3.326
187.6	154.2	0.543	9.01	6.850	1.621	1.598	5.790	0.347	2.637	2.289	0.691	1.837	1.490	0.799	3.314
192.8	156.1	0.558	9.26	6.870	1.636	1.613	5.783	0.341	2.652	2.311	0.697	1.845	1.504	0.807	3.313
198.0	157.0	0.573	9.51	6.888	1.641	1.617	5.775	0.332	2.656	2.323	0.706	1.847	1.515	0.809	3.291
203.3	158.2	0.588	9.76	6.907	1.649	1.625	5.768	0.326	2.663	2.337	0.712	1.851	1.525	0.812	3.282
208.5	159.6	0.603	10.01	6.926	1.659	1.635	5.761	0.319	2.673	2.354	0.719	1.856	1.537	0.817	3.273
213.7	160.6	0.618	10.26	6.946	1.664	1.639	5.754	0.312	2.677	2.365	0.726	1.858	1.546	0.820	3.258
218.9	162.3	0.634	10.51	6.965	1.678	1.652	5.747	0.305	2.691	2.386	0.733	1.865	1.560	0.826	3.253
224.1	163.4	0.648	10.76	6.985	1.684	1.658	5.739	0.297	2.696	2.399	0.741	1.867	1.570	0.829	3.238
229.3	164.9	0.664	11.01	7.005	1.695	1.668	5.731	0.289	2.705	2.417	0.749	1.871	1.583	0.834	3.227
234.5	166.0	0.679	11.27	7.025	1.702	1.674	5.724	0.282	2.711	2.430	0.755	1.874	1.593	0.837	3.216
239.7	167.4	0.694	11.52	7.045	1.711	1.682	5.716	0.274	2.719	2.445	0.762	1.878	1.604	0.841	3.207
245.0	168.2	0.709	11.77	7.064	1.715	1.686	5.709	0.267	2.723	2.456	0.770	1.880	1.613	0.843	3.189
250.2	169.7	0.724	12.02	7.084	1.724	1.695	5.702	0.260	2.732	2.472	0.777	1.884	1.624	0.847	3.182
255.4	171.4	0.740	12.27	7.105	1.737	1.707	5.695	0.253	2.744	2.491	0.784	1.890	1.637	0.854	3.178
260.6	172.1	0.755	12.52	7.125	1.739	1.709	5.687	0.245	2.745	2.500	0.791	1.891	1.646	0.854	3.160
265.8	173.6	0.770	12.77	7.146	1.750	1.718	5.680	0.238	2.755	2.517	0.798	1.895	1.658	0.859	3.152
271.0	174.6	0.785	13.02	7.166	1.755	1.723	5.674	0.232	2.759	2.527	0.804	1.898	1.666	0.861	3.142
276.2	175.4	0.800	13.27	7.187	1.758	1.725	5.666	0.224	2.761	2.537	0.812	1.899	1.674	0.862	3.124
281.4	176.1	0.815	13.52	7.208	1.759	1.726	5.660	0.218	2.763	2.545	0.819	1.900	1.682	0.863	3.108
286.6	177.1	0.830	13.78	7.229	1.763	1.730	5.655	0.213	2.767	2.554	0.824	1.902	1.689	0.865	3.099
291.8	178.1	0.846	14.03	7.250	1.769	1.734	5.648	0.205	2.771	2.566	0.831	1.904	1.698	0.867	3.086

Stantec

Consolidated Undrained Triaxial Compression

ASTM D 4767

Project Name LFUCG Sewer
Source C-3, 5.5'-6.0'
Description Fat Clay with Sand (CH), brown, moist, firm
Specimen Type Intact
Preparation Wet Mounting

Project No. 175668041
Lab ID 29B
Test ID 1-C

Date Received 12/12/2018
Date Tested 01/11/2019

Specific Gravity 2.78
ASTM D 854, Dry

Liquid Limit 60
Plastic Limit 25
Plasticity Index 35
ASTM D 4318

Target Test Parameters

Nominal Chamber Pressure (psi) 90
Nominal Back Pressure (psi) 60
Nominal Consolidation Pressure (psi) 30

Saturation / Consolidation Results

Pore Pressure Parameter B 0.97
Measured Effective Consol. Stress (tsf) 1.895
Time to 50% Consolidation (min) 63.00
Actual Axial Strain Rate of Test (%/min) 0.005

Consolidated Specimen Conditions

Moist Unit Weight (pcf) 122.0
Moisture Content (%) 30.9
Dry Unit Weight (pcf) 93.2
Void Ratio 0.858
Degree of Saturation (%) 100.0

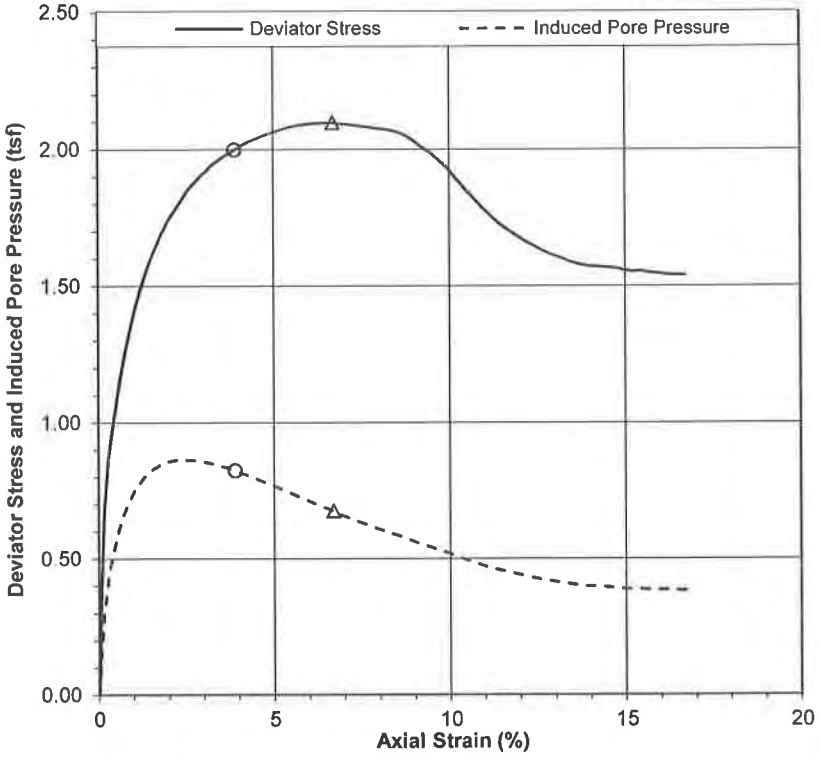
At Drained Failure

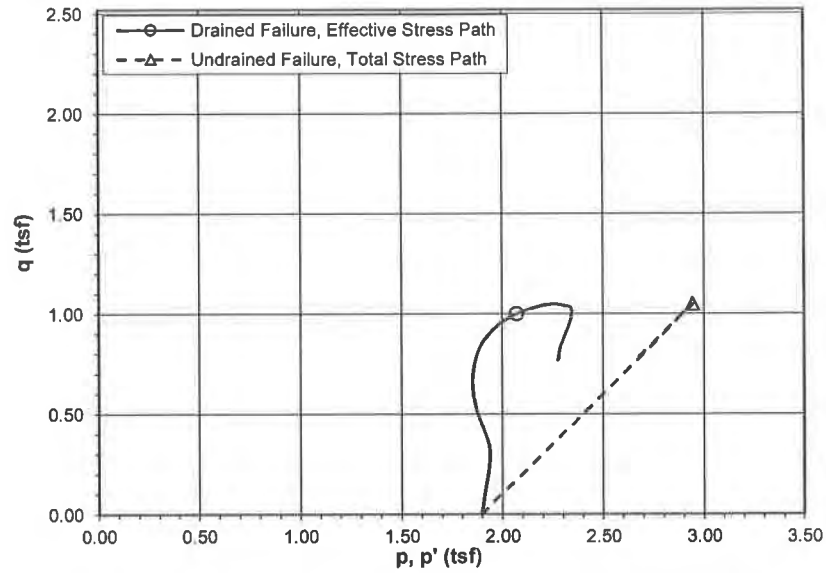
Failure Criteria: Max. Eff. Prin. Stress Ratio
Axial Strain (%) 3.893
Deviator Stress (tsf) 1.999
Induced Pore Pressure (tsf) 0.824
Minor Effective Stress, σ_3' (tsf) 1.072
Major Effective Stress, σ_1' (tsf) 3.071
Eff. Principal Stress Ratio, σ_1'/σ_3' 2.864
p' (tsf) 2.072
q (tsf) 0.999

At Consolidated Undrained Failure

Failure Criterion: Peak Deviator Stress
Axial Strain (%) 6.690
Deviator Stress (tsf) 2.097
Minor Principal Stress, σ_3 (tsf) 1.894
Major Principal Stress, σ_1 (tsf) 3.991
p (tsf) 2.942
q (tsf) 1.048

Failure Sketch





Comments

Reviewed KG

Template: tmp_cu_input xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: KG
Report Date: 01/23/2019

Project: 175668041			Source: C-3, 5.5'-6.0'								Lab ID: 29B		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in^2)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
372.5	149.9	0.107	1.80	6.367	1.695	1.691	5.433	0.848	3.589	2.741	1.050	2.743	1.895	0.845	2.611
393.2	152.0	0.113	1.90	6.373	1.717	1.713	5.437	0.853	3.611	2.758	1.045	2.754	1.901	0.856	2.639
413.9	154.3	0.119	1.99	6.379	1.741	1.736	5.442	0.858	3.635	2.777	1.041	2.767	1.909	0.868	2.669
434.6	156.4	0.125	2.09	6.386	1.763	1.758	5.444	0.860	3.657	2.797	1.038	2.778	1.918	0.879	2.693
455.3	158.4	0.131	2.20	6.393	1.784	1.779	5.447	0.862	3.677	2.815	1.036	2.788	1.925	0.889	2.717
476.0	160.3	0.137	2.29	6.399	1.804	1.798	5.448	0.864	3.697	2.833	1.035	2.798	1.934	0.899	2.738
496.7	162.1	0.143	2.39	6.406	1.822	1.816	5.447	0.863	3.714	2.851	1.035	2.806	1.943	0.908	2.755
517.4	164.1	0.149	2.49	6.412	1.843	1.837	5.447	0.863	3.735	2.871	1.035	2.816	1.953	0.918	2.775
538.1	165.9	0.155	2.59	6.419	1.861	1.854	5.447	0.863	3.752	2.889	1.035	2.825	1.962	0.927	2.792
558.8	167.4	0.161	2.69	6.426	1.875	1.869	5.446	0.862	3.766	2.904	1.035	2.832	1.970	0.934	2.805
579.4	168.9	0.167	2.79	6.432	1.891	1.884	5.445	0.861	3.781	2.920	1.036	2.839	1.978	0.942	2.818
600.1	170.3	0.172	2.89	6.438	1.904	1.897	5.443	0.859	3.794	2.935	1.038	2.846	1.987	0.948	2.827
620.8	171.5	0.178	2.99	6.445	1.916	1.909	5.441	0.857	3.806	2.949	1.040	2.851	1.995	0.955	2.836
641.5	172.8	0.184	3.09	6.452	1.928	1.921	5.438	0.854	3.818	2.964	1.043	2.857	2.003	0.960	2.841
662.2	174.3	0.191	3.19	6.459	1.943	1.935	5.435	0.851	3.831	2.980	1.045	2.864	2.013	0.967	2.851
682.9	175.4	0.196	3.28	6.465	1.953	1.945	5.432	0.848	3.842	2.994	1.049	2.869	2.021	0.973	2.855
703.6	176.5	0.203	3.40	6.472	1.964	1.955	5.429	0.844	3.852	3.007	1.052	2.874	2.030	0.978	2.859
724.3	177.5	0.209	3.50	6.479	1.973	1.964	5.425	0.840	3.861	3.020	1.056	2.879	2.038	0.982	2.860
745.0	178.6	0.214	3.59	6.485	1.983	1.974	5.421	0.837	3.871	3.034	1.060	2.884	2.047	0.987	2.862
765.7	179.5	0.220	3.69	6.492	1.991	1.982	5.417	0.833	3.878	3.045	1.064	2.887	2.054	0.991	2.863
786.4	180.4	0.227	3.80	6.499	1.999	1.990	5.412	0.828	3.886	3.058	1.069	2.891	2.063	0.995	2.862
807.1	181.5	0.232	3.89	6.506	2.008	1.999	5.408	0.824	3.895	3.071	1.072	2.896	2.072	0.999	2.864
827.8	182.3	0.239	4.00	6.513	2.016	2.006	5.403	0.819	3.902	3.083	1.077	2.899	2.080	1.003	2.862
848.5	183.2	0.244	4.09	6.519	2.024	2.014	5.398	0.814	3.909	3.095	1.082	2.902	2.088	1.007	2.862
869.2	184.2	0.250	4.18	6.525	2.032	2.022	5.394	0.810	3.917	3.108	1.086	2.906	2.097	1.011	2.862
889.8	184.9	0.256	4.29	6.533	2.038	2.028	5.388	0.804	3.923	3.119	1.091	2.909	2.105	1.014	2.858
910.5	185.6	0.262	4.39	6.540	2.044	2.033	5.384	0.799	3.929	3.130	1.097	2.912	2.113	1.016	2.854
931.2	186.4	0.269	4.50	6.547	2.050	2.038	5.377	0.793	3.934	3.141	1.102	2.915	2.122	1.019	2.849
951.9	187.1	0.275	4.60	6.554	2.055	2.044	5.373	0.789	3.939	3.151	1.107	2.917	2.129	1.022	2.847
972.6	187.7	0.280	4.68	6.560	2.060	2.049	5.368	0.784	3.944	3.160	1.111	2.919	2.135	1.024	2.844
1024.3	189.3	0.295	4.95	6.578	2.072	2.060	5.355	0.770	3.955	3.184	1.124	2.925	2.154	1.030	2.832
1076.1	190.8	0.310	5.19	6.595	2.083	2.071	5.341	0.756	3.965	3.209	1.138	2.930	2.173	1.035	2.820
1127.8	192.3	0.324	5.43	6.611	2.094	2.081	5.327	0.743	3.975	3.232	1.151	2.935	2.192	1.040	2.807
1179.5	193.6	0.340	5.69	6.630	2.102	2.089	5.313	0.729	3.982	3.253	1.165	2.938	2.209	1.044	2.793
1231.3	194.4	0.354	5.93	6.647	2.106	2.091	5.300	0.715	3.985	3.269	1.178	2.939	2.224	1.046	2.774
1283.0	195.4	0.370	6.19	6.665	2.111	2.096	5.285	0.701	3.989	3.288	1.193	2.941	2.240	1.048	2.757
1334.7	196.0	0.384	6.43	6.682	2.112	2.096	5.272	0.688	3.990	3.302	1.205	2.942	2.254	1.048	2.739
1386.4	196.7	0.399	6.69	6.701	2.113	2.097	5.260	0.675	3.991	3.315	1.218	2.942	2.267	1.048	2.721
1438.2	196.9	0.414	6.93	6.718	2.110	2.093	5.245	0.660	3.986	3.326	1.233	2.940	2.279	1.046	2.697
1489.9	197.2	0.429	7.19	6.737	2.108	2.090	5.232	0.647	3.983	3.336	1.246	2.938	2.291	1.045	2.678
1541.6	197.3	0.444	7.43	6.755	2.103	2.084	5.219	0.635	3.978	3.343	1.258	2.935	2.301	1.042	2.656
1593.3	197.6	0.459	7.69	6.773	2.100	2.081	5.207	0.623	3.974	3.351	1.270	2.933	2.310	1.041	2.639
1645.1	197.7	0.474	7.94	6.792	2.096	2.077	5.194	0.610	3.969	3.358	1.282	2.930	2.320	1.038	2.620
1696.8	198.0	0.488	8.17	6.809	2.093	2.073	5.184	0.600	3.965	3.366	1.292	2.929	2.329	1.037	2.604
1748.5	198.0	0.504	8.45	6.829	2.087	2.067	5.173	0.589	3.958	3.369	1.303	2.925	2.336	1.033	2.586
1800.2	197.5	0.519	8.69	6.847	2.077	2.055	5.162	0.578	3.947	3.369	1.314	2.919	2.341	1.028	2.565
1852.0	196.1	0.534	8.95	6.867	2.056	2.034	5.149	0.565	3.926	3.361	1.327	2.909	2.344	1.017	2.533
1903.7	194.5	0.548	9.18	6.885	2.034	2.012	5.138	0.554	3.903	3.350	1.338	2.897	2.344	1.006	2.503
1955.4	192.8	0.564	9.44	6.905	2.011	1.988	5.127	0.542	3.879	3.337	1.349	2.885	2.343	0.994	2.473
2007.2	190.8	0.578	9.69	6.923	1.984	1.960	5.115	0.531	3.852	3.321	1.361	2.872	2.341	0.980	2.441
2058.9	188.5	0.594	9.94	6.943	1.955	1.931	5.105	0.521	3.822	3.301	1.370	2.856	2.336	0.965	2.409
2110.6	185.5	0.608	10.19	6.962	1.918	1.893	5.092	0.508	3.785	3.277	1.384	2.838	2.330	0.947	2.368
2162.3	182.5	0.623	10.44	6.981	1.882	1.856	5.081	0.497	3.747	3.251	1.395	2.819	2.323	0.928	2.331
2214.1	179.6	0.639	10.70	7.001	1.847	1.820	5.069	0.485	3.711	3.226	1.405	2.801	2.316	0.910	2.295
2265.8	176.8	0.653	10.93	7.020	1.813	1.786	5.059	0.475	3.677	3.202	1.416	2.784	2.309	0.893	2.262
2317.5	174.3	0.668	11.19	7.040	1.782	1.755	5.051	0.466	3.645	3.179	1.424	2.768	2.301	0.877	2.232
2369.2	172.2	0.682	11.43	7.059	1.756	1.728	5.042	0.457	3.618	3.161	1.433	2.754	2.297	0.864	2.206
2421.0	170.3	0.698	11.69	7.080	1.732	1.703	5.034	0.450	3.593	3.143	1.440	2.741	2.292	0.851	2.182
2472.7	168.8	0.713	11.94	7.100	1.712	1.683	5.028	0.443	3.573	3.129	1.446	2.731	2.288	0.841	2.163
2524.4	167.3	0.728	12.19	7.120	1.691	1.662	5.019	0.435	3.551	3.116	1.455	2.721	2.286	0.831	2.142
2576.1	166.1	0.743	12.44	7.141	1.675	1.644	5.013	0.428	3.534	3.106	1.461	2.712	2.284	0.822	2.125
2627.9	164.8	0.758	12.69	7.162	1.657	1.626	5.006	0.421	3.515	3.094	1.468	2.702	2.281	0.813	2.107
2679.6	164.1	0.773	12.95	7.183	1.645	1.613	5.001	0.416	3.502	3.086	1.473	2.696	2.280	0.806	2.095
2731.3	163.4	0.788	13.19	7.203	1.633	1.601	4.995	0.411	3.491	3.080	1.479	2.690	2.279	0.801	2.083
2783.0	162.6	0.803	13.45	7.224	1.621	1.588	4.990	0.406	3.477	3.071	1.483	2.683	2.277	0.794	2.070
2834.8	162.3	0.817	13.69	7.244	1.613	1.579	4.986	0.401	3.468	3.067	1.488	2.679	2.277	0.790	2.062
2886.5	162.2	0.832	13.94	7.265	1.607	1.573	4.983	0.399	3.462	3.063	1.491	2.676	2.277	0.786	2.055
2938.2	162.5	0.847	14.19	7.287	1.605	1.571	4.982	0.398	3.460	3.062	1.492	2.675	2.277	0.785	2.053
2989.9	162.8	0.862	14.45	7.308	1.604	1.568	4.980	0.396	3.457	3.062	1.493	2.673	2.278	0.784	2.050

Stantec

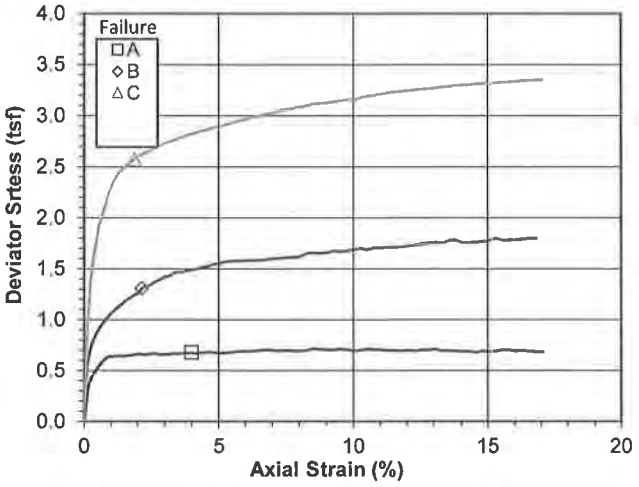
Consolidated Undrained Triaxial Compression

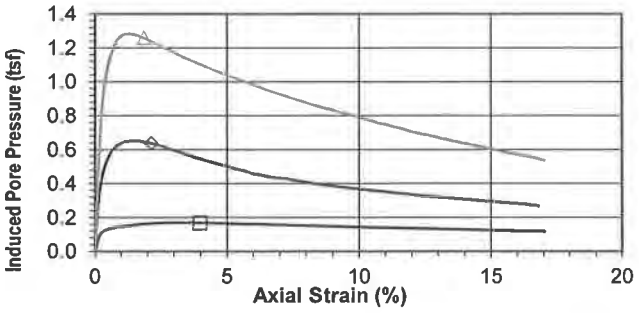
ASTM D 4767

Project Name LFUCG Sewer

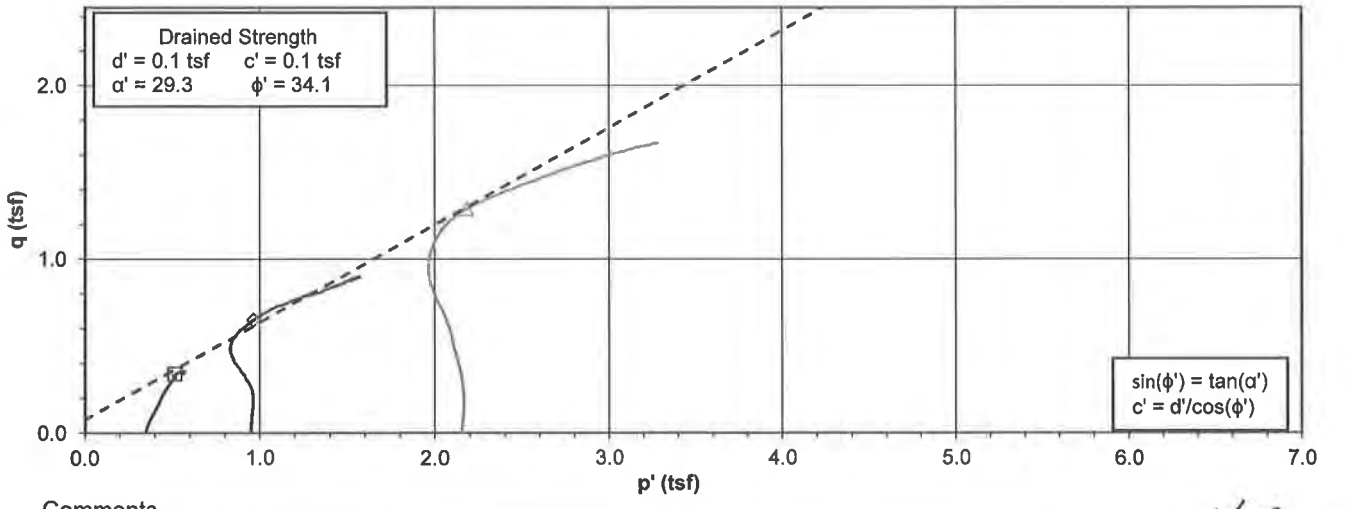
Project 175668041
Set ID 2

Test	Lab ID	Source	Description	Gs	LL	PL	PI
A	27A	C-33, 2.0'-2.5'	Fat Clay (CH), brown, moist, firm	2.69			
B	20	C-15, 5.0'-5.5'	Fat Clay (CH), brown, moist, firm, Mn	2.79			
C	23	C-21, 5.0'-5.5'	Fat Clay (CH), brown, moist, firm, Mn concretions	2.89			





Specimen	A	B	C		
	Initial Specimen Conditions				
Average Height (in)	6.055	6.064	6.145		
Average Diameter (in)	2.863	2.875	2.876		
Moist Unit Weight (pcf)	120.7	122.7	124.9		
Moisture Content (%)	24.4	27.4	27.3		
Dry Unit Weight (pcf)	97.1	96.3	98.2		
Void Ratio	0.727	0.805	0.835		
Degree of Saturation (%)	90.1	95.0	94.3		
	Consolidated Specimen Conditions				
Moist Unit Weight (pcf)	123.6	125.2	126.8		
Moisture Content (%)	26.7	27.7	28.6		
Dry Unit Weight (pcf)	97.5	98.0	98.6		
Void Ratio	0.719	0.773	0.826		
Degree of Saturation (%)	100.0	100.0	100.0		
Eff. Con. Stress, σ_3' (tsf)	0.345	0.950	2.151		
	At Drained Failure				
Failure Criterion	Max. Eff. Prin. Stress Ratio				
Axial Strain (%)	3.990	2.149	1.874		
Deviator Stress (tsf)	0.677	1.308	2.575		
Induced Pore Press. (tsf)	0.168	0.638	1.259		
Minor Eff. Stress, σ_3' (tsf)	0.177	0.311	0.892		
Major Eff. Stress, σ_1' (tsf)	0.854	1.620	3.468		
Eff. Stress Ratio, σ_1'/σ_3'	4.825	5.201	3.887		
p' (tsf)	0.516	0.966	2.180		
q (tsf)	0.339	0.654	1.288		



Comments

Reviewed By KG

Stantec

Consolidated Undrained Triaxial Compression
ASTM D 4767

Project Name: LFUCG Sewer
Source: C-33, 2.0'-2.5'
Description: Fat Clay (CH), brown, moist, firm
Specimen Type: Intact
Preparation: Wet Mounting

Project No.: 175668041
Lab ID: 27A
Test ID: 2-A

Date Received: 12/12/2018
Date Tested: 01/17/2019

Specific Gravity: 2.69
ASTM D 854, Dry

Liquid Limit:
Plastic Limit:
Plasticity Index:

Target Test Parameters

Nominal Chamber Pressure (psi)	90
Nominal Back Pressure (psi)	85
Nominal Consolidation Pressure (psi)	5

Saturation / Consolidation Results

Pore Pressure Parameter B	0.95
Measured Effective Consol. Stress (tsf)	0.345
Time to 50% Consolidation (min)	0.35
Actual Axial Strain Rate of Test (%/min)	0.100

Consolidated Specimen Conditions

Moist Unit Weight (pcf)	123.6
Moisture Content (%)	26.7
Dry Unit Weight (pcf)	97.5
Void Ratio	0.719
Degree of Saturation (%)	100.0

At Drained Failure

Failure Criterion: Max. Eff. Prin. Stress Ratio

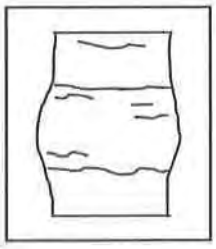
Axial Strain (%)	3.990
Deviator Stress (tsf)	0.677
Induced Pore Pressure (tsf)	0.168
Minor Effective Stress, σ_3' (tsf)	0.177
Major Effective Stress, σ_1' (tsf)	0.854
Eff. Principal Stress Ratio, σ_1'/σ_3'	4.825
p' (tsf)	0.516
q (tsf)	0.339

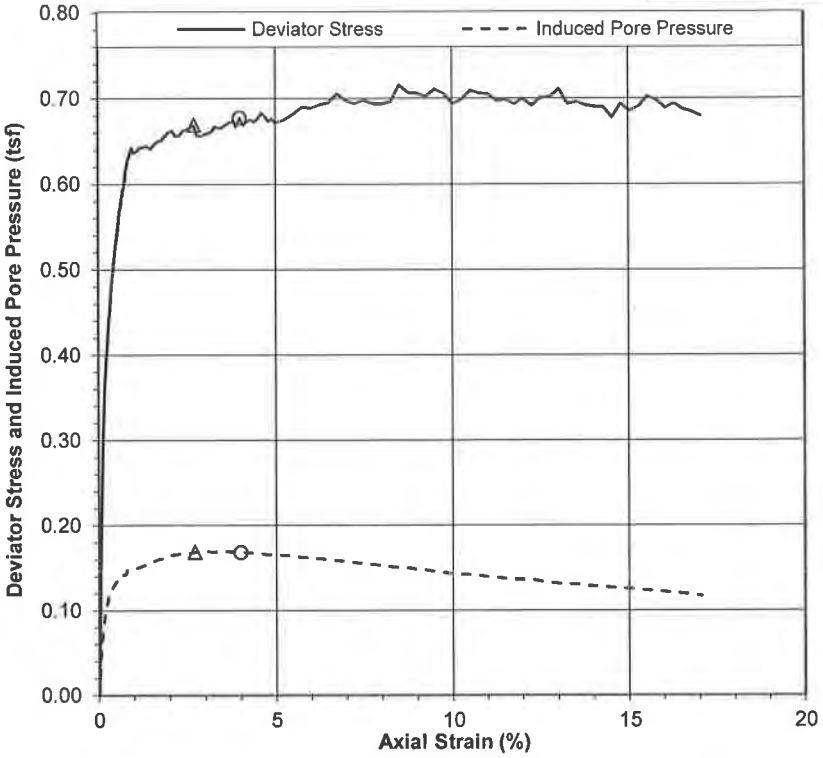
At Consolidated Undrained Failure

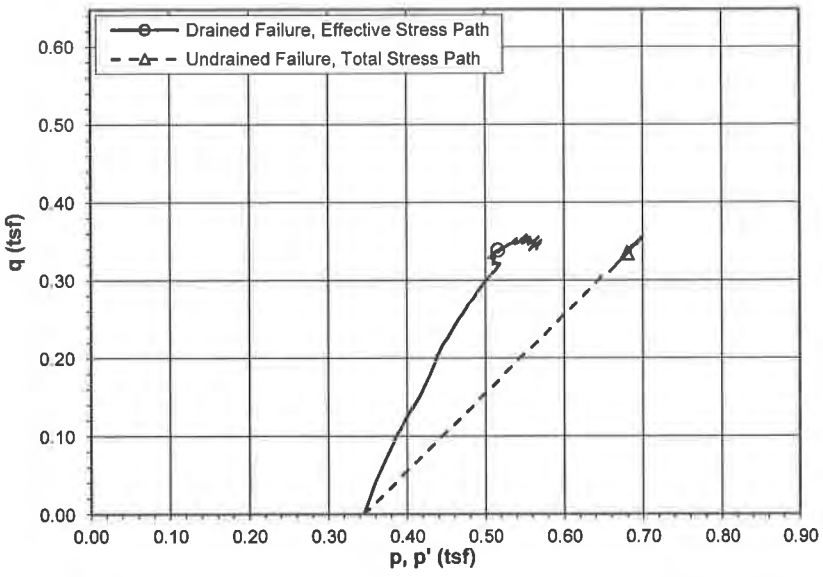
Failure Criterion: Peak Deviator Stress

Axial Strain (%)	2.697
Deviator Stress (tsf)	0.669
Minor Principal Stress, σ_3 (tsf)	0.345
Major Principal Stress, σ_1 (tsf)	1.014
p (tsf)	0.680
q (tsf)	0.334

Failure Sketch







Comments

Reviewed KG

Template: tmp_cu_Input xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: KG
Report Date: 01/23/2019

Project: 175668041			Source: C-33, 2.0'-2.5'								Lab ID: 27A		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in^2)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
9.8	57.4	0.060	0.99	6.463	0.639	0.637	6.284	0.149	0.983	0.834	0.198	0.665	0.516	0.318	4.219
10.9	57.5	0.066	1.09	6.470	0.640	0.638	6.285	0.150	0.984	0.834	0.196	0.665	0.515	0.319	4.246
11.8	58.0	0.071	1.18	6.475	0.645	0.642	6.287	0.151	0.988	0.837	0.195	0.667	0.516	0.321	4.301
12.8	58.2	0.078	1.29	6.483	0.646	0.643	6.289	0.153	0.989	0.836	0.193	0.667	0.514	0.322	4.339
13.9	58.4	0.084	1.39	6.489	0.648	0.644	6.290	0.154	0.990	0.836	0.191	0.668	0.513	0.322	4.372
14.8	58.1	0.090	1.49	6.496	0.645	0.641	6.293	0.157	0.986	0.829	0.189	0.666	0.509	0.320	4.400
15.9	58.7	0.096	1.59	6.502	0.650	0.646	6.294	0.158	0.991	0.833	0.187	0.668	0.510	0.323	4.454
16.9	59.1	0.102	1.68	6.509	0.654	0.650	6.296	0.160	0.995	0.835	0.186	0.670	0.510	0.325	4.503
17.9	59.3	0.108	1.78	6.515	0.655	0.651	6.297	0.161	0.996	0.835	0.184	0.671	0.510	0.325	4.530
18.9	59.9	0.115	1.89	6.523	0.661	0.656	6.298	0.162	1.002	0.840	0.183	0.673	0.512	0.328	4.581
19.9	60.3	0.120	1.98	6.529	0.665	0.660	6.300	0.164	1.006	0.842	0.181	0.675	0.511	0.330	4.647
20.9	60.6	0.126	2.08	6.535	0.667	0.662	6.301	0.165	1.008	0.842	0.180	0.676	0.511	0.331	4.677
21.9	60.1	0.133	2.19	6.542	0.661	0.656	6.302	0.166	1.001	0.835	0.179	0.673	0.507	0.328	4.656
22.9	60.2	0.139	2.29	6.549	0.662	0.657	6.303	0.167	1.002	0.835	0.179	0.674	0.507	0.328	4.678
23.9	60.8	0.145	2.39	6.556	0.668	0.662	6.303	0.168	1.007	0.840	0.178	0.676	0.509	0.331	4.726
24.9	61.1	0.151	2.49	6.563	0.670	0.664	6.303	0.168	1.009	0.842	0.178	0.677	0.510	0.332	4.737
25.9	61.3	0.157	2.59	6.569	0.672	0.666	6.304	0.168	1.011	0.843	0.177	0.678	0.510	0.333	4.750
26.9	61.7	0.163	2.70	6.576	0.675	0.669	6.304	0.169	1.014	0.845	0.177	0.680	0.511	0.334	4.789
27.9	60.7	0.169	2.79	6.583	0.664	0.657	6.304	0.168	1.002	0.834	0.177	0.674	0.505	0.328	4.713
28.9	60.7	0.175	2.89	6.590	0.663	0.656	6.305	0.169	1.001	0.832	0.176	0.673	0.504	0.328	4.721
29.9	60.9	0.181	3.00	6.597	0.665	0.658	6.305	0.169	1.003	0.834	0.176	0.674	0.505	0.329	4.736
30.9	61.1	0.187	3.09	6.603	0.667	0.659	6.305	0.169	1.005	0.835	0.176	0.675	0.506	0.330	4.745
31.9	61.5	0.194	3.19	6.610	0.669	0.662	6.304	0.168	1.007	0.838	0.176	0.676	0.507	0.331	4.751
32.9	62.0	0.200	3.30	6.618	0.675	0.667	6.305	0.169	1.012	0.844	0.176	0.679	0.510	0.334	4.779
33.9	62.0	0.206	3.40	6.624	0.674	0.666	6.305	0.169	1.011	0.842	0.176	0.678	0.509	0.333	4.779
34.9	62.1	0.211	3.49	6.630	0.674	0.666	6.305	0.169	1.011	0.842	0.176	0.678	0.509	0.333	4.782
35.9	62.5	0.218	3.60	6.638	0.678	0.669	6.305	0.169	1.015	0.845	0.176	0.680	0.511	0.335	4.801
36.9	62.8	0.224	3.70	6.645	0.681	0.672	6.305	0.169	1.017	0.848	0.176	0.681	0.512	0.336	4.809
37.9	63.1	0.230	3.80	6.652	0.683	0.673	6.304	0.168	1.019	0.850	0.177	0.682	0.513	0.337	4.814
38.9	62.5	0.236	3.90	6.659	0.676	0.667	6.304	0.168	1.012	0.844	0.177	0.679	0.510	0.333	4.769
39.9	63.6	0.242	3.99	6.665	0.687	0.677	6.304	0.168	1.022	0.854	0.177	0.684	0.516	0.339	4.825
40.9	62.9	0.248	4.10	6.672	0.678	0.668	6.304	0.168	1.014	0.845	0.177	0.679	0.511	0.334	4.775
41.9	63.3	0.254	4.19	6.679	0.683	0.672	6.304	0.168	1.018	0.850	0.177	0.681	0.514	0.336	4.794
42.9	63.7	0.261	4.30	6.687	0.686	0.675	6.303	0.167	1.020	0.853	0.178	0.683	0.515	0.338	4.800
43.9	63.5	0.267	4.40	6.694	0.683	0.673	6.304	0.168	1.018	0.850	0.178	0.682	0.514	0.336	4.787
44.9	64.0	0.273	4.50	6.701	0.687	0.676	6.302	0.167	1.022	0.855	0.179	0.683	0.517	0.338	4.788
45.9	64.7	0.279	4.61	6.708	0.694	0.683	6.303	0.167	1.028	0.862	0.179	0.687	0.520	0.342	4.823
46.9	64.4	0.285	4.71	6.715	0.690	0.679	6.301	0.166	1.024	0.859	0.180	0.685	0.519	0.339	4.776
47.9	64.0	0.291	4.81	6.722	0.685	0.673	6.301	0.165	1.019	0.853	0.180	0.682	0.517	0.337	4.745
48.9	64.3	0.297	4.90	6.729	0.688	0.676	6.301	0.166	1.022	0.856	0.180	0.683	0.518	0.338	4.759
49.9	64.0	0.303	5.00	6.736	0.684	0.672	6.301	0.165	1.017	0.852	0.180	0.681	0.516	0.336	4.725
52.4	64.5	0.318	5.25	6.754	0.688	0.675	6.301	0.165	1.020	0.856	0.181	0.683	0.518	0.338	4.737
54.9	65.4	0.334	5.50	6.772	0.695	0.682	6.299	0.163	1.027	0.864	0.182	0.686	0.523	0.341	4.745
57.4	66.4	0.349	5.75	6.790	0.704	0.690	6.298	0.162	1.035	0.873	0.183	0.690	0.528	0.345	4.766
59.9	66.5	0.364	6.01	6.808	0.703	0.689	6.297	0.162	1.034	0.873	0.184	0.690	0.528	0.344	4.742
62.4	67.1	0.379	6.25	6.826	0.708	0.693	6.297	0.161	1.039	0.878	0.185	0.692	0.531	0.346	4.747
64.9	67.5	0.394	6.51	6.844	0.711	0.695	6.295	0.159	1.040	0.881	0.186	0.693	0.534	0.347	4.729
67.4	68.8	0.409	6.75	6.863	0.722	0.706	6.294	0.158	1.051	0.893	0.187	0.698	0.540	0.353	4.773
69.9	68.3	0.425	7.01	6.881	0.715	0.698	6.293	0.158	1.043	0.886	0.188	0.694	0.537	0.349	4.715
72.4	68.2	0.440	7.26	6.900	0.712	0.694	6.292	0.156	1.039	0.883	0.189	0.692	0.536	0.347	4.668
74.9	68.8	0.454	7.50	6.918	0.716	0.698	6.291	0.155	1.043	0.887	0.190	0.694	0.538	0.349	4.677
77.4	68.7	0.470	7.76	6.937	0.713	0.694	6.290	0.154	1.039	0.886	0.191	0.692	0.538	0.347	4.627
79.9	68.9	0.485	8.00	6.956	0.713	0.694	6.289	0.153	1.039	0.886	0.192	0.692	0.539	0.347	4.612
82.4	69.4	0.501	8.27	6.976	0.716	0.696	6.287	0.151	1.041	0.890	0.194	0.693	0.542	0.348	4.595
84.9	71.5	0.516	8.51	6.994	0.736	0.716	6.286	0.150	1.060	0.910	0.195	0.702	0.552	0.358	4.678
87.4	70.9	0.531	8.76	7.014	0.728	0.707	6.286	0.150	1.052	0.902	0.195	0.698	0.549	0.353	4.624
89.9	71.1	0.546	9.01	7.032	0.728	0.706	6.284	0.148	1.051	0.903	0.197	0.698	0.550	0.353	4.587
92.4	71.0	0.561	9.26	7.052	0.725	0.702	6.283	0.147	1.047	0.900	0.197	0.696	0.548	0.351	4.562
94.9	72.1	0.576	9.51	7.072	0.734	0.711	6.281	0.146	1.055	0.910	0.199	0.700	0.554	0.355	4.576
97.4	71.8	0.592	9.77	7.092	0.729	0.706	6.280	0.144	1.050	0.905	0.200	0.697	0.553	0.353	4.534
99.9	70.9	0.607	10.02	7.112	0.718	0.694	6.280	0.144	1.038	0.894	0.200	0.691	0.547	0.347	4.468
102.4	71.6	0.622	10.27	7.131	0.723	0.698	6.278	0.142	1.042	0.900	0.202	0.693	0.551	0.349	4.459
104.9	73.0	0.638	10.52	7.152	0.735	0.710	6.277	0.142	1.054	0.912	0.202	0.699	0.557	0.355	4.507
107.4	72.9	0.652	10.76	7.171	0.732	0.706	6.277	0.141	1.050	0.909	0.203	0.697	0.556	0.353	4.478
110.0	73.1	0.668	11.02	7.192	0.732	0.705	6.275	0.139	1.049	0.910	0.205	0.697	0.557	0.353	4.445
112.4	72.6	0.683	11.27	7.212	0.724	0.697	6.274	0.138	1.041	0.903	0.205	0.692	0.554	0.349	4.393
114.9	73.0	0.698	11.53	7.233	0.727	0.699	6.273	0.137	1.043	0.906	0.207	0.694	0.556	0.349	4.373
117.4	72.7	0.714	11.78	7.253	0.722	0.694	6.273	0.137	1.038	0.901	0.207	0.691	0.554	0.347	4.343
120.0	73.7	0.728	12.02	7.273	0.729	0.700	6.272	0.136	1.044	0.908	0.208	0.694	0.558	0.350	4.361

Stantec

Consolidated Undrained Triaxial Compression
ASTM D 4767

Project Name LFUCG Sewer
Source C-15, 5.0'-5.5'
Description Fat Clay (CH), brown, moist, firm, Mn
Specimen Type Intact
Preparation Wet Mounting

Project No. 175668041
Lab ID 20
Test ID 2-B

Date Received 12/12/2018
Date Tested 01/17/2019

Specific Gravity 2.79
ASTM D 854, Dry

Liquid Limit
Plastic Limit
Plasticity Index

Target Test Parameters

Nominal Chamber Pressure (psi)	90
Nominal Back Pressure (psi)	75
Nominal Consolidation Pressure (psi)	15

Saturation / Consolidation Results

Pore Pressure Parameter B	0.99
Measured Effective Consol. Stress (tsf)	0.949
Time to 50% Consolidation (min)	5.30
Actual Axial Strain Rate of Test (%/min)	0.057

Consolidated Specimen Conditions

Moist Unit Weight (pcf)	125.2
Moisture Content (%)	27.7
Dry Unit Weight (pcf)	98.0
Void Ratio	0.773
Degree of Saturation (%)	100.0

At Drained Failure

Failure Criteria: Max. Eff. Prin. Stress Ratio

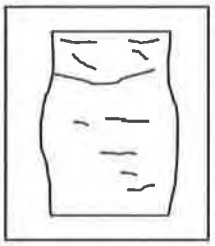
Axial Strain (%)	2.149
Deviator Stress (tsf)	1.308
Induced Pore Pressure (tsf)	0.638
Minor Effective Stress, σ_3' (tsf)	0.311
Major Effective Stress, σ_1' (tsf)	1.620
Eff. Principal Stress Ratio, σ_1'/σ_3'	5.201
p' (tsf)	0.966
q (tsf)	0.654

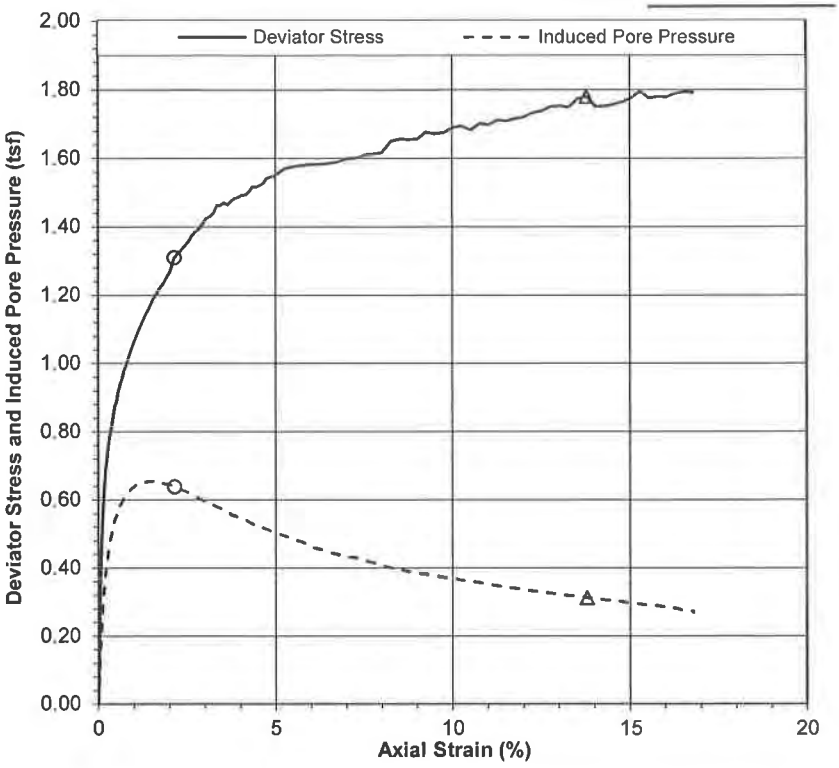
At Consolidated Undrained Failure

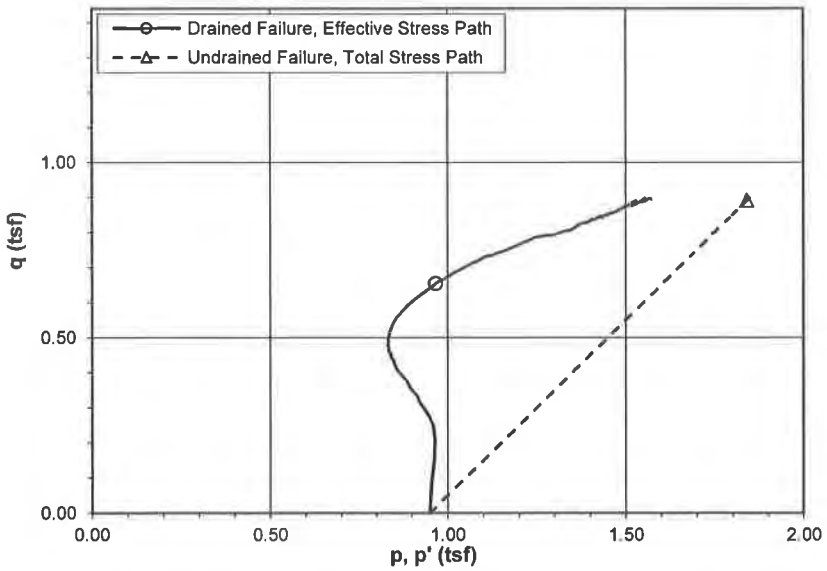
Failure Criterion: Peak Deviator Stress

Axial Strain (%)	13.778
Deviator Stress (tsf)	1.780
Minor Principal Stress, σ_3 (tsf)	0.948
Major Principal Stress, σ_1 (tsf)	2.728
p (tsf)	1.838
q (tsf)	0.890

Failure Sketch







Comments

Reviewed KG

Template: tmp_cu_input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: KG
Report Date: 01/23/2019

Project: 175668041			Source: C-15, 5.0'-5.5'								Lab ID: 20		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in^2)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
29.2	109.5	0.099	1.65	6.525	1.208	1.204	6.188	0.653	2.153	1.499	0.295	1.551	0.897	0.602	5.077
31.0	110.9	0.105	1.75	6.531	1.223	1.219	6.186	0.651	2.168	1.517	0.298	1.559	0.908	0.609	5.084
32.7	112.4	0.111	1.85	6.538	1.238	1.234	6.182	0.647	2.182	1.535	0.301	1.565	0.918	0.617	5.095
34.5	114.3	0.117	1.95	6.545	1.258	1.253	6.180	0.645	2.202	1.556	0.303	1.575	0.930	0.626	5.129
36.2	115.8	0.123	2.04	6.551	1.272	1.267	6.177	0.643	2.217	1.574	0.307	1.583	0.940	0.634	5.133
38.0	119.6	0.130	2.15	6.558	1.313	1.308	6.173	0.638	2.258	1.620	0.311	1.604	0.966	0.654	5.201
39.8	120.8	0.136	2.25	6.565	1.325	1.320	6.169	0.634	2.268	1.634	0.315	1.609	0.975	0.660	5.192
41.5	121.8	0.141	2.34	6.571	1.335	1.329	6.163	0.628	2.278	1.650	0.321	1.613	0.985	0.665	5.147
43.3	123.2	0.147	2.45	6.578	1.348	1.342	6.159	0.624	2.292	1.667	0.325	1.620	0.996	0.671	5.135
45.1	124.4	0.153	2.54	6.585	1.360	1.354	6.155	0.620	2.304	1.684	0.329	1.627	1.007	0.677	5.111
46.8	126.3	0.160	2.65	6.592	1.380	1.373	6.150	0.615	2.323	1.708	0.335	1.636	1.021	0.687	5.103
48.6	127.5	0.166	2.75	6.599	1.391	1.385	6.144	0.609	2.335	1.726	0.341	1.642	1.033	0.692	5.062
50.4	128.6	0.172	2.85	6.605	1.402	1.395	6.138	0.603	2.343	1.740	0.345	1.646	1.043	0.697	5.042
52.1	130.1	0.178	2.95	6.612	1.417	1.410	6.133	0.598	2.358	1.760	0.351	1.654	1.056	0.705	5.021
53.9	131.6	0.184	3.05	6.619	1.431	1.424	6.129	0.594	2.373	1.779	0.355	1.661	1.067	0.712	5.008
55.7	132.2	0.190	3.15	6.626	1.437	1.429	6.124	0.589	2.379	1.790	0.361	1.665	1.076	0.715	4.960
57.4	133.3	0.196	3.25	6.633	1.446	1.439	6.118	0.583	2.388	1.805	0.366	1.669	1.085	0.719	4.932
59.2	135.5	0.202	3.35	6.639	1.469	1.461	6.113	0.578	2.411	1.833	0.371	1.680	1.102	0.731	4.934
61.0	135.7	0.208	3.44	6.646	1.470	1.462	6.109	0.574	2.412	1.837	0.376	1.681	1.107	0.731	4.889
62.7	136.6	0.213	3.54	6.653	1.479	1.470	6.103	0.568	2.420	1.851	0.382	1.685	1.117	0.735	4.853
64.5	136.2	0.220	3.65	6.660	1.472	1.463	6.099	0.564	2.413	1.849	0.386	1.682	1.118	0.732	4.790
66.3	137.5	0.226	3.74	6.667	1.485	1.475	6.090	0.556	2.425	1.869	0.394	1.687	1.132	0.738	4.746
68.0	138.3	0.232	3.85	6.674	1.492	1.482	6.087	0.552	2.431	1.879	0.397	1.690	1.138	0.741	4.734
69.8	138.8	0.238	3.95	6.681	1.496	1.486	6.082	0.547	2.436	1.888	0.402	1.693	1.145	0.743	4.693
71.6	139.5	0.244	4.05	6.688	1.501	1.492	6.079	0.544	2.441	1.897	0.406	1.696	1.152	0.746	4.676
73.3	139.8	0.250	4.15	6.695	1.503	1.493	6.074	0.539	2.442	1.903	0.410	1.696	1.157	0.746	4.639
75.1	140.7	0.256	4.25	6.702	1.512	1.501	6.069	0.534	2.451	1.918	0.416	1.701	1.167	0.751	4.608
76.9	142.1	0.262	4.34	6.708	1.526	1.515	6.064	0.529	2.464	1.936	0.420	1.707	1.178	0.758	4.604
78.6	142.4	0.268	4.45	6.716	1.526	1.515	6.060	0.525	2.464	1.939	0.424	1.707	1.181	0.758	4.576
80.4	143.0	0.274	4.55	6.723	1.531	1.520	6.056	0.521	2.469	1.948	0.428	1.709	1.188	0.760	4.554
82.2	143.6	0.280	4.65	6.730	1.536	1.525	6.051	0.517	2.475	1.958	0.433	1.712	1.196	0.763	4.522
83.9	145.2	0.286	4.74	6.737	1.551	1.540	6.048	0.513	2.490	1.977	0.437	1.720	1.207	0.770	4.522
88.4	146.6	0.301	5.00	6.755	1.562	1.550	6.036	0.502	2.499	1.998	0.448	1.724	1.223	0.775	4.464
92.8	148.8	0.316	5.25	6.772	1.582	1.570	6.028	0.493	2.519	2.026	0.456	1.734	1.241	0.785	4.438
97.2	149.9	0.332	5.50	6.791	1.590	1.576	6.017	0.483	2.526	2.044	0.467	1.738	1.255	0.788	4.374
101.6	150.7	0.347	5.75	6.809	1.594	1.580	6.010	0.475	2.530	2.055	0.475	1.740	1.265	0.790	4.326
106.0	151.4	0.362	6.00	6.827	1.597	1.582	5.995	0.461	2.529	2.068	0.486	1.738	1.277	0.791	4.256
110.4	151.9	0.377	6.25	6.845	1.598	1.582	5.989	0.454	2.529	2.075	0.492	1.738	1.284	0.791	4.213
114.8	152.6	0.392	6.50	6.863	1.601	1.585	5.980	0.445	2.531	2.086	0.501	1.739	1.293	0.793	4.164
119.3	153.4	0.407	6.75	6.882	1.605	1.588	5.973	0.438	2.535	2.096	0.508	1.741	1.302	0.794	4.127
123.7	154.9	0.422	7.01	6.901	1.616	1.599	5.967	0.432	2.546	2.114	0.515	1.746	1.315	0.799	4.104
128.1	155.5	0.438	7.26	6.920	1.618	1.600	5.965	0.430	2.550	2.121	0.520	1.750	1.320	0.800	4.077
132.5	156.8	0.452	7.51	6.938	1.627	1.609	5.956	0.421	2.558	2.136	0.528	1.753	1.332	0.804	4.049
136.9	157.5	0.467	7.75	6.956	1.630	1.611	5.951	0.416	2.561	2.146	0.534	1.756	1.340	0.806	4.016
141.3	158.4	0.482	8.00	6.975	1.635	1.616	5.942	0.407	2.563	2.156	0.540	1.755	1.348	0.808	3.991
145.7	162.2	0.498	8.26	6.995	1.669	1.649	5.935	0.400	2.597	2.196	0.547	1.772	1.372	0.825	4.016
150.2	163.3	0.513	8.52	7.015	1.676	1.655	5.930	0.396	2.603	2.207	0.552	1.775	1.380	0.828	3.999
154.6	163.6	0.528	8.76	7.033	1.675	1.654	5.924	0.389	2.601	2.212	0.559	1.775	1.385	0.827	3.960
159.0	164.2	0.543	9.01	7.053	1.677	1.655	5.919	0.384	2.602	2.218	0.563	1.775	1.391	0.827	3.938
163.4	166.8	0.558	9.25	7.071	1.698	1.676	5.917	0.382	2.625	2.243	0.567	1.787	1.405	0.838	3.954
167.8	166.8	0.573	9.51	7.091	1.694	1.671	5.912	0.377	2.620	2.243	0.572	1.785	1.407	0.835	3.922
172.2	167.7	0.589	9.77	7.112	1.698	1.674	5.907	0.372	2.623	2.251	0.577	1.786	1.414	0.837	3.903
176.6	169.8	0.603	10.01	7.131	1.714	1.690	5.903	0.368	2.638	2.270	0.580	1.793	1.425	0.845	3.915
181.1	170.8	0.619	10.27	7.151	1.719	1.694	5.898	0.363	2.643	2.280	0.585	1.796	1.433	0.847	3.894
185.5	170.1	0.634	10.52	7.172	1.708	1.682	5.895	0.360	2.631	2.272	0.590	1.790	1.431	0.841	3.853
189.9	172.6	0.650	10.78	7.192	1.728	1.702	5.890	0.356	2.650	2.294	0.593	1.799	1.444	0.851	3.870
194.3	172.8	0.665	11.02	7.212	1.725	1.698	5.885	0.350	2.647	2.296	0.598	1.797	1.447	0.849	3.841
198.7	174.7	0.680	11.28	7.233	1.739	1.711	5.882	0.347	2.660	2.313	0.601	1.804	1.457	0.856	3.847
203.1	175.0	0.695	11.53	7.253	1.737	1.709	5.876	0.341	2.657	2.316	0.607	1.802	1.461	0.854	3.817
207.5	176.2	0.709	11.77	7.273	1.744	1.715	5.874	0.339	2.664	2.325	0.610	1.806	1.467	0.858	3.814
211.9	177.3	0.725	12.02	7.294	1.750	1.721	5.870	0.335	2.669	2.334	0.613	1.808	1.473	0.860	3.807
216.4	179.1	0.740	12.27	7.315	1.763	1.733	5.866	0.331	2.681	2.350	0.616	1.814	1.483	0.867	3.812
220.8	180.2	0.755	12.52	7.336	1.769	1.739	5.863	0.328	2.687	2.358	0.620	1.818	1.489	0.869	3.806
225.2	182.0	0.770	12.77	7.357	1.782	1.751	5.859	0.324	2.698	2.373	0.623	1.823	1.498	0.875	3.811
229.6	182.9	0.785	13.03	7.379	1.785	1.753	5.856	0.321	2.701	2.379	0.626	1.824	1.503	0.877	3.801
234.0	183.0	0.801	13.29	7.400	1.780	1.748	5.852	0.317	2.695	2.378	0.630	1.821	1.504	0.874	3.777
238.4	186.0	0.815	13.52	7.421	1.805	1.772	5.851	0.316	2.720	2.404	0.632	1.834	1.518	0.886	3.806
242.8	187.5	0.831	13.78	7.443	1.814	1.780	5.846	0.311	2.728	2.417	0.637	1.838	1.527	0.890	3.797
247.3	185.1	0.846	14.03	7.465	1.785	1.751	5.844	0.309	2.700	2.391	0.639	1.824	1.515	0.876	3.739

Stantec

Consolidated Undrained Triaxial Compression
ASTM D 4767

Project Name LFUCG Sewer
Source C-21, 5.0'-5.5'
Description Fat Clay (CH), brown, moist, firm, Mn concretions
Specimen Type Intact
Preparation Wet Mounting

Project No. 175668041
Lab ID 23
Test ID 2-C

Date Received 12/12/2018
Date Tested 01/18/2019

Specific Gravity 2.89
ASTM D 854, Dry

Liquid Limit
Plastic Limit
Plasticity Index

Target Test Parameters
Nominal Chamber Pressure (psi) 90
Nominal Back Pressure (psi) 60
Nominal Consolidation Pressure (psi) 30

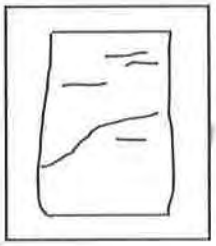
Saturation / Consolidation Results
Pore Pressure Parameter B 0.98
Measured Effective Consol. Stress (tsf) 2.151
Time to 50% Consolidation (min)
Actual Axial Strain Rate of Test (%/min) 0.064

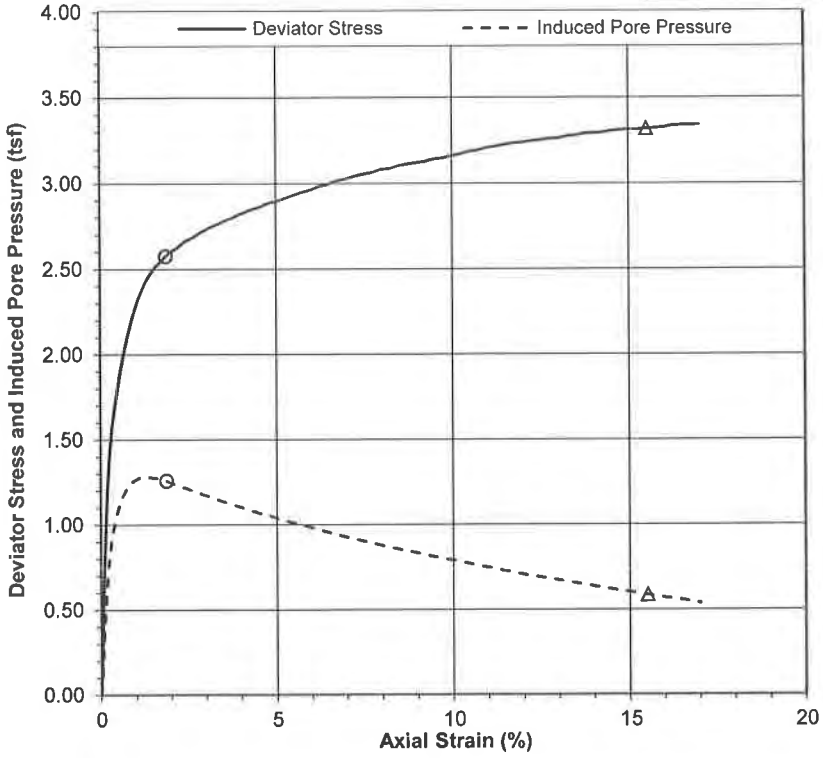
Consolidated Specimen Conditions
Moist Unit Weight (pcf) 126.8
Moisture Content (%) 28.6
Dry Unit Weight (pcf) 98.6
Void Ratio 0.826
Degree of Saturation (%) 100.0

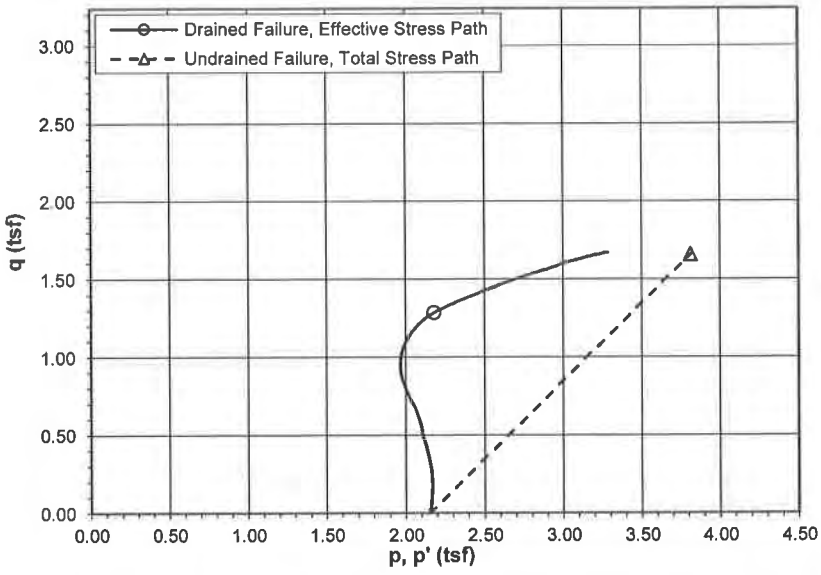
At Drained Failure
Failure Criteria: Max. Eff. Prin. Stress Ratio
Axial Strain (%) 1.874
Deviator Stress (tsf) 2.575
Induced Pore Pressure (tsf) 1.259
Minor Effective Stress, σ_3' (tsf) 0.892
Major Effective Stress, σ_1' (tsf) 3.468
Eff. Principal Stress Ratio, σ_1'/σ_3' 3.887
p' (tsf) 2.180
q (tsf) 1.288

At Consolidated Undrained Failure
Failure Criterion: 15% Axial Strain
Axial Strain (%) 15.497
Deviator Stress (tsf) 3.319
Minor Principal Stress, σ_3 (tsf) 2.151
Major Principal Stress, σ_1 (tsf) 5.471
p (tsf) 3.811
q (tsf) 1.660

Failure Sketch







Comments

Reviewed KG

Template: tmp_cu_Input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: KG
Report Date: 01/23/2019

Project: 175668041			Source: C-21, 5.0'-5.5'								Lab ID: 23		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
15.4	206.2	0.058	0.96	6.602	2.249	2.247	5.592	1.261	4.398	3.136	0.889	3.274	2.013	1.123	3.527
15.8	207.8	0.059	0.98	6.604	2.266	2.263	5.594	1.263	4.413	3.150	0.887	3.282	2.019	1.132	3.552
17.3	214.0	0.066	1.09	6.611	2.330	2.328	5.607	1.276	4.478	3.202	0.875	3.315	2.039	1.164	3.662
18.9	218.5	0.072	1.18	6.617	2.378	2.375	5.611	1.280	4.526	3.246	0.871	3.338	2.058	1.188	3.728
20.5	223.0	0.078	1.28	6.624	2.424	2.421	5.614	1.284	4.572	3.289	0.868	3.362	2.078	1.211	3.791
22.0	226.5	0.083	1.37	6.630	2.459	2.456	5.613	1.282	4.607	3.325	0.869	3.379	2.097	1.228	3.826
23.6	229.4	0.089	1.47	6.637	2.488	2.485	5.610	1.279	4.635	3.356	0.872	3.393	2.114	1.242	3.851
25.2	232.4	0.096	1.58	6.644	2.519	2.515	5.608	1.277	4.666	3.388	0.873	3.408	2.131	1.257	3.880
26.7	234.3	0.102	1.67	6.651	2.537	2.533	5.602	1.271	4.683	3.412	0.879	3.417	2.146	1.266	3.881
28.3	236.6	0.108	1.78	6.657	2.559	2.555	5.596	1.265	4.706	3.441	0.886	3.429	2.164	1.277	3.883
29.9	238.8	0.114	1.87	6.664	2.580	2.575	5.590	1.259	4.727	3.468	0.892	3.439	2.180	1.288	3.887
31.4	240.8	0.120	1.97	6.671	2.599	2.594	5.582	1.251	4.745	3.494	0.900	3.448	2.197	1.297	3.882
33.0	242.4	0.126	2.07	6.678	2.614	2.609	5.575	1.244	4.760	3.516	0.907	3.455	2.212	1.304	3.875
34.6	243.9	0.133	2.18	6.685	2.627	2.622	5.567	1.236	4.774	3.538	0.916	3.463	2.227	1.311	3.861
36.1	245.6	0.139	2.28	6.692	2.642	2.637	5.559	1.228	4.788	3.560	0.923	3.470	2.242	1.318	3.856
37.7	247.2	0.144	2.38	6.698	2.657	2.652	5.551	1.220	4.803	3.583	0.931	3.477	2.257	1.326	3.847
39.3	248.9	0.150	2.47	6.705	2.673	2.667	5.544	1.213	4.818	3.605	0.938	3.484	2.271	1.333	3.844
40.8	250.2	0.157	2.58	6.712	2.684	2.678	5.535	1.204	4.828	3.625	0.947	3.490	2.286	1.339	3.828
42.4	251.3	0.163	2.68	6.719	2.693	2.687	5.527	1.196	4.838	3.642	0.955	3.495	2.298	1.343	3.813
44.0	253.1	0.169	2.78	6.726	2.710	2.703	5.521	1.191	4.854	3.663	0.960	3.502	2.312	1.351	3.815
45.6	254.4	0.175	2.87	6.733	2.721	2.714	5.514	1.183	4.864	3.681	0.968	3.508	2.325	1.357	3.804
47.1	255.9	0.181	2.98	6.740	2.733	2.726	5.507	1.176	4.878	3.702	0.976	3.515	2.339	1.363	3.794
48.7	257.1	0.187	3.08	6.747	2.744	2.737	5.500	1.169	4.888	3.719	0.983	3.520	2.351	1.368	3.785
50.3	258.2	0.193	3.17	6.754	2.753	2.745	5.491	1.160	4.897	3.736	0.992	3.524	2.364	1.372	3.768
51.8	259.5	0.199	3.28	6.761	2.764	2.756	5.485	1.154	4.907	3.753	0.997	3.529	2.375	1.378	3.764
53.4	260.6	0.205	3.38	6.768	2.773	2.765	5.476	1.145	4.916	3.771	1.006	3.533	2.388	1.382	3.749
55.0	261.8	0.211	3.47	6.774	2.782	2.774	5.469	1.138	4.925	3.787	1.013	3.538	2.400	1.387	3.739
56.5	263.0	0.217	3.57	6.781	2.792	2.784	5.463	1.133	4.935	3.802	1.019	3.543	2.410	1.392	3.733
58.1	264.1	0.223	3.68	6.789	2.801	2.792	5.456	1.126	4.944	3.819	1.027	3.548	2.423	1.396	3.719
59.7	265.1	0.230	3.79	6.796	2.809	2.800	5.449	1.118	4.950	3.832	1.033	3.551	2.433	1.400	3.711
61.2	266.5	0.235	3.87	6.803	2.820	2.811	5.442	1.111	4.963	3.851	1.040	3.557	2.446	1.406	3.702
62.8	267.7	0.242	3.98	6.810	2.831	2.821	5.436	1.105	4.973	3.868	1.047	3.562	2.457	1.411	3.695
64.4	268.6	0.248	4.08	6.817	2.837	2.827	5.429	1.098	4.978	3.880	1.053	3.565	2.466	1.413	3.684
65.9	270.1	0.254	4.18	6.824	2.849	2.839	5.424	1.093	4.991	3.898	1.059	3.572	2.479	1.420	3.681
67.5	270.9	0.260	4.28	6.832	2.855	2.845	5.415	1.084	4.997	3.913	1.068	3.575	2.491	1.422	3.663
69.1	271.8	0.266	4.38	6.839	2.862	2.851	5.408	1.078	5.002	3.924	1.073	3.576	2.499	1.426	3.657
70.6	272.8	0.272	4.48	6.846	2.869	2.859	5.402	1.071	5.010	3.939	1.081	3.581	2.510	1.429	3.645
72.2	273.8	0.278	4.58	6.853	2.877	2.866	5.397	1.066	5.018	3.952	1.086	3.585	2.519	1.433	3.639
73.8	275.3	0.284	4.68	6.861	2.889	2.878	5.391	1.060	5.029	3.969	1.091	3.590	2.530	1.439	3.638
75.4	276.1	0.291	4.79	6.868	2.894	2.883	5.385	1.054	5.035	3.981	1.098	3.593	2.539	1.441	3.626
76.9	277.4	0.297	4.88	6.875	2.905	2.893	5.377	1.046	5.044	3.998	1.105	3.598	2.551	1.447	3.618
78.5	277.7	0.303	4.98	6.882	2.905	2.893	5.371	1.040	5.045	4.005	1.112	3.599	2.559	1.446	3.601
82.4	280.3	0.318	5.23	6.900	2.925	2.913	5.355	1.024	5.064	4.040	1.127	3.607	2.583	1.456	3.584
86.3	282.9	0.333	5.49	6.919	2.944	2.931	5.343	1.012	5.082	4.070	1.139	3.616	2.605	1.465	3.572
90.2	285.4	0.348	5.73	6.937	2.962	2.949	5.327	0.996	5.100	4.104	1.155	3.626	2.629	1.474	3.553
94.2	287.6	0.364	5.99	6.956	2.977	2.963	5.313	0.982	5.114	4.131	1.169	3.632	2.650	1.481	3.535
98.1	290.6	0.379	6.24	6.974	3.000	2.985	5.300	0.969	5.136	4.167	1.183	3.644	2.675	1.492	3.523
102.0	292.2	0.394	6.49	6.993	3.009	2.993	5.286	0.955	5.145	4.190	1.197	3.648	2.694	1.497	3.501
105.9	295.2	0.409	6.73	7.011	3.032	3.016	5.273	0.942	5.168	4.226	1.210	3.660	2.718	1.508	3.492
109.8	297.0	0.424	6.98	7.030	3.042	3.025	5.259	0.928	5.177	4.249	1.223	3.664	2.736	1.513	3.473
113.8	299.6	0.440	7.24	7.050	3.060	3.042	5.247	0.916	5.195	4.279	1.236	3.673	2.757	1.521	3.461
117.7	301.7	0.455	7.49	7.068	3.073	3.055	5.234	0.903	5.207	4.304	1.249	3.679	2.777	1.527	3.446
121.6	303.4	0.470	7.74	7.088	3.082	3.064	5.221	0.890	5.215	4.325	1.261	3.683	2.793	1.532	3.429
125.5	306.0	0.485	7.98	7.106	3.101	3.082	5.210	0.879	5.233	4.354	1.272	3.692	2.813	1.541	3.422
129.4	307.6	0.500	8.24	7.126	3.108	3.088	5.198	0.867	5.239	4.372	1.284	3.695	2.828	1.544	3.405
133.3	310.1	0.515	8.48	7.145	3.125	3.105	5.187	0.856	5.256	4.400	1.295	3.703	2.847	1.552	3.398
137.3	311.9	0.531	8.74	7.165	3.135	3.114	5.176	0.845	5.266	4.421	1.307	3.709	2.864	1.557	3.382
141.2	313.6	0.546	8.99	7.185	3.142	3.121	5.166	0.835	5.273	4.439	1.318	3.713	2.878	1.560	3.368
145.1	315.1	0.561	9.24	7.205	3.149	3.127	5.153	0.822	5.279	4.457	1.330	3.716	2.894	1.564	3.351
149.0	317.6	0.576	9.49	7.225	3.165	3.143	5.143	0.812	5.295	4.482	1.340	3.723	2.911	1.571	3.346
152.9	319.1	0.591	9.73	7.244	3.172	3.148	5.133	0.802	5.301	4.499	1.350	3.727	2.925	1.574	3.331
156.9	321.3	0.607	9.99	7.265	3.184	3.160	5.123	0.792	5.313	4.521	1.361	3.733	2.941	1.580	3.322
160.8	323.2	0.622	10.24	7.285	3.194	3.170	5.111	0.780	5.322	4.542	1.373	3.738	2.957	1.585	3.309
164.7	325.6	0.637	10.49	7.305	3.209	3.184	5.101	0.770	5.337	4.567	1.383	3.745	2.975	1.592	3.303
168.6	327.4	0.652	10.74	7.326	3.218	3.193	5.089	0.758	5.344	4.586	1.393	3.748	2.990	1.596	3.291
172.5	329.9	0.667	10.99	7.346	3.233	3.206	5.081	0.750	5.359	4.609	1.402	3.755	3.006	1.603	3.287
176.4	331.7	0.682	11.24	7.367	3.242	3.215	5.070	0.739	5.367	4.628	1.413	3.759	3.021	1.607	3.275
180.4	333.8	0.698	11.49	7.388	3.253	3.225	5.060	0.729	5.378	4.649	1.424	3.766	3.037	1.613	3.264
184.3	335.7	0.713	11.74	7.409	3.262	3.234	5.050	0.719	5.387	4.668	1.434	3.770	3.051	1.617	3.256

UNCONFINED COMPRESSIVE STRENGTH TESTING - BEDROCK

Stantec

Uniaxial Compressive Strength of Intact Rock Core Specimens

ASTM D 7012, Method C

Project Name: LFUCG Sewer
Project Number: 175668041
Lithology: Limestone, light gray, hard
Lab ID: UCR-7
Hole Number: B-15
Depth (ft): 13.9'-14.3'
Date Received: 11/06/2018

Temperature (°C): 22
Moisture Condition: As Prepared, Moist
Date Tested: 11/13/2018

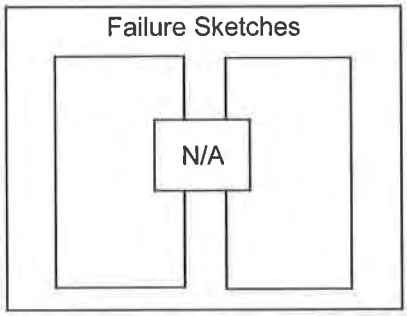
Side Planeness	Pass	Height (in)	4.379	Wet Unit Weight (pcf)	166.7
Perpendicularity	Pass	Diameter (in)	1.981	Dry Unit Weight (pcf)	N/A
End Planeness	Pass	Area (in^2)	3.083	Moisture Content (%)	N/A
Parallelism	Pass				

Loading Rate (lbf/sec): 203
Peak Load (lbf): 40571

Failure Type: Undetermined

Compressive Strength (psi): 13160
Compressive Strength (psf): 1895040
Compressive Strength (tsf): 948

Failure Sketches



Comments: Testing load indicated compressive failure of specimen, no external visual sign of failure was observed.

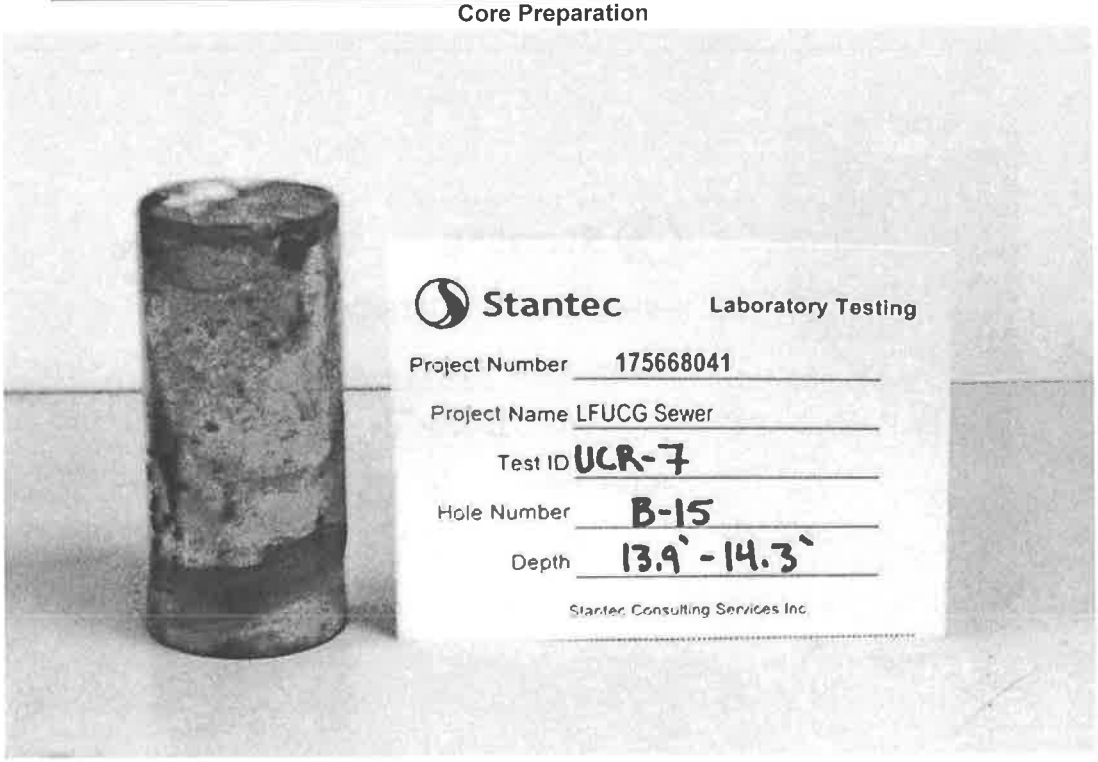
Reviewed By: JW

Stantec

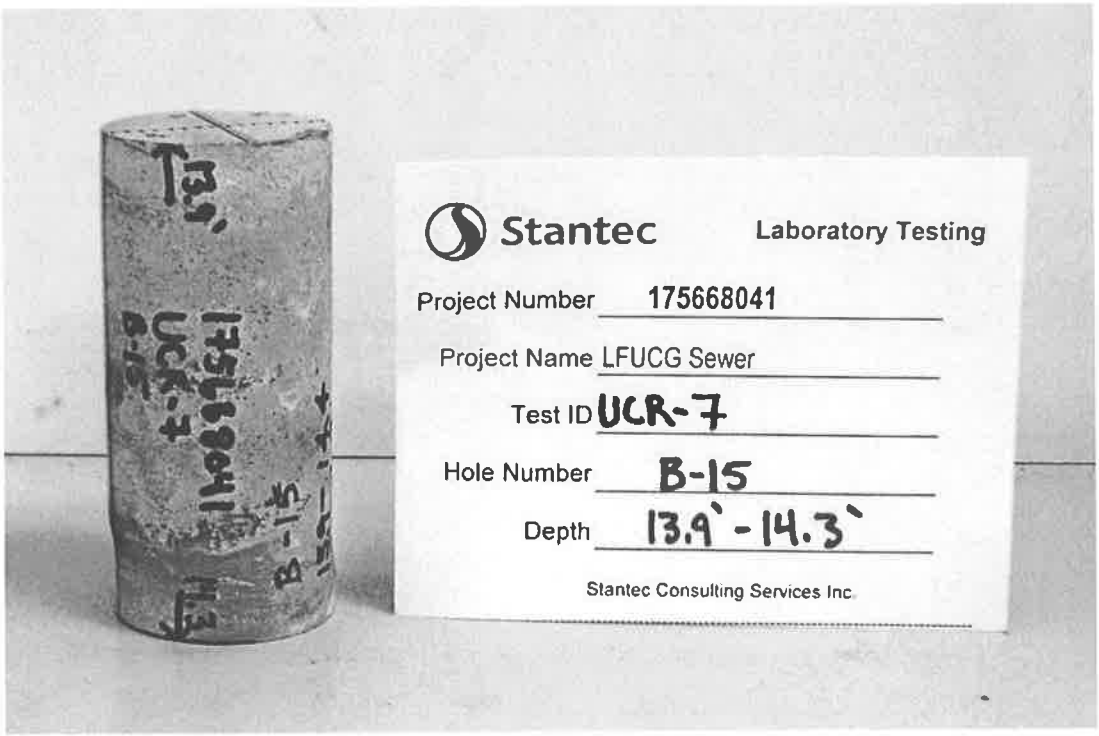
Photo Report

Project Name LFUCG Sewer
Project Number 175668041
Lithology Limestone, light gray, hard
Lab ID UCR-7
Hole Number B-15 Depth (ft) 13.9'-14.3'
Test Type Uniaxial Compressive Strength of Intact Rock Core

Core Preparation



Post Test



Stantec

Uniaxial Compressive Strength of Intact Rock Core Specimens

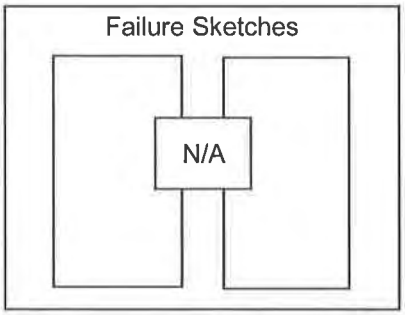
ASTM D 7012, Method C

Project Name	LFUCG Sewer	Project Number	175668041
Lithology	Limestone, light gray, hard	Lab ID	UCR-8
Hole Number	B-15	Depth (ft) 23.7'-24.1'	Date Received 11/06/2018
Temperature (°C)	22	Moisture Condition	As Prepared, Moist
			Date Tested 11/13/2018

Side Planeness	Pass	Height (in)	4.613	Wet Unit Weight (pcf)	166.0
Perpendicularity	Pass	Diameter (in)	1.982	Dry Unit Weight (pcf)	N/A
End Planeness	Pass	Area (in^2)	3.086	Moisture Content (%)	N/A
Parallelism	Pass				

Loading Rate (lbf/sec)	182
Peak Load (lbf)	22397
Failure Type	Undetermined
Compressive Strength (psi)	7260
Compressive Strength (psf)	1045440
Compressive Strength (tsf)	523

Failure Sketches



Comments: Testing load indicated compressive failure of specimen, no external visual sign of failure was observed.

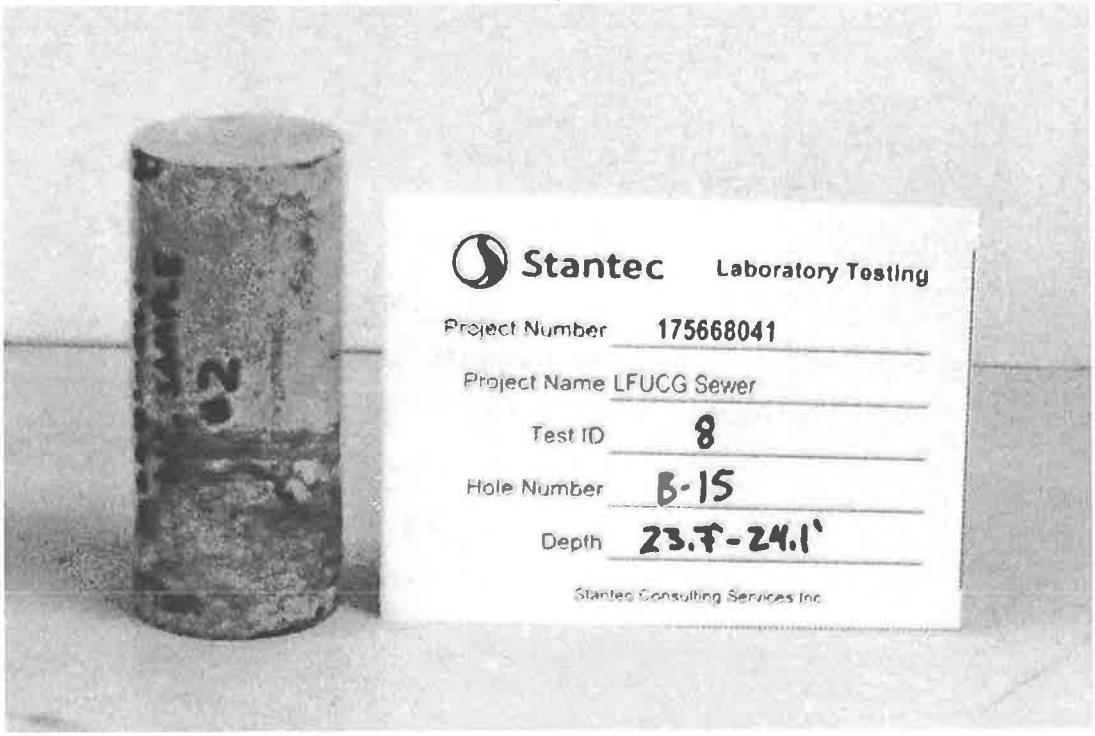
Reviewed By: JW

Stantec

Photo Report

Project Name LFUCG Sewer
Project Number 175668041
Lithology Limestone, light gray, hard
Lab ID UCR-8
Hole Number B-15 Depth (ft) 23.7'-24.1'
Test Type Uniaxial Compressive Strength of Intact Rock Core

Core Preparation



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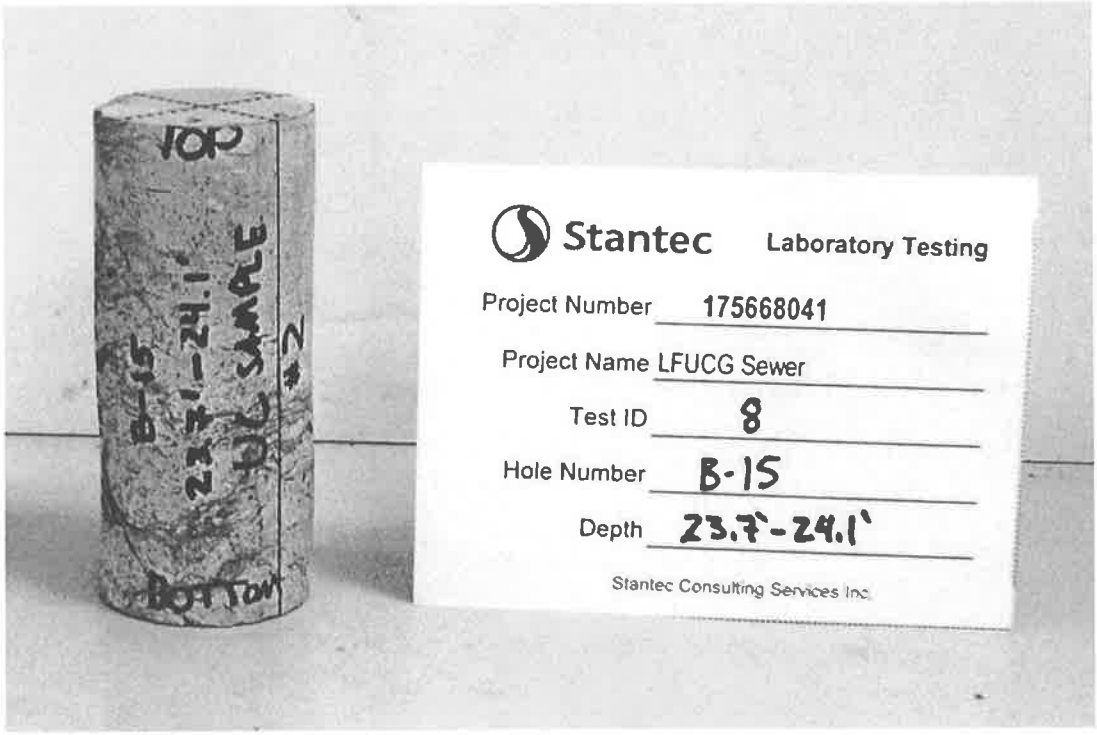


Stantec

Uniaxial Compressive Strength of Intact Rock Core Specimens

ASTM D 7012, Method C

Project Name: LFUCG Sewer
Project Number: 175668041
Lithology: Limestone, light gray, hard
Lab ID: UCR-9
Hole Number: B-16
Depth (ft): 27.7'-28.1'
Date Received: 11/06/2018

Temperature (°C): 22
Moisture Condition: As Prepared, Moist
Date Tested: 11/13/2018

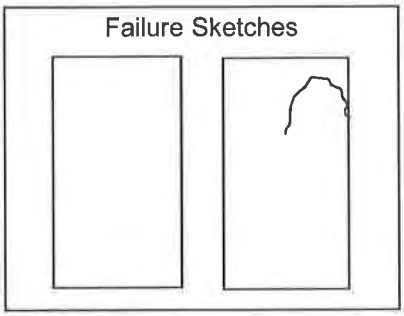
Side Planeness	Pass	Height (in)	4.258	Wet Unit Weight (pcf)	167.2
Perpendicularity	Pass	Diameter (in)	1.988	Dry Unit Weight (pcf)	N/A
End Planeness	Pass	Area (in^2)	3.102	Moisture Content (%)	N/A
Parallelism	Pass				

Loading Rate (lbf/sec): 196
Peak Load (lbf): 52479

Failure Type: Undetermined

Compressive Strength (psi): 16920
Compressive Strength (psf): 2436480
Compressive Strength (tsf): 1218

Failure Sketches



Comments

Reviewed By: JW

Stantec

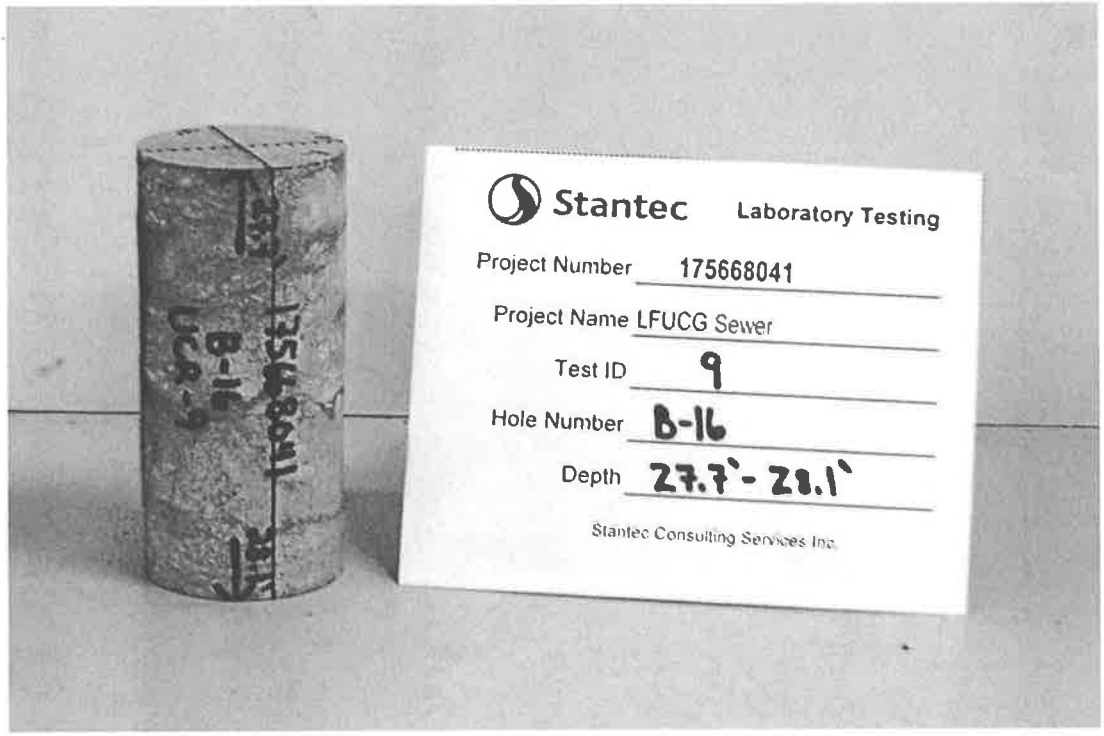
Photo Report

Project Name LFUCG Sewer
Lithology Limestone, light gray, hard
Hole Number B-16 Depth (ft) 27.7'-28.1'
Test Type Uniaxial Compressive Strength of Intact Rock Core

Project Number 175668041
Lab ID UCR-9

Core Preparation

Post Test



Stantec

Uniaxial Compressive Strength of Intact Rock Core Specimens

ASTM D 7012, Method C

Project Name: LFUCG Sewer
Project Number: 175668041
Lithology: Limestone, light gray, hard
Lab ID: UCR-10
Hole Number: B-16
Depth (ft): 40.6'-41.0'
Date Received: 11/06/2018

Temperature (°C): 22
Moisture Condition: As Prepared, Moist
Date Tested: 11/13/2018

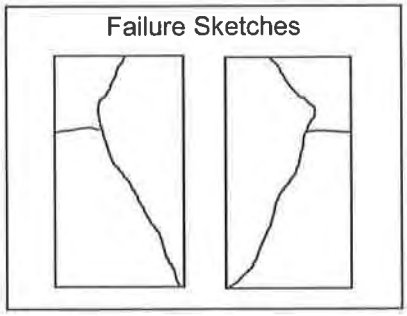
Side Planeness	Pass	Height (in)	4.550	Wet Unit Weight (pcf)	166.5
Perpendicularity	Pass	Diameter (in)	1.991	Dry Unit Weight (pcf)	N/A
End Planeness	Pass	Area (in^2)	3.112	Moisture Content (%)	N/A
Parallelism	Pass				

Loading Rate (lbf/sec): 187
Peak Load (lbf): 53956

Failure Type: Shear

Compressive Strength (psi): 17340
Compressive Strength (psf): 2496960
Compressive Strength (tsf): 1248

Failure Sketches



Comments

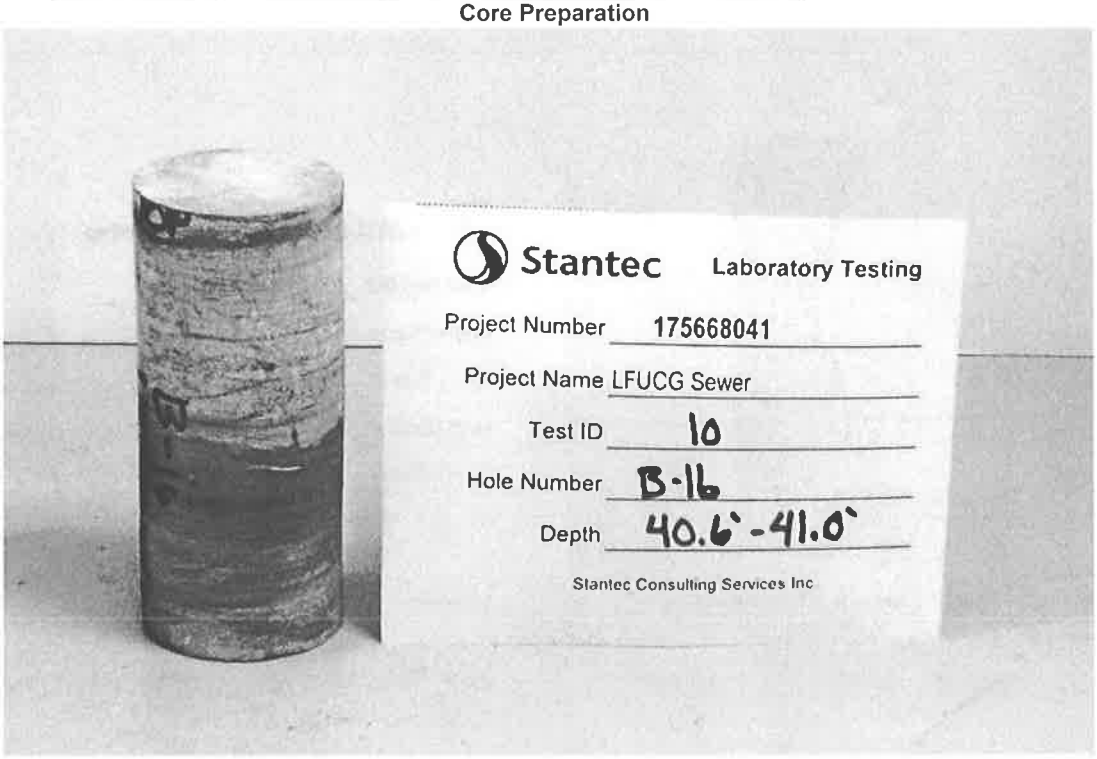
Reviewed By: JW

Stantec

Photo Report

Project Name LFUCG Sewer
Project Number 175668041
Lithology Limestone, light gray, hard
Lab ID UCR-10
Hole Number B-16 Depth (ft) 40.6'-41.0'
Test Type Uniaxial Compressive Strength of Intact Rock Core

Core Preparation



Post Test

HARDNESS AND ABRASIVENESS TESTING

GeoTesting EXPRESS

Client:	Stantec Inc.				
Project:	LFUCG Sewer				
Location:	Lexington, KY			Project No:	GTX-309130
Boring ID:	---	Sample Type:	---	Tested By:	smd
Sample ID:	---	Test Date:	11/12/18	Checked By:	jsc
Depth :	---	Test Id:	481064		

Mohs Hardness Test

Boring ID	Sample ID	Depth	Scale of Hardness Number
B-15	---	10.9-11.5 ft	2.5
B-15	---	24.4-25.0 ft	2.5
B-16	---	30.8-31.4 ft	2.5
B-16	---	43.2-43.8 ft	2.5

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:	Stantec Inc.				
Project:	LFUCG Sewer				
Location:	Lexington, KY			Project No:	GTX-309130
Boring ID:	B-15	Sample Type:	cylinder	Tested By:	smd
Sample ID:	---	Test Date:	11/13/18	Checked By:	jsc
Depth :	10.9-11.5 ft	Test Id:	481057		
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-15	---	10.9-11.5 ft	1	0.3	0.4	0.35	
			2	1.1	1.3	1.20	
			3	0.5	1.0	0.75	
			4	0.3	0.5	0.40	
			5	0.4	0.6	0.50	
			Average CAIs			0.64	
			Average CAI *			1.11	
			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

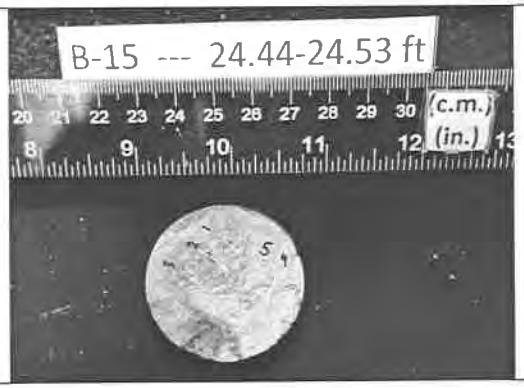
Client:	Stantec Inc.				
Project:	LFUCG Sewer				
Location:	Lexington, KY			Project No:	GTX-309130
Boring ID:	B-15	Sample Type:	cylinder	Tested By:	smd
Sample ID:	---	Test Date:	11/13/18	Checked By:	jsc
Depth :	24.4-25.0 ft	Test Id:	481058		
Test Comment:	---				
Visual Description:	---				
Sample Comment:	---				

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625

Boring ID	Sample ID	Depth	Stylus No	Reading 1	Reading 2	Average	Comments
B-15	---	24.44-24.53	1	0.2	0.3	0.25	
			2	0.3	0.3	0.30	
			3	0.2	0.4	0.30	
			4	0.4	0.7	0.55	
			5	0.4	0.5	0.45	
			Average CAIs			0.37	
			Average CAI *			0.85	
			CERCHAR Abrasiveness Index Classification			**Low 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:	Stantec Inc.				
Project:	LFUCG Sewer				
Location:	Lexington, KY			Project No:	GTX-309130
Boring ID:	B-16	Sample Type:	cylinder	Tested By:	smd
Sample ID:	---	Test Date:	11/13/18	Checked By:	jsc
Depth :	30.8-31.4 ft	Test Id:	481059		
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-16	---	30.8-31.4 ft	1	0.7	0.5	0.60	
			2	1.0	1.3	1.15	
			3	1.5	1.8	1.65	
			4	0.3	0.4	0.35	
			5	1.0	0.5	0.75	
			Average CAIs			0.9	
			Average CAI *			1.37	
			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:	Stantec Inc.				
Project:	LFUCG Sewer				
Location:	Lexington, KY			Project No:	GTX-309130
Boring ID:	B-16	Sample Type:	cylinder	Tested By:	smd
Sample ID:	---	Test Date:	11/13/18	Checked By:	jsc
Depth :	43.2-43.8 ft	Test Id:	481060		
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-16	---	43.25-43.33 ft	1	1.1	1.0	1.05	
			2	1.2	1.4	1.30	
			3	1.3	1.6	1.45	
			4	1.5	1.3	1.40	
			5	1.1	1.3	1.20	
			Average CAIs			1.28	
			Average CAI *			1.75	
			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:

SECTION 00410 – BID FORM

Sanitary Sewer Improvements-Manchester Street and Willard Street

Division of Water Quality
Lexington-Fayette Urban County Government

LFUCG Bid No. 79-2019

1.01 GENERAL

Place: Lexington, Kentucky Date: 9/13/19

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

This Bid Form Submitted by LAGCO, INC.
1490 SUNSHINE LANE LEXINGTON, KY 40505
(Name and Address of Bidder)

(Hereinafter called "Bidder"), organized and existing under the laws of the State of KENTUCKY 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 **Sanitary Sewer Improvements – Manchester Street and Willard Street**; 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 **180** 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 9/3/19; Addendum No. ____ Date _____

Addendum No. ____ Date _____; Addendum No. ____ Date _____

Addendum No. ____ Date _____; Addendum No. ____ Date _____

Addendum No. ____ Date _____; 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.

1.03 BIDDERS AFFIDAVIT

Comes the Affiant, RANDY GREENE (LAGCO, Inc.) and after being first duly sworn, states under penalty of perjury as follows:

A. His/her name is RANDY GREENE and he/she is the individual submitting the Bid or is the authorized representative of LAGCO, 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.

Randy Greene
Affiant Signature

STATE OF KENTUCKY
COUNTY OF FAYETTE

The foregoing instrument was subscribed, sworn to and acknowledged before me by Randy Greene on this the 13th day of September, 2019.

My Commission expires: 8/26/22

John Nicholas Smith
NOTARY PUBLIC, STATE AT LARGE

6	Bituminous Pavement Zone Fill - Flowable Fill	3,681	CY	$ 105.00	$ 386,505.00
7	Verification of lateral activity	40	EA	$ 256.00	$ 10,240.00
8	Bituminous Pavement Zone Fill - 6" Concrete installed	210	CY	$ 131.00	$ 27,510.00
9	Bituminous Pavement Zone Fill - 2" Bituminous Surface Mix installed	144	TON	$ 257.00	$ 37,008.00
10	Pavement Striping - Permanent Paint	4,000	LF	$ .50	$ 2,000.00
11	Sanitary Sewer Bypass Pumping (for 8-inch diameter mainline)	1	LS	$ 55,160.00	$ 55,160.00
12	Sanitary Sewer Bypass Pumping (for 24-inch diameter mainline)	1	LS	$ 92,879.00	$ 92,879.00
13	ESC Maintenance	1	LS	$ 3,498.00	$ 3,498.00
14	Traffic Maintenance and Control	1	LS	$ 22,759.00	$ 22,759.00
15	Mobilization/Demobilization	1	LS	$ 40,842.00	$ 40,842.00
16	Post Construction CCTV Inspection	2,000	LF	$ 4.50	$ 9,000.00
17					
18					
21					
22					
23					
24					
TOTAL LUMP SUM BID (Items 1 thru 16)				$ 1,683,780.00	

TOTAL LUMP SUM BID AMOUNT for the SANITARY SEWER IMPROVEMENTS – MANCHESTER STREET AND WILLARD STREET PROJECT in words and figures. In case of a discrepancy, the amount shown in words will govern.

ONE MILLION, SIX HUNDRED EIGHTY THREE THOUSAND,

Respectfully Submitted,

FIRM: LAGCO, INC.

ADDRESS: 1490 SUNSHINE LANE

CITY/STATE/ZIP: LEXINGTON, KY 40505

DATE: 9/13/19

BY: [signature] (must be original signature)

TITLE: PRESIDENT

PHONE: 859-293-7473 (area code, number & extension) FAX: 859-293-7471

EMAIL ADDRESS: randy@lagco.com

OFFICIAL ADDRESS AND PHONE:

LAGCO, INC.
1490 SUNSHINE LANE
LEXINGTON, KY 40505 (Seal if Bid is by Corporation)

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

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

NAME	POSITION DESCRIPTION	NO. OF YEARS WITH BIDDER
SEE ATTACHED		

J. MWDBE Participation on current bonded projects under contract:

SUBCONTRACTORS (LIST)	PROJECT (SPECIFIC TYPE)	MWDBE	% of WORK
N/A			

(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. ASPHALT PAVING	Name: RANDLE DAVIES CO PAVE Address: 1 MILL CREEK PARK FRANKFORT, KY 40601	NO	2%
2. _____	Name: _____ Address: _____	____	____
3. _____	Name: _____ Address: _____	____	____
4. _____	Name: _____ Address: _____	____	____
5. _____	Name: _____ Address: _____	____	____
6. _____	Name: _____ Address: _____	____	____

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

1.08 STATEMENT OF EXPERIENCE

NAME OF INDIVIDUAL: SEE ATTACHED

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

_____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

_____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

_____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

_____

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:	N/A
Kentucky Contractor's License Number:	

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	
Name of designated Project Manager	
Name of designated Field Superintendent	
Number of Regular Employees of the Organization	

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

- Resume of designated Project Manager.
- Resume of designated Field Superintendent.
- Company's existing work commitments.

table (Y / N)			

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.

1.10 LFUCG MWDBE PARTICIPATION FORM

LFUCG Bid/RFP/Quote Reference No. 79-2019

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 Central Purchasing for approval immediately.

MWDBE Company, Name, Address, Phone, Email	Work to be Performed	Total Dollar Value of the Work	% Value of Total Contract
N/A			

The undersigned company representative submits the above list of MWDBE 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.

N/A
Company

Company Representative

Date

Title

1.12 MWDBE QUOTE SUMMARY FORM

LFUCG Bid/RFP/Quote Reference No. 79-2019

The undersigned acknowledges that the minority and/or veteran subcontractors listed on this form did submit a quote to participate on this project.

Company Name N/A	Contact Person
Address/Phone/Email	Bid Package / Bid Date

MWDBE Company Address	Contact Person	Contact Information (work phone, Email, cell)	Date Contacted	Services to be performed	Method of Communication (email, phone meeting, ad, event, etc)	Total dollars ($) Do Not Leave Blank (Attach Documentation)	DBE * AA HA AS NA Female	Veteran
N/A								

*(DBE designation / AA=African American / HA= Hispanic American/AS = Asian American/Pacific Islander/ NA= Native American)

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

N/A
Company

Company Representative

Date

Title

1.14 LFUCG STATEMENT OF GOOD FAITH EFFORTS

LFUCG Bid/RFP/Quote No. 79-2019

By the signature below of an authorized company representative, we certify that we have utilized the following Good Faith Efforts to obtain the maximum participation by MWDBEs and/or Veterans on the project and can supply the appropriate documentation.

_____ 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 MWDBE firms to participate.

_____ Included documentation of advertising in the above publications with the bidders good faith efforts package

_____ Attended LFUCG Central Purchasing Economic Inclusion Outreach event

✓ Attended pre-bid meetings that were scheduled by LFUCG to inform MWDBEs of subcontracting opportunities

_____ Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and MWDBE firms

_____ Requested a list of MWDBE subcontractors or suppliers from LFUCG Economic Engine and showed evidence of contacting the companies on the list(s).

_____ Contacted organizations that work with MWDBE companies for assistance in finding certified MWBDE firms to work on this project. Those contacted and their responses should be a part of the bidder's good faith efforts documentation.

_____ Sent written notices, by certified mail, email or facsimile, to qualified, certified MWDBEs 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.

_____ Followed up initial solicitations by contacting MWDBEs to determine their level of interest.

_____ Provided the interested MWBDE firm with adequate and timely information about the plans, specifications, and requirements of the contract.

_____ Selected portions of the work to be performed by MWDBE firms in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate MWDBE participation, even when the prime contractor may otherwise perform these work items with its own workforce

_____ Negotiated in good faith with interested MWDBE firms not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.

_____ Included documentation of quotations received from interested MWDBE firms which 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.

_____ 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

1.15 EQUAL EMPLOYMENT OPPORTUNITY AFFIRMATIVE ACTION POLICY

It is the policy of LAGCO, 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.

13. EVIDENCE OF INSURABILITY

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT CONSTRUCTION PROJECT
(Use separate form for each Agency or Brokerage agreeing to provide coverage)

Names Insured: LAGCO, Inc.

Employee ID: _____

Address: 1490 Sunshine Lane Lexington, KY 40505

Phone 859-293-7473

Project to be insured: Manchester + Willard Sanitary Sewer

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 Part V (Special Conditions), including all requirements, and conditions:

Section Items	Coverage	Minimum Limits and Policy Requirements	Limits Provided To Insured	Name of Insurer	A.M. Best's Code	Rating
SC-3, Section 2, Part 4.1 – see provisions	CGL	$1,000,000 per occ. And $2,000,000 aggregate	$ 1,000,000 2,000,000	Westfield Ins. Co.	A	XIV
SC-3, Section 2, Part 4.1 – see provisions	AUTO	$2,000,000/per occ.	$ 1,000,000	Westfield Ins. Co.	A	XIV
SC-3, Section 2, Part 4.1 – see provisions	WC	Statutory w /endorsement as noted	$ 4,000,000	Ky Assoc. Gen contractors	A-	

Section 2 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.

Arthur J. Gallagher + Co.
Agency or Brokerage

Sandra Burnash
Name of Authorized Representative

9300 Shelbyville Rd
Street Address

Asst. Manager
Title

Louisville KY 40222
City State Zip

Sandra Burnash
Authorized Signature

502-716-7851
Telephone Number

9/13/19
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 coverage's listed above is not provided with the bid.

1.19 DEBARMENT CERTIFICATION

All Contractors/Subcontractors shall complete this certification.

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: LA Lobo, Inc.

Project: Manchester & Willard Sanitary Sewer

Printed Name: Randy Greene

Title of Authorized Representative: President

Signature: J.R. Greene

Date: 9/13/15

AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:
(Name, legal status and address)
Lagco, Inc.
P.O. Box 12510
Lexington, KY 40583

SURETY:
(Name, legal status and principal place of business)
Great American Insurance Company
301 E. 4th Street
Cincinnati, OH 45202

OWNER:
(Name, legal status and address) Lexington Fayette Urban County Government
Lexington, KY

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

BOND AMOUNT: Five Percent of the Amount Bid
($ 5% of Bid)

PROJECT:
(Name, location or address, and Project number, if any)
Sanitary Sewer Improvements Manchester Street and Willard Street

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner 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. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this 13th day of September 2013

(Witness)

Lagco, Inc.
(Principal) (Seal)
DIVISION MANAGER
(Title)

Maggie M. Lowery
(Witness)

Great American Insurance Company
(Surety) (Seal)
James H. Martin
(Title) James H. Martin
Attorney-In-Fact

Init.

MAYOR LINDA GORTON

LEXINGTON

TODD SLATIN
DIRECTOR
CENTRAL PURCHASING

ADDENDUM #1

Bid Number: #79-2019

Date: September 3, 2019

Subject: Sanitary Sewer Improvements Manchester & Willard Streets

Address inquiries to:
Brian Marcum
859.258.3320

TO ALL PROSPECTIVE SUBMITTERS:

Please be advised of the following clarifications to the above referenced Bid:

Questions and answers from the Manchester Street Sanitary Sewer Replacement on Tuesday September 3, 2019.

1. Are plumbing permits required for the lateral replacements? No, all work is to be in the Right of Way. The cleanout to be installed is in the sidewalk at the transition from public to private property.
2. Mechanical Rock Removal and Flowable Fill will be paid in actual quantities.
3. All coordination with utility companies is the responsibility of the contractor, including guy wire relocation and power line insulation.
4. The selected contractor will need to contact and arrange access to the affected businesses along Manchester Street.
5. The selected contractor will need to have at least one representative at a public meeting at a later date.

Please see the attached owner submitted traffic plan that has not been approved yet by the state. The Contractor will need to comply with the approved traffic plan.

See the attached prebid sign in sheet.

LAGCO
EXCAVATION
P.O. Box 12510 * Lexington, Kentucky 40583
PHONE: (859) 293-7473 * FAX: (859) 293-7471

FROM : Jarrod Conn
PROJECT : Manchester Sanitary Sewer
DATE : 9/13/2019

JOBS & REFRENCES (Both Current and Complete)
Schedule A and B

Start Date: 2016
Name: LFUCG Meadows Northland Arlington Phase E & F
Location: Lexington, KY
Prime: Lagco Inc.
Description: Site grading site sanitary and storm
Reference / Contact Name: LFUCG Jim Gillis / Andrew Grunwald
Reference Address / Phone: Lexington, KY
(859)-509-6784
Project Owner: LFUCG
Date Complete: *not yet*
Design Engineer: Integrated Engineering
Contract Price: $2,400,000.00

Start Date: July, 2017
Name: Alpha Chi Omega
Location: Lexington, KY
Prime: Alliance Corp
Description: Site grading and storm
Reference / Contact Name: Brandon Ackers / Alliance
Reference Address / Phone: 2014 KY RT 321
Prestonsburg, KY 41653
(606)-886-8748

Description: Excavation for mechanical work at new UK Student Center
Reference / Contact Name: Tom Finney with Finney Company
Reference Address / Phone: 1132 Finney Dr,
Lexington, KY 40511
(859) 253-0659
Project Owner: University of Kentucky
Design Engineer: CMTA
Date Complete: *complete*
Contract Price: $1,611,118.00

Start Date: June 2015
Name: Student Center Electrical Excavation
Location: Lexington, KY
Prime: Davis H. Elliot
Description: Excavation for electrical work at new UK Student Center
Reference / Contact Name: Jeff Zellen with Davis H. Elliot
Reference Address / Phone: 673 Blue Sky Parkway
Lexington, Kentucky 40509
(859) 263-5148 ext. 1115 Office
Project Owner: University of Kentucky
Design Engineer: CMTA
Date Complete: *complete*
Contract Price: $787,348.00

Start Date: April 2015
Name: Frankfort Telecom Headend Facility
Location: Frankfort Kentucky
Prime: Woodbine Construction
Description: Site grading and storm for new building and lot at Frankfort Telecom Headend Facility
Reference / Contact Name: Rusty Stafford with Woodbine Construction
Reference Address / Phone: 425 East Woodbine Street
Louisville, Kentucky 40208
502-435-1195

Prime: Lagco
Description: Storm work for the city of Lexington
Reference / Contact Name: Jim Gillis with LFUCG
Reference Address / Phone: 101 East Vine Street, 4th floor
Lexington, KY 40507
(859)258-3410
Project Owner: LFUCG
Design Engineer: Fred Eastridge
Date Complete: August 2015
Contract Price: $820,911.00

Start Date: February 2014
Name: EKU Steam Line Phase III
Location: Richmond, KY
Prime: Lagco
Description: Installing new steam line and vaults
Reference / Contact Name: John Mason
Reference Address / Phone: Staggs & Fisher, Inc.
3264 Lochness Drive
Lexington, KY 40517
(859) 271-3246
Project Owner: Eastern Kentucky University
Design Engineer: Staggs & Fisher
Date Complete: November 2015
Contract Price: $1,060,994.00

Start Date: November 2013
Name: Anniston Wickland Storm Sewer
Location: Lexington, KY
Prime: Lagco
Description: Installation of city storm sewer
Reference / Contact Name: Billy Warren with LFUCG
Reference Address / Phone: 101 East Vine Street, 4th floor
Lexington, KY 40507
(859)258-3410
Project Owner: LFUCG
Design Engineer: Fred Eastridge

Name: EKU Steam Line Replacement Phase 2
Location: Richmond Ky
Prime: Yes
Description: Installing new steam line
Reference / Contact Name: John Mason
Reference Address / Phone: Staggs & Fisher, Inc.
3264 Lochness Drive
Lexington, Ky 40517
(859) 271-3246
Project Owner: EKU
Design Engineer: Staggs & Fisher
Date Complete: August, 2013
Contract Price: $ 338,500.00

Start Date: May 2013
Name: Glendover Elementary School
Location: Lexington, KY
Prime: No
Description: Site grading & storm drainage
Reference / Contact Name: Ashley Davis
Reference Address / Phone: Woodford Builders
440 Fairman Road
Lexington, KY 40511
Project Owner: Fayette County School Board
Design Engineer: Carman Engineering
Date Complete: August 2015
Contract Price: $ 499,845.00

Start Date: June 2012
Name: Sunset Avenue Storm Line
Location: Richmond
Prime: Yes
Description: Installing storm piping in street
Reference / Contact Name: CDP Engineers - Sandy Camargo
Reference Address / Phone: 3250 Blazer Parkway
Lexington, KY 40509
(859) 264-7500
Project Owner: City Of Richmond

Description: Grading, Storm drainage & sanitary
Reference / Contact Name: Turner Construction, Jason Kruse
Reference Address / Phone: 633 West Main Street Suite 450
Louisville, KY 40202
(502) 377-0688
Project Owner: University Of KY
Design Engineer: Vision Engineer
Date Complete: June 2012
Contract Price: $313,485.00

Start Date: December May 2010
Name: UK Steam Line
Location: Lexington
Prime: No
Description: Excavate & install new steam line
Reference / Contact Name: Dan Branscum w/ Staggs & Fisher
Reference Address / Phone: Staggs & Fisher, Inc.
3264 Lochness Drive
Lexington, KY 40517
(859) 271-3246
Project Owner: University of KY
Design Engineer: Staggs & Fisher
Date Complete: Complete
Contract Price: $948,950.00

Start Date: February 2009
Name: Bluegrass Station Infrastructure
Location: Lexington Ky
Prime: Yes
Description: installing site storm, sanitary, water, asphalt & fire protection
Reference / Contact Name: Bluegrass Station - Paul Cable
Reference Address / Phone: 5751 Briar Hill Road
Lexington, KY 40516
(859) 293-3203
Project Owner: Bluegrass Station
Design Engineer: CDP Engineers
Date Complete: June 2012

Reference / Contact Name: LFUCG – Rick Day
Reference Address / Phone: 301 Lisle Industrial Ave. Lexington, KY 40511
(859) 425-2407
Project Owner: Lexington Fayette Urban County Government
Design Engineer: Lexington Fayette Urban County Government
Date Complete: 2011
Contract Price: $ 653,827.00

Start Date: 2009
Name: Lower Howards Creek
Location: Winchester, KY
Prime: Yes
Description: Installing Gravity Sanitary Sewer
Reference / Contact Name: Winchester Municipal Utilities, Duke Dryden
Reference Address / Phone: WMU
150 N Main St,
Winchester, KY 40391
(859) 744-5434
Project Owner: WMU
Design Engineer: Palmer Engineering
Date Complete: 2010
Contract Price: $ 737,522.00

Start Date: 2009
Name: UK CAER Phase 1
Location: Lexington
Prime: No
Description: Grading & installing storm, sanitary, Concrete, etc..
Reference / Contact Name: Turner Construction, Jason Kruse
Reference Address / Phone: 633 West Main Street Suite 450
Louisville, KY 40202
(502) 377-0688

Project Owner: University Of KY
Design Engineer: Vision Engineering
Date Complete: June 2010
Contract Price: $834,489.00

Montessori Elementary	$ 174,890.00
2008	
UK Farm Road Steam Line	$ 1,042,315.00
Nicholas County High	$ 236,444.00
Southwest High	$ 130,856.00
Scott County Career Tech	$ 123,181.00
Anderson County Annex	$ 252,000.00
2009	
UK Patient Care	$ 167,115.00
Rowan County Courthouse	$ 508,332.00
BB&T Bank	$ 133,857.00
Waynesburg Elementary	$ 286,975.00
Eastern State Hospital	$ 87,000.00
2010 & 2011	
UK fine Arts Building	$ 59,000.00
Congleton Lumber Building	$ 52,497.00
Tire Discounters	$ 70,725.00
2012 & 2013	
Kentucky military museum	$ 25,000.00
Lexmark building 005	$ 181,900.00
Logans Roadhouse	$ 65,567.00
Meadothorpe Elementary School	$ 239,443.00
North Maysville water line	$ 94,403.00
Panda express	$ 82,784.00
Taco Bell	$ 16,182.00

SECTION 00510 – NOTICE OF AWARD

CONTRACTOR:_____

_____

_____

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

PROJECT: **Sanitary Sewer Improvements – Manchester Street and Willard Street**
Lexington-Fayette Urban County Government

LFUCG Bid No. 79-2019

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 _____, 20___

It appears that it is to the best interest of said Owner to accept your Bid in the amount of _____ dollars ($_____), and you are hereby notified that your Bid has been accepted for

Sanitary Sewer Improvements – Manchester Street and Willard Street

LFUCG Bid No. **79-2019**

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 _____day of _____, 20____.

Lexington-Fayette Urban County Government

By:_____

Title:_____

NOTICE OF ACCEPTANCE

Receipt of the above Notice of Award is hereby acknowledged this _____ day of _____, 20___.

By:_____

Title:_____

END OF SECTION

SECTION 00520 – AGREEMENT (CONTRACT)

THIS AGREEMENT, made on the 10th day of October, 2019, by and between Lexington Fayette Urban County Government, acting herein called "OWNER" and **Lagco, Inc.** doing business as a corporation located in the City of Lexington, County of Fayette, State of Kentucky, hereinafter called "CONTRACTOR".

WITNESSETH: That the CONTRACTOR and the OWNER in consideration of one million six hundred eighty - three thousand seven hundred eighty Dollars and No Cents ($1,683,780.00) quoted in the BID by the CONTRACTOR, dated September 13, 2019, hereby agree to commence and complete the construction described as follows:

1.01 SCOPE OF WORK

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
Sanitary Sewer Improvements – Manchester Street and Willard Street
LFUCG Bid No.**79-2019**.

1.02 TIME OF COMPLETION

The time period estimated and authorized by the OWNER for Substantial Completion of Work by the AGREEMENT, in full, is hereby fixed as 180 **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

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

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

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

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.

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.

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

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

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 ($1,000.00) 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

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

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

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 Sommers
Deputy Clerk of Urban County Council

By: Linda Gorton
(Signature of Mayor)

Linda Gorton, Mayor
(Name/Title)

(Seal)

LACCO, Inc.
(Contractor)

Joseph D. Greene Jr.
(Secretary)*

By: Randy Greene
(Contractor's Signature)

(Witness)

RANDY GREENE - PRESIDENT
(Name/Title)

1490 SUNSHINE LANE
(Address)

LEXINGTON, KY 40505

*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

AIA® Document A312™ – 2010

Performance Bond

3131484

CONTRACTOR:
(Name, legal status and address)
Lagco, Inc.
P.O. Box 12510
Lexington, KY 40583

SURETY:
(Name, legal status and principal place of business)
Great American Insurance Company
301 E. 4th Street
Cincinnati, OH 45202

OWNER:
(Name, legal status and address)
Lexington Fayette Urban County Government
Water Quality
125 Lisle Industrial Ave., Suite 18
Lexington, KY 40511

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

CONSTRUCTION CONTRACT
Date: October 10, 2019

Amount: One Million Six Hundred Eighty-Three Thousand Seven Hundred Eighty and 00/100
($ 1,683,780.00)

Description: Sanitary Sewer Improvements - Manchester Street and
(Name and location) Willard Street - LFUCG Bid No. 79-2019

BOND
Date: October 17, 2019
(Not earlier than Construction Contract Date)

Amount: One Million Six Hundred Eighty-Three Thousand Seven Hundred Eighty and 00/100
($ 1,683,780.00)

Modifications to this Bond: ☒ None ☐ See Section 16

CONTRACTOR AS PRINCIPAL
Company: *(Corporate Seal)*
Lagco, Inc.

Signature:
Name and Title: BRUCE G. KUNTZ DIVISION MANAGER

SURETY
Company: *(Corporate Seal)*
Great American Insurance Company

Signature: James H. Martin
Name and Title: James H. Martin, Attorney-In-Fact

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)
AGENT or BROKER:
Smith Manus
2300 Regency Road
Lexington, KY 40503
859-254-1800

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. 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 be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

AIA® Document A312™ – 2010

Payment Bond

3131484

CONTRACTOR:
(Name, legal status and address)

Lagco, Inc.
P.O. Box 12510
Lexington, KY 40583

SURETY:
(Name, legal status and principal place of business)

Great American Insurance Company
301 E. 4th Street
Cincinnati, OH 45202

OWNER:
(Name, legal status and address)

Lexington Fayette Urban County Government
Water Quality
125 Lisle Industrial Ave., Suite 18
Lexington, KY 40511

CONSTRUCTION CONTRACT
Date: October 10, 2019

Amount: One Million Six Hundred Eighty-Three Thousand Seven Hundred Eighty and 00/100
($ 1,683,780.00)

Description: Sanitary Sewer Improvements - Manchester Street and
(Name and location) Willard Street - LFUCG Bid No. 79-2019

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

BOND
Date: October 17, 2019
(Not earlier than Construction Contract Date)

Amount: One Million Six Hundred Eighty-Three Thousand Seven Hundred Eighty and 00/100
($ 1,683,780.00)

Modifications to this Bond: ☒ None ☐ See Section 18

CONTRACTOR AS PRINCIPAL
Company: *(Corporate Seal)*
Lagco, Inc.

Signature:
Name and Title: ROLLEC. HUNTER DIVISION MANAGER

SURETY
Company: *(Corporate Seal)*
Great American Insurance Company

Signature: James N. Martin
Name and Title: James H. Martin Attorney-in-Fact

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)
AGENT or BROKER:

Smith Manus
2300 Regency Road
Lexington, KY 40503
859-254-1800

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

.2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. 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 be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

.1 the name of the Claimant;
.2 the name of the person for whom the labor was done, or materials or equipment furnished;
.3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
.4 a brief description of the labor, materials or equipment furnished;
.5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
.6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
.7 the total amount of previous payments received by the Claimant; and
.8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 9/23/2019

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
Arthur J. Gallagher Risk Management Services, Inc.
9300 Shelbyville Road, Suite 704
Louisville KY 40222

CONTACT NAME: Sandra Whaley
PHONE (A/C, No, Ext): 502-716-7851 FAX (A/C, No): 502-716-7909
E-MAIL ADDRESS: sandra_whaley@ajg.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Westfield Insurance Company	24112
INSURER B : Kentucky AGC Self Insurors Fund	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED LAGCINC-01
Lagco, Inc.
P O Box 12510
Lexington KY 40583

COVERAGES **CERTIFICATE NUMBER:** 1906387262 **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	Y		CMM0812485	10/31/2018	10/31/2019	EACH OCCURRENCE	$ 1,000,000
	CLAIMS-MADE [X] OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 500,000
							MED EXP (Any one person)	$ 10,000
							PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 2,000,000
	POLICY [X] PRO-JECT [ ] LOC						PRODUCTS - COMP/OP AGG	$ 2,000,000
	OTHER:							$
A	AUTOMOBILE LIABILITY			CMM0812485	10/31/2018	10/31/2019	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	X HIRED AUTOS ONLY / X NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
A	X UMBRELLA LIAB X OCCUR			CMM0812485	10/31/2018	10/31/2019	EACH OCCURRENCE	$ 10,000,000
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$ 10,000,000
	DED X RETENTION $ 0							$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N	N/A		207	1/1/2019	1/1/2020	X PER STATUTE / OTH-ER	
	ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? [ ] (Mandatory in NH)						E.L. EACH ACCIDENT	$ 4,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 4,000,000
							E.L. DISEASE - POLICY LIMIT	$ 4,000,000
A	Installation Floater Leased/ Rented Equip			CMM0812485	10/31/2018	10/31/2019	Limit Limit	$1,000,000 $200,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Per Endorsement CG2037 (07/04), CG 2010 (07/04), CA7078 (09/11), CA9944 (10/13) Certificate holder is additional insured in respect to the General Liability, Additional Insured/ Loss Payee in respect to the Comm Auto policy when required by written contract with the named insured The insurance provided is primary and any other insurance is shall be excess only and not contributing. Waiver of Subrogation applies to all companies as respects to all policies, pursuant to and subject to the policy's terms, definitions, conditions and exclusions.

The Producer will endeavor to mail 30 days written notice to the Certificate Holder named on the certificate if any policy listed on the certificate is cancelled prior
See Attached...

CERTIFICATE HOLDER

LFUCG
200 E Main
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
Christie Reeves

AGENCY CUSTOMER ID: LAGCINC-01

LOC #:

ADDITIONAL REMARKS SCHEDULE

AGENCY	NAMED INSURED
Arthur J. Gallagher Risk Management Services, Inc.	Lagco, Inc. P O Box 12510 Lexington KY 40583
POLICY NUMBER	
CARRIER / NAIC CODE	EFFECTIVE DATE:

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: 25 FORM TITLE: CERTIFICATE OF LIABILITY INSURANCE

to the expiration date. Failure to do so shall impose no obligation or liability of any kind upon the Producer or otherwise alter the policy terms.
LFUCG is named additional insured with respect to the general liability as required by written contract.

GREAT AMERICAN INSURANCE COMPANY®

Administrative Office: 301 E 4TH STREET • CINCINNATI, OHIO 45202 • 513-369-5000 • FAX 513-723-2740

The number of persons authorized by
this power of attorney is not more than SEVEN

No. 0 18170

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That the GREAT AMERICAN INSURANCE COMPANY, a corporation organized and existing under and by virtue of the laws of the State of Ohio, does hereby nominate, constitute and appoint the person or persons named below, each individually if more than one is named, its true and lawful attorney-in-fact, for it and in its name, place and stead to execute on behalf of the said Company, as surety, any and all bonds, undertakings and contracts of suretyship, or other written obligations in the nature thereof; provided that the liability of the said Company on any such bond, undertaking or contract of suretyship executed under this authority shall not exceed the limit stated below.

Name		Address	Limit of Power
JAMES T. SMITH	BROOK T. SMITH	ALL OF	ALL
RAYMOND M. HUNDLEY	WILLIAM PRECIOUS	LOUISVILLE, KENTUCKY	$100,000,000
JAMES H. MARTIN	RYAN BRITT		
JASON D. CROMWELL			

This Power of Attorney revokes all previous powers issued on behalf of the attorney(s)-in-fact named above.

IN WITNESS WHEREOF the GREAT AMERICAN INSURANCE COMPANY has caused these presents to be signed and attested by its appropriate officers and its corporate seal hereunto affixed this 21ST day of JANUARY, 2018.

Attest

Assistant Secretary

GREAT AMERICAN INSURANCE COMPANY

Divisional Senior Vice President

MARK VICARIO (877-377-2405)

STATE OF OHIO, COUNTY OF HAMILTON - ss:

On this 21ST day of JANUARY, 2018, before me personally appeared MARK VICARIO, to me known, being duly sworn, deposes and says that he resides in Cincinnati, Ohio, that he is a Divisional Senior Vice President of the Bond Division of Great American Insurance Company, the Company described in and which executed the above instrument; that he knows the seal of the said Company; that the seal affixed to the said instrument is such corporate seal; that it was so affixed by authority of his office under the By-Laws of said Company, and that he signed his name thereto by like authority.

Susan A. Kohorst
Notary Public, State of Ohio
My Commission Expires 05-16-2020

This Power of Attorney is granted by authority of the following resolutions adopted by the Board of Directors of Great American Insurance Company by unanimous written consent dated June 9, 2008.

RESOLVED: That the Divisional President, the several Divisional Senior Vice Presidents, Divisional Vice Presidents and Divisonal Assistant Vice Presidents, or any one of them, be and hereby is authorized, from time to time, to appoint one or more Attorneys-in-Fact to execute on behalf of the Company, as surety, any and all bonds, undertakings and contracts of suretyship, or other written obligations in the nature thereof; to prescribe their respective duties and the respective limits of their authority; and to revoke any such appointment at any time.

RESOLVED FURTHER: That the Company seal and the signature of any of the aforesaid officers and any Secretary or Assistant Secretary of the Company may be affixed by facsimile to any power of attorney or certificate of either given for the execution of any bond, undertaking, contract of suretyship, or other written obligation in the nature thereof, such signature and seal when so used being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

CERTIFICATION

I, STEPHEN C. BERAHA, Assistant Secretary of Great American Insurance Company, do hereby certify that the foregoing Power of Attorney and the Resolutions of the Board of Directors of June 9, 2008 have not been revoked and are now in full force and effect.

Signed and sealed this 17th day of October, 2019.

Assistant Secretary

POWER OF ATTORNEY

(to be inserted)

C. FINANCIAL RESPONSIBILITY

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.

If requested, Contractor shall provide Owner copies of all insurance policies, including all endorsements.

6. Right to Review, Audit and Inspect

   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.

7. 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).

(This page is intentionally left blank).

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

Issued and Published Jointly by

ACEC
American Council of Engineering Companies

ASCE American Society of Civil Engineers

National Society of Professional Engineers
Professional Engineers in Private Practice

AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A Practice Division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Endorsed by

CONSTRUCTION SPECIFICATIONS INSTITUTE

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

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.

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.

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

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

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.

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.

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

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.

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:

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,

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

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;

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

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.

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.

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

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

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:

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.

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.

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.

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.

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.

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.

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.

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

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.

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.

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

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.

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.

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

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.

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 of time 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.

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 in regards to 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.

sample, samples or piece of equipment may be rejected on the basis of 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 property 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

14.05.A Prior to Substantial Completion of the Project, OWNER may request Contractor in writing to permit him to use a specified part of the Project which he believes he may use without significant interference with construction of the other parts of the Project. If Contractor agrees, he will certify to OWNER and Engineer that said part of the Project is substantially complete and request the Engineer to issue a certificate of Substantial Completion for that part of the Project. Within a reasonable time thereafter, OWNER, Contractor and Engineer shall make an inspection of that part of the Project to determine its status of completion. If Engineer and OWNER do not consider that it is substantially complete, Engineer will notify Contractor in writing giving his reasons therefor. If Engineer and OWNER consider that part of the Project to be substantially complete, Engineer will execute and deliver to OWNER and Contractor a certificate to that effect, fixing the date of Substantial Completion as to that part of the Project, attaching thereto a tentative list of items to be completed or corrected before Substantial Completion of the entire Project and fixing the responsibility between OWNER and Contractor for maintenance, heat, and utilities as to that part of the Project. OWNER shall have the right to exclude Contractor from any part of the Project which Engineer has so certified to be substantially complete, but OWNER shall allow Contractor reasonable access to complete items on the tentative list.

14.05.B Equipment Warranty will not begin until after successful start-up, training, and acceptance by Owner for Partial Utilization. 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

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 of 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

(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 00820 – WAGE DETERMINATION SCHEDULE

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. This Contract shall be based upon payment by the Contractor and his Subcontractors of wage rates not less than the prevailing hourly wage rate for each craft or type of workman engaged on the Work as determined by the US Department of Labor and the Davis-Bacon and Related Acts (DBRA).

B. The Contractor and each Subcontractor shall keep accurate records indicating the hours worked each day by each employee in each classification of work and the amount paid each employee for his work in each classification. Such records shall be submitted weekly to the contracting agency.

D. The Contractor and each Subcontractor shall post and keep posted in a conspicuous place or places at the construction site a copy or copies of federal prevailing rates of wages and working hours as prescribed in these Contract Documents.

E. If, during the life of this Contract, the prevailing hourly rate of wages is changed by the US Department of Labor, such change shall not be the basis of any claim by the Contractor against the Owner, nor will deductions be made by the Owner against sums due the Contractor by reason of any such change.

F. The federal prevailing wage law does not prohibit payment of more than the prevailing rate of wages.

G. Pursuant to Kentucky Revised Statute 337.510, no laborer, workman, mechanic, helper, assistant, or apprentice shall be permitted to work more than 8 hours in one calendar day, nor more than 40 hours in one week, except in cases of emergency caused by fire, flood, or damage to life or property. Whenever work in excess of 8 hours per day or 40 hours per week is required, payment of overtime shall be at not less than one and one-half times the prevailing rate of wages.

1.02 PREVAILING WAGE REQUIREMENTS

A. Wage rates applicable to this project are included in the following pages, or will be issued by an addendum prior to the bid opening.

KYTC Encroachment Permit

KENTUCKY TRANSPORTATION CABINET
Department of Highways
PERMITS BRANCH

TC 99-1A
Rev. 09/2018

APPLICATION FOR ENCROACHMENT PERMIT

KYTC KEPT #: _____

SECTION 1: APPLICANT CONTACT INFORMATION

NAME LFUCG Division of Water Quality	**ADDRESS** 125 Lisle Industrial Avenue	**CITY** Lexington	
EMAIL bprater@lexingtonky.gov		**STATE** KY	**ZIP** 40511
CONTACT NAME 1 Craig Prater	**EMAIL** bprater@lexingtonky.gov	**PHONE #** (859) 425-2446 **CELL #** (859) 425-2446	
CONTACT NAME 2 (*if applicable*)	**EMAIL**	**PHONE #** **CELL #**	

SECTION 2: PROPOSED WORK LOCATION

ADDRESS 942 Manchester Street	**CITY** Lexington		**STATE** Kentucky	**ZIP** 40508
COUNTY Fayette	**ROUTE #** 1681	**MILE POINT** N/A	**LONGITUDE** (*X*) 84°30'38.3" W	**LATITUDE** (*Y*) 38°03'11.7" N

FOR KYTC USE ONLY

Permit Type: ☐ Air Right ☐ Entrance ☐ Utilities ☐ Vegetation Removal ☐ Other: _____

Location: ☐ Left ☐ Right ☐ Crossing

Access: ☐ Full ☐ Partial ☐ by Permit

SECTION 3: GENERAL DESCRIPTION OF WORK

Excavation and replacement of the sanitary sewer pipeline running directly under Manchester Street and Willard Street an approximate total length of 1,888 linear feet. Limits are from approximately 881 Manchester Street to 1135 Manchester Street, and from Manchester Street to 237 Willard Street. Work also includes replacing the existing manholes. After replacement of all pipes and manholes and trenches are backfilled, entire width of roads are to be resurfaced.

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.

_____ _____

SIGNATURE **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

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.

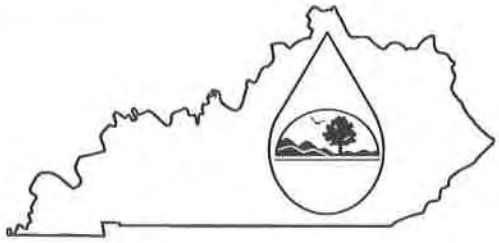
14. Upon a violation of any provision of the permit, or otherwise in its reasonable discretion, the Department may require additional action by the permittee, its successors and assigns, up to and including the removal of the encroachment and restoration of the right-of-way. In the event additional actions 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.

KDOW Sanitary Sewer Line Extension Permit

FORM S-1



Commonwealth of Kentucky
Energy and Environment Cabinet
Division of Water

CONSTRUCTION PERMIT APPLICATION for CLEAN WATER COLLECTION SYSTEM

See the INSTRUCTIONS for more information about selected portions of this application.
Questions on completing this application? Contact the Water Infrastructure Branch at 502/564-3410 or visit our website at http://water.ky.gov for more information.

I. CONSTRUCTION PROJECT INFORMATION

Project Name: LFUCG Sanitary Sewer Improvements - Manchester Street and Willard Street

Name of WWTP which will treat sewage from this project: Town Branch WWTP

KPDES Number of the WWTP: KY 0021491 WWTP County: Fayette County

Name of Receiving Collection System (if different than WWTP): _____

KPDES Number of the Receiving Collection System (if applicable): KY _____ Project County: _____

Project Latitude/Longitude (DMS): 84°30'38.3", 38°03'11.7" Estimated Construction Cost: $ 2,077,080

Identify the funding sources for the project:

☐ CWSRF ☐ SPAP ☒ Other: LFUCG

If the project is SRF, is the SRF Plans and Specs Checklist included? _____

II. APPLICANT MAILING ADDRESS

Applicant (Entity paying for construction): Lexington Fayette Urban County Government Division of Water Quality

Street Address: 125 Lisle Industrial Ave

City, State, Zip: Lexington, KY 40511

Phone: (859) 425-2446 Fax: N/A E-mail: bprater@lexingtonky.gov

Will ownership be transferred? ☐ Yes, future owner will be: _____ ☒ No

III. DESIGN CONSIDERATIONS

A. PLANS AND SPECIFICATIONS COMPLIANCE REQUIREMENTS:

Design plans and specifications shall comply with **401 KAR 5:005** and **"Recommended Standards for Wastewater Facilities" ("Ten States' Standards")**, 2014 edition. If engineering practices, other than those contained in "Ten States' Standards", were used in the design, indicate the source and the corresponding portion of the design. **[See 401 KAR 5:005, Section 7]**

Plans and specification submittals shall meet one of the following options:

the operation and maintenance of the sewer line when it is constructed. **[Section 8]**

ü 8. Letters from both the owner of the sewer system and the WWTP stating that they approve the connection and accept responsibility for the additional flow. **[Section 8]**

ü 9. A written statement that the portion of the sewer system used by the connection has adequate capacity to transport the current and anticipated peak flow to the WWTP and that the portion of the sewer system used by the connection is not subject to excessive infiltration or excessive inflow. **[Section 8]**

N/A 10. A written statement that the WWTP has adequate capacity to treat the current and anticipated flow and is not subject to excessive infiltration or excessive inflow. **[Section 8]**

IV. Fees

Fees. Check or money order must be made payable to "**Kentucky State Treasurer**" for the total amount. **Fees do not apply** for a municipality, sanitation district, or other publicly owned facility. **[Section 5]** If claiming Non-Profit status, provide proof.

Sewer Collection Project Category: N/A - Municipality **Total Amount:** $ 0

VI. CERTIFICATION

I, the applicant, certify under penalty of law that this document and all attachments were prepared under my direction or supervision. 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 or imprisonment or both for known violations. **[Section 2]**

Applicant's Name and Official Title (Type or Print)	**Phone Number (Include area code)**
Craig Prater / Capacity Assurance Program Manager	(859) 425-2446
Signature	**Date**

SECTION 00910 - ADDENDA

(Insert Addenda as they are issued.)

END OF SECTION

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 **Sanitary Sewer Improvements - Manchester Street and Willard Street**

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.

B. 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. A. Work to be done is shown on the set of Drawings entitled: **Sanitary Sewer Improvements - Manchester Street and Willard Street**. 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,

Contractor. The Owner shall deduct the cost of additional engineering from monies due the Contractor.

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.

C. Unless otherwise specifically permitted, all work that would be subject to damage shall be stopped during inclement, stormy or freezing weather. Only such work as will not suffer injury to workmanship or materials will be permitted. Contractor shall carefully protect his work against damage or injury from the weather, and when work is permitted during freezing weather, he shall provide and maintain approved facilities for heating the materials and for protecting the finished work.

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.

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. Refer to **Section 02225** of these specifications for blasting requirements.

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.

1.18 CONSTRUCTION VIDEO

A. The Contractor shall video the entire project site including all concrete and asphalt pavements, curb and gutter, fencing to remain, structures to be demolished, and existing structures that are to remain or be modified. The original video image shall be turned over to the Engineer prior to beginning construction activities. The video shall be provided as an Audio Video Interleave File (.avi) and shall be provided on DVD+R/DVD-ROM compatible media only. The video shall clearly identify existing site and structural conditions prior to construction.

PART 2 – PRODUCT (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01025 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 WORK INCLUDED

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.

G. Payment for pipeline items shall be limited to seventy percent (70%) of the bid price prior to testing and acceptance by the Engineer, then shall be limited to eighty-five percent (85%) after passing testing included in the line item, and one hundred percent (100%) after rough clean up and grading (final restoration paid separately).

H. Payment for structures (manholes, junction boxes, curb box inlets, etc) shall be limited to eighty-five percent (85%) when set and backfilled, with the remaining fifteen percent (15%) being paid after passing testing (if applicable).

I. Refer to **Section 00800**, Articles 14.02.A.6-8 for retainage requirements.

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

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

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

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

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

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

Payment is for furnishing and installing Ductile Iron Tee Fittings for Gravity Sewers at the contract unit price per pound, 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 (excluding rock excavation), shoring, sheeting, bedding, backfilling, cleanup, testing, and all other items necessary for a complete installation.

2.12 TEE FITTINGS FOR GRAVITY SEWER LATERAL CONNECTION (NON-DUCTILE IRON)

Payment is for furnishing and installing Tee Fittings for Gravity Sewers (non-ductile iron) 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 (excluding rock excavation), shoring, sheeting, bedding, backfilling, cleanup, testing, and all other items necessary for a complete installation.

2.13 BACK TRAP VALVES

Payment is for furnishing and installing Back Trap Valves at the contract unit price per each 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, labor, equipment, and all other items necessary for a complete installation. Back Trap Valves shall be 6-inch Rectorseal Extendable model # 96926.

2.14 STEEL ENCASEMENT PIPE, OPEN CUT

Payment is for furnishing and installing Encasement Pipe at the contract unit price per linear foot, 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 encasement pipe, carrier pipe, materials, hauling, excavation (excluding rock excavation), shoring, sheeting, bedding, backfilling, spacers, concrete brick and mortar end seals, cleanup, and all other items necessary for a complete installation.

2.15 STEEL ENCASEMENT PIPE, BORE AND JACK

Payment is for furnishing and installing Encasement Pipe at the contract unit price per linear foot, 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 encasement pipe, carrier pipe, spacers, materials, hauling, bore and jack installation, excavation (excluding rock excavation), shoring, sheeting, backfilling, concrete brick and mortar end seals, cleanup, and all other items necessary for a complete installation.

2.16 PIPE BURSTING

Payment is for furnishing and installing pipe using pipe bursting at the contract unit price per linear foot, 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 pipe, pipe fusing, materials, hauling, pipe bursting installation, excavation (excluding rock excavation), reconnection of laterals, sewer saddles at lateral connection, reconnection at manholes, shoring, sheeting, backfilling, cleanup, and all other items necessary for a complete installation.

2.17 CURED-IN-PLACE PIPE (CIPP)

place, which shall include compensation for the manhole casting, Xypex or Conshield admixture, anti-floatation slab, waterstops, crushed stone, SS frame anchors, frame and cover, grout, materials, hauling, excavation (excluding rock excavation), bedding, backfilling, testing, cleanup, and all other items necessary for a complete installation on existing sewer lines.

2.24 MANHOLE BARREL EXTENSION

Payment is for furnishing and installing a Manhole Barrel Extension, based on the size as indicated on the Bid Schedule. This is to be paid at the contract unit price per vertical foot, complete in place, which shall include compensation for manhole casting, Xypex or Conshield admixture, grout, sealant, materials, hauling, excavation (excluding rock excavation), bedding, backfilling, cleanup, testing, coating, and all other items necessary for a complete installation on new or existing sewer lines.

2.25 MANHOLE DROP CONNECTION

Payment is for furnishing and installing a Manhole Drop Connection, 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 casting, piping/ fittings cast into manhole concrete, Xypex or Conshield admixture, materials, assembly, installation, testing, and all other items necessary for a complete installation on new or existing sewer lines.

2.26 MANHOLE ACCESSORIES FOR LOCATION WITHIN 100-YEAR FLOODPLAIN

Payment is for furnishing and installing a manhole diaphragm, a concrete anti-flotation collar cast into the manhole, and the additional cost to provide a watertight cover instead of standard cover for frame. This is to be paid at the contract unit price each, complete in place, which shall include compensation for diaphragm, concrete collar cast into the manhole, upcharge for watertight cover, materials, installation, and all other items necessary for a complete installation.

2.27 RECONNECT EXISTING GRAVITY SEWER OR SERVICE LATERAL TO NEW MANHOLE

Payment is for furnishing and installing a new manhole connection to an existing gravity sewer or service lateral. 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 (excluding rock excavation), bedding, backfilling, cleanup, coring, and all other items necessary for a complete installation.

2.28 CONNECT FORCE MAIN TO NEW MANHOLE

Payment is for furnishing and installing a new manhole connection to an existing force main. 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 (excluding rock excavation), bedding, backfilling, cleanup, coring, and all other items necessary for a complete installation.

2.29 CUT AND CAP EXISTING SEWER

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 (excluding rock excavation), backfilling, cleanup, restoration, and all other items necessary for a complete capping.

Payment for tree removal shall be paid for at the Contract unit price each, which shall include equipment, excavation, removal of trees, hauling, backfilling, and all appurtenances necessary for complete removal. Measurement of the tree diameter made at 36-inches above grade at base of tree.

2.37 BITUMINOUS CONCRETE: TRENCH CONSTRUCTION, STREET

Payment for bituminous concrete relating to trench construction in streets shall be paid for at the Contract unit price per square yard, which shall include placement of aggregate, compaction, bituminous concrete, removal of existing surface, placement of bituminous concrete, taper of new pavement into existing pavement, and all appurtenances necessary for a complete installation.

2.38 BITUMINOUS CONCRETE: FULL WIDTH PAVING, STREET

Payment for bituminous concrete relating to full width paving in streets shall be paid for at the Contract unit price per square yard, which shall include placement of aggregate, compaction, bituminous concrete, milling of existing surface, placement of bituminous concrete, proper grading, taper of new pavement into existing pavement, and all appurtenances necessary for a complete installation.

2.39 BITUMINOUS CONCRETE: PRIVATE PARKING LOTS/DRIVEWAYS

Payment for bituminous concrete relating to construction in private parking lots and driveways shall be paid for at the Contract unit price per square yard, which shall include placement of aggregate, compaction, bituminous concrete, removal of existing surface, placement of bituminous concrete, proper grading, taper of new pavement into existing pavement, and all appurtenances necessary for a complete installation.

2.40 PORTLAND CEMENT CONCRETE PAVING: PRIVATE PARKING LOTS/DRIVEWAYS/APRONS

Payment for Portland cement concrete 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, Portland cement concrete, removal of existing surface, placement of Portland cement concrete, proper grading, taper of new surface into existing surface, and all appurtenances necessary for a complete installation.

2.41 ASPHALT PAVEMENT PATCH

Payment for asphalt pavement patch shall be paid for at the Contract unit price per square yard, which shall include saw cutting and removal of existing pavement, placement of new asphalt pavement (depth to match existing), compaction, all maintenance of traffic, including flaggers, arrow board, message board, etc., and all appurtenances and manpower necessary for a complete installation.

2.42 ROADWAY STRIPING

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.

2.50 SITE RESTORATION, METHOD C

Payment for site restoration, method C (as defined in the General Notes), 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.

2.51 SOD

Payment for sod 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.

2.52 MONOLITHIC CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT

Payment for monolithic concrete curb and gutter removal and replacement shall be paid for at the Contract unit price per linear foot, which shall include base, compaction, formwork, concrete, placement of monolithic concrete curb and gutter, curing compound, maintenance of traffic, removal of existing curb and gutter, and all appurtenances necessary for a complete installation.

2.53 CONCRETE CURB REMOVAL AND REPLACEMENT

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.

2.54 BITUMINOUS CURB REMOVAL AND REPLACEMENT

Payment for bituminous curb removal and replacement shall be paid for at the Contract unit price per linear foot, which shall include base, compaction, bituminous asphalt, placement of bituminous curb, maintenance of traffic, removal of existing curb, and all appurtenances necessary for a complete installation.

2.55 DENSE GRADED AGGREGATE – DGA, EXTRA AS DIRECTED BY ENGINEER

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.

2.56 NO. 9 CRUSHED STONE, EXTRA AS DIRECTED BY ENGINEER

Payment for No. 9 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.

2.57 NO. 57 CRUSHED STONE, EXTRA AS DIRECTED BY ENGINEER

Payment for No. 57 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.

be complete in place, which shall include compensation for the mobilization, set up, testing (per **Section 01520**), takedown, and demobilization for the pumps, hoses, line plugs, generator, and all appurtenances necessary for a compete bypass pumping system. Payment shall be for a single set up per location. Provision of redundant pumping capability per **Section 01520** is incidental to the cost of bypass pumping and shall be included in the pay item for Bypass Pumping.

2.66 BYPASS PUMPING

Payment is for operation of a bypass pumping. This is to be paid for at the Contract unit price per hour, based on the actual run-time of the bypass pumps for the sewer pipes as indicated on the Bid Schedule. Work shall be complete in place, which shall include compensation for rental fees, fuel, monitoring, piping, duty and backup pumps, check valve, adapters, hose, maintenance, and all appurtenances necessary for the continued operation of the bypass pumping system. Set up and takedown of the pumps and suction and discharge lines are paid for separately under the pay item Bypass Pumping Setup. Testing of the bypass pump setup per **Section 01520** is incidental to the cost of the setup and takedown and shall be included in the pay item for Bypass Pumping Setup. Provision of redundant pumping capability per **Section 01520** is incidental to the cost of bypass pumping and shall be included in this pay item.

2.67 ROAD RAMPS (AS DIRECTED BY ENGINEER)

Payment is for road ramps. This is to be paid at the contract unit price each, which shall be compensation for all labor and materials, including placement, connections, and all equipment and materials necessary.

2.68 SSO SITE CLEANUP

Payment is for SSO site cleanup. This is to be paid at the contract unit price each, which shall be compensation for all labor and materials, including raking, disposal of waste materials, washing down the area, disinfection, and all equipment and materials necessary.

2.69 MAINTENANCE OF TRAFFIC

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.

2.70 COMBINATION VACUUM / HYDRAULIC JET / HYDRO EXCAVATOR, EXTRA AS DIRECTED BY ENGINEER

Payment for a combination vacuum/hydraulic jet/hydro excavator shall be paid for at the Contract unit price per hour when work is authorized by Engineer, which shall include the equipment, delivery, rental costs, fuel, operator, disposal of waste materials, and all appurtenances necessary.

2.71 BACKHOE / EXTEND-A-HOE, EXTRA AS DIRECTED BY ENGINEER

Payment for a backhoe/extend-a-hoe shall be paid for at the Contract unit price per hour, which shall include the equipment, delivery, rental costs, fuel, operator, and all appurtenances necessary.

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.

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 01040 - COORDINATION

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall allow the Owner or his agents, and other project Contractors or their agents, to enter upon the work for the purpose of constructing, operating, maintaining, removing, repairing, altering, or replacing such pipes, sewers, conduits, manholes, wires, poles, or other structures and appliances which may be required to be installed at or in the work. The Contractor shall cooperate with all aforesaid parties and shall allow reasonable provisions for the prosecution of any other work by the Owner, or others, to be done in connection with his work, or in connection with normal use of the facilities.

B. Each Contractor shall cooperate fully with the Owner, the Engineer, and all other Contractors employed on the Work, to effect proper coordination and progress to complete the project on schedule and in proper sequence. Insofar as possible, decisions of all kinds required from the Engineer shall be anticipated by the Contractor to provide ample time for inspection, or the preparation of instructions.

C. Each Contractor shall assume full responsibility for the correlation of all parts of his work with that of other Contractors. Each Contractor's superintendent shall correlate all work with other Contractors in the laying out of work. Each Contractor shall lay out his own work in accordance with the Drawings, Specifications, and instructions of latest issue and with due regard to the work of other Contractors.

D. Monthly general progress coordination meetings will be held at regularly scheduled times convenient for all parties involved. These meetings are in addition to specific meetings held for other purposes, such as special pre-installation meetings. Representation at each meeting by every part currently involved in coordination or planning for the work of the entire project is requested. Meetings shall be conducted in a manner that will resolve coordination problems. Results of the meetings shall be recorded and copies distributed to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.02 COORDINATION OF CRAFTS, TRADES, AND SUBCONTRACTORS

A. The Contractor shall coordinate the work of all crafts, trades and subcontractors engaged on the Work, and he shall have final responsibility as regards the schedule, workmanship and completeness of each and all parts of the work.

B. Each Subcontractor is expected to be familiar with the General requirements and all sections of the detailed Specifications for all other trades and to study all Drawings applicable to his work to the end that complete coordination between trades will be effected. Consult the Engineer if conflicts exist on the Drawings.

C. Contractor's Superintendent, or his designee who is employed by Contractor, must be on site at all times when work is being performed, except for periods which will not exceed 1 hour.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

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 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.

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. 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.

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.

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.

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

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)

END OF SECTION

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 registered in the Commonwealth of Kentucky.

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

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 BARRICADES, WARNING SIGNS AND LIGHTS

A. The General Contractor shall provide, erect and maintain as necessary, strong and suitable barricades, danger signs and warning lights along all roads accessible to the public, as required by the Manual on Uniform Traffic Control Devices or as required by the authority having jurisdiction, to insure safety to the public. All barricades and obstructions along public roads shall include reflective material, shall be illuminated at night, and all lights for this purpose shall be kept burning from sunset to sunrise.

B. Each Contractor shall provide and maintain such other warning signs and barricades in areas of and around their respective work as may be required for the safety of all those employed in the work, the Owner's operating personnel, or those visiting the site.

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 - 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. This includes providing access to affected properties during the construction.

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.

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. 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.

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.

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, the Owner, the Contractor, and the Engineer. This sign shall be 3' x 6' and provided and installed by the Contractor.

B. "Working Hard" sign (as shown on page 01580-3) shall be provided by the Owner and mounted and installed by the Contractor. Contractor shall provide posts and backing.

C. Colors shall be as selected by the Engineer.

D. Number Required: 2

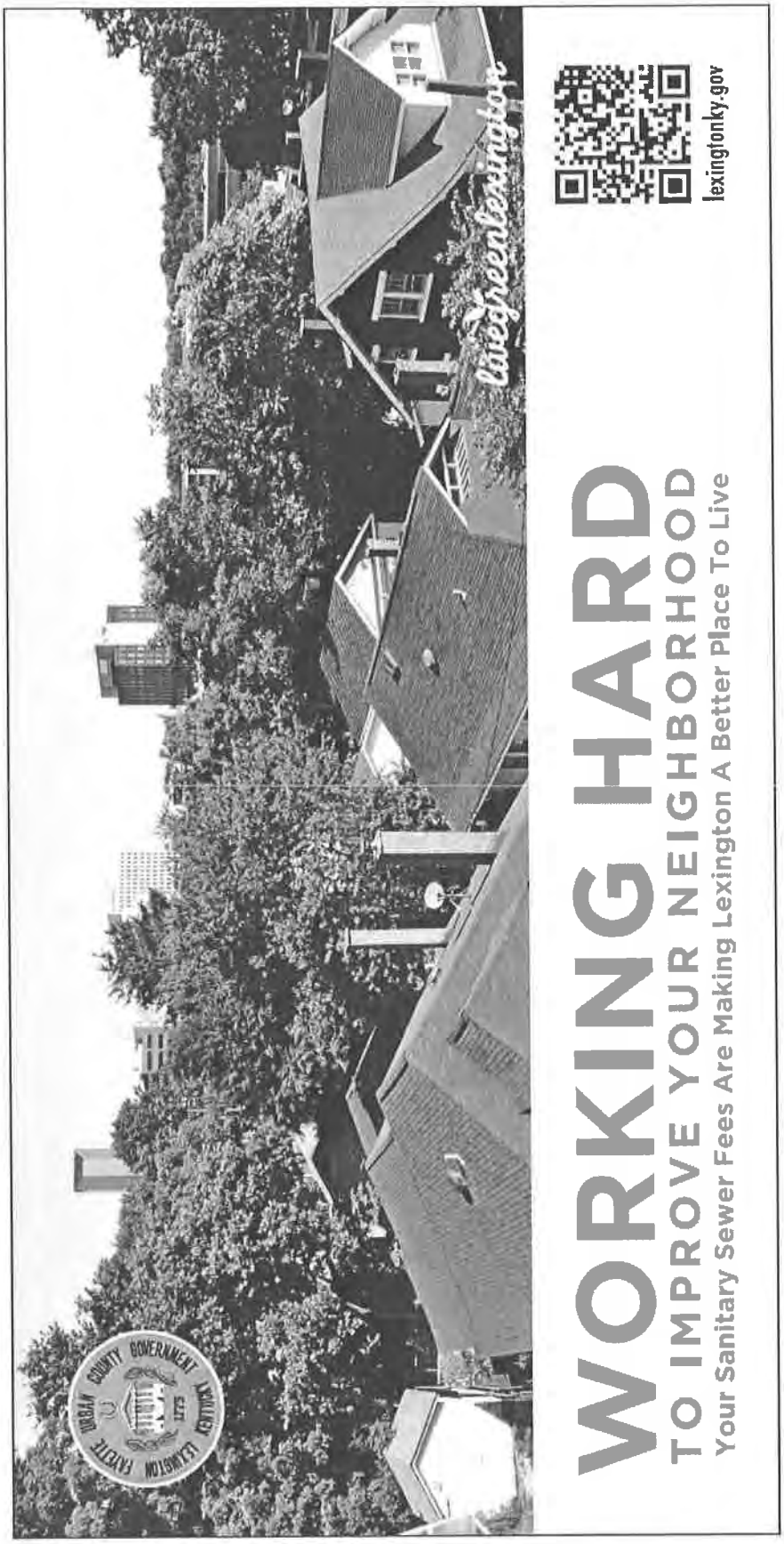
PART 3 - EXECUTION

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

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

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.

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.

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, providing construction supervision, labor, materials, tools, test equipment necessary for the **Sanitary Sewer Improvements along Manchester Street and Willard Street.** Please see Geotechnical report located in **Section 00320** for more information on extrapolated rock depth along each pipe's alignment.

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

For mass excavation, competent rock is determined by the Owner's Geotechnical Engineer (or

1. Storage, security, and accountability: Bureau of Alcohol, Tobacco, and Firearms (ATF): 27 CFR Part 555.
2. Shipment: DOT, 49 CFR Parts 171-179, 390-397.
3. Safety and Health: OSHA 29 CFR Part 1926, Subpart U.
4. Transportation and Storage: NFPA 495, Chapters 3 through 6.
5. Kentucky Department of Mines and Minerals code for explosive disintegration of rock.

B. The Contractor must complete the following before explosives are brought to site:

1. Obtain all required permits from authorities having jurisdiction, with copies to Owner.

2. Obtain Blasting and Liability insurance in accordance with Kentucky Department of Highway requirements. A copy of the Declaration of Insurance shall be provided to the Owner.

3. Complete preblast survey with signed copy to Owner.

4. The Contractor shall submit a blasting plan by a professional blaster to the Engineer.

C. No explosives shall be used within 20 feet of:

1. Building and/or structures existing, constructed, or under construction.

2. Underground and/or overhead utilities whether existing or partially constructed.

3. See Section 3.07 for additional blasting restrictions.

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

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

F. The Contractor shall be solely responsible for his blasting operations. The Contractor shall not hold the Owner and/or Engineer liable for any damages resulting from his blasting operations on this project. Furthermore, the Contractor shall, at his expense, repair any damage to any structure, resulting from his blasting operations.

G. The Contractor shall submit a blasting plan prepared by a licensed blaster to the Engineer, as well as Kentucky Utilities (Distribution and Transmission), Columbia Gas, and Kentucky American Water [Engineer to tailor named utilities as appropriate].

3.05 SEISMOGRAPHIC MONITORING

All blasting shall be monitored by seismographic methods by an independent third-party seismographic monitoring expert. The seismographic monitoring shall be conducted as follows:

A. Monitoring shall be continuous from the time the blasting program begins until the time it ends. Monitors shall be left in place from the beginning of the work week until the end of the work

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.

D. The Contractor may backfill the area with rock fragments created during the blasting operation. No rock fragments shall have any dimension greater than 12 inches in any direction. Oversized rock shall be subjected to further size reduction until the fragments are less than 6 inches or will be required to be removed off-site, and at no additional cost to the Owner.

END OF SECTION

SECTION 02222 – EXCAVATION

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. 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.

G. 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.

H. The Contractor shall furnish all labor, equipment, and material required to complete the work including but not limited to the following:

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.

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

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.

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.

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

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. Earthwork: Section 02200

B. Excavating, Backfilling, and Compacting for Utilities: Section 02225

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.**

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 02920 – Lawns and Grasses.

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

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.

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.

END OF SECTION

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.

PART 2 - PRODUCTS

2.01 BEDDING AND BACKFILLING MATERIALS

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

D. Flowable fill material shall conform to the Kentucky Transportation Cabinet's Standard Specifications for Road and Bridge Construction, Current Edition, latest revision.

PART 3 - EXECUTION

3.01 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 pipeline 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 No. 9 crushed limestone or flowable fill.

3. The Engineer will not be responsible for determining requirements for bracing or sheeting.

4. Trench bracing and sheeting requirements are identified in **Section 02229**.

SECTION 02229 – TRENCH BRACING AND SHEETING

PART 1 - GENERAL

1.01 SUMMARY

A. Contractor is responsible for the installation, maintenance and removal of trench bracing and sheeting during excavation operations.

B. Design, installation, and removal of trench systems shall be accomplished in accordance with OSHA Standard 29, CFR 1926, Subpart P, latest revision.

C. The Contractor shall prepare and submit a Trenching and Excavation Plan for approval by the Engineer. Excavation will not be permitted until approval of the Trenching and Excavation Plan. Preparation of the Plan shall be considered incidental to the cost of laying the pipe.

D. The Contractor shall prepare and submit a Settlement and Monitoring Plan to the Engineer for approval. Excavation shall not be permitted until approval of the Settlement and Monitoring Plan. Preparation of the Plan shall be considered incidental to the cost of laying the pipe.

E. A Pre-Construction Structure Survey **may** be submitted in lieu of a Settlement and Monitoring Plan.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Dewatering: **Section 02240**

B. Excavating, Backfilling, and Compacting for Utilities: **Section 02225**

C. Rock Removal: **Section 02221**

1.03 REFERENCES

A. OSHA Standard 29, CFR 1926, Subpart P, latest revision. Standard is available at https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926SubpartP.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. Bracing and sheeting shall be designed, constructed, and maintained to provide a safe working environment and prevent damage to adjacent utilities, structures, and private property from ground movement during trench excavation, rock removal, sewer replacement and backfilling operations.

B. Submittal review by the Engineer shall not relieve the Contractor of responsibility for errors or problems occurring during construction. The Engineer's review is intended only to verify conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Review of submittals shall not release the Contractor from responsibility of complying with the Contract Documents or OSHA Standards.

Drawings should include plan view(s), elevation view(s), sections and details that clearly describe the system to be installed. Dimensions and spacing of members shall be clearly noted.

2. Drawings shall illustrate existing utility locations and temporary supports for utilities.

3. A description of the methods and procedures to be followed to install the shoring and bracing system.

4. Manufacturer's information for shoring and bracing equipment or devices.

5. A description of each material that will be used as part of the shoring and bracing system.

6. Geotechnical, surcharge, hydraulic, and other applicable loading that will or could be encountered during the installation, use, and removal of the system shall be identified and considered in the shoring and bracing system design.

7. Design calculations and supporting annotated tabular data shall be included and sealed by a professional engineer, licensed in the Commonwealth of Kentucky, experienced in the design and specification of trench support systems.

8. A sample of the daily excavation inspection form that will be submitted to the Engineer during trench excavation operations.

9. Protocol for verifying sheeting and bracing system is properly installed.

3.03 DEFLECTION AND SETTLEMENT MONITORING

A. Where excavations exceed a depth of 12 feet, deflection and settlement monitoring shall be performed during trench excavation and backfilling operations to verify ground movement impacts on adjacent utilities and structures.

B. Deflection and settlement monitoring shall include furnishing all equipment, material, labor for installing, maintaining monitoring, analyzing, reporting and removing instrumentation for monitoring structures adjacent to trenching operations.

C. The Contractor shall maintain and protect deflection and settlement monitoring instrumentation until the trench/excavation is backfilled. Damaged or inoperable instrumentation shall be replaced within 24 hours of detection.

D. Installation, calibration, data collection, and analysis of instrumentation results shall be performed by individuals with a minimum of 5 years of experience of deflection/settlement monitoring.

E. Calibration of monitoring equipment shall meet the manufacturer's minimum calibration requirements.

F. Monitoring results shall be documented daily and submitted to the Engineer.

laying the pipe.

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.

C. A Trench Dewatering Plan shall be submitted to the Engineer for approval. Installation of piping, manholes, concrete, backfill or subgrade materials will not be permitted until Engineer approval of the Trench Dewatering Plan. Preparation of the Plan shall be considered incidental to the cost of laying the pipe.

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. Dewatering/pumping activities which include groundwater dewatering and sanitary sewer bypass operations shall remain as separate pumping/bypass processes throughout construction.

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.

H. A Trench Dewatering Plan shall be submitted to the Engineer for approval. The Trench Dewatering Plan shall identify equipment to be utilized and proposed approach for maintaining proper conditions for installing pipe, concrete, backfill or other material or structure in the excavation. The Plan shall also include emergency actions to be implemented in the event of pump failure or flooding.

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 approved 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.

B. The Contractor may use this SWPPP 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.

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.

Also See Construction Plans for Stormwater BMPs

SECTION 02372 - 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 Stormwater Pollution Prevention Plan (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) and prevent them from being discharged into or alongside any body of water or into natural or man-made channels leading thereto.

C. The Contractor shall at all times minimize disturbance and the period of time that the disturbed area is exposed without stabilization practices. In "critical areas" (within 25 feet of a stream) erosion prevention measures such as erosion control mats/blankets, mulch, or straw blown in and stabilized with tackifiers or by treading, etc shall be implemented on disturbed areas within 24 hours or "as soon as practical" after completion of disturbance/grading or following cessation of activities.

D. Temporary erosion controls include, but are not limited to grassing, mulching, seeding, providing erosion control and turf reinforcement mats on all disturbed surfaces including waste area surfaces and stockpile and borrow area surfaces; scheduling work to minimize erosion and providing interceptor ditches at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits.

E. Temporary sedimentation controls include, but are not limited to, silt dams, traps, barriers, and appurtenances on sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits.

F. Contractor is responsible for providing and maintaining effective temporary erosion and sediment control measures prior to and during construction or until final controls become effective.

G. Prior to construction, the Contractor shall obtain a 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). 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 mulch, blankets, sediment barriers, and/or other controls as necessary to control pollution, erosion, and sedimentation to the satisfaction of the regulatory agency.

H. The Contractor shall inspect and repair all erosion and sedimentation controls as follows:

   1. At least once every seven (7) calendar days, and

   2. Within 24 hours after any storm event of 0.5 inch or greater.

I. Final stabilization practices on those portions of the project where construction activities have permanently ceased shall be initiated within fourteen (14) days of the date of cessation of

anchored with bituminous materials regardless of the slope. Permanent mulches shall be used in conjunction with planting trees, shrubs, and other ground covers that do not provide adequate soil stabilization.

B. Straw shall come from wheat, rye, or barley and may be spread by hand or machine. Straw shall be anchored. Straw shall be applied at two tons per acre or 90 pounds per 1,000 square feet. Straw shall be free from weeds and coarse matter.

C. Wood chips do not require tacking. Wood chips shall be applied at 270 cubic yards per acre or 6 cubic yard per 1,000 square feet and approximately 2 inches deep. Wood chips shall be treated with 20 pounds of nitrogen per acre or shall be treated with 12 pounds slow-release nitrogen per ton to prevent nutrient deficiency in plants.

D. Bark chips or shredded bark shall be applied at 70 cubic yards per acre or 1.5 to 2 cubic yards per 1,000 square feet and about one-half inch thick. Bark does not require additional nitrogen fertilizer.

E. Manufacturer's recommendations shall be followed during application of manufactured wood fiber and recycled paper sold as mulch materials applied in a hydroseeder slurry with binders/tackifiers. Recycled paper (newsprint) or wood fiber shall be mixed at 50 pounds per 100 gallons of water and applied according to manufacturer's recommendations and model of hydroseeder in use.

F. Liquid mulch binders/tackifiers shall be applied according to manufacturer's recommendations. Chemical soil stabilizers or soil binders/tackifiers/emulsions shall not be used alone.

G. Netting and mats shall be used in critical areas such as waterways where concentrated flows are expected.

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

2.02 TEMPORARY SEED

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

2.03 PERMANENT SEED

A. Permanent seeding shall be applied within 14 days after final grade has been reached, except during December through February. Permanent seeding shall also be applied on any areas that will not be disturbed again for a year even if final grades have not been reached. The use of mulch and erosion matting and netting with permanent seeding shall be in accordance with applicable sections of this Specification. "Seed mats" may be used for permanent seeding in accordance with manufacturers' recommendations.

B. Permanent seeding shall be used on disturbed areas where permanent, long-lived vegetative cover is needed to stabilize the soil and on rough graded areas that will not be brought to final grade for one year or more.

C. The area to be seeded shall be protected from excess runoff as necessary with diversions, grassed waterways, terraces, or sediment ponds.

D. Contractor shall use the following Permanent Seed Mix, with the following exceptions:

E. Soil material shall be capable of supporting permanent vegetation and shall consist of at least 25 percent silt and clay to provide an adequate amount of moisture holding capacity. An excessive amount of sand will not consistently provide sufficient moisture for the sod regardless of other soil factors.

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

G. The sod shall consist of strips of live, vigorously growing grasses. The sod shall be free of noxious and secondary noxious weeds and shall be obtained from good, solid, thick-growing stands. The sod shall be cut and transferred to the job in the largest continuous pieces that will hold together and are practical to handle.

H. The sod shall be cut with smooth clean edges and square ends to facilitate laying and fitting. The sod shall be cut to a uniform thickness of not less than three-fourth inch measured from the crown of the plants to the bottom of the sod strips for all grasses except bluegrass. Bluegrass sod shall be cut to a uniform thickness of not less than one and one-half inches.

I. The sod shall be mowed to a height of not less than two inches and no more than four inches prior to cutting.

J. The sod shall be kept moist and covered during hauling and preparation for placement on the sod bed.

2.05 ROAD/PARKING STABILIZATION

A. Gravel or paved material shall be used to stabilize permanent roads or parking areas or roads or parking areas used repeatedly by construction traffic. Stabilization shall be accomplished within 14 days of grading or initiation of use for construction traffic. Unstabilized roads are not acceptable except in instances where the road will be used less than one month.

B. Road/parking stabilization shall be used wherever roads or parking areas are constructed, whether permanent or temporary, for use by construction traffic.

C. Stabilization shall be accomplished with a minimum depth of six inches of crushed stone. Stabilized construction roadbeds shall be at least 14 feet wide for one-way traffic and at least 20 feet wide for two-way traffic.

D. Temporary roads shall follow the contour of the natural terrain to the extent possible. Slopes shall not exceed 10 percent.

E. Temporary parking areas shall be located on naturally flat areas to minimize grading. Grades shall be sufficient to provide drainage but shall not exceed 4 percent.

F. All cuts and fills shall be 2H:1V or flatter.

G. Drainage ditches shall be provided as needed.

H. Crushed stone shall be KYTC aggregate No. 2 (1.5 to 3 inches in diameter), or equivalent.

2.06 CONSTRUCTION ENTRANCE

A. A stabilized construction entrance shall be constructed wherever vehicles are leaving a construction site to enter a public road or at any unpaved entrance/exit location where there

TRMs shall be used at the water line to control wave action in wet ponds. TRMs shall be used in accordance with manufacturer's recommendations. Erosion control matting may be used to stabilize channels and swales and on recently planted slopes to protect seedlings until they become established.

B. Effective netting and matting shall require firm, continuous contact between the materials and the soil. If there is no contact, the material will not hold the soil and erosion will occur underneath the material.

C. Nets and mats shall be suitable for their intended purpose and shall be as indicated in the Construction Drawings.

2.09 TEMPORARY DIVERSION DITCH

A. Temporary diversion ditches shall be used to collect sediment-laden runoff from disturbed areas and direct it to a sediment pond where applicable. Temporary ditches are those expected to be in use for less than one year. Temporary diversion ditches do not require stabilization, unless otherwise indicated on the Construction Drawings.

B. Temporary diversion ditches shall have stable outlets. The combination of conditions of site, slopes, and soils should be so that the ditch can be maintained throughout its planned life.

C. Temporary diversion ditches shall not be constructed below high sediment-producing areas unless land treatment practices or structural measures, designed to prevent damaging accumulations of sediment in the channels, are installed with or before the diversion.

D. A typical diversion cross section consists of a channel and a supporting ridge. In the case of an excavated-type diversion, the natural ground serves as the diversion ridge. Diversion cross sections shall be adapted to the equipment that will be used for their construction and maintenance.

E. The channel may be parabolic or trapezoidal in shape. V-shaped ditches shall not be constructed.

F. Diversions shall be located so that water will empty onto an established area such as a stable watercourse, waterway, or structure.

G. Any high sediment-producing area above a diversion shall be controlled by good land use management or by structural measures to prevent excessive sediment accumulation in the diversion channel.

H. Temporary diversions above steep slopes or across graded rights-of-way shall have a berm with a minimum top width of 2 feet, side slopes of 2:1 or flatter and a minimum height of 18 inches measured from the channel bottom.

I. Diversions installed to intercept flow on graded rights-of-way shall be spaced 200 to 300 feet apart.

J. A level lip spreader shall be used at diversion outlets discharging onto areas already stabilized by vegetation.

2.10 LEVEL SPREADER

A. Level spreaders shall be constructed at the outlets of temporary diversion ditches. Level spreaders shall also be constructed at outlets of permanent constructed waterways where they terminate on undisturbed areas.

upstream dam is at the same elevation as the top of the next downstream dam.

H. The spacing of coir and wood fiber check dams is one log every 100 feet for velocities of 5 fps, 50 feet for velocities between 5 and 7.5 fps, and 25 feet for velocities greater than 10 fps, unless otherwise shown in the Construction Documents.

I. Stone check dams shall be constructed of KYTC Class II channel lining.

J. Coir log or wood fiber log check dams shall be constructed of a single log with a diameter of at least 20 inches.

2.15 SEDIMENT TRAP

A. Sediment traps shall be installed below all disturbed areas of less than 5 acres that do not drain to a sediment pond.

B. Erosion control practices such as seeding, mulching, sodding, diversion dikes, etc., shall be used in conjunction with sediment traps to reduce the amount of sediment flowing into the trap. The amount of sediment entering a trap can be reduced by the use of stabilized diversion dikes and ditches.

C. The trap shall not be located in a stream. It shall be located to trap sediment-laden runoff before it enters the stream.

D. Trap depth shall be at least 2 feet at the inlet and 4 feet at the outlet. Effective trap width shall be at least 10 feet and trap length shall be at least 30 feet.

E. The Construction Drawings shall indicate the final disposition of the sediment trap after the upstream drainage area is stabilized. The Construction Drawings shall indicate methods for the removal of excess water lying over the sediment, stabilization of the pond site, and the disposal of any excess material.

2.16 SEDIMENT POND

A. A sediment pond shall be installed at the outlet of a disturbed area of 5 acres or more. The maximum drainage area for a single pond is 100 acres.

B. Design and construction shall comply with all federal, state, and local laws, ordinances, rules, and regulations regarding dams.

C. Erosion control practices such as seeding, mulching, sodding, diversion dikes, etc., shall be used in conjunction with sediment ponds to reduce the amount of sediment flowing into the pond.

D. The pond shall not be located in a stream. It shall be located to trap sediment-laden runoff before it enters the stream.

E. Contractor shall construct the sediment pond as shown on the Construction Drawings.

F. Permanent ponds designed for stormwater detention or water quality treatment may serve as temporary sediment ponds if site conditions make the use of these structures desirable. At the time of conversion from a sediment pond to a permanent stormwater management pond, excess sediment shall be cleaned from the pond. If the pond is converted to a water quality basin, the sand in the sand filter outlet shall be replaced with clean sand unless it is shown to be clean.

G. The Construction Drawings shall indicate the final disposition of the sediment pond after the

2.19 FILTER STRIP

A. Filter strips shall be used on each side of permanent constructed channels.

B. Filter strips shall only be used to remove sediment from overland flow. Filter strips are not effective in removing sediment from concentrated flows.

C. If vegetative filters are proposed as a sediment control device and they do not already exist, they shall be planted and established prior to initiating land disturbing activities.

D. The minimum filter strip width shall be 50 feet for streams, wetlands, and sinkholes. The minimum filter strip width shall be ten feet for constructed waterways.

E. Where a post development floodplain or wet weather conveyance is being protected, filter strips shall be provided on each side. When a wetland or sinkhole is being protected, filter strips shall be provided around the perimeter.

F. Contractor shall construct the filter strips as shown on the Construction Drawings.

G. Existing grass or grass/legume mixtures used as filter strips shall be dense and well established, with no bare spots. When establishing new seeding, consideration shall be given to wildlife needs and soil conditions on the site. The following chart provides a list of alternative grass and grass/legume mixtures:

SEEDING MIXTURE AND SITE SUITABILITY CHART

Seeding Mixture	Rate lbs/acre	Soil Suitability
Alfalfa *Or* Red Clover *Plus* Timothy *Or* Orchardgrass *Or* Bromegrass	6 10 4 6 6	Well Drained
Ladino *Plus* Timothy *Or* Orchardgrass *Or* Bromegrass	.05 4 6 8	Wet or Well-Drained

Notes:

1. All seeding shall be in accordance with the seeding sections of this Specification.

2. Well drained sites include sites that are drained with tile as well as naturally well drained and droughty sites. Wet sites include sites that are excessively wet only a portion of the growing season.

PART 3 – EXECUTION

3.01 GENERAL

A. Erosion and sediment control practices shall be consistent with the requirements of the state and local regulatory agencies and in any case shall be adequate to prevent erosion of disturbed and/or regraded areas.

B. Contractor is responsible for notifying the state regulatory agency concerning inclusion under the KPDES General Permit for Storm Water Discharges Associated with Construction Activities.

C. Gravity sewer lines, force mains and water lines that cross streams shall be constructed by methods that maintain normal stream flow and allow for a dry excavation. Water pumped from the excavation shall be contained and allowed to settle prior to reentering the stream. Excavation equipment and vehicles shall operate outside of the flowing portion of the stream. Spoil material from the line excavation shall not be allowed to enter the flowing portion of the stream. The provisions of this condition shall apply to all types of utility line stream crossings.

D. Removal of riparian vegetation in the utility line right-of-way shall be limited to that necessary for equipment access. Effective erosion and sedimentation control measures shall be employed at all times during the project to prevent degradation of waters of the Commonwealth. Site regrading and reseeding shall be accomplished with 14 days after disturbance.

3.02 MULCH

A. Seed shall be applied prior to mulching except where seed is to be applied as part of a hydroseeder slurry containing mulch.

B. Lime and fertilizer shall be incorporated and surface roughening accomplished as needed prior to mulching in accordance with applicable sections of this Specification.

C. Mulch materials shall be spread uniformly by hand or mechanically so the soil surface is covered. During or immediately following application, the mulch shall be anchored or otherwise secured to the ground according to one of the following methods:

1. Mechanical – Use a disk, crimper, or similar type tool set straight to punch or anchor the mulch material into the soil.

2. Mulch Tackifiers/Nettings/Emulsions – Use according to the manufacturer's recommendations. This is a superior method in areas of water concentration to hold mulch in place.

3. Wood Fiber – Wood fiber hydroseeder slurries may be used to tack straw mulch. This combination treatment is well suited to steep slopes and critical areas, and severe climate conditions.

D. Mulch shall be anchored using a mulch anchoring tool, a liquid binder/tackifier, or mulch nettings. Nets and mats shall be installed to obtain firm, continuous contact between the material and the soil. Without such contact, the material is useless and erosion occurs.

E. A mulch anchoring tool is a tractor-drawn implement that is typically used for anchoring straw and is designed to punch mulch approximately two inches into the soil surface. Machinery shall be operated on the contour and shall not be used on slopes steeper than 3H:1V.

C. The needed erosion control practices, such as diversions, temporary waterways for diversion outlets, and sediment ponds, shall be installed prior to seeding.

D. Prior to seeding, lime and fertilizer shall be worked into the soil with a disk harrow, springtooth harrow, or similar tools to a depth of four inches. On sloping areas, the final operation shall be on the contour.

E. Where compacted soils occur, they shall be broken up sufficiently to create a favorable rooting depth of six to eight inches.

F. The seed shall be applied uniformly with a cyclone seeder, drill, cultipacker, seeder, or hydroseeder (slurry may include seed and fertilizer) preferably on a firm, moist seedbed. Seed shall be sown no deeper than one-fourth inch to one-half inch.

G. The seedbed shall be firmed following seeding operations with a cultipacker, roller, or light drag.

H. On sloping land, seeding operations shall be on the contour wherever possible.

I. Mulch shall be applied, in the amounts described in the mulch section of this Specification, to protect the soil and provide a better environment for plant growth.

J. New seed shall have adequate water for growth, through either natural means or irrigation, until plants are firmly established.

K. Seeded areas shall be inspected at least weekly after planting and after each rainfall of 0.5 inches or more. Areas requiring additional seed and mulch shall be repaired within 48 hours.

L. If vegetative cover is not established (>70%) within 21 days, the area shall be reseeded. If 40 to 70 percent groundcover is established, seed and fertilize, using half of rates originally applied, and mulch. If less than 40 percent groundcover is established, follow original seedbed preparation methods, seeding and mulching specifications, and apply lime and fertilizer as needed according to soil tests.

3.05 SOD

A. The area to be sodded shall be protected from excess runoff, as necessary, with appropriate BMPs.

B. Prior to sodding, the soil surface shall be cleared of all trash, debris, and stones larger than one and one-half inches in diameter, and of all roots, brush, wire, and other objects that would interfere with the placing of the sod.

C. Compacted soils shall be broken up sufficiently to create a favorable rooting depth of six to eight inches.

D. Lime and fertilizer shall be worked into the soil with a disk harrow, springtooth harrow, or other suitable field equipment to a depth of four inches.

E. After the lime and fertilizer have been applied and just prior to the laying of the sod, the soil in the area to be sodded shall be loosened to a depth of one inch. The soil shall be thoroughly dampened immediately after the sod is laid if it is not already in a moist condition.

F. No sod shall be placed when the temperature is below 32°F. No frozen sod shall be placed nor shall any sod be placed on frozen soil.

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

3.07 CONSTRUCTION ENTRANCE

A. Vegetation, roots, and all other obstructions shall be cleared in preparation for grading. Prior to placing geotextile (filter fabric), the entrance shall be graded and compacted to 80% of standard proctor density.

B. To reduce maintenance and loss of aggregate, the geotextile shall be placed over the existing ground before placing the stone for the entrance. Stone shall be placed to depth of 6 inches or greater for the entire width and length of the stabilized construction entrance.

C. If wash racks are used, they shall be installed according to manufacturer's specifications.

D. The stabilized construction entrance shall be inspected once each week and after there has been a high volume of traffic or a storm event greater than 0.2 inches.

E. The entrance shall be maintained in a condition that will prevent tracking or flow of sediments onto public rights-of-way. This may require periodic top dressing with additional stone, as conditions demand, and repair and/or cleanout of any structures used to trap sediment.

F. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately.

3.08 DUST CONTROL

A. See Articles on Temporary Seed, Permanent Seed, Sod, Mulch, Road/Parking Stabilization, and Construction Entrance of this Specification Section.

B. When construction is active on the site, dust control shall be implemented as needed.

C. When using tillage as a dust control measure, Contractor shall begin plowing on windward side of area. Chisel-type plows spaced about 12 inches apart, spring-toothed harrow, and similar plows are examples of equipment that may produce the desired effect.

D. The site shall be observed daily for evidence of windblown dust and reasonable steps shall be taken to reduce dust whenever possible. When construction on a site is inactive for a period, the site shall be inspected at least weekly for evidence of dust emissions or previously windblown sediments. Dust control measures shall be implemented or upgraded if the site inspection shows evidence of wind erosion.

3.09 NETS AND MATS

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

3.10 TEMPORARY DIVERSION DITCH

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

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

3.12 PERMANENT CONSTRUCTED WATERWAY

A. All ditches or other depressions to be crossed shall be filled before construction begins or as part of construction, and the earth fill used to fill the depressions shall be compacted using the treads of the construction equipment. All old terraces, fence rows, or other obstructions that will interfere with the successful operation of the channel shall be removed.

B. The earth materials used to construct the earth fill portions of the channel shall be obtained from the excavated portion of the channel or other approved source.

C. The earth fill materials used to construct the channel shall be compacted by running the construction equipment over the fill in such a manner that the entire surface of the fill will be traversed by at least one tread track of the equipment.

D. The completed channel shall conform to the cross section and grade shown on the Construction Drawings.

E. Channels shall be inspected regularly to check for points of scour or bank failure; rubbish or channel obstruction; rodent holes; breaching; and excessive wear from pedestrian or construction traffic.

F. Channels shall be repaired at the time damage is detected. Sediment deposits shall be removed from adjoining vegetative filter strips when they are visible.

G. Channels shall be reseeded and fertilized as needed to establish vegetative cover.

H. The subgrade of paved channels shall be constructed to the required elevations. All soft sections and unsuitable material shall be removed and replaced with suitable material. The subgrade shall be thoroughly compacted and shaped to a smooth, uniform surface. The subgrade shall be moist when pouring concrete.

I. Before permanent stabilization of the slope, the structure shall be inspected after each rainfall. Any damages to the paved channel or slope shall be repaired immediately.

3.13 PIPE SLOPE DRAIN

A. The pipe slope drain shall be placed on undisturbed or well-compacted soil.

B. Soil around and under the entrance section shall be hand-tamped in 4-inch to 8-inch lifts to the top of the dike to prevent piping failure around the inlet.

C. Filter fabric shall be placed under the inlet and extended 5 feet in front of the inlet and be keyed in 6 inches on all sides to prevent erosion.

D. Backfilling around and under the pipe with stable soil material hand compacted in lifts of 4 inches to 8 inches shall be done to ensure firm contact between the pipe and the soil at all points.

E. The pipe slope drain shall be securely staked to the slope using grommets provided for this purpose at intervals of 10 feet or less.

F. All slope drain sections shall be securely fastened together and have watertight fittings.

G. The pipe shall be extended beyond the toe of the slope and discharged at a non-erosive velocity into a stabilized area or to a sediment trap or pond.

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

F. Check dams shall be checked for sediment accumulation after each rainfall. Sediment shall be removed before or when it reaches one-third of the original height.

G. Check dams shall remain in place and operational until the drainage area and channel are completely stabilized, or up to 30 days after the permanent site stabilization is achieved.

3.16 SEDIMENT TRAP

A. The area to be excavated shall be cleared of all trees, stumps, roots, brush boulders, sod, and debris. All channel banks and sharp breaks shall be sloped to no steeper than 1:1. All topsoil containing excessive amounts of organic matter shall be removed.

B. Seeding, fertilizing, and mulching of the material taken from the excavation shall comply with the applicable soil stabilization sections of this Specification.

C. Construction specifications for sediment traps are provided in the Construction Drawings.

D. Any material excavated from the trap shall be placed in one of the following ways so that it will not be washed back into the trap by rainfall:

1. uniformly spread to a depth not exceeding 3 feet and graded to a continuous slope away from the trap

2. uniformly placed or shaped reasonably well with side slopes assuming the natural angle of repose for the excavated material behind a berm width not less than 12 feet.

E. Sediment shall be removed from the trap when the capacity is reduced to one third of the design volume. Contractor shall follow the methods for disposing of sediment removed from the trap as shown in the Construction Drawings.

3.17 SEDIMENT POND

A. The foundation area shall be cleared of all trees, stumps, roots, brush boulders, sod, and debris. All channel banks and sharp breaks shall be sloped to no steeper than 1:1. All topsoil containing excessive amounts of organic matter shall be removed. The surface of the foundation area shall be thoroughly scarified before placement of the embankment material.

B. A cutoff trench shall be backfilled with suitable material. The trench shall be kept free of standing water during backfill operations.

C. The pipe conduit barrel shall be placed on a firm foundation. Selected backfill material shall be placed around the conduit in layers, and each layer shall be compacted to at least the same density as the adjacent embankment. All compaction within 2 feet of the pipe spillway shall be accomplished with hand-operated tamping equipment.

D. All borrow areas outside the pond and in the drainage area shall be graded and left in such a manner that water will not be ponded.

E. The material placed in the fill shall be free of all sod, roots, frozen soil, stones more than 6 inches in diameter, and other objectionable material. The placing and spreading of the fill material shall occur in approximately 6-inch horizontal layers or of such thickness that the required compaction can be obtained with the equipment used. Each layer shall be compacted in a way that will result in achieving 95 percent of the maximum standard dry

F. At joints, filter fabric shall be lapped with terminating posts with a minimum overlap of 3 feet.

G. The trench shall be backfilled and soil compacted over the filter fabric.

H. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

I. Silt fences and filter barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately. Knocked down fences shall be repaired at the end of each day.

J. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and if the barrier is still necessary, the fabric shall be replaced promptly.

K. Sediment deposits shall be removed after each storm event or when deposits reach approximately one-third the height of the barrier.

L. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded.

M. Silt fences shall be replaced every 6 months.

3.19 STORM DRAIN INLET PROTECTION

A. For silt fence drop inlet protection, the following specifications apply:

1. For stakes, Contractor shall use 2 x 4-inch wood (preferred) or equivalent metal with a minimum length of 3 feet.

2. Stakes shall be evenly spaced around the perimeter of the inlet a maximum of 3 feet apart and securely driven into the ground, approximately 18 inches deep.
3. To provide needed stability to the installation, Contractor shall frame with 2 x 4-inch wood strips around the crest of the overflow area at a maximum of 1.5 feet above the drop inlet crest and shall brace diagonally.

4. Contractor shall place the bottom 12 inches of the fabric in a trench and backfill the trench with at least 4 inches of crushed stone or 12 inches of compacted soil.

5. Contractor shall fasten fabric securely to the stakes and frame. Joints shall be overlapped to the next stake.

B. For sod drop inlet protection, sod shall be placed to form a turf mat covering the soil for a distance of 4 feet from each side of the inlet structure. Soil preparation and sod placement shall be in accordance with the section entitled Sod.

C. For gravel curb inlet protection, the following specifications apply:

1. Wire mesh with ½-inch openings shall be placed over the curb inlet opening so that at least 12 inches of wire extends across the concrete gutter from the inlet opening.

2. KYTC No. 2 Coarse Aggregate shall be piled against the wire so as to anchor it against the gutter and inlet cover and to cover the inlet opening completely.

3. This type of device must never be used where overflow may endanger an exposed fill slope. Consideration shall also be given to the possible effects of ponding on traffic movement, nearby structures, working areas, and adjacent property.

3.21 STREAM CROSSING

A. Clearing and excavation of the streambed and banks shall be kept to a minimum.

B. The structure shall be removed as soon as it is no longer necessary for project construction.

C. Upon removal of the structure, the stream shall immediately be reshaped to its original cross section and properly stabilized.

D. The approaches to the structure shall consist of stone pads with a minimum thickness of 6 inches, a minimum width equal to the width of the structure, and a minimum approach length of 25 feet on each side.

E. The structure shall be inspected after every rainfall and at least once a week and all damages repaired immediately.

3.22 PUMP-AROUND FLOW DIVERSION

A. Operations shall be scheduled such that diversion installation, in-stream excavation, in-stream construction, stream restoration, and diversion removal are completed as quickly as possible. Contractor shall not construct in a stream when rainfall is expected during the time excavation will be occurring in the stream.

B. Check dams shall be installed across the stream during low flow conditions.

C. Stream flow shall be pumped around the check dams. Outlet protection shall be installed as required at the discharge point.

D. Contractor shall dewater the work area and pump into a sediment trapping device.

E. Contractor shall complete construction activities across the stream.

F. Contractor shall restore the streambed and banks.

G. Contractor shall remove sandbags and shut down pumping operation. (Salvage sandbags for future use if multiple stream crossings are required on the project.) Contractor shall remove all sandbags from the stream, including damaged and empty bags.

H. Pumps shall be manned around-the-clock when the pump-around diversion is in the stream.

I. This control provides short-term diversion of stream flow (typically 1 day to 3 days). Additional sandbags or pumps may be required to maintain 1-foot freeboard on the sandbag checks if flow conditions change.

J. Contractor shall add sandbags as required to seal leaks in checks.

3.23 CONSTRUCTION DEWATERING

A. Contractor shall follow the specifications for sediment traps and basins. The manufacturer's recommendations shall be followed for commercial products.

B. The dewatering structure shall be inspected frequently to ensure it is functioning properly and not overtopping. Accumulated sediment shall be spread out on site and stabilized or disposed of offsite.

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.

N. Upon completion of the project and establishment of all permanent erosion and sediment control structures and devices, 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.

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.

LFUCG LAND DISTURBANCE PERMIT APPLICATION AND ESC PLAN CHECKLIST

OWNER / DEVELOPER Name: _____ **Date:** _____ **Zone:** _____

Address: _____ **City:** _____ **State:** _____ **Zip:** _____

Contractor Name and Address: _____ **Reg #:** _____

Contact Name, Phone/ FAX/Email: _____

ITEM DESCRIPTION	Y	N	N/A	PAGE #	NOTES
I. Permits:					
KY Construction Permit (KYR10 or Indvid)	☐	☐	☐		
USCOE 404 Permit	☐	☐	☐		
KYDOW 401 Water Quality Cert.	☐	☐	☐		
KY Stream Construction Permit	☐	☐	☐		
FEMA LOMR or CLOMR	☐	☐	☐		
II. BMPS:					
Site Preparation:					
Phasing plan for large projects	☐	☐	☐		Maximum disturbed area = 25 acres
Limits of disturbance clearly marked	☐	☐	☐		25 foot undisturbed buffer strip along streams
Construction Entrance/ Exit Pad	☐	☐	☐		No. 2 stone w/ filter fabric, min. 50 ft long (100' where practical)
Temporary Diversion (Berm or Ditch)	☐	☐	☐		Offsite (clean) water routed around disturbed area
Stream Crossings	☐	☐	☐		Not allowed without US Army Corps 404 permit
Concrete Washout Area	☐	☐	☐		One washout pit for every 40 lots
Soil Stabilization:					
Seeding/sodding schedule/timing	☐	☐	☐		Applied within 14 days of reaching final grade or suspending work
Slope Protection:					
Silt Fence downslope of bare areas	☐	☐	☐		
Silt Fence installed along contour	☐	☐	☐		
Erosion Control Blankets on slopes	☐	☐	☐		Conforms with Fig. 11-1 in LFUCG Stormwater Manual
Drainage System Control:					
Inlets Protected	☐	☐	☐		
Pipe Outfall Erosion Prevention	☐	☐	☐		
Channel Lining	☐	☐	☐		Sodding or seed w/ blankets/mats immediately after construction
Check Dams	☐	☐	☐		Max drainage area = 10 acres
Sediment Basins and Traps:					
Sediment Traps (drainage area < 5 ac)	☐	☐	☐		Minimum volume = 2yr-24hr runoff volume
Sediment Basins (drainage area = > 5 ac)	☐	☐	☐		Minimum volume = 2yr-24hr runoff volume
Good Housekeeping:					
Material storage addressed	☐	☐	☐		
Spill Prevention and Control addressed	☐	☐	☐		
Dust control addressed	☐	☐	☐		
Dewatering operations are filtered	☐	☐	☐		
Narrative:					
Schedule/sequence for BMP installation	☐	☐	☐		
BMP Inspection Requirement	☐	☐	☐		Every 7 days, or every 14 days and after 0.5" of rainfall
BMP Maintenance Requirement	☐	☐	☐		
Roadway Cleaning	☐	☐	☐		

LFUCG USE ONLY: Review Date: _____ **Status:** In Compliance: Y N Additional Info Needed: Y N

Reviewed By: _____ **Department:** _____

Comments / Items Missing or Incomplete:

Form Effective Date - January 13, 2011

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: _____

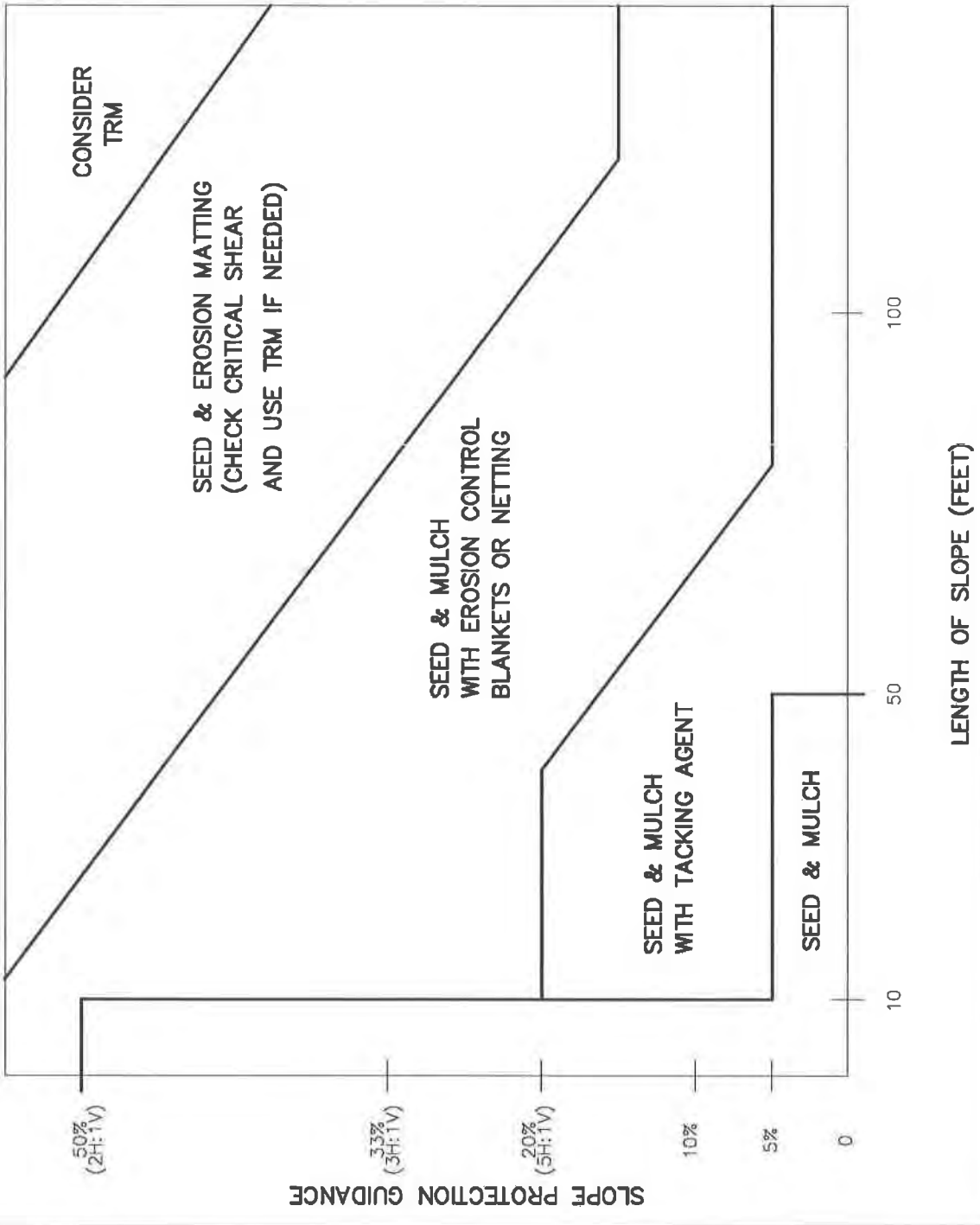
STORMWATER MANUAL

FIGURE 11–1

SLOPE PROTECTION GUIDANCE

(OCTOBER 1, 2016)

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.



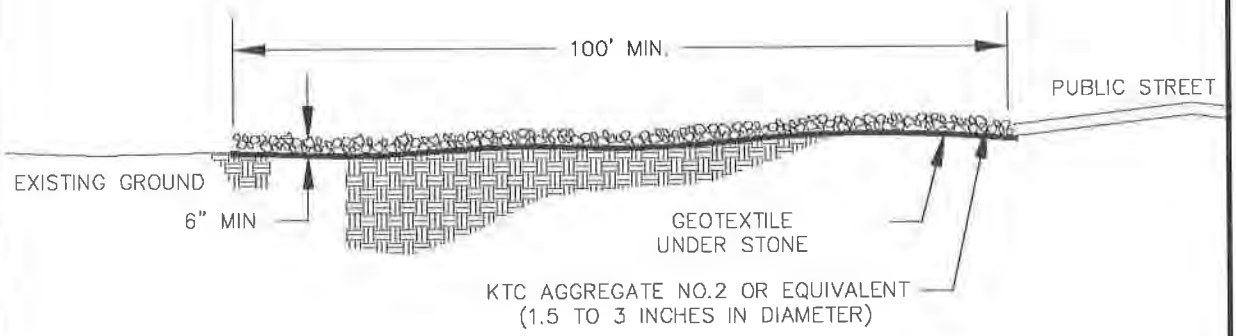
STORMWATER MANUAL

FIGURE 11–3

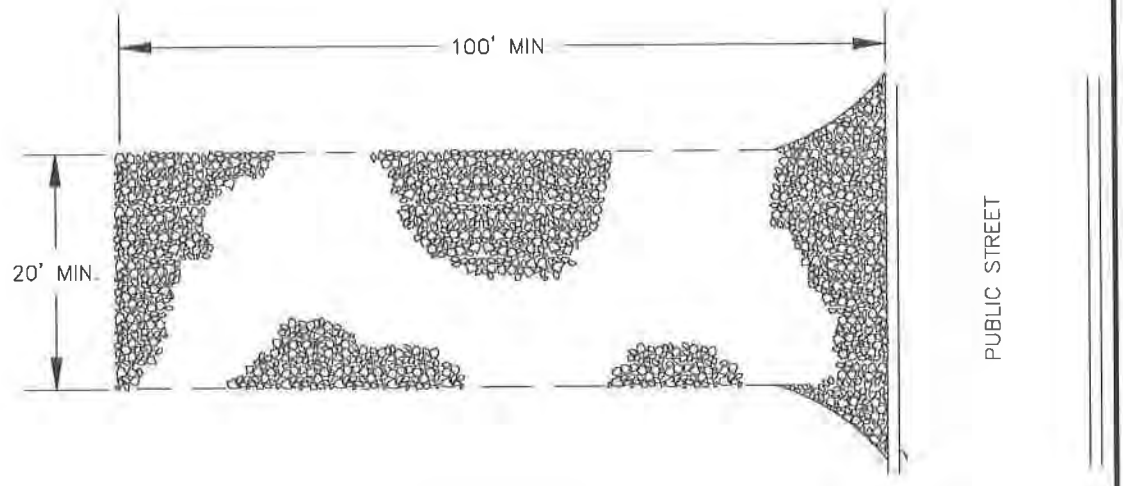
CONSTRUCTION ENTRANCE

(OCTOBER 1, 2016)

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.



CROSS SECTION



PLAN VIEW

STORMWATER MANUAL

FIGURE 11-5

STAPLE PATTERN FOR STRAW OR EXCELSIOR MATS

(OCTOBER 1, 2016)

SLOPES UP TO 1.5H:1V

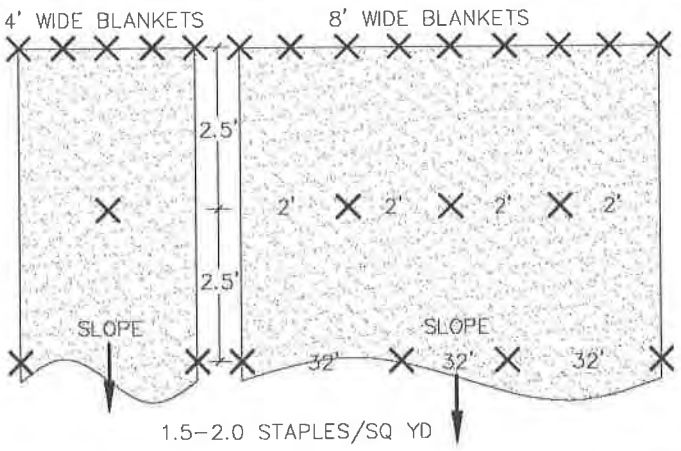
- INSTALL BLANKET VERTICALLY OR HORIZONTALLY
- USE 12" STAPLE SPACING ON STARTER ROW.

COHESIVE SOILS:

- NO OVERLAP REQUIRED ON SIDE SEAMS
- USE 6" STAPLE LENGTH

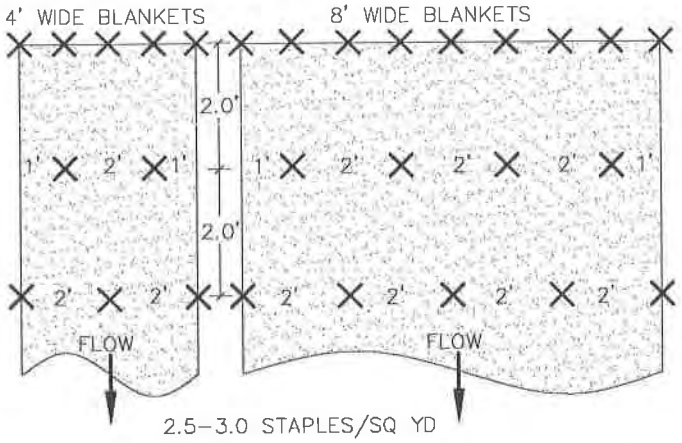
NON-COHESIVE SOILS:

- USE 6" SIDE SEAM OVERLAP
- USE 8" STAPLE LENGTH
- USE 6" ANCHOR TRENCH AT TOP OF SLOPE



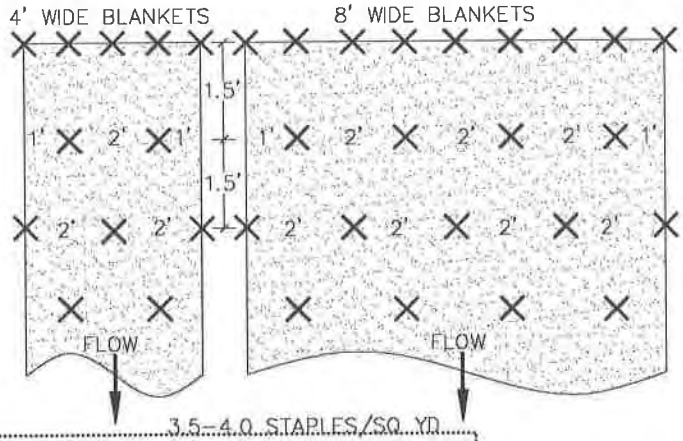
CHANNELS IN COHESIVE SOILS

- USE 6" SIDE SEAM OVERLAP
- USE 6" STAPLE LENGTH
- USE 6" TRANSVERSE ANCHOR TRENCH AT 100-FT. INTERVALS
- USE 12" STAPLE SPACING ON STARTER ROW.
- UPSTREAM BLANKET SHOULD OVERLAP DOWNSTREAM BLANKET A DISTANCE OF 12" IN A "SHINGLE" FASHION AND BURY THE FINISHED TOE AT LEAST 6".



CHANNELS IN NON-COHESIVE SOILS

- USE 6" SIDE SEAM OVERLAP
- USE 8" STAPLE LENGTH
- USE 6" TRANSVERSE ANCHOR TRENCH AT 50-FT. INTERVALS
- USE 12" STAPLE SPACING ON STARTER ROW.
- UPSTREAM BLANKET SHOULD OVERLAP DOWNSTREAM BLANKET A DISTANCE OF 12" IN A "SHINGLE" FASHION AND BURY THE FINISHED TOE AT LEAST 6".



NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

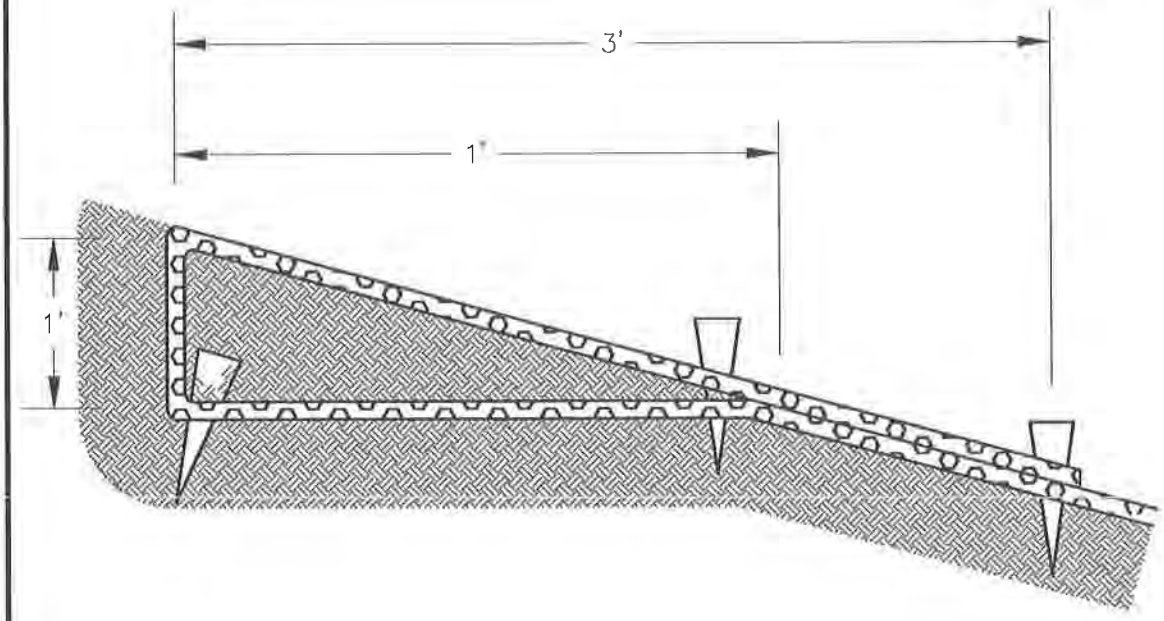
STORMWATER MANUAL

FIGURE 11–7

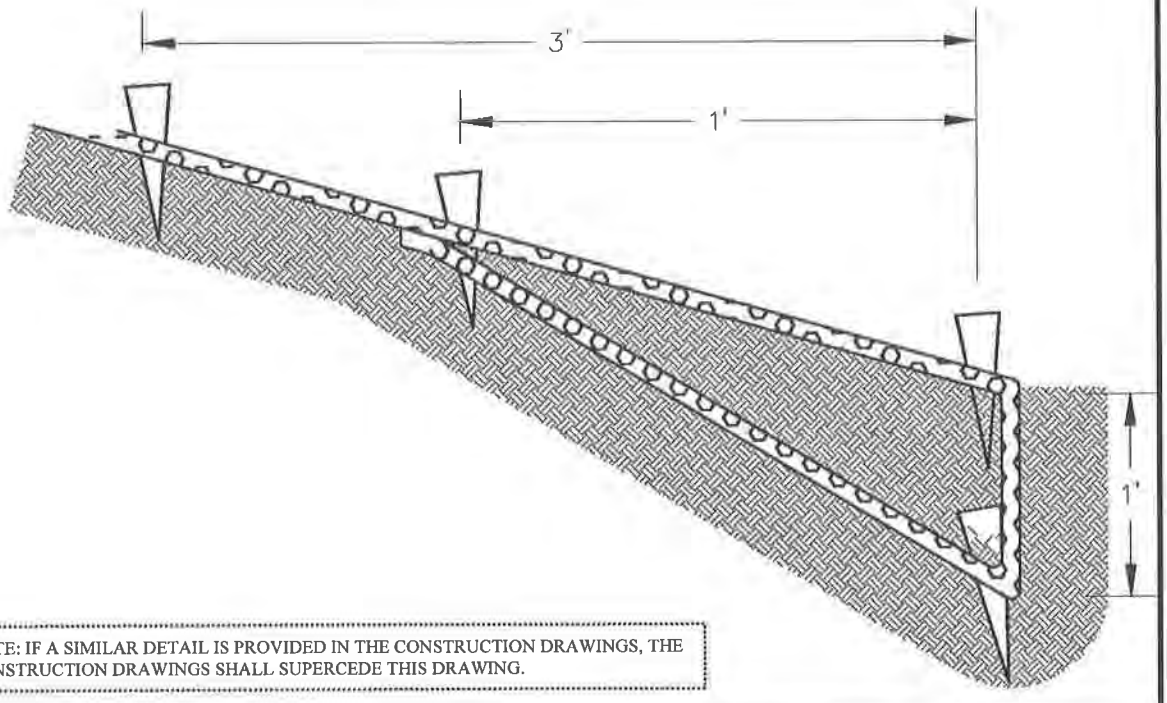
ANCHOR SLOT DETAILS FOR TRM

(OCTOBER 1, 2016)

UPSTREAM ANCHOR SLOT DETAIL



DOWNSTREAM ANCHOR SLOT DETAIL



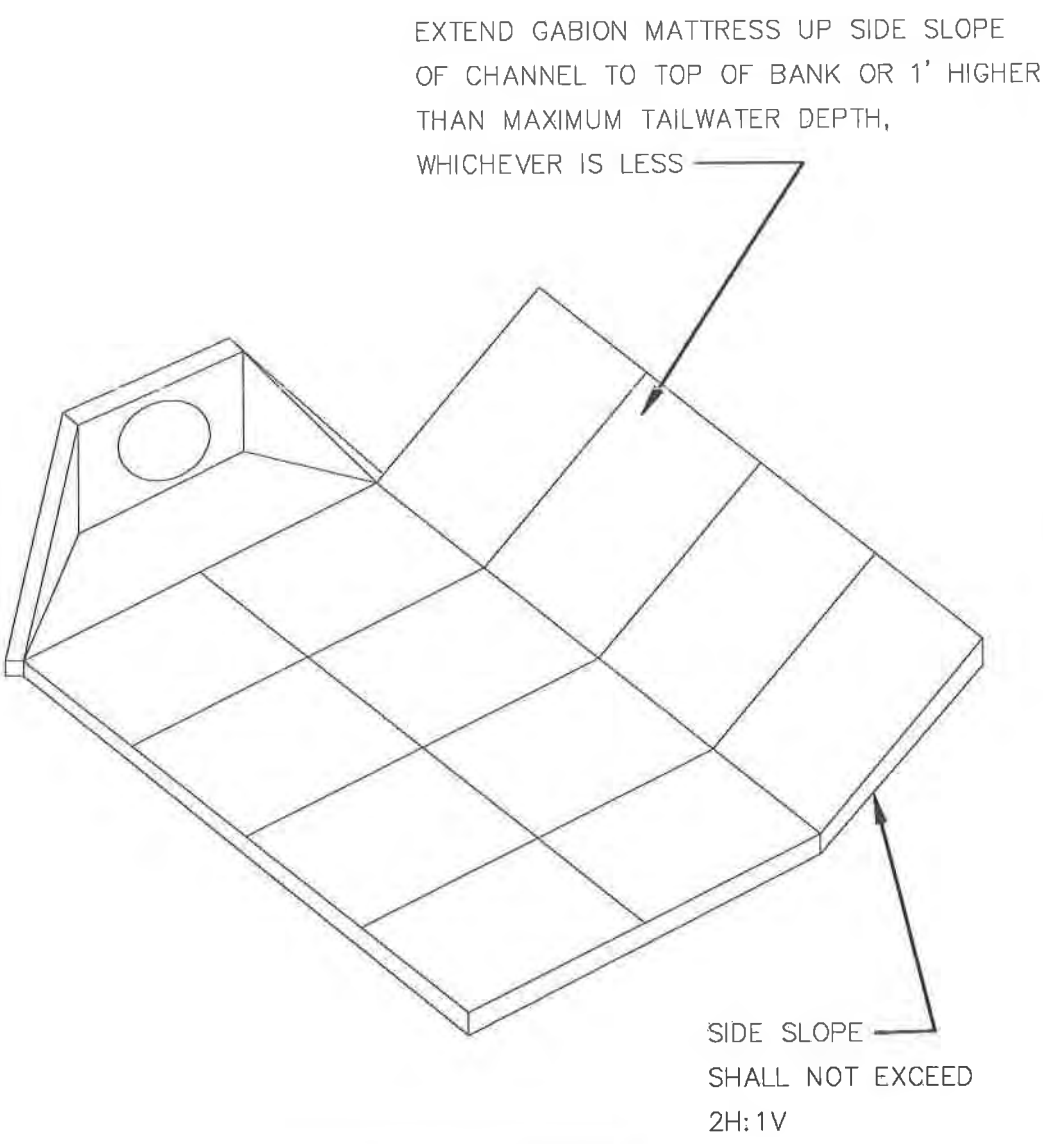
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–9

GABION MATTRESS AT OUTLET INTO WELL–DEFINED CHANNEL

(OCTOBER 1, 2016)



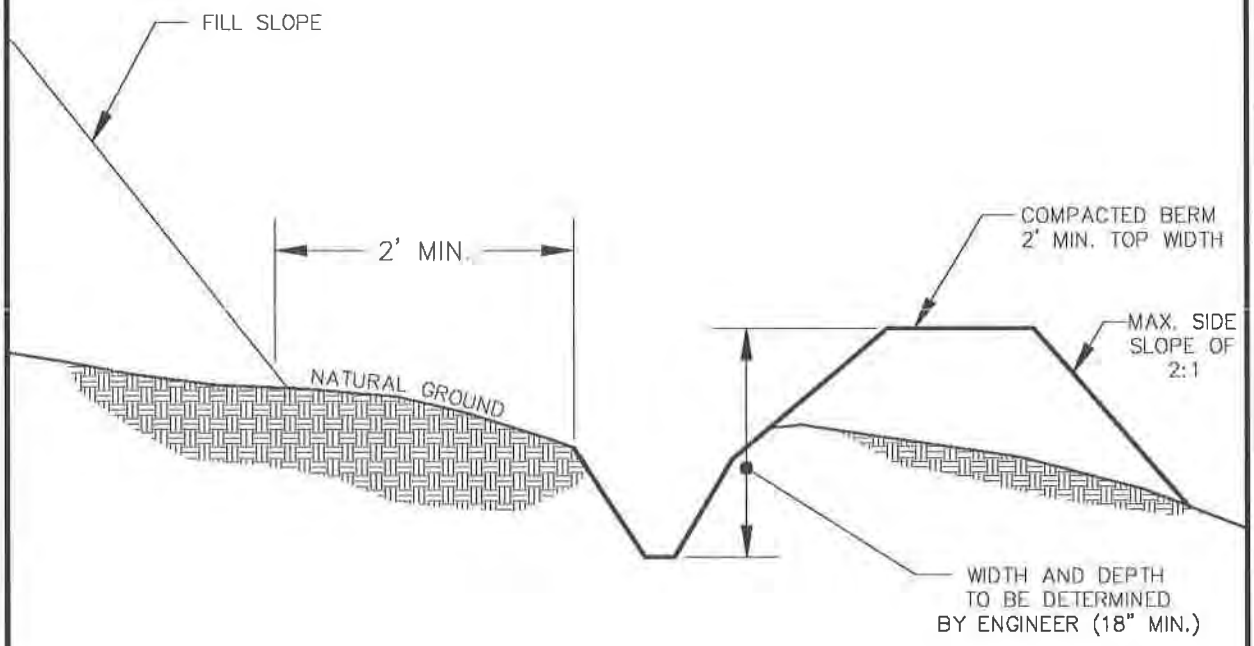
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–12

TEMPORARY DIVERSION DITCH

(OCTOBER 1, 2016)



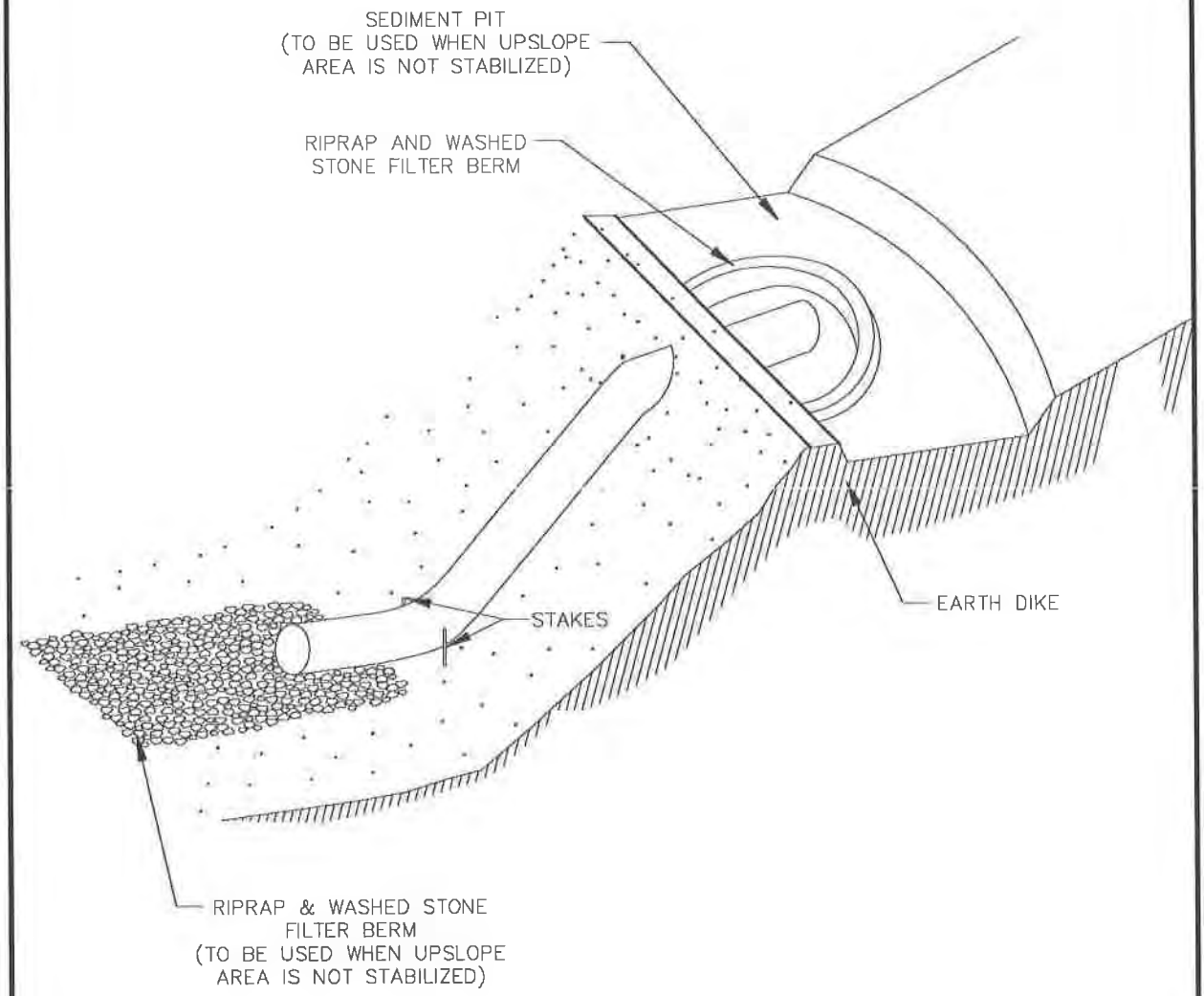
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–14

FLEXIBLE PIPE SLOPE DRAIN

(OCTOBER 1, 2016)



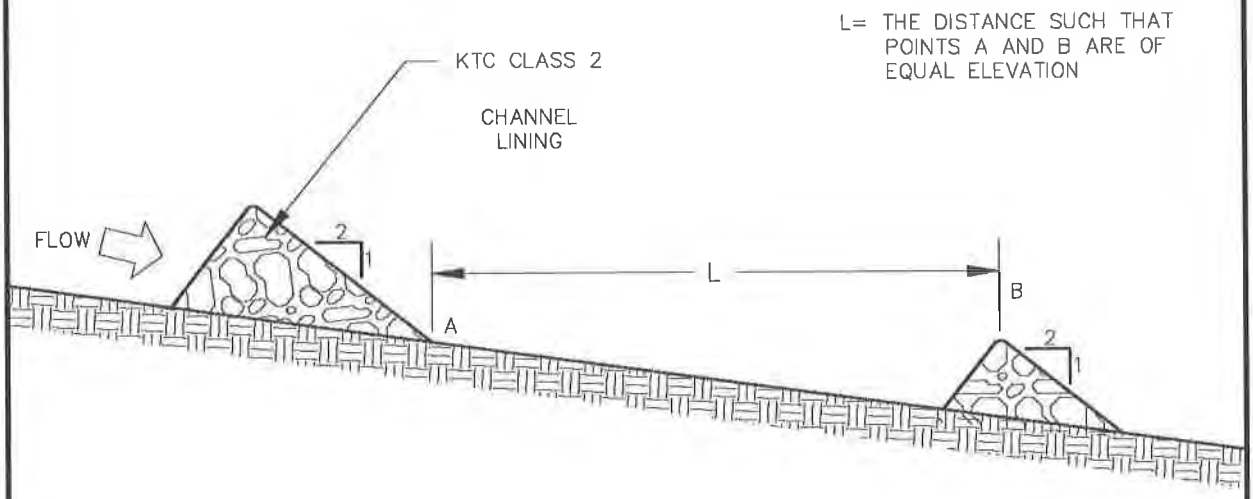
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

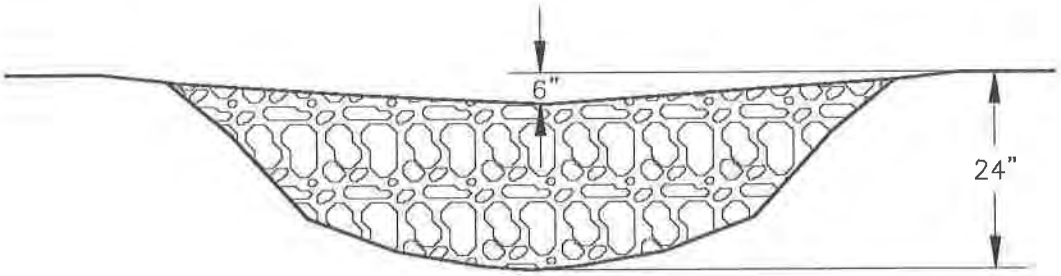
FIGURE 11–16

ROCK CHECK DAM

(OCTOBER 1, 2016)



LONGITUDINAL SECTION SHOWING SPACING BETWEEN CHECK DAMS



SECTION ACROSS CHANNEL

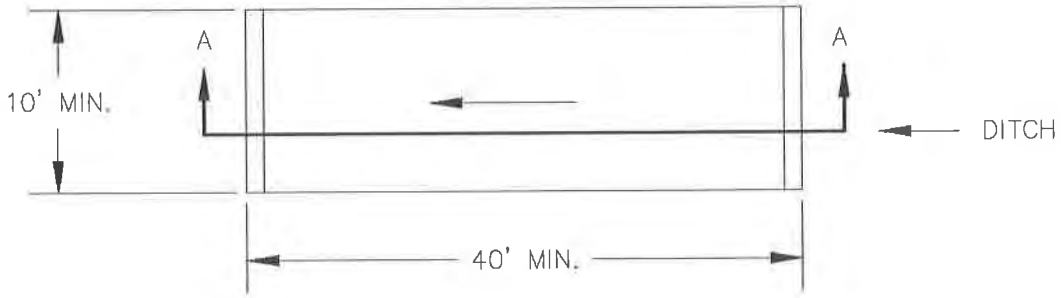
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

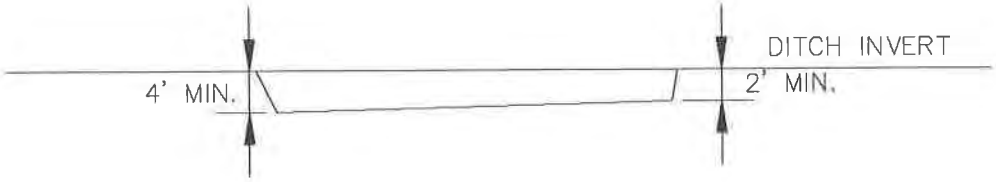
FIGURE 11–18

SEDIMENT TRAP

(OCTOBER 1, 2016)



PLAN VIEW



SECTION A–A

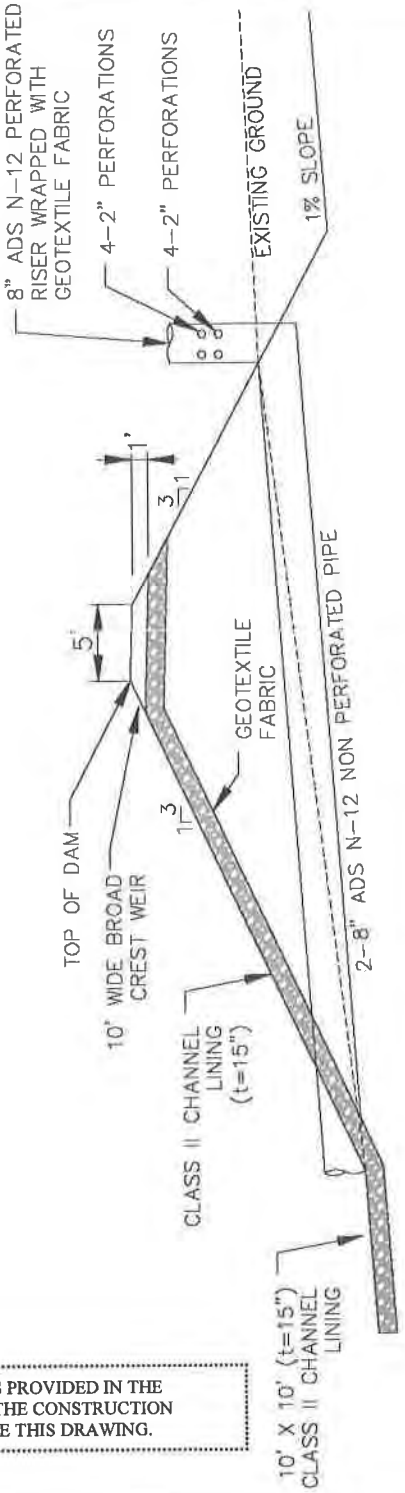
NOTES:

1) THE SIZE, SHAPE AND LOCATION OF TRAP MAY BE ADJUSTED FROM THAT SHOWN IN THE CONSTRUCTION PLANS, AS DIRECTED BY THE ENGINEER.
2) THE SEDIMENT TRAP MAY BE CONSTRUCTED AS DIRECTED BY THE ENGINEER AS LONG AS THE AREA AND DEPTH IS AT LEAST AS THAT INDICATED ON THE PLANS.
3) SEDIMENT TRAP SHALL BE CONSTRUCTED BY EXCAVATING THE BASIN IN NATURAL OR EXCAVATED CHANNELS. SEDIMENT DEPOSITS IN TRAP SHALL BE REMOVED EACH TIME THE TRAP IS APPROXIMATELY 50 PERCENT FILLED. WHEN THEIR USEFULNESS HAS ENDED, THE TRAPS SHALL BE REMOVED, SURPLUS MATERIAL DISPOSED OF AND THE ENTIRE DISTURBED AREA SHALL BE SEEDED AND PROTECTED, OR SODDED, AS DIRECTED. SEDIMENT TRAPS MAY REMAIN IN PLACE UPON COMPLETION OF THE PROJECT ONLY WHEN PERMITTED BY THE ENGINEER OR THE PLANS.

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–20
TEMPORARY SEDIMENTATION BASIN
OUTLET STRUCTURE / SPILLWAY
DETAIL
(OCTOBER 1, 2016)



TEMPORARY SEDIMENTATION BASIN
OUTLET STRUCTURE / SPILLWAY
N.T.S.

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–22

TEMPORARY SILT FENCE
GENERAL NOTES

(OCTOBER 1, 2016)

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.
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.

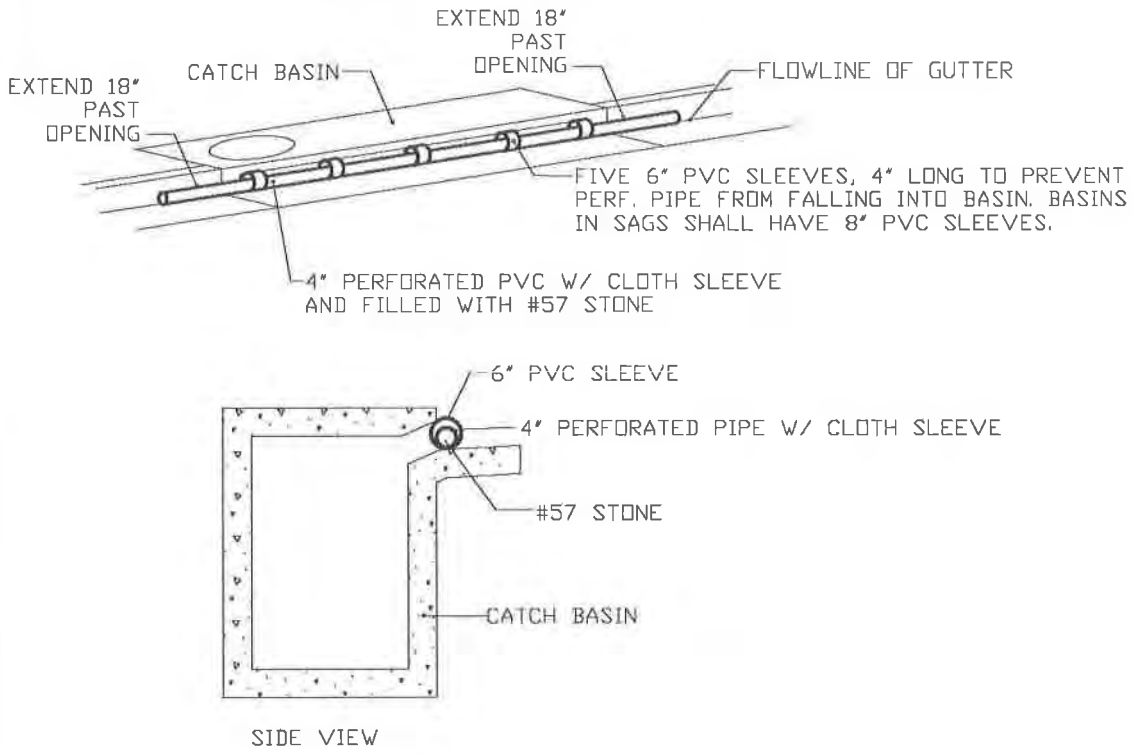
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–24

CATCH BASIN INLET PROTECTION DETAIL

(OCTOBER 1, 2016)



CATCH BASIN INLET PROTECTION DETAIL

N.T.S.

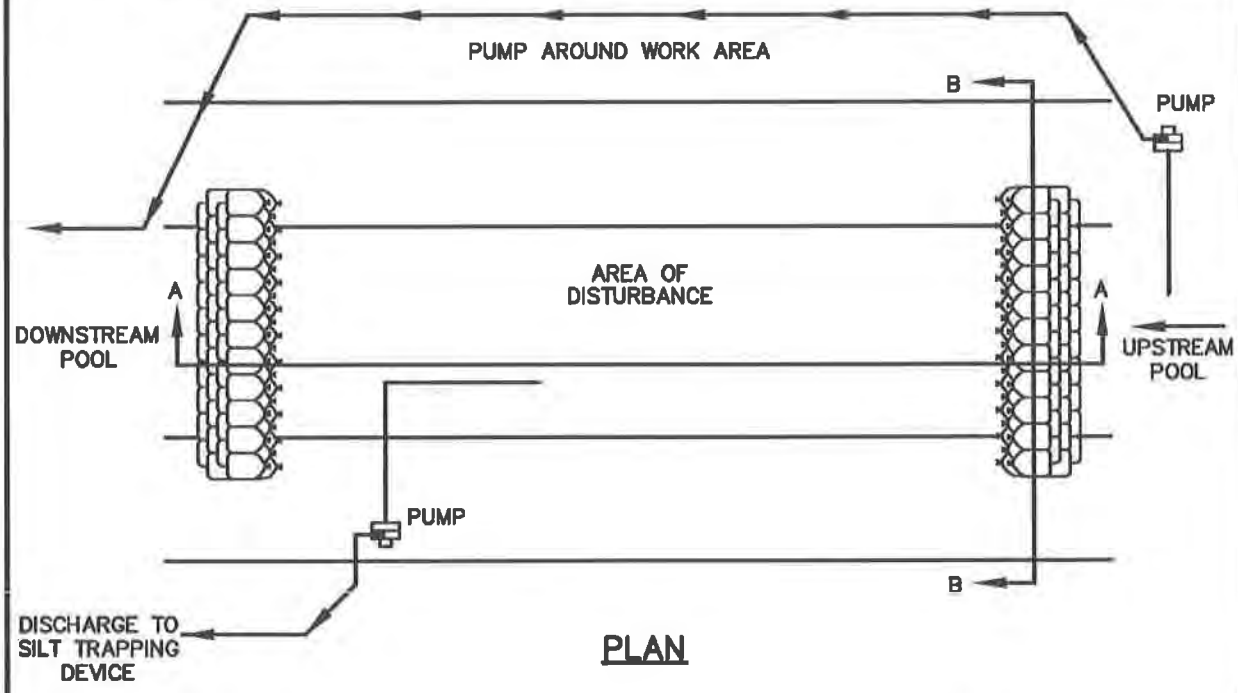
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–26

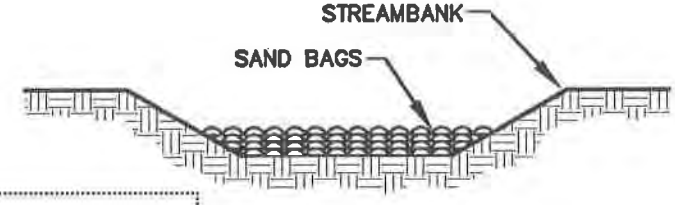
PUMP–AROUND FLOW DIVERSION

(OCTOBER 1, 2016)



PLAN

SECTION A–A



NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

SECTION B–B

SECTION 02373 – STREAM CROSSINGS, STREAMBANK RESTORATION, AND STREAM BUFFER 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 crossings, streambank restoration, and stream buffer restoration areas. Work in this section may include installation of Constructed Riffles, Temporary Stream Crossings, Streambank Restoration, and/or Stream Buffer Restoration.

B. The Contractor shall take all measures necessary to minimize the use of equipment within the banks of a stream.

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. Stream buffer seeding 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.

B. The Stream Buffer Permanent Seed Mix shall consist of the following mix spread at a rate of 20 lbs/acre:

Common Name	Scientific Name	%	Lbs/ac
Redtop	*Agrostis alba*	10%	2
Elm-leaved Goldenrod	*Solidago ulmifolia*	5%	1
Big Bluestem	*Andropodon gerardii*	20%	4
Virginia Wild Rye	*Elymus virginicus*	20%	4
Prairie Switchgrass	*Panicum virgatum*	15%	3
Cutleaf Coneflower	*Rudbeckia laciniata*	5%	1
Ox Eye Sunflower	*Heliopsis helianthoides*	5%	1
River Oats	*Chasmanthium latifolium*	15%	3
Black-eyed Susan	*Rudbeckia hirta*	5%	1
TOTAL		**100%**	**20**

fibrous roots and the root mass shall contain its shape when removed from the container. Plant material with broken containers shall be rejected. All rejected plant material shall be removed from the project site by the Contractor by the close of each working day.

F. Fertilizer for container plants shall be MYCOtabs 20-10-5 slow release mycorrhizal fertilizer tablets or equivalent.

2.04 LIVE STAKES

A. Live stake plant species shall be silky dogwood unless otherwise denoted in the Construction Drawings. Cuttings shall be alive, but dormant, with side branches removed and bark intact.

B. Cuttings shall be ½ to 2-inch diameter stock and 3 feet in length.

C. The basal ends of the cuttings shall be cut on an angle to facilitate insertion into the soil.

D. The materials may be collected or purchased.

E. No species shall be substituted without prior written approval from the Owner.

F. Cuttings shall be bagged and/or bundled by species and shall be identified with durable and waterproof labeling and/or weatherproof ink. Labels shall state the scientific name of the plant species grouping. Common names are not acceptable. The scientific names must match those in the specification. Plants that are unlabeled or improperly labeled shall not be accepted.

G. Plant material that is damaged or desiccated, or does not meet the material specifications shall not be accepted. All rejected plant material shall be removed from the project site by the Contractor by the close of the working day.

2.05 BRANCH PACKING

A. Material may consist of branches of silky dogwood species. Branches should be a minimum of 5 feet long and should be installed the same day that they are prepared, if harvested locally. Materials can be either harvested from existing living trees or purchased from a vendor. If immediate planting cannot be performed, the basal end of the plant shall be kept in water and the plant shall be refrigerated.

2.06 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 Construction Drawings.

2.07 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

D. Biodegradable wooden stakes shall be inserted sporadically within void spaces and areas with puckers in the fabric.

3.04 CONTAINER PLANTS

A. Planting operations shall be performed only during periods when successful results are likely. To minimize stress or transplant shock, no plants shall be installed when ambient temperatures are forecasted to rise above 90°F at any point during a forty-eight (48) hour period following installation. In addition, no plants shall be installed when ambient temperatures are forecasted to drop below freezing. In general, trees and shrubs do best when planted in early spring or fall.

B. If trees and shrubs are not planted through erosion control blanket, then mulch in the form of hardwood mulch or mulch mats shall be used.

C. The Contractor shall mulch and fertilize.

D. All trees and shrubs should be fertilized with MYCOtabs 20-10-5 slow release mycorrhizal fertilizer tablets or equivalent. Each containerized plant should receive one 21 gram tablet. All fertilizer tablets are to be installed 4 inches below and 4 inches to the side of the plant roots.

E. All plants shall be watered thoroughly once unloaded and immediately after planting. Water until saturated once per week for the first four to six weeks and once every other week through the fall season. Water shall not contain elements toxic to plant life.

F. Prior to shipping to the site, the Contractor shall request approval of trees, shrubs, and fertilizer ordered. A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery of trees and shrubs.

G. If plants are not planted on the day of delivery, the plants shall be stored onsite in a shaded location and will be kept moist and cool.

H. Each root ball from containerized woody stock shall be carefully removed from the container without damaging the root system or plant.

I. When digging a planting hole for containerized woody stock, the diameter of the planting hole shall be at least 30% greater than the diameter of the root ball.

J. Trees and shrubs shall be placed in the center of the hole with top of root ball 1 inch above finished grades.

K. Following planting, each hole shall be backfilled with soil removed from the hole when the hole was formed.

L. Where the removed soil is unacceptable, a soil amendment shall be required.

M. Each planted tree and shrub shall have a minimum depth of 6 inches of organic material.

N. Organic soil amendment may consist of composted wood chips, composted leaf mulch, or other suitable and available natural organic material.

O. If amending the planting areas with topsoil, acceptable topsoil shall meet the material requirements of this **Section 02373**, Article 3.08 - Topsoil.

P. Containerized trees and shrubs planted through erosion control blanket shall be planted through clean incisions in the blanket. Incisions shall be parallel to the direction of flow in the stream.

C. Branches shall be soaked for 24 hours prior to installation in clear water, with the basal end of the plant in the water and shall be removed from the water no more than 1 hour before planting.

D. Branches shall not be soaked for a length greater than ten (10) days.

E. The live branches should be placed in a crisscross configuration with the growing tips generally oriented toward the slope face.

F. The density of the branches shall be 10-15 branches per linear foot.

G. After the live branches are configured, cover with a thin layer of soil approximately 1" thick.

3.07 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 Construction Drawings and shall be placed in the manner shown in Construction Drawings.

3.08 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.

3.09 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:

required on the project.) Contractor shall remove all sandbags from the stream, including damaged and empty bags.

3.10 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

[Note to engineer: Verify that the most up to date version is included prior to advertising the project.]

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SECTION 02445

UTILITY HAND TUNNELING (UHT)

PART 1 - GENERAL

1.01 SCOPE

A. The work described by this Section consists of furnishing all labor, materials, equipment and supplies required for tunnel construction including excavation by open face hand mining techniques such as tunnel workers using pneumatic hand tools, roadheader machine, or drill and blast methods as required to install the initial tunnel support and stabilize the tunnel bore. This Section also includes the use of compressed air to prevent inflow of groundwater as needed. Initial tunnel support shall be in accordance with Section 02425 – Initial Tunnel Support and 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. **(Neither section is included/required for this project Scope).**

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 that have been 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, tunnel excavation tooling and sizing, equipment and materials necessary for tunnel excavation, and initial tunnel support materials best suited for ground conditions as required to maintain face stability, 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,

8. Control equipment and required power.

9. 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) permits 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

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 Kentucky Department of Environmental Protection (DEP).

1.04 DEFINITIONS

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 combination of utility hand tunneling methods shall be capable of mining through and/or removing solid rock, cobbles and boulders from the tunnel alignment as needed to complete tunnel installation.

E. All design calculations provided by the Contractor as part of the required submittals shall be sealed by a licensed Professional Engineer licensed 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.

2. Manufacturer and type of tunneling equipment proposed including specifications and type and output of lighting and ventilation systems.

3. Drawings and design details for entrance shaft and exit shaft, indicating number required, proposed spacing, or criteria for installing, and method of operation.

4. Number and duration of shifts planned to be worked each day in accordance with restrictions on work hours,

5. Sequence of work/operations.

6. Procedures for handling, control and disposal of surface water, water input to the tunnel by Contractor and groundwater inflow.

7. 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.

8. Survey methods and proposed procedures for alignment and grade control.

9. Identification of critical utility crossings and special precautions proposed.

10. Manufacturer and type of any lubricants and chemical grouts proposed.

C. Initial support design shall be in accordance with **Section 02425 – Initial Tunnel Support (Not included/required for this project Scope)**.

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

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 on this Project.

B. The Contractor or Subcontractor shall have the following minimum experience related to utility hand tunneling (UHT):

1. A minimum of five (5) years of experience performing utility hand tunneling with pneumatic hand tool excavation, modified soft ground excavation, SEM/NATM methods, or under compressed air on tunnels of similar diameter (or similar rectangular excavation cross-section) and scope.

2. Installed a minimum of 2,000 linear feet of carrier pipe within a utility tunnel.

3. Excavated by pneumatic or SEM/NATM methods, and appropriately installed initial tunnel supports, a minimum of 2,500 linear feet of 54-inch or larger diameter tunnel (or rectangular excavation cross-section greater than or equal to minimum tunnel diameter) in moderate strength or higher hard rock conditions.

4. Three (3) tunnel projects completed in moderate strength or higher hard rock meeting the following conditions:

    a. completed in the last 10-years,
    b. excavation performed by pneumatic, or SEM/NATM methods,
    c. individual, single drives of 400 LF or greater,
    d. built in-place initial tunnel support such as rib and wood lagging, steel liner plate, concrete segments, or rock bolts and mesh,
    e. carrier pipe installed and grouted in-place following tunnel completion.

5. Experience including three (3) underground construction projects completed in the last ten (10) years that involved the design and construction of a temporary or permanent shaft meeting the following conditions:

    a. excavated in soft rock and clays while controlling the face of excavation and preventing breakout with hand excavation techniques,

    b. shaft invert requiring dewatering.

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 implementation.

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 to the materials.

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 LFUCG.

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 support system shall be in accordance with **Section 02425 – Initial Tunnel Support (Not included/required for this project Scope)**.

PART 3 – EXECUTION

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. When not in operation, isolate with additional measures approved by the Engineer and Owner as required to prevent unauthorized personnel from accessing.

1. Tunneling operations shall be conducted 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 0.25 inch.

3. If the ground subsidence or heave exceeds 0.25 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 required to install the initial support system 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 pit/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. Entrance and exit shaft subgrade shall be kept continuously free from ground and surface waters during tunneling operations. Dewatering shall be controlled such that the entrance and exit shafts are free of water, but the surrounding ground water 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 bags in accordance with all applicable regulatory requirements and the approved Erosion & Sedimentation Control Plan.

3.07 INSTALLATION – ENTRANCE AND EXIT SHAFTS

A. Excavate entrance 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 ground water. 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, and stormwater control requirements.

E. Do not apply loads to concrete until it has achieved required design strength.

F. 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. 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.

C. 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.

D. Install initial tunnel support system immediately during excavation. Install initial support in accordance with **Section 02425 – Initial Tunnel Support (Not included/required for this project Scope).** 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.

E. If tunnel conditions require changes to the installation method or material, the Contractor shall submit complete information on proposed changes to Engineer for review prior to making any changes.

F. 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 closed.

corrections to avoid reverse grades in gravity sewers. 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.

H. Initial support shall be clearly marked with paint every 50-feet along the tunnel with stationing as indicated on the drawings.

3.12 REPORTS

A. Maintain and submit daily activity reports in accordance with Article 1.06.

3.13 INSTALLATION OF CARRIER PIPE

A. Install carrier pipe in initial support system in accordance with **Section 02426 – Installation of Carrier Pipe in Tunnels (Not included/required for this project Scope).**

3.14 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.

3.15 SITE RESTORATION

A. Site restoration shall be in accordance with the Drawings and applicable sections of these specifications.

END OF SECTION

SECTION 02531 – SEWAGE FORCE MAINS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Provide all labor, materials, equipment and services required for furnishing and installing all force main pipe and appurtenances as specified and shown on Drawings.

PART 2 - PRODUCTS

2.01 POLYVINYL CHLORIDE (PVC) PLASTIC PRESSURE PIPE

A. AWWA C905 (Outside Diameter compatible with Cast Iron O.D.)

1. 14-inch through 36-inch PVC plastic pipe shall conform to ANSI/AWWA C905. Pipe shall be pressure Class 165, DR 25 for 14-inch through 16-inch; pressure Class 200, DR 21 for 18-inch through 36-inch. PVC pipe shall have a minimum laying length of 12 feet, with 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.

2. Joints for polyvinyl chloride (PVC) mains shall be integral bell and spigot type joints with rubber o-ring gasket. The cleaning and assembling of the pipe joints shall be in accordance with manufacturer's recommendations.

3. Pipe color shall be green.

4. Fittings shall be DI in the same pressure class as pipe with Protecto 401 lining as specified in this Section.

B. AWWA C900 (Outside Diameter compatible with Cast Iron O.D.)

1. 8-inch through 12-inch PVC plastic pipe shall conform to ANSI/AWWA C900. Pipe shall be pressure Class 165, DR 25. PVC pipe shall have a minimum laying length of 12 feet, with 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.

2. Joints for polyvinyl chloride (PVC) mains shall be integral bell and spigot type joints with rubber o-ring gasket. The cleaning and assembling of the pipe joints shall be in accordance with manufacturer's recommendations.

3. Pipe color shall be green.

4. Fittings shall be DI in the same pressure class as pipe with Protecto 401 lining as specified in this Section.

C. Pipe shall be as manufactured by JM Eagle, H & W Pipe Company, Diamond Plastics, or equal.

2.02 RESTRAINT DEVICES FOR POLYVINYL CHLORIDE PLASTIC (PVC) PIPE

A. Each restraint system shall be manufactured of ductile iron conforming to ASTM A536. A backup ring shall be utilized behind the PVC Bell. A restraint ring incorporating a plurality of individually actuating gripping surfaces shall be used to grip the pipe then bolted to the

(a) ASTM B-117 Salt Spray (scribed panel) – Results to equal 0.0 undercutting after two years.

(b) ASTM G-95 Cathodic Disbondment 1.5 volts @ 77°F. Results to equal no more than 0.5 mm undercutting after 30 days.

(c) Immersion Testing rated using ASTM D-714-87.

i. 20% Sulfuric Acid – no effect after two years
ii. 25% Sodium Hydroxide – No effect after two years
iii. 160°F Distilled Water – No effect after two years
iv. 120° Tap Water (scribed panel) – 0.0 undercutting after two years with no effect.

(3) An abrasion resistance of no more than 4 mils (.10 mm) loss after one million cycles European Standard EN 598: 1994 section 7.8 Abrasion resistance.

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 using the guidelines outlined in DIPRA-1 Solvent Cleaning. 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 Protecto 401. 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 Protecto 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

I. Pipe shall be as manufactured by U.S. Pipe and Foundry Company, Clow, American Pipe Company, or equal.

J. 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.

2.04 FIBERGLASS REINFORCED POLYMER MORTAR PIPE (FRPM)

A References

1. ASTM D3754 – Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer and Industrial Pressure Pipe.

2. ASTM D4161 – Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastorneric 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. [Design Engineer must specify pressure class as required]

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 D362.

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 02531**.

2.05 PRESTRESSED CONCRETE CYLINDER PIPE (PCCP) – DOES NOT APPLY TO THIS PROJECTS SCOPE

A. Unless otherwise specified, the design materials and workmanship for pipe shall conform to the requirements of AWWA C301. Core and coating thickness for pipe shall be as specified in AWWA C301.

B. Prestressed concrete cylinder pipe and fittings shall be manufactured by Hanson Pressure Pipe, Grand Prairie, TX or equal.

C. Design Conditions

   1. Pipe shall be designed in accordance with the AWWA C304 Standard, using the following design conditions; these conditions shall also be used in designing fittings that include a Portland cement mortar interior and exterior coating of the steel cylinder:

      a. External Loading

         (1) The earth load shall be taken as the greater of the following:

            (a) Depth from existing ground level to top of pipe as shown on plans, or

            (b) Five feet minimum in all cases.

         (2) Earth loads shall be computed using the following parameters:

            (a) Unit Soil Weight = 120 pounds per cubic foot

            (b) TYPE R___ Bedding

            (c) Bedding angle = ___°

         (3) Live loads shall be calculated as:

            (a) Pipe in streets and other paved areas: AASHTO HS-20 for two trucks passing

            (b) Pipe within railroad right-of-way: AREA Cooper E-80

            (c) Both HS-20 and E-80 live loads shall be computed in accordance with the American Concrete Pipe Association "Concrete Pipe Design Manual" or "Concrete Pipe Handbook".

      b. Internal Pressure

         (1) Design working pressure (Pw) shall be ____ psi

         (2) Surge Pressure (Pt) shall be ____ psi.

         (3) Field Test Pressure (Pft) shall be ____ psi.

D. Fittings

steel ring is drawn down into position to form a lock between the bell and spigot by tightening a single steel bolt.

Both joint types shall be capable of transmitting the longitudinal thrust forces due to working pressure and test pressure and must be encased in grout after the joint has been completed and before the line is pressurized using special grout bands supplied by the pipe manufacturer.

Field welding of the joints for thrust restraint during initial installation can be done from inside the pipe or outside the pipe as permitted by the pipe manufacturer and applicable safety regulations.

L. The rubber gaskets shall be in accordance with AWWA C301 and shall be designed and manufactured so that the completed joint will withstand an internal water pressure in excess of the highest pressure to which the pipe will be subjected without showing any leakage by the gasket or displacement of it.

M. Bell and spigot wall fittings shall be the manufacturer's standard design. Wall fittings shall be supplied with adequate bracing to keep them round and true during transportation and installation.

N. Alignment for long-radius, curved sections as specified on the drawings may be produced by joint deflections of joints not to exceed that recommended by the manufacturer. Required deflections which are in excess of those recommendations shall be produced by beveling the spigot end of the pipe.

O. All Prestressed Concrete Cylinder Pipe shall include full thickness internal protection to prevent microbiologically induced corrosion with concrete admixture ConShield Technologies, Inc. or approved equal.

P. Pipe Manufacturer's Field Service Representative:

1. Pipe manufacturer shall provide a qualified Field Service Representative, who shall be available to be on the project site, with proper notice, from the Contractor's, Engineer's, or Owner's representative.

2. The Field Service Representative, who shall be an employee of the pipe manufacturer, must have experience as a representative of the pipe manufacturer in the area of providing such services. The individual may be a Registered Professional Engineer possessing a minimum of 2 years of experience in the area of manufacture of pipe, sales and service representation.

3. It is the intent of the Owner to be assured that the installation of this pipeline is performed in accordance with the specified standards and manufacturer's recommendations. Good installation procedures will assure integrity of the pipeline with the minimum amount of pipe joints required for completion of the main. Therefore, the Contractor shall include in his Bid as a minimum that the pipe manufacturer's Field Service Representative will be on-site for the following periods:

   a. Initial construction training and monitoring.
   b. Provide problem-solving assistance during construction.

2.06 COUPLING AND ADAPTORS

A. Flexible couplings shall be of the sleeve type with a middle ring, two wedge shaped resilient gaskets at each end, two follower rings, and a set of steel trackhead bolts. The middle ring shall be flared at each end to receive the wedge portion of the gaskets. The follower rings shall confine the outer ends of the gaskets, and tightening of the bolts shall cause the follower rings to compress the gaskets against the pipe surface, forming a leak-proof seal. Flexible couplings shall be steel with minimum wall thickness of the middle ring or sleeve

B. All pipes shall be laid with ends abutting and true to line and grade as given by the Engineer. Supporting of pipes shall be as set out hereinbefore under "Pipe Bedding" and in no case shall the supporting of pipes on blocks be permitted.

C. Before each piece of pipe is lowered into the trench, it shall be thoroughly inspected to insure it's clean. Each piece of pipe shall be lowered separately unless special permission is given otherwise by the Engineer. No piece of pipe or fitting which is known to be defective shall be laid or placed in the lines. If any defective pipe or fitting shall be discovered after the pipe is laid, they shall be removed and replaced with a satisfactory pipe or fitting without additional charge. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe.

D. Pipe shall not be laid on solid rock. Pipe bedding shall be installed prior to laying pipe. Irregularities in subgrade in an earth trench shall be corrected by use of #9 crushed limestone.

E. When ordered by the Engineer, unsuitable materials in subgrades shall be removed below ordinary trench depth in order to prepare a proper bed for the pipe.

F. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood or fabricated 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.

G. No backfilling (except for securing pipe in place) over pipe will be allowed until the Engineer has had an opportunity to make an inspection of the joints, alignment and grade, in the section laid.

3.04 BACKFILLING PIPELINE TRENCHES

A. Backfilling shall be in accordance with LFUCG Standard Drawings.

3.05 SETTLEMENT OF TRENCHES

A. Whenever lines are in, or cross, driveways and streets, the Contractor shall be responsible for any trench settlement which occurs within these rights-of-way within one year from the time of final acceptance of the work. If paving shall require replacement because of trench settlement within this time, it shall be replaced by the Contractor at no extra cost to the Owner. Repair of settlement damage shall meet the approval of the Owner and/or the State Department of Transportation.

3.06 CONCRETE THRUST BLOCKS OR ENCASEMENT

A. Concrete thrust blocks shall be formed and placed at all bends or where shown on the Drawings. Encasement of pipe bends or fittings shall only occur at the direction of the Engineer.

B. All bends and fittings shall be wrapped with a minimum of 6 mil plastic prior to concrete placement.

C. Concrete thrust blocks shall be placed against undisturbed or compacted earth.

D. Concrete trust blocks shall be 3000 psi concrete.

3.07 INSTALLATION OF PCCP AND FITTINGS

A. Prestressed concrete cylinder pipe and fittings shall be installed in accordance with

clock, designed for 9-inch charts, and shall be approved by the Engineer.

F. Duration of test shall be not less than 24 hours.

G. Where leaks are visible at exposed joints, evident on the surface where joints are covered and/or identified by isolating a section of pipe, the joints shall be repaired.

H. All pipe, fittings, valves, and other materials found to be defective under test shall be removed and replaced at no additional expense to the owner.

I. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are complied with.

J. The Contractor will provide water for testing the pressure piping.

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 within 2,000 LF downstream or to nearest manhole beyond 2,000 LF of a force main discharge 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 standard of quality is Protecto 401 Ceramic Epoxy. The material shall be an amine cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment. Any request for substitution must be accompanied by a successful history of lining pipe and fittings for sewer service, a test report verifying the following properties, and a certification of the test results.

(1) A permeability rating of 0.00 when tested according to Method A of ASTM E-96-66, Procedure A with a test duration of 30 days.

(2) The following test must be run on coupons from factory lined ductile iron pipe:

(a) ASTM B-117 Salt Spray (scribed panel) – Results to equal 0.0 undercutting after two years.

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

Protecto 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 be tested for pinholes with a non-destructive 2,500-volt test. Any defects found shall be repaired prior to shipment.

(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

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

Protecto 401 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

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 80-60-03 in accordance with ASTM A339-55.

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, Clow, 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. 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 D362.

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 02531.**

the requirements of AWWA C301. Core and coating thickness for pipe shall be as specified in AWWA C301.

B. Prestressed concrete cylinder pipe and fittings shall be manufactured by Hanson Pressure Pipe, Grand Prairie, TX or equal.

C. Design Conditions

1. Pipe shall be designed in accordance with the AWWA C304 Standard, using the following design conditions; these conditions shall also be used in designing fittings that include a Portland cement mortar interior and exterior coating of the steel cylinder:

a. External Loading

(1) The earth load shall be taken as the greater of the following:

(a) Depth from existing ground level to top of pipe as shown on plans, or

(b) Five feet minimum in all cases.

(2) Earth loads shall be computed using the following parameters:

(a) Unit Soil Weight = 120 pounds per cubic foot

(b) TYPE R3 Bedding

(c) Bedding angle = ___°

(3) Live loads shall be calculated as:

(a) Pipe in streets and other paved areas: AASHTO HS-20 for two trucks passing

(b) Pipe within railroad right-of-way: AREA Cooper E-80

(c) Both HS-20 and E-80 live loads shall be computed in accordance with the American Concrete Pipe Association "Concrete Pipe Design Manual" or "Concrete Pipe Handbook".

D. Fittings

1. Steel thickness of all fittings shall be designed in accordance with Chapter 8 of the AWWA M9 Manual. Fittings shall be designed for the same conditions as the adjacent pipe.

2. Fabrication of the fittings shall be as per AWWA M9 Manual and C301.

3. Interior and exterior concrete/mortar coating shall be as per AWWA C301.

E. The date of manufacture or a serial number traceable to the date of manufacture and the design strength classification shall be clearly marked by stencil with waterproof paint at the end of the pipe barrel. Unsatisfactory or damaged pipe will be permanently rejected, repaired in the field if permitted by the Engineer and the pipe manufacturer, or returned to the pipe plant for repairs. Pits, blisters, rough spots, minor concrete or mortar breakage, and other imperfections may be repaired unless prohibited by the Engineer. Repairs shall be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 3,000 psi at the end of 7 days and 4,500 psi at the end of 28 days, when tested in cylinders stored in the standard manner. Major breakage or spalling from interior of pipe may be reason for the rejection of pipe. Pipe may be repaired under unloaded conditions (removal of prestressing wire). Cement mortar used for repair shall have a

2.05 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 pii 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. Contractor shall contact the manufacturer for fill height limits involving hydrostatic pressure and include recommendations in the pipe submittal. 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.

throughout the length of the pipe shall be provided by tamping select fill in the haunch area and at the side of the pipe to achieve the required bedding support angle. BLOCKING WILL NOT BE PERMITTED.

B. Gasket, gasket groove, and bell sealing surfaces shall be cleaned and lubricated with a lubricant furnished by the pipe manufacturer. The lubricant shall be approved for use in potable water and shall be harmless to the rubber gasket. Use only lubricant supplied by the pipe manufacturer. Pipe shall be laid with bell ends looking ahead in the direction of laying. As soon as the spigot ring is centered in the bell of the previously laid pipe, it shall be forced home with approved equipment. After the gasket is compressed, verify the position of the gasket in the spigot ring groove with a feeler gage provided by the pipe manufacturer.

C. The grout diaper for PCCP shall consist of a Typar synthetic fabric layer (gray in color) and a layer of closed cell foam. These layers are sewn together along with a pair of 5/8" wide steel bands at each edge which are used to secure the diaper to the pipe exterior. Use only grout diapers supplied by the pipe manufacturer. A stretching tool is used to tighten the steel bands. Once the bands are pulled tight, a steel clip is crimped around the bands to hold them in position. It is important that the diaper be carefully placed against the exterior surface of the pipe to insure that it is flush with no gaps or gathers. The closed cell foam surface is to be placed against the pipe exterior.

The wet grout will flow down to the bottom of the diaper and begin to bulge it out. It is often helpful to place some bedding material (or sandbags) directly under the diaper at the bottom to support the weight of the wet grout. Take care to not push excessive amounts of bedding material under the diaper such that the diaper is pushed up into the joint recess impeding the flow of wet grout.

Mix the grout using one part ASTM C150 Type 1 or Type 2 portland cement to not more than three parts clean sand with sufficient water to achieve a pourable consistency. The grout should look and pour like a thick cream. Carefully pour the mixed grout into the gap at the top of the diaper. As the pouring proceeds, the workers must inspect the diaper around the joint periphery to insure that the grout is flowing all around. Once the diaper is full and wet grout is puddling at the gap at the top, apply a stiffer mix the consistency of wet brick mortar over the joint insuring that all steel components of the joint are covered.

3.04 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.

3.05 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 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. Cleaning shall be in accordance with **Section 02650**. TV survey shall be in accordance with **Section 02651.**

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

SECTION 02540 – PIPE ABANDONMENT

******Note to specifier: Existing sewer pipes that are to be abandoned during construction shall be called out on the drawings. Both gravity sewers and force mains shall follow this protocol. Public access paved areas shall include public roads, commercial/industrial driveways and parking lots and multi-family apartments with more than 2 units.**

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 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% by weight of cement.** The cementitious crystalline admixture shall be **Xypex C-1000 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 (in addition to the cementitious crystalline admixture listed in paragraph 2.01.C above), or approved equal.

E. Manholes located in the 100-year floodplain shall have a concrete base that includes an anti-flotation collar. The collar shall have a radius 6-inches larger than the exterior wall of the base section.

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.

A. Manholes steps shall be the polypropylene plastic type reinforced with a 1/2 inch diameter deformed steel rod. The step shall be 10-3/4 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 manhole boots shall conform to the latest revision of ASTM-C923. The boots shall be A-Lok Manhole Pipe Seal A-Lok Premium manufactured by A-Lok Corporation, Trenton, NJ; or an approved equal.

2.06 MANHOLE DIAPHRAGM (FOR WATERTIGHT LID APPLICATIONS)

A. 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 manholes susceptible to inflow as indicated on the Drawings.

B. 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.

C. 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.

D. 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.

E. 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.

F. 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.

G. Diaphragm shall be Rainstopper manufactured by Rainstopper, Inc. in color white, 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.

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 7 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 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

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

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

SECTION 02620 – STORM UTILITY PIPING

PART 1 – GENERAL

1.01 SUMMARY

The Contractor shall furnish all labor, material, and equipment necessary to install storm utility piping to replace existing storm piping with same material and in like manner.

1.02 SUBMITTALS

A. The Contractor shall comply with the requirements of **Section 01300** of the specifications.

B. 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 have a minimum cell classification of 12454B or 12454 C as defined in 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-17845 and ASTM F-679. Pipe and fittings shall have a minimum cell classification of 14545C. The minimum wall thickness shall conform to T-1 as specified in 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".

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

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 television (CCTV), 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

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

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 CCTV inspection.

PART 2 - PRODUCTS

2.01 EQUIPMENT

A. The 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, CCTV 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 CCTV 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, CCTV 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 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

SECTION 02700 - ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The asphalt concrete 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	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

SECTION 02765 - CURED-IN-PLACE PIPE LINING

PART 1 - GENERAL

1.01 REQUIREMENTS

A. It is the intent of this specification to provide for the reconstruction of pipelines and casing pipe by the installation of a resin-impregnated flexible tube which is formed to the original conduit and cured to produce a continuous and tight fitting Cured-In-Place Pipe (CIPP). Cured-In-Place Pipe shall be designed for wastewater application.

B. The work specified in this Section includes all labor, materials, accessories, equipment and tools necessary to install and test cured-in-place (CIPP) pipe lining as shown on the Drawings and as specified herein.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings and other information to the Owner for review in accordance with **Section 01300 - Submittals**.

B. With the bid, the following submittals are required:

Documentation as outlined herein under paragraph 1.06 A, including installation references of projects that are similar in size and scope to this project. The submittal shall include, at a minimum, the client contact name, phone number, and the diameter and footage of pipe rehabilitated. Documentation for product and installation experience must be satisfactory to the Owner.

C. After contract award, the following submittals are required.

1. The Contractor shall submit design data and specification data sheets listing all parameters used in the CIPP design and thickness calculations based on ASTM F1216 or F2019 and D2412 for "fully deteriorated gravity pipe conditions." All CIPP liner design calculations shall be sealed and signed by a registered professional Engineer in the Commonwealth of Kentucky. Submit P.E. certification form for all CIPP design data. Submit detailed installation procedures, lining production schedule and location, testing procedures and schedule, quality control procedures, liner curing procedures including heat-up and cool-down rates, curing temperature and duration, and shipping and storage requirements, schedule and procedures. Detailed design calculations as specified herein under paragraph 2.01 Q.

2. Various test results as specified herein under Section 2.03.

3. Documentation as specified herein for the Cure Report under Paragraph 3.08 A.

4. Documentation as specified herein for the Television Survey under Paragraph Section 3.10 Television Survey.

D. Curing log, including temperatures, pressures, and times during the curing process to document that a proper cure has been achieved. Curing log is to be submitted immediately after the curing is complete for each line segment that is rehabilitated.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. **Section 02650 – Sewer Line Cleaning**

C. The Owner shall approve or disapprove the Contractor and/or manufacturer based on the submitted information and a follow up interview, if warranted.

D. Inspection of the liner may be made by the representative of the Owner after delivery. The liner shall be subject to rejection at any time on account of failure to meet any of the requirements specified, even though sample liner may have been accepted as satisfactory at the place of manufacture. Liner rejected after delivery shall be marked for identification and shall be removed from the job site at once.

E. Sewer rehabilitation products submitted for approval must provide third party test results supporting the long term performance and structural strength of the product and such data shall be satisfactory to the Owner. Test samples shall be prepared so as to simulate installation methods and trauma of the product. No product will be approved without independent third party testing verification.

1.06 GUARANTEE

A. All CIPP lining placed shall be guaranteed by the Contractor and manufacturer for a period of one year from the date of final acceptance. During this period, defects discovered in the CIPP lining, as determined by the Owner, shall be removed and replaced in a satisfactory manner by the Contractor at no cost to the Owner. The Owner may conduct an independent television inspection, at his own expense, of the lining work prior to the completion of the one year guarantee period.

1.07 DELIVERY, STORAGE AND HANDLING

A. Care shall be taken in shipping, handling and storage to avoid damaging the liner. Extra care shall be taken during cold weather construction. Any liner damaged in shipment shall be replaced as directed by the Owner.

B. Any liner showing a split or tear, or which has otherwise received damage shall be marked as rejected and removed at once from the job site.

C. The liner shall be maintained at a proper temperature in refrigerated facilities to prevent premature curing at all times prior to installation. The liner shall be protected from UV light prior to installation. Any liner showing evidence of premature curing will be rejected for use and will be removed from the site immediately.

PART 2 - PRODUCTS

2.01 CIPP LINING

A. CIPP lining shall be Insituform by Insituform Technologies, Inliner by Inliner Technologies, Premier Pipe, Blue-Tek by Reline America, or approved equal.

B. The sewn tube shall consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F1216 or ASTM F1743, Section 5. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge breaks and missing sections of the existing pipe, and stretch to fit irregular pipe sections. The new jointless pipe-within-a-pipe must fit tightly against the old pipe wall and consolidate all disconnected sections into a single continuous conduit, substantially reducing or eliminating infiltration or exfiltration.

C. The wetout tube shall have a uniform thickness that when compressed at installation pressures will meet or exceed the Design thickness.

ASTM D-790 testing) will be used in design calculations for external buckling. The percentage, or the long-term creep retention value utilized, will be verified by this testing. Values in excess of 50% will not be applied unless substantiated by qualified third party test data. The materials utilized for the contracted project shall be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in design.

P. The minimum required structural CIPP wall thickness shall be based on the physical and structural properties described herein and in accordance with the design equations in the appendix of ASTM F 1216 or F 2019, and the following design parameters:

Design Safety Factor	2.0
Retention Factor for Long-Term Flexural Modulus to be used in Design *(as determined by Long-Term tests described in paragraph 2.03)*	50 %
Ovality*	2 %
Soil Depth (above crown)	Refer to Contract Plans
Design Condition	Fully deteriorated

Q. The lining manufacturer shall submit to the Owner for review complete design calculations for the liner, signed and sealed by a Professional Engineer registered in the Commonwealth of Kentucky and certified by the manufacturer as to the compliance of his materials to the values used in the calculations. The buckling analysis shall account for the combination of dead load, live load, hydrostatic pressure and grout pressure (if any). The liner side support shall be considered as if provided by soil pressure against the liner. The existing pipe shall not be considered as providing any structural support. Modulus of soil reaction shall be 1000, corresponding to a moderate degree of compaction of bedding and a fine-grained soil as shown in AWWA Manual M45, Fiberglass Pipe Design.

R. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If separation of the layers occurs during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.

S. Any layers of the tube that are not saturated with resin prior to insertion into the existing pipe shall not be included in the structural CIPP wall thickness computation.

2.02 END SEALS

A. A watertight seal shall be made at every manhole entrance and exit and all other terminus of the liner. End seals shall be made by using a hydrophilic seal such as Insignia or equal.

2.02 STRUCTURAL REQUIREMENTS FOR MAIN LINES

A. Resin shall be impregnated by vacuum application or approved equal. If reinforcing materials (fiberglass, etc.) are used, the reinforcing material must be fully encapsulated within the resin to assure that the reinforcement is not exposed, either to the inside of the pipe or at the interface of the CIPP and the existing pipe.

6. The extraction and labeling of test specimens shall be done in the presence of the Owner. The Owner and Contractor shall, upon completion of sample extraction and labeling, both sign a chain-of-custody form that shall subsequently accompany the sample at all times and shall ultimately be received and signed at the testing laboratory. Test reports shall include a copy of the chain-of-custody form with all signatures to ensure that reported test results are for the correct sample.

7. The flexural properties must meet or exceed the values specified herein.

8. Wall thickness of samples shall be determined as described in paragraph 8.1.6 of ASTM F1743.

9. Visual inspection of the CIPP shall be by closed-circuit television.

PART 3 -- EXECUTION

3.01 CLEANING/SURFACE PREPARATION

A. It shall be the responsibility of the Contractor to clean the pipeline with a high-pressure water jet and to remove all internal debris out of the pipeline in accordance with **Section 02650 - Sewerline Cleaning.**

3.02 SEWER REPAIRS

A. Any protruding pieces of concrete, dropped joints or broken pipe shall be subjected to point repairs so that the pipe is left in a clean smooth condition in all respects ready for lining, unless otherwise jointly determined by the Contractor and the Owner that the defect will not compromise the integrity of the liner.

B. If conditions such as broken pipe and major blockages are found that will prevent proper cleaning, or where additional damage would result if cleaning is attempted or continued, the Contractor, with the advance concurrence of the Owner, shall perform the necessary point repair(s), and then complete the cleaning.

3.03 JOINT, CRACK, ANNULAR SPACE, AND LINER END CHEMICAL SEALING

A. Prior to cured-in-place liner installation, all active leaks of a magnitude to compromise the integrity of the liner shall be stopped using chemical grout, at no additional cost to the Owner.

B. Materials used on this Project shall have the following properties: react quickly to form a permanent watertight seal; resultant seal shall be flexible and immune to the effects of wet/dry cycles; non-biodegradable and immune to the effects of acids, alkalis, and organics in sewage; component packaging and mixing compatible with field conditions and worker safety; extraneous sealant left inside pipe shall be readily removable; and shall be compatible with the CIPP liner resin system utilized. The chemical sealing materials shall be acrylic resin type and shall be furnished with activators, initiators, inhibitors and any other materials recommended by the manufacturer for a complete grout system. Sealing grout shall be furnished in liquid form in standard manufacturer's containers. Sealing grout shall be AV-100 manufactured by Avanti International or approved equal.

C. The Contractor shall modify his equipment as necessary to seal the leaks, however both his equipment and sealing method must meet the approval of the Owner prior to use. Extreme caution shall be utilized during leak sealing (pressure) operations in order to avoid damaging the already weakened sewer pipe. If any damage occurs, it shall be repaired at the Contractor's cost and to the satisfaction of the Owner. Excessive pumping of grout which might plug a service lateral shall be avoided. Any service laterals blocked by the grouting operation shall be cleared immediately by the Contractor.

B. Initial cure shall be deemed complete when the exposed portions of the tube appear to be hard and sound and the temperature sensor indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin manufacturer and may require continuous recirculation of the water to maintain the temperature. The Contractor shall have on hand at all times, for use by his personnel and the Owner, a digital thermometer or other means of accurately and quickly checking the temperature of exposed portions of the liner.

C. CIPP installation shall be in accordance with ASTM F1216, Section 7, ASTM F1743, Section 6 or ASTM F2019, with modifications as listed herein.

D. Resin Impregnation: The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. A vacuum impregnation or approved equal process shall be used. To insure thorough resin saturation throughout the length of the felt tube, the point of vacuum shall be no further than 25 feet from the point of initial resin introduction. After vacuum in the tube is established, a vacuum point shall be no further than 75 feet from the leading edge of the resin. The leading edge of the resin slug shall be as near to perpendicular as possible. A roller system shall be used to uniformly distribute the resin throughout the tube. If the Installer uses an alternate method of resin impregnation, the method must produce the same results. Any alternate resin impregnation method must be proven.

E. Tube Insertion: The wetout tube shall be positioned in the pipeline using either inversion or a pull-in method. If pulled into place, a power winch should be utilized and care should be exercised not to damage the tube as a result of pull-in friction. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point.

F. Temperature gauges shall be placed inside the tube at the invert level of each end to monitor the temperatures during the cure cycle.

G. Curing shall be in accordance with the manufacturer's recommended cure schedule.

H. Cooldown: The Contractor shall cool the hardened pipe to a temperature below 100 F before relieving the hydrostatic head. Cooldown may be accomplished by the introduction of cool water into the inversion standpipe to replace water being pumped out of the manhole. Care should be taken in release of static head so that vacuum will not be developed that could damage the newly installed liner.

I. Service Connections (Sewer Laterals): Contractor shall determine the exact location of all sewer service connections in the field by TV inspection prior to lining of sewer. After the lining process is complete, all service connections temporarily obstructed by the new sewer liner shall be located by using a pivot-headed CCTV camera from inside the lined pipe. A remote cutting tool shall cut a hole matching the service connection diameter, and grout the area where the service connection enters the lined pipe to produce a watertight seal (except that grouting need not be performed where service connection rehabilitation liners are installed). Restored service connection shall exhibit a nearly full-diameter hole, free from burrs or projections and with a smooth and crack-free edge. The hole shall be 95 percent minimum and 100 percent maximum of the original service connection inside diameter. The invert of the service connection shall match the bottom of the reinstalled service opening. During cutting, a CCTV shall be recorded and shall included a pan and tilt view of entire lateral circumference following cutting. Contractor may use "brushing" as a technique to smooth edges of re-instated lateral openings. Existing inactive sewer laterals serving vacant properties shall also be reconnected unless directed otherwise by the Engineer.

J. Finish: The new pipe shall be cut off in the manhole at a suitable location. The finished product shall be continuous over the length of pipe reconstructed and be free from dry spots, delamination and lifts. Pipe entries and exits shall be smooth, free of irregularities, and watertight. No visible leaks shall be present and the Contractor shall be responsible for grouting to remove leaks or fill voids between the host pipe and the liner. During the warranty

3.09 WET-OUT AND CURE REPORT

A. The Contractor shall submit "wet out" and "cure" reports documenting the specific details of the liner's vacuum impregnation and saturation with resin and the CIPP installation of the liner. A report shall be generated for each liner installation. A copy of all "wet out" and "cure" records shall be made available to the Owner upon request, and shall be turned over to the Owner on a weekly basis and prior to request for payment. If the "wet out" and "cure" reports are not presented prior to a payment request for a repair work order, payment for the work will not be made and the request will be rejected. At a minimum, this report shall include, in addition to Contractor and Contract identification:

1. Line identification and location
2. Wet-out date
3. Sample identification(s) and technician
4. Installation (in sewer) date
5. Host sewer pipe inside diameter
6. Liner thickness
7. Liner length
8. Liner and resin batch numbers
9. Resin type
10. Wet out length
11. Roller spacing
12. Vacuum setting
13. Quantity of resin and catalyst utilized
14. Wet out technicians
15. Time wet out started and completed
16. Applicable remarks
17. (Heat cure) Boiler and liner heating fluid pressure and temperature versus time log during cure period
18. (UV cure) Pressure and temperature versus time log and light train speed during cure period.
19. Cool down report

3.10 CLEANUP

A. After the liner installation has been completed and accepted, the Contractor shall cleanup the entire project area and return the ground cover to the original or better condition. All excess material and debris not incorporated into the permanent installation shall be disposed of by the Contractor.

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

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

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/yd³ 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.*

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 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.

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 (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 work day 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 falls 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.

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

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.

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

ASLEXCA-01 ACARTER1

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 9/26/2019

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
Lexington / AssuredPartners NL
2443 Sir Barton Way, Suite 400
Lexington, KY 40509

CONTACT NAME: Ashley S. Carter
PHONE (A/C, No, Ext): (859) 685-6563 6563 FAX (A/C, No):
E-MAIL ADDRESS: ashley.s.carter@assuredpartners.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Frankenmuth Mutual Insurance Company	13986
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED
ASL Excavating, Inc.
P.O. Box 321
Flemingsburg, KY 41041

COVERAGES CERTIFICATE NUMBER: 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			6606358	10/15/2019	10/15/2020	EACH OCCURRENCE	$ 1,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 500,000
							MED EXP (Any one person)	$ 10,000
							PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 2,000,000
	POLICY PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$ 2,000,000
	OTHER:							$
A	AUTOMOBILE LIABILITY			6606357	10/15/2019	10/15/2020	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
A	X UMBRELLA LIAB X OCCUR			6606358	10/15/2019	10/15/2020	EACH OCCURRENCE	$ 5,000,000
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$ 5,000,000
	DED X RETENTION $ 10,000							$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N			6606356	10/15/2019	10/15/2020	PER STATUTE / OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) N/A						E.L. EACH ACCIDENT	$ 1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000
A	Equipment Floater			6606358	10/15/2019	10/15/2020	Leased & Rented	500,000
A	Equipment Floater			6606358	10/15/2019	10/15/2020	Installation Floater	100,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Policy includes: General Liability form- Owners, Lessees, or Contractors- Automatic Status when required in construction agreement with you- limited Products-Completed Operations (07741) General Liability policy is Primary and Non-Contributory when required by written contract.(CG 2001)

RE: Oxford Circle Sidewalk Project

CERTIFICATE HOLDER

Lexington Fayette Urban County Government
Division of Inspection
Contractors Registration
200 E Main St Ste 925
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
David Keith

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A310
Bid Bond

KNOW ALL MEN BY THESE PRESENTS, THAT WE ASL Excavating, Inc.
P.O. Box 321, Flemingsburg, KY 41041

as Principal, hereinafter called the Principal, and Great American Insurance Company
301 East Fourth Street, Cincinnati, OH 45202

a corporation duly organized under the laws of the State of OH

as Surety, hereinafter called the Surety, are held and firmly bound unto Lexington-Fayette Urban County Government
200 East Main Street, Lexington, KY 40507

as Obligee, hereinafter called the Obligee, in the sum of Five Percent of Amount Bid
Dollars ($ 5%),

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 Oxford Circle Sidewalk Project

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal 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 with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and materials furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty 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.

Signed and sealed this 23rd day of July, 2019

ASL Excavating, Inc.
(Principal) *(Seal)*

(Witness)

By: Gary Shannon President
(Title)

Great American Insurance Company
(Surety) *(Seal)*

(Witness)

By: Susan A. Yeazell
Attorney-In-Fact Susan A. Yeazell *(Title)*

MAYOR LINDA GORTON

LEXINGTON

TODD SLATIN
DIRECTOR
CENTRAL PURCHASING

ADDENDUM #1

Bid Number: #69-2019

Date: July 1, 2019

Subject: Oxford Circle Sidewalk Project

Address inquiries to:
Sondra Stone
859.258.3320

TO ALL PROSPECTIVE SUBMITTERS:

Please be advised of the following clarifications to the above referenced Bid:

See attached bid plans in pdf.

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: A S L EXCAVATING INC.

ADDRESS: P.O. Box 321
Flemingsburg, KY 41041
606-849-4511

SIGNATURE OF BIDDER: Gary Shannon ✓

Project: Oxford Circle Sidewalk

Bid Date: 7/23/2019

Bid# 69-2019

Contractor: ASL Excavating Inc.

Item No.	Item	Unit	Spec Sec.	Quantity	Unit Price	Total Price
1	Remove Curb	LF	6	590	17.85	10,531.50
2	Remove Bollard	EA	6	3	300.00	900.00
3	Remove Sidewalk, Entrance Pavement	SY	6	85	22.50	1,912.50
4	Remove Bituminous Concrete Pavement	SY	6	105	19.20	2,016.00
5	Dense Graded Aggregate	TN	8	25	56.40	1,410.00
6	Crushed Stone (No. 57's)	TN	9	40	44.60	1,784.00
7	Unfinished Concrete	CY	15	7	268.00	1,876.00
8	4.5" Concrete Sidewalk	SY	12	225	98.50	22,162.50
9	6" Concrete Entrance	SY	13	125	110.20	13,775.00
10	Header Curb	LF	15	615	39.50	24,292.50
11	Class 1 Bituminous Surface	TN	18	20	200.00	4,000.00
12	Bituminous Material for Tack	TN	19	0.02	1.00	0.02
13	Sodding	SY	32	165	15.00	2,475.00
14	Detectable Warning - Imbedded (installation only)	SF	55	20	35.00	700.00
15	Erosion and Sediment Control	LS	41	1	3,000.00	3,000.00
16	Maintenance of Traffic	LS	B	1	12,845.00	12,845.00
17	Mobilization (Max. 5%)	LS	A	1	3,225.00	3,225.00
18	Demobilization (Min. 1.5%)	LS	A	1	1,711.00	1,711.00
						108,616.02

LEXINGTON

Lexington-Fayette Urban County Government
Division of Engineering

Oxford Circle Sidewalk Project

P02-628-1700004160

KYTC Item No.: 07-3220

PART 1

ADVERTISEMENT FOR BIDS

INDEX

4. METHOD OF RECEIVING BIDS

Bids will be received from **KYTC Prequalified Prime Contracting** firms on a **Line Item Unit Price Basis** for total Project. The Bidder must include a price for all bid items to be considered. **Bids shall be submitted in the manner and subject to the conditions as set forth and described in the Instruction to Bidders and Special Conditions.**

Mailed bids/proposals should be sent to the Director, Division of Central Purchasing, 200 East Main Street, Lexington, KY 40507.

5. METHOD OF AWARD

The Contract, if awarded, will be to the lowest responsive and responsible bidder for the total project 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. In analyzing Bids, the OWNER may take into consideration alternate and unit prices, if requested by the Bid forms.

6. BID WITHDRAWAL

No bidder may withdraw his bid for a period of sixty (60) 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. Bids may be withdrawn in person prior to the closing date of receipt of bids.

7. BID SECURITY

If the bid is $50,000 or greater, bid shall be accompanied by a certified check or bid bond payable to the Lexington-Fayette Urban County Government in an amount not less than Five Percent (5%) of the base bid. Bid bond shall be 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. 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.

The Lexington-Fayette Urban County Government has set a goal that not less than ten percent (10%) of the total value of this Contract be subcontracted to Disadvantaged Business Enterprises, which is made up of MBEs and 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. 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
Lexington-Fayette Urban County Government
200 East Main Street, 3rd Floor, Room 338
Lexington, Kentucky 40507
859-258-3323
smiller@lexingtonky.gov

12. NOTICE CONCERNING DBE GOAL - KYTC

Notice of requirement for Affirmative Action to ensure Equal Employment Opportunities and Disadvantaged Business Enterprises (DBE) contract participation.

The Kentucky Transportation Cabinet has set a recommended goal of not less than **five percent (5%)** of the total value of this contract be subcontracted to Disadvantaged Business Enterprises. DBE participation must be in compliance with the requirements of 49 CFR 26 and the policies of the Kentucky Transportation Cabinet. Bidders and DBE subcontractors must be prequalified with the Kentucky Transportation Cabinet and possess a Certificate of Eligibility at the time of the bid opening. All other subcontractors must be prequalified when accepting subcontracts.

PART II

INFORMATION FOR BIDDERS

INDEX

4. QUALIFICATION OF BIDDER

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 Contract and to complete the Work contemplated therein. Conditional bids will not be accepted.

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 prices, as requested. OWNER may consider maintenance requirements, performance data, and disruption or damage to private property. It is OWNER'S intent to accept alternatives by the bid forms, in the order in which they are listed in the Bid Form but OWNER may accept or decline them in order or combination. The contract, if awarded, will be awarded to the lowest responsive and 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.

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 Urban County Government of the above listed elements.

A. 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.

B. Corporate firms are required to be registered with the Office of the Secretary of State, Commonwealth of Kentucky.

C. 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.

of his bid, shall forfeit to the OWNER, as liquidated damages for such failure or refusal, the security deposited with his bid.

7. TIME OF COMPLETION AND LIQUIDATED DAMAGES

It is mutually agreed by and between the parties hereto that time is of the essence of this Contract, and that there will be sustained by the OWNER damages, monetary and otherwise, in the event of delay in the completion of the Work hereby contracted. The CONTRACTOR will be held responsible to the OWNER for delays in completion of the Work herein contracted beyond the date set for completion. Completion is defined in Section 108.03 of the KDOH Standard Specifications, Current Edition. Such monetary damage shall be deducted from the Contract sum in the amount of TWO HUNDRED FIFTY DOLLARS ($250.00) per calendar day of such delay. If the Work contracted to be done shall not, in good faith, be commenced at the time specified, then the CONTRACTOR together with the Surety or Sureties upon the bond herein provided for, shall be liable for and shall pay to the OWNER all damages sustained by reason of such failure for breach of Contract, and the OWNER may immediately re-let the Work involved.

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. Bidder must agree also to pay liquidated damages, or the sum as specified in the Contract for each consecutive calendar day thereafter as hereinafter provided in the General Conditions.

8. 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 Section 4 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

divide such commission with any person other than a duly licensed resident local agent.

C. **Contractor shall use standard Performance and Payment Bond forms such as documents provided with this contract book or AIA form A312-1984 (or later).**

11. POWER OF ATTORNEY

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.

12. TAXES AND WORKMEN'S COMPENSATION

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. 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 proposal. 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 his Contract.

13. LAWS AND REGULATIONS

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.

14. EROSION AND SEDIMENT CONTROL AND PERMITS

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 "special" permits including but not limited to Corp of Engineers 404 permits, 401 Water Quality Certifications, Stream Crossing and Floodplain Encroachment Permits as described in Part 4 General Conditions Paragraph 5.17.

15. PREVAILING WAGE LAW AND MINIMUM HOURLY RATES

Federal wage rates and regulations, if required for this Project, will be as described in the Special Conditions.

of such alternate bid and the conditions under which such alternate bids will be considered for award of a contract will be established in the Invitation.

Any Bidder who submits a bid incorporating an alternate proposal when alternate bids/proposals have not been requested in the Invitation for Bids shall have his/her bid rejected as non-responsive.

Any Bidder who submits a bid incorporating two (2) or more prices for an item or groups of items (unless such method of pricing is requested in the Invitation for Bids), or which imposes conditions for acceptance other than those established in the Invitation for Bids, shall have their bid rejected as non-responsive.

20. SIGNING OF AGREEMENT

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 with all other written Contract Documents attached. Within ten days thereafter, CONTRACTOR shall sign and deliver the required number of counterparts of the Agreement 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.

21. ASSISTANCE TO BE OFFERED T0 DISADVANTAGED BUSINESS ENTERPRISE (DBE) CONTRACTORS

I. Outreach

The Lexington-Fayette Urban County Government (LFUCG) maintains a data base of DBE companies. When a LFUCG construction project is advertised for bidding, notices are sent to the appropriate commodity code via email through LFUCG Ionwave electronic bidding system. The bid notices describe the project, indicate the deadline for submitting bids, and review the bonding assistance which is available. If you wish to be added to the LFUCG Ionwave database please register your company at https://lexingtonky.ionwave.net. If you wish to be added to the LFUCG DBE contractor mailing list, please contact:

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

22. DBE PARTICIPATION GOALS

A. GENERAL

1) The LFUCG request all potential contractors to make a concerted effort to include Disadvantaged Business Enterprises (DBE) as subcontractors or suppliers in their bids.

2) Toward that end, the LFUCG has established **5%** of total procurement costs as a Goal for participation of Disadvantaged Businesses Enterprise (DBE) on this contract.

3) DBE Subcontractors must be prequalified and certified with the Kentucky Transportation Cabinet at the time of bid if utilized as a DBE meeting the DBE Goal.

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

B. PROCEDURES

1) The successful bidder will be required to report to the LFUCG, the dollar amounts of all purchase orders submitted to DBE subcontractors and suppliers for work done or materials purchased for this contract. (See Subcontractor Monthly Payment Report)

2) Replacement of a DBE 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 DBE Firm; this is subject to approval by the LFUCG. (See KYTC DBE Substitution Form)

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

    a) The Lexington-Fayette Urban County Government, Division of Central Purchasing (859-258-3320)

4) The LFUCG will make every effort to notify interested DBE 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.

23. REQUIRED SUBMITTALS

The entire proposal must be completed and submitted or your bid may considered non-responsive and rejected.

24. LFUCG NON-APPROPRIATION CLAUSE

Contractor acknowledges that the LFUCG is a governmental entity, and the contract validity is based upon the availability of public funding under the authority of its statutory mandate.

In the event that public funds are unavailable and not appropriated for the performance of the LFUCG's obligations under this contract, then this contract shall automatically expire without penalty to the LFUCG thirty (30) days after written notice to Contractor of the unavailability and non-appropriation of public funds. It is expressly agreed that the LFUCG shall not activate this non-appropriation provision for its convenience or to circumvent the requirements of this contract, but only as an emergency fiscal measure during a substantial fiscal crisis, which affects generally its governmental operations.

In the event of a change in the LFUCG's statutory authority, mandate and mandated functions, by state and federal legislative or regulatory action, which adversely affects the LFUCG's authority to continue its obligations under this contract, then this contract shall automatically terminate without penalty to the LFUCG upon written notice to Contractor of such limitation or change in the LFUCG's legal authority.

PART III

Invitation to Bid No. 69-2019

Oxford Circle Sidewalk Project

1. FORM OF PROPOSAL

Place: Lexington, Kentucky

Date: 7/23/19

The following Form of Proposal shall be followed exactly in submitting a proposal for this Work.

This Proposal Submitted by A S L EXCAVATING INC.
P.O. Box 321
Flemingsburg, KY 41041
606-849-4511
(Name and Address of Bidding Contractor)

(Hereinafter called "Bidder"), organized and existing under the laws of the State of Kentucky, 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 Purchasing
200 East Main Street, 3rd Floor
Lexington, KY 40507

Gentlemen:

The Bidder, in compliance with your Invitation for Bids for **Oxford Circle Sidewalk Project** having examined the Plans and Specifications with related documents, having examined the site for proposed Work, and being familiar with all of the conditions 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 lump sum and/or unit prices stated hereinafter. These prices are to cover all expenses incurred in performing the Work required under the Contract Documents, of which this proposal is a part. The OWNER will issue work orders for work to be performed under this Contract.

BIDDER hereby agrees to commence work under this contract as to be specified in the Notice to Proceed and to fully complete the project within forty five (45) consecutive calendar days thereafter. BIDDER further agrees to pay liquidated damages, the sum of $250.00 for each consecutive calendar day thereafter.

2. LEGAL STATUS OF BIDDER

Bidder ASL Excavating Inc

Date 7/23/19

* 1. A corporation duly organized and doing business under the laws of the State of Kentucky, for whom Gary Shannon, bearing the official title of President, whose signature is affixed to this Bid/Proposal, is duly authorized to execute contracts.

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

_____

_____

_____

_____

_____

* 3. An individual, whose signature is affixed to this Bid/Proposal (please print name)

_____

_____

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

statements during the affidavit effective period, I will notify the Finance and Administration Cabinet, Office of Procurement Services immediately. I understand that the Commonwealth retains the right to request an updated affidavit at any time.

Gary Shannon
Signature

Gary Shannon
Printed Name

President
Title

7/23/19
Date

Company Name A S L EXCAVATING INC.
P.O. Box 321
Flemingsburg, KY 41041
Address 606-849-4511

Subscribed and sworn to before me by Gary Shannon
(Affiant)

President
(Title)

of A S L Excavating Inc (Company Name) this 23rd day of July, 2019.

Georgia A Cropper
Notary Public
[seal of notary]

My commission expires: 6/28/21

OFFICIAL SEAL
GEORGIA A. CROPPER
NOTARY PUBLIC - KENTUCKY
STATE-AT-LARGE
My Comm. Expires 6/28/21

BIDDERS AFFIDAVIT - LFUCG

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

1. His/her name is Gary Shannon and he/she is the individual submitting the bid or is the authorized representative of A S L Excavating Inc, the entity submitting the bid (hereinafter referred to as "Bidder").
2. 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 contract and will maintain a "current" status in regard to those taxes and fees during the life of the contract.
3. Bidder will obtain a Lexington-Fayette Urban County Government business license, if applicable, prior to award of the contract.
4. 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.

4. BID SCHEDULE – SCHEDULE OF VALUES

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.

Form of proposal must include unit bid prices written in words, unit price written in numbers and total amount bid (unit price x quantity) per line item OR bid may be considered non-responsive. In case of price discrepancy, unit bid price written in words will prevail followed by unit price written in numbers then total amount bid per line item.

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.

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.

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

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

The LFUCG's decision on the bid amount is final.

The contract, if awarded, will be on the basis of materials and equipment specified in the specifications without consideration of possible substitute or "or equal" items.

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. Determination of the actual quantities and classification of unit price work performed by the Contractor will be made by the Engineer in accordance with the General Conditions.

Payment:
Accepted quantities for Work shall be paid for at their respective Contract "Unit Price" as quoted (which shall be for all Work required under this Section) and paid per "Unit To Bid On" of specified "Description" satisfactorily placed. All labor, materials, equipment, and excavation shall be incidental to the Work.

Digital Bid Submittals:
Bidders will also be required to submit a digital version of the Unit Prices and Total Amount Bid. The excel spreadsheet is available through the LFUCG's Ionwave website (https://lexingtonky.ionwave.net). If there is a discrepancy between the digital and written versions, then the written version shall prevail.

Item No.	Quantity	Unit to Bid On	Description	Unit Price	Total Amount Bid
10	615	LF	Header Curb Thirty-nine Dollars fifty Cents	$ 39.50	$ 24,292.50
11	20	TN	Class 1 bituminous surface (less than 50 tons) Two hundred Dollars NO Cents	$ 200.00	$ 4000.00
12	0.02	TN	Bituminous material for tack One Dollars NO Cents	$ 1.00	$ 0.02
13	165	SY	Sodding Fifteen Dollars NO Cents	$ 15.00	$ 2475.00
14	20	SF	Detectable warning - imbedded (Installation only) Thirty-five Dollars NO Cents	$ 35.00	$ 700.00
15	1	LS	Erosion and Sediment Control Three thousand Dollars NO Cents	$ 3000.00	$ 3000.00
16	1	LS	Maintenance of Traffic Twelve thousand eight hundred forty-five Dollars NO Cents	$ 12,845.00	$ 12,845.00
17	1	LS	Mobilization (Max. 5%) Three thousand two hundred twenty-five Dollars NO Cents	$ 3225.00	$ 3225.00
18	1	LS	Demobilization (Min. 1.5%) One thousand seven hundred eleven Dollars NO Cents	$ 1711.00	$ 1711.00

$108,616.02

One hundred eight thousand six hundred sixteen dollars and two cents

5. STATEMENT OF BIDDER'S QUALIFICATIONS

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

1. Name of Bidder: ASL Excavating Inc.

2. Permanent Place of Business: 1692 Mockingbird Hill, Flemingsburg Ky 41041

3. When Organized: July, 1996

4. Where Incorporated: Flemingsburg, Ky

5. Construction Plant and Equipment Available for this Project:

See attached equipment List

(Attach Separate Sheet If Necessary)

6. 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.

7. In the event the Contract is awarded to the undersigned, surety bonds will be furnished by:

Great American Insurance Company (Surety)

Signed: Susan A. Yeazell (Representative of Surety)

Susan A. Yeazell, Attorney-in-Fact

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

NAME	LOCATION	CONTRACT SUM
LFUCG	unit price Contract	*5000 +↑
Various KYTC	projects statewide	60,000 ↑

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

NAME	LOCATION	CONTRACT SUM
19-4202	Powell Co. KY	286,630
19-4208	Rowan Co. KY	1,859,584

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

NAME	POSITION DESCRIPTION	NO. OF YEARS WITH BIDDER
Gary Shannon	Owner / Supervisor	23 yrs.
Steve Allen	Owner / Supervisor	23 yrs
Henry Cropper	Superintendent	21 yrs

6. LIST OF PROPOSED SUBCONTRACTORS

The following list of proposed subcontractors is required by the OWNER to be executed, completed and submitted with the BIDDER'S FORM OF PROPOSAL. 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 Such as: Grading, bituminous paving, concrete, seeding and protection, construction staking, etc.	SUBCONTRACTOR	DBE Yes/No	% of Work
1. Asphalt	Name: C & R Asphalt Address: Frankfort KY	No	3.69%
2. Sodding	Name: JAG Inc Address: 657 Bayswater Way Lexington KY 40503	Yes	2.28%
3. Staking	Name: Allen Engineering Address: Lexington KY	Yes	2.76
4.	Name: Address:		

7. LIST OF MATERIALS/ SUPPLIERS

Bidders are hereby advised that this list must be complete and submitted with the Bid.

Listing "as per plans and specifications", will not be considered as sufficient identification. Where more than one "Make or Brand" is listed for any one item, the Owner has the right to select the one to be used.

Item	Brand Name, Manufacturer and/or Supplier
1. Concrete Supplier	Harrod Concrete & Stone
2. Asphalt Supplier	ATS

3) A Disadvantaged Business (DBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by a person(s) that are economically and socially disadvantaged.

4) A 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 and/or a service disabled veteran.

5) 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) Bidders reaching the Goal are required to submit only the MWDBE Participation Form." The form must be fully completed including names and telephone number of participating MWDBE firm(s); type of work to be performed; estimated value of the contract and value expressed as a percentage of the total Lump Sum Bid Price. The form must be signed and dated, and is to be submitted with the bid.

2) Bidders not reaching the Goal must submit the "MWDBE Participation Form", the "Quote Summary Form" and a written statement documenting their Good Faith Effort to do so. If bid includes no MWDBE and/or Veteran participation, bidder shall enter "None" on the subcontractor / supplier form). In addition, the bidder must submit written proof of their Good Faith Efforts to meet the Participation Goal:

   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 MWDBE firms and Veteran-Owned businesses to participate.

   b. Included documentation of advertising in the above publications with the bidders good faith efforts package

o. Made an effort to offer assistance to or refer interested MWDBE firms and Veteran-Owned businesses to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal

p. Made efforts to expand the search for MWBE firms and Veteran-Owned businesses beyond the usual geographic boundaries.

q. Other--any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include MWDBE and Veteran participation.

Note: Failure to submit any of 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 Efforts must be submitted with the Bid, if the participation Goal is not met.

We have compiled the list below to help you locate certified MBE, WBE and DBE certified businesses. Below is a listing of contacts for LFUCG Certified MWDBEs and Veteran-Owned Small Businesses in (https://lexingtonky.ionwave.net)

Business	Contact	Email Address	Phone
LFUCG	Sherita Miller	smiller@lexingtonky.gov	859-258-3323
Commerce Lexington – Minority Business Development	Tyrone Tyra	ttyra@commercelexington.com	859-226-1625
Tri-State Minority Supplier Diversity Council	Susan Marston	smarston@tsmsdc.com	502-365-9762
Small Business Development Council	Shawn Rogers UK SBDC	shawn.rogers@uky.edu	859-257-7666
Community Ventures Corporation	Phyllis Alcorn	palcorn@cvky.org	859-231-0054
KY Transportation Cabinet (KYTC)	Melvin Bynes	Melvin.bynes2@ky.gov	502-564-3601
KYTC Pre-Qualification	Shella Eagle	Shella.Eagle@ky.gov	502-782-4815
Ohio River Valley Women's Business Council (WBENC)	Sheila Mixon	smixon@orvwbc.org	513-487-6537
Kentucky MWBE Certification Program	Yvette Smith, Kentucky Finance Cabinet	Yvette.Smith@ky.gov	502-564-8099
National Women Business Owner's Council (NWBOC)	Janet Harris-Lange	janet@nwboc.org	800-675-5066
Small Business Administration	Robert Coffey	robertcoffey@sba.gov	502-582-5971
LaVoz de Kentucky	Andres Cruz	lavozdeky@yahoo.com	859-621-2106
The Key News Journal	Patrice Muhammad	production@keynewsjournal.com	859-685-8488

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 Central Purchasing 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.

SUBSTITUTED MWDBE Company Name, Address, Phone, Email	MWDBE 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**

LFUCG SUBCONTRACTOR MONTHLY PAYMENT REPORT

The LFUCG has a 10% goal plan adopted by city council to increase the participation of minority and women owned businesses in the procurement process. The LFUCG also has a 3% goal plan adopted by cited council to increase the participation of veteran owned businesses in the procurement process. In order to measure that goal LFUCG will track spending with MWDBE and Veteran contractors on a monthly basis. By the signature below of an authorized company representative, you certify that the information is correct, and that each of the representations set forth below is true. Any misrepresentation may result in termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims. Please submit this form monthly to the Division of Central Purchasing/ 200 East Main Street / Room 338 / Lexington, KY 40507.

Bid/RFP/Quote #_____

Total Contract Amount Awarded to Prime Contractor for this Project_____

Project Name/ Contract #	**Work Period/ From:** **To:**
Company Name:	**Address:**
Federal Tax ID:	**Contact Person:**

Subcontractor Vendor ID (name, address, phone, email	Description of Work	Total Subcontract Amount	% of Total Contract Awarded to Prime for this Project	Total Amount Paid for this Period	Purchase Order number for subcontractor work (please attach PO)	Scheduled Project Start Date	Scheduled Project End Date

By the signature below of an authorized company representative, you certify that the information is correct, and that each of the representations set forth below is true. Any misrepresentations may result in the termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims.

_____ _____

Company **Company Representative**

_____ _____

Date **Title**

items with its own workforce

_____ Negotiated in good faith with interested MWDBE firms and Veteran-Owned businesses not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.

_____ Included documentation of quotations received from interested MWDBE firms and Veteran-Owned businesses which 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.

_____ 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 MWDBE and/or Veteran-Owned business's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy MWDBE and Veteran goals.

_____ Made an effort to offer assistance to or refer interested MWDBE firms and Veteran-Owned businesses to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal

_____Made efforts to expand the search for MWBE firms and Veteran-Owned businesses beyond the usual geographic boundaries.

_____ Other--any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include MWDBE **and Veteran participation.**

NOTE: Failure to submit any of 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 approval by the MBE Liaison. Documentation of Good Faith Efforts must be submitted with the Bid, if the participation Goal is not met.

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**

10. DBE SUB-CONTRACTOR BIDDERS LIST

The Department of Transportation Federal Regulations requires that the Kentucky Transportation Cabinet provide a bidders list to be maintained in the Office of Personnel Management, Small Business Development Branch (49CFR 26:11) for each federally funded project awarded.

Project No.

List all quotes/bids received on this project.

DBE (Disadvantaged Business Enterprise) Contractors, Consultants, and Suppliers submitting quotes/bids for this project:

1. JAG Inc
2. Allen Engineering INC
3.
4.
5.
6.
7.
8.

DBE (Disadvantaged Business Enterprise) Contractors, Consultants, and Suppliers contacted who did NOT submit quotes/bids for this project.

1.
2.
3.
4.
5.
6.
7.
8.

Non-DBE (Disadvantaged Business Enterprise) Contractors, Consultants, and Suppliers submitting quotes/bids for this project:

1. Richard L Adkins
2. IMI
3. Harrod Concrete & Stone
4. C & R Asphalt
5. Randle - Davis
6.
7.
8.

If you need additional space, please attach a separate page. If you need assistance regarding this form, please contact Melvin Bynes or Anita Hall at (502)564-3601.

12. CERTIFICATION OF PERFORMANCE

Certification with regard to the Performance of Previous Contracts or Subcontracts subject to the Equal Opportunity Clause and the filing of Required Reports.

The bidder, hereby certifies that he/she has, participated in previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925, 11114, or 11246, and that he, filed with the Joint Reporting committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the Former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

ASL Excavating Inc.
(Name of Individual, Co-Partnership, or Corporation submitting bid)

Gary Shannon — President
(Name of Officer or Authorized Agent) (Title)

Gary Shannon — 7/23/19
(Signature) (Date)

NOTE: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7 (b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with the contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of $10,000 or under are exempt.)

Currently, Standard Form 100 (EE0-1) is the only report required by the Executive Orders of their implementing regulation.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed reports should note that 41 CFR 60-1.7 (b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

14. CERTIFICATION OF BID PROPOSAL/DBE

We (I) proposed to furnish all labor, equipment and material necessary to construct and/or improve the subject project in accordance with the plans, the Transportation Cabinet's Standard Specifications for Road and Bridge Construction, current edition, special provisions, notes applicable to the project as indicated herein and all addenda issued on this project subsequent to purchase of proposal.

We (I) attach a bid guaranty as provided in the special provisions in an amount not less than 5% of the total bid. We agree to execute a contract in accordance with this proposal within 15 calendar days after the receipt of the notice of award for the project.

We (I) have examined the site of proposed work, project plans, specifications, special provisions, and notes applicable to the project referred to herein. We understand that the quantities shown herein are estimated quantities subject increase or decrease as provided in the specifications.

We (I) acknowledge receipt of all addendum(s) (if applicable) and have made necessary revisions to the bid proposal. We have considered all addendum(s) in calculation of the submitted bid and applied the updated bid items, which are included.

"The bidder certifies that it has secured participation by Disadvantaged Business Enterprises (DBE) in amount of five 5 percent (5 %) of the total value of this contract and that the DBE participation is in compliance with the requirements of 49 CFR 26 and the policies of the Kentucky Transportation Cabinet pertaining to the DBE Program."

ASI Excavating Inc
(Name of Individual, Co-Partnership or Corporation submitting bid)

Gary Shannon — President
(Name of Officer or Authorized Agent) (Title)

✓ Gary Shannon — 7/23/19
(Signature) (Date)

When two or more organizations bid as a joint venture, enter names of each organization and an authorized agent for each organization must sign above.

Kentucky Transportation Cabinet
Office of Local Programs
LPA CHANGE ORDER

TC 20-33
07/2010

Page

Contract ID
Change Order No
Contractor
Contractor
Address

Project Sponsor
County
Project Number
Project Name

Reasons for Proposed Changes and Cost Analysis:

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

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

1 Whether the bidder attended any pre-bid meetings that were scheduled by LFUCG to inform DBEs of subcontracting opportunities;

2 Whether the bidder provided solicitations through all reasonable and available means;

3 Whether the bidder provided written notice to all DBEs listed in the DBE directory at the time of the letting that are pre-qualified in the areas of work that the bidder will be subcontracting;

4 Whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainly whether they were interested. If a reasonable amount of DBEs within the targeted districts do not provide an intent to quote or no DBEs are pre-qualified in the subcontracted areas, the bidder must notify the Minority Business Enterprise Liaison in the Division of Central Purchasing to give notification of the bidder's inability to get DBE quotes;

5 Whether the bidder selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise perform these work items with its own forces;

6 Whether the bidder provided interested DBEs with adequate and timely information about the plans, specifications, and requirements of the contract;

7 Whether the bidder negotiated in good faith with interested DBEs not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached;

8 Whether quotations were received from interested DBE firms but were rejected as unacceptable without sound reasons why the quotations were considered unacceptable. The fact that the DBE firm's quotation for the work is not the lowest quotation received will not in itself be considered as a sound reason for rejecting the quotation as unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a DBE quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy DBE goals;

9 Whether the bidder specifically negotiated with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be subcontracted includes potential DBE participation;

10 Whether the bidder made any efforts and/or offered assistance to interested DBEs in obtaining the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal; and

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

FAILURE TO MEET GOOD FAITH REQUIREMENT

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

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

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
DIVISION OF CONSTRUCTION PROCUREMENT
DBE Plan/SUBCONTRACT REQUEST

TC 14-35
Rev. 07/07/16

CONTRACT ID (CONTID) _____
Subcontract # : _____
TO : Rachel Mills, Director
Division of Construction Procurement

FROM : _____ 1st Tier Subcontractor: _____
Prime Contractor (if applicable)

SUBJECT : _____ County _____ Project Number

I hereby request to utilize for DBE participation a portion of the subject project to: _____ of _____

DBE Employer Identification Numbers: Federal _____ KY _____
The amount to be subcontracted by this request is DBE _____ or _____ Contract Worth _____ or _____ of the
(original contract) or a subcontract amount of

I have previously requested approval for subcontracts or agreements with other DBE as follows:

Name of DBE firm	DBE Amount	DBE %	Contract "Worth" Amount	Contract %
Totals based on original contract Amounts				

This section applicable if DBE firm is also a Subcontractor of work on Project: _____
This subcontractor has been furnished a copy of Appendix B of 49 CFR Part 29 and advised to include the Certification in all lower tier covered transactions and in all solicitations for lower tier transactions (Federal Aid Contracts only).

_____ Prime Contractor's Signature _____ Date

_____ 1st Tier Subcontractor's Signature(if applicable) _____ Date

_____ DBE Participant Signature _____ Date

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
DIVISION OF CONSTRUCTION PROCUREMENT
DBE Plan/SUBCONTRACT REQUEST

Contract ID (ContID) ____________ DBE Firm ____________

(*) When description is limited by such as "Laying Only" "Erection Only" "Manipulation Only" etc. it should be so indicated and explained.

(**) When the quantity is not the entire amount of (Contract) or (Sub-Contract) estimate, limitations by stations must be shown or definitely designated in some suitable, positive manner.

Unit prices using Contract "worth" Unit Price should be for Bid Unit Price for work to be performed by Sub Contractor. If partial work item ie "laying only" then use agreed to price for Contract "worth" Unit Price. DBE Unit price should be for the agreed upon price for item or portion of item of contract work.

The Items to be subcontracted are as follows:

Supplier 60% Y/N	Project Control (PCN) Number	Category Number	Project Line Number	Description	Unit	Contract Quantity	Contract "Worth" Unit Price	Dollar Amount based on Contract Price	DBE Quantity	DBE Unit Price	Dollar Amount based on DBE Price
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Comments:

NAME OF INDIVIDUAL: Steve Allen

POSITION/TITLE: Owner / Supervisor

STATEMENT OF EXPERIENCE: 23 yrs experience with ASL in street and road. With an additional 20 yrs as owner/operator.

NAME OF INDIVIDUAL: Henry Gopper

POSITION/TITLE: Superintendent

STATEMENT OF EXPERIENCE: 21 yrs experience as supervisor with ASL plus 17 yrs additional experience with another company

NAME OF INDIVIDUAL:

POSITION/TITLE:

STATEMENT OF EXPERIENCE:

NAME OF INDIVIDUAL:

POSITION/TITLE:

STATEMENT OF EXPERIENCE:

18. EQUAL OPPORTUNITY AGREEMENT

Standard Title VI Assurance

The Lexington Fayette-Urban County Government, (hereinafter referred to as the "Recipient") hereby agrees that as a condition to receiving any Federal financial assistance from the U.S. Department of Transportation, it will comply with Title VI of the Civil Rights Act of 1964, 78Stat.252, 42 U.S.C. 2000d-4 (hereinafter referred to as the "Act"), and all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, (49 CFR, Part 21) Nondiscrimination in Federally Assisted Program of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act of 1964 (hereinafter referred to as the "Regulations") and other pertinent directives, no person in the United States shall, on the grounds of race, color, national origin, sex, age (over 40), religion, sexual orientation, gender identity, veteran status, or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Recipient receives Federal financial assistance from the U.S. Department of Transportation, including the Federal Highway Administration, and hereby gives assurance that will promptly take any necessary measures to effectuate this agreement. This assurance is required by subsection 21.7(a) (1) of the Regulations.

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 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 – 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.

19. EQUAL EMPLOYMENT OPPORTUNITY AFFIRMATIVE ACTION POLICY

It is the policy of A S L Excavating Inc. 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.

Georgia Cropper has been appointed Equal Employment Compliance (EEOC) Officer and shall be available for counseling, answering of questions in regards to this company policy, and to hear any complaints of discrimination. The EEOC Officer may be reached by calling 606-849-4511

Signature: Gary Shannon
(Bidding Contractor)

Title: President

Date: 7/23/19

21. EVIDENCE OF INSURABILITY

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT CONSTRUCTION PROJECT
(Use separate form for each Agency or Brokerage agreeing to provide coverage)

Names Insured: A S L Excavating Inc

Address: P O Box 321 Flemingsburg Ky 41041

Employee ID:

Phone: 606-849-4511

Project to be insured: Oxford Circle Sidewalk Project

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 Part V (Special Conditions), including all requirements, and conditions:

Section Items	Coverage	Minimum Limits and Policy Requirements	Limits Provided To Insured	Name of Insurer	A.M. Best's Code	A.M. Best's Rating
SC-3, Section 2, Part 4.1 – see provisions	CGL	$1,000,000 per occ. And $2,000,000 aggregate	$ 1 Mil Per Occ. $ 2 Mil Agg	Frankenmuth Ins. Group	000402	A:X
SC-3, Section 2, Part 4.1 – see provisions	AUTO	$1,000,000/per occ.	$1 Mil CSL $5 Mil Umbrella	Frankenmuth Ins. Group	000402	A:X
SC-3, Section 2, Part 4.1 – see provisions	WC	Statutory w /endorsement as noted	$1Mil/$1Mil/$1Mil Limits, KY Statutory	Frankenmuth Ins. Group	000402	A:X

Section 2 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

2443 Sir Barton Way, Ste. 400
Street Address

Lexington | KY | 40509
City | State | Zip

859-685-6517
Telephone Number

Virginia McKenzie
Name of Authorized Representative

Account Manager
Title

Virginia McKenzie
Authorized Signature

07/19/19
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 coverage's listed above is not provided with the bid.

23. DEBARMENT CERTIFICATION

All contractors/subcontractors shall complete the following certification and submit it with the bid proposal.

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 proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

   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 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: ASL Excavating Inc

Project: Oxford Circle Sidewalk

Printed Name and Title of Authorized Representative: Gary Shannon, President

Signature: Gary Shannon

Date: 7/23/19

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

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

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

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

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

Gary Shannon
Signature of Authorized Official

President
Title

7/23/19
Date

END OF SECTION