

PART 6

CONTRACT AGREEMENT

INDEX

1. SCOPE OF WORK
2. TIME OF COMPLETION AND LIQUIDATED DAMAGES
3. ISSUANCE OF WORK ORDERS
4. THE CONTRACT SUM
5. PROGRESS PAYMENTS
6. ACCEPTANCE AND FINAL PAYMENT
7. THE CONTRACT DOCUMENTS
8. EXTRA WORK
9. CONSENT DECREE REQUIREMENTS
10. ENUMERATION OF SPECIFICATIONS AND DRAWINGS

**PART VI**

**CONTRACT AGREEMENT**

THIS AGREEMENT, made on the 5<sup>th</sup> day of July, 2022, by and between **Lexington-Fayette Urban County Government**, acting herein called "OWNER" and NAC Heavy Highway Inc., doing business as ~~\*(an individual) (a partnership)~~ (a corporation) located in the City of Lexington, County of Fayette, and State of Kentucky, hereinafter called "CONTRACTOR."

WITNESSETH: That the CONTRACTOR and the OWNER in consideration of One Million Two Hundred Eighty-Three Thousand Fifty-two Dollars and Zero Cents \$1,283,052.00 quoted in the proposal by the CONTRACTOR, dated May 18, 2022, hereby agree to commence and complete the construction described as follows:

**1. SCOPE OF WORK**

The CONTRACTOR shall furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, and the Special Conditions of the Contract, the Specifications and Contract Documents therefore as prepared by Bell Engineering, for the **Leestown Road Industrial Pump Station Replacement**.

**2. TIME OF COMPLETION AND LIQUIDATED DAMAGES**

The time period estimated and authorized by the OWNER for the proper execution of the Work by the Contract, in full, is hereby fixed as **ONE HUNDRED FIFTY (150) calendar days for Substantial Completion and ONE HUNDRED EIGHTY (180) calendar days to final completion.** The time shall begin ten (10) days after the CONTRACTOR is given the Notice to Proceed with the Work. **TIME IS OF THE ESSENCE IN THE PERFORMANCE OF THIS AGREEMENT AND CONTRACTOR SHALL BE LIABLE AND RESPONSIBLE FOR DAMAGES SUFFERED BY OWNER AS A RESULT OF THE DELAY CAUSED BY CONTRACTOR.**

Should the contractor fail or refuse to complete the work within the time specified in his Proposal and/or Contract (or extension of time granted by the owner), the Contractor shall pay liquidated damages in an amount of **FOUR HUNDRED DOLLARS (\$400.00) per day.** The amount of liquidated damages shall in no event be considered as a penalty, nor other than an amount agreed upon by the Contractor and the Owner for damages, loses, additional engineering, additional resident representation and other cost that will be sustained by the owner, if the Contractor fails to complete the work within the specified time. Liquidated damages will be applied on a rate per day for each and every calendar day (Sundays and holidays included) beyond the Contract expiration date stipulated in the Contract Documents, considering all time extension granted. **These Liquidated Damages are in addition to any other damages/fees/penalties that are incurred as a result of Consent Decree requirements.**

**3. ISSUANCE OF WORK ORDERS**

Notice to begin Work will be given in whole or for part of the Work as determined by the OWNER pending the availability of funds. The order of construction will be as determined by the OWNER and ENGINEER, after consultation with the CONTRACTOR and the OWNER.

**4. THE CONTRACT SUM**

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

**5. PROGRESS PAYMENTS**

The OWNER shall make payments on account of the Contract, as provided in accordance with the General Conditions, as estimated by the ENGINEER, less the aggregate of previous payments.

**6. ACCEPTANCE AND FINAL PAYMENT**

Final payment shall be due within ninety (90) days after completion of the Work, provided the Work be then fully completed and the Contract fully accepted.

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 Work 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 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.

**7. THE CONTRACT DOCUMENTS**

The Advertisement for Bids, Information for Bidders, the General Conditions, Performance and Payment Bonds, Contract Agreement, Special Conditions, Technical Specifications, any and all Addenda, and Proposal, and Plan Drawings form the Contract, and they are fully a part of the Contract as if hereto attached or herein repeated.

**8. EXTRA WORK**

The OWNER, without invalidating the Contract, may order extra work or make changes by altering, adding to or deducting from the Work, the Contract Sum being adjusted accordingly. All such Work shall be executed and paid for in accordance with the General Conditions, which is a part of this Contract.

## **CONSENT DECREE REQUIREMENTS (NOT APPLICABLE TO THIS PROJECT)**

**8.1** 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.

**8.2** TIME IS OF THE ESSENCE IN THE PERFORMANCE OF THIS AGREEMENT. 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 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.

**8.3** The provisions of this Section and the various rates of compensation for CONTRACTOR's services provided for elsewhere in this Agreement have been agreed to in anticipation of the orderly and continuous progress of the PROJECT through completion.

**8.4** 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 PROJECT 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. Section 9.6 of this Agreement (Disputes) shall apply in the event the parties cannot agree upon an extension of time.

In the event that the overall delay resulting from the above-described causes is sufficient to prevent complete performance of the Agreement 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. Section 9.6 of this Agreement shall apply in the event the parties cannot agree upon an adjustment of fee.

**8.5** 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 as provided in Section 9.2, above. Section 9.6 of this Agreement (Disputes) 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.

**8.6 DISPUTES**

Except as otherwise provided in this Agreement, 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 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 in accordance with the directions of the OWNER.

**9. THE FOLLOWING IS AN ENUMERATION OF THE SPECIFICATIONS AND DRAWINGS (CONTRACT DOCUMENTS):**

**SPECIFICATIONS**

SECTION NO.	TITLE	PAGES
1	Advertisement for Bids	AB 1 thru 5
2	Information for Bidders	IB 1 thru 9
3	Form of Proposal	P 1 thru 43
4	General Conditions	GC 1 thru 51
5	Special Conditions	SC 1 thru 6
6	Contract Agreement	CA 1 thru 6
7	Performance and Payment Bonds	PB 1 thru 7
8	Addenda	AD 1 thru 1
9	Technical Specifications	
	01001 General Specifications	1 thru 12
	02110 Site Clearing and Grubbing	1 thru 2
	02140 Dewatering	1
	02235 Crushed Stone and Dense Graded Aggregate (DGA)	1 thru 3
	02270 Geotextiles	1 thru 2
	02370 Erosion and Sediment Control	1 thru 43
	02371 Storm Water Pollution Prevention Plan (SWPPP)	1 thru 18
	02510 Concrete Paving	1 thru 4
	02610 Water and Sewage Force Main Pipe	1 thru 43
	02700 Sewer and Drain Pipe	1 thru 41
	02830 Fencing	1 thru 10
	02930 Sodding and Seeding	1 thru 7

	03301	Cast-in-Place Concrete (Minor Structures)	1 thru 4
	05520	Metal Fabrications	1 thru 11
	05540	Castings	1 thru 3
	11312	Submersible Sewage Pumps and Accessories	1 thru 8
10	Appendices	AP	1 thru 1

IN WITNESSETH WHEREOF, the parties hereto have executed this Contract as of the date and year above written.

(Seal)

Lexington-Fayette Urban County Government.  
Lexington, Kentucky

(Owner)

ATTEST:

Mackenzie Stock  
Clerk of the Urban County Council

BY: Linda Gorton  
MAYOR

Brenda Whittington  
(Witness)

Mayor  
(Title)

(Seal)

(Contractor)

[Signature]  
(Secretary)\*

BY: [Signature]

[Signature]  
(Witness)

PRESIDENT  
(Title)

310 Cutters Hill Ct., Lexington, KY 40509  
(Address and Zip Code)

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 Contract.



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

6/9/2022

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).

<b>PRODUCER</b> Arthur J. Gallagher Risk Management Services, Inc 1601 Alliant Avenue Louisville KY 40299	<b>CONTACT NAME:</b> Becky Chowning <b>PHONE (A/C, No, Ext):</b> 502-415-7021 <b>FAX (A/C, No):</b> 502-415-7001 <b>E-MAIL ADDRESS:</b> Becky_Chowning@ajg.com	
	<b>INSURER(S) AFFORDING COVERAGE</b>	
<b>INSURED</b> NAC Heavy Highway, Inc 310 Cutters Hill Court Lexington KY 40509	<b>INSURER A :</b> Westfield Insurance Company <b>NAIC #</b> 24112	
	<b>INSURER B :</b> Kentucky AGC Self Insurors Fund	
	<b>INSURER C :</b>	
	<b>INSURER D :</b>	
	<b>INSURER E :</b>	
	<b>INSURER F :</b>	

**COVERAGES****CERTIFICATE NUMBER:** 340880072**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	<input checked="" type="checkbox"/> <b>COMMERCIAL GENERAL LIABILITY</b> <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input checked="" type="checkbox"/> LOC OTHER:	Y		TRA4782783	4/4/2022	4/4/2023	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 500,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 \$
A	<input checked="" type="checkbox"/> <b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY <input type="checkbox"/> OTHER:	Y		TRA4782783	4/4/2022	4/4/2023	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	<input checked="" type="checkbox"/> <b>UMBRELLA LIAB</b> <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> <b>EXCESS LIAB</b> <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$ 0			TRA4782783	4/4/2022	4/4/2023	EACH OCCURRENCE \$ 4,000,000 AGGREGATE \$ 4,000,000 \$
B	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N N	N/A	7092	1/1/2022	1/1/2023	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER E.L. EACH ACCIDENT \$ 4,500,000 E.L. DISEASE - EA EMPLOYEE \$ 4,500,000 E.L. DISEASE - POLICY LIMIT \$ 4,500,000
A	Leased/rented equip			TRA4782783	4/4/2022	4/4/2023	Per Item \$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: Division of Water Quality for Leestown Road Industrial Pump Station, Replacement Bid #40-2022

Lexington-Fayette Urban County Government is Additional Insured, on a Primary & Non-Contributory basis, including on-going and completed operations, as required by written contract, as respects General Liability and Automobile Liability policies.  
 30 days notice of cancellation shall be given to the Certificate Holder, 10 days for non-payment of premium.

**CERTIFICATE HOLDER****CANCELLATION**

Lexington-Fayette Urban County Government Division of Water Quality 200 East Main Street 3rd Floor, Room 338 Lexington KY 40507	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 
---	---

© 1988-2015 ACORD CORPORATION. All rights reserved.

RESOLUTION NO. 355 - 2022

A RESOLUTION ACCEPTING THE BID OF NAC HEAVY HIGHWAY, INC., IN THE AMOUNT \$1,283,052.00, FOR THE LEESTOWN INDUSTRIAL PUMP STATION REPLACEMENT PROJECT, FOR THE DIVISION OF WATER QUALITY, AND AUTHORIZING THE MAYOR, ON BEHALF OF THE URBAN COUNTY GOVERNMENT, TO EXECUTE AN AGREEMENT WITH NAC HEAVY HIGHWAY, INC., RELATED TO THE BID.

---

BE IT RESOLVED BY THE COUNCIL OF THE LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT:

Section 1 - That the bid of NAC Heavy Highway, Inc., in the amount of \$1,283,052.00, for the Leestown Industrial Pump Station Replacement Project, for the Division of Water Quality, be and hereby is accepted and approved as to the specifications and amounts set forth in the terms of the bid and agreement, which are attached hereto and incorporated herein by reference, and the Mayor, on behalf of the Lexington-Fayette Urban County Government, be and hereby is authorized to execute the Agreement with NAC Heavy Highway, Inc., related to the bid.

Section 2 - That an amount, not to exceed the sum of \$1,283,052.00, be and hereby is approved for payment to NAC Heavy Highway, Inc. from account #4003-303408-92811, pursuant to the terms of the bid and the Agreement.

Section 3 - That this Resolution shall become effective on the date of its passage.

PASSED URBAN COUNTY COUNCIL: July 5, 2022



\_\_\_\_\_  
MAYOR

ATTEST:

  
\_\_\_\_\_  
CLERK OF URBAN COUNTY COUNCIL

0613-22:DJB:X:\Cases\WATER-AIR\22-LE0003\LEG\00758754.DOC

1.01 PERFORMANCE BOND

PERFORMANCE BOND

Bond No. 3850802

KNOW ALL MEN BY THESE PRESENTS, that

NAC Heavy Highway, Inc.  
(Name of CONTRACTOR)

310 Cutters Hill Court, Lexington, KY 40509  
(Address of CONTRACTOR)

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

called Principal, and Great American Insurance Company  
(Name of Surety)

301 E. 4th Street, Cincinnati, OH 45202  
(Address of Surety)

hereinto called Surety, are held and firmly bound unto

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

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

One Million Two Hundred Eighty-Three Thousand Fifty-two dollars  
and zero cents \_\_\_\_\_ dollars (\$ 1,283,052.00 ),

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

WHEREAS, Principal by written agreement is entering into an Agreement (Contract) with OWNER for the Leestown Road Industrial Pump Station Replacement, LFUCG Bid No. 40-2022, in accordance with Contract Documents prepared by Bell Engineering and dated **February 2022**, which Agreement (Contract) is by reference made a part hereof, and is hereinafter referred to as the Agreement (Contract).

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

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

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

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

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

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

IN WITNESS WHEREOF, this instrument is executed in 3 (Three) counterparts, each one of (number)

which shall be deemed an original, this the 5th day of July, 20 22.

ATTEST:

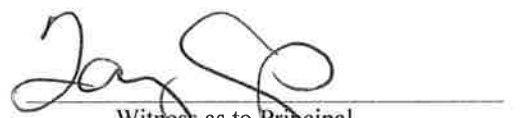
NAC Heavy Highway, Inc.  
Principal

  
(Principal) Secretary

By:  (s)

310 Cutters Hill Court  
Address

Lexington, KY 40509

  
Witness as to Principal

310 Cutters Hill Ct  
Address

Lexington ky 40509

Great American Insurance Company  
Surety

ATTEST:

By: \_\_\_\_\_  
Attorney-in-Fact

  
(Surety) Secretary

301 E. 4th Street  
Address

Cincinnati, OH 45202

(SEAL)  
  
Andrea Cortes Witness to Surety

1601 Alliant Avenue  
Address

Louisville, KY 40299

Title: Attorney-In-Fact  
Surety

By:   
Thomas J. Mitchell

Title: Attorney-In-Fact

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

1.02 PAYMENT BOND

PAYMENT BOND

Bond No. 3850802

KNOW ALL MEN BY THESE PRESENTS, that

NAC Heavy Highway, Inc.  
(Name of CONTRACTOR)

310 Cutters Hill Court, Lexington, KY 40509  
(Address of CONTRACTOR)

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

called Principal, and Great American Insurance Company  
(Name of Surety)

301 E. 4th Street, Cincinnati, OH 45202  
(Address of Surety)

hereinto called Surety, are held and firmly bound unto

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

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

One Million Two Hundred Eighty-Three Thousand Fifty-two dollars  
and zero cents dollars (\$ 1,283,052.00 ),

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

WHEREAS, Principal by written agreement is entering into an Agreement (Contract) with OWNER for the Leestown Road Industrial Pump Station Replacement, LFUCG Bid No. 40-2022 in accordance with Contract Documents prepared by Bell Engineering and dated February 2022, which Agreement (Contract) is by reference made a part hereof, and is hereinafter referred to as the Agreement (Contract).

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

1. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor material, or both, used or reasonably required for use in the performance of the Agreement (Contract), labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Agreement (Contract).
2. The above named Principal and Surety hereby jointly and severally agree with the OWNER that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such



sum or sums as may be justly due claimant and have execution thereon. The OWNER shall not be liable for the payment of any costs or expenses of any such suit.

3. No suit or action shall be commenced hereunder by any claimant:
  - (a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: The Principal, the OWNER, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the Work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the Work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, OWNER, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.
  - (b) After the expiration of one (1) year following the date on which Principal ceased Work on said Agreement (Contract), it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.
  - (c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.
4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against aid improvement, whether or not claim for the amount of such lien be presented under and against this bond.

IN WITNESS WHEREOF, this instrument is executed in 3 (Three) counterparts, each one of (number)

which shall be deemed an original, this the 5th day of July, 20 22.

ATTEST:

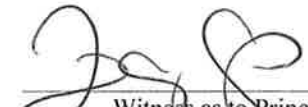
  
(Principal) Secretary

NAC Heavy Highway, Inc.  
Principal

By:  (s)

310 Cutters Hill Court  
Address

Lexington, KY 40509

  
Witness as to Principal  
310 Cutters Hill Ct  
Address  
Lexington KY 40509

Great American Insurance Company  
Surety

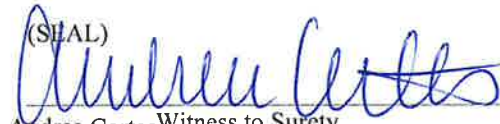
ATTEST:

  
(Surety) Secretary

By: \_\_\_\_\_  
Attorney-in-Fact

301 E. 4th Street  
Address

Cincinnati, OH 45202

(SEAL)  
  
Andrea Cortes Witness to Surety

Title: Attorney-In-Fact  
Surety

1601 Alliant Avenue  
Address

By:   
Thomas J. Mitchell

Louisville, KY 40299

Title: Attorney-In-Fact

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

1.03 EROSION AND SEDIMENT CONTROL PERFORMANCE BOND

Bond No. 3850802

EROSION AND SEDIMENT CONTROL PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that

NAC Heavy Highway, Inc.  
(Name of CONTRACTOR)

310 Cutters Hill Court, Lexington, KY 40509  
(Address of CONTRACTOR)

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

called Principal, and Great American Insurance Company  
(Name of Surety)

301 E. 4th Street, Cincinnati, OH 45202  
(Address of Surety)

hereinto called Surety, are held and firmly bound unto

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

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

Twenty one thousand dollars and zero cents dollars (\$21,000.00), for the payment of whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into an Agreement (Contract) with OWNER for the Leestown Road Industrial Pump Station Replacement, LFUCG Bid No. 40-2022 in accordance with Contract Documents prepared by Bell Engineering and dated February 2022, which Agreement (Contract) is by reference made a part hereof, and is hereinafter referred to as the Agreement (Contract).

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

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

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

1. Complete the installation, maintenance, and removal of the soil erosion and sediment controls and final stabilization of the site during the full period of land disturbance in accordance with the Agreement (Contract), the LFUCG Land Disturbance Permit, Chapter 16 Article X Division 5 of the LFUCG Code of Ordinances, Chapter 11 of the LFUCG Stormwater Manual, and the KPDES General Permit for Stormwater Discharges Associated with Construction Activities (KYR10).

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


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

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

IN WITNESS WHEREOF, this instrument is executed in 3 (Three) counterparts, each one of (number)

which shall be deemed an original, this the 5th day of July, 20 22.

ATTEST:

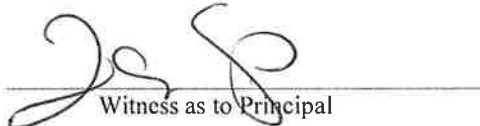
  
(Principal) Secretary

NAC Heavy Highway, Inc.  
Principal

By:  (s)

310 Cutters Hill Court  
Address

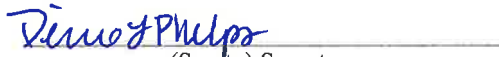
Lexington, KY 40509

  
Witness as to Principal  
310 Cutters Hill Ct  
Address

Lexington Ky 40509

Great American Insurance Company  
Surety

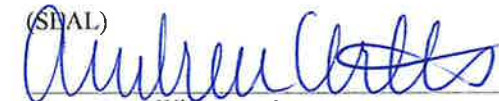
ATTEST:

  
(Surety) Secretary

By: \_\_\_\_\_  
Attorney-in-Fact

301 E. 4th Street  
Address

Cincinnati, OH 45202

(S)AL  
  
Andrea Cortes Witness to Surety

1601 Alliant Avenue  
Address

Louisville, KY 40299

Title: Attorney-In-Fact  
Surety

By:   
Thomas J. Mitchell

Title: Attorney-In-Fact

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Agreement (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 **TEN**

No. 0 21452

**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
WILLIAM A. KANTLEHNER, III	ANDREW G. WINDHORST, JR.	ALL
THOMAS J. MITCHELL	ROSS E. JOHNSON	\$100,000,000
RYAN P. MITCHELL	ANDREA CORTES	
DIANE L. PHELPS	WILLIAM A. KANTLEHNER, IV	
CHRISTOPHER E. VON ALLMEN	ELIZABETH DAWSON	

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 14TH day of JULY, 2020



*Stephen C. Beraha*  
Assistant Secretary

GREAT AMERICAN INSURANCE COMPANY

*Mark Vicario*  
Divisional Senior Vice President

STATE OF OHIO, COUNTY OF HAMILTON - ss:

On this 14TH day of JULY, 2020

MARK VICARIO (877-377-2405)

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 Comm. Expires  
May 18, 2025

*Susan A Kohorst*

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 Divisional 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 5th day of July, 2022



*Stephen C. Beraha*  
Assistant Secretary



**CONTRACT DOCUMENTS  
AND  
SPECIFICATIONS**

**DIVISION OF WATER QUALITY**

**FOR**

**LEESTOWN ROAD INDUSTRIAL  
PUMP STATION REPLACEMENT**

**Bid No. 40-2022**

**April 2022**  
**Bid Set**

**TABLE OF CONTENTS**

**CONTRACT DOCUMENTS**

**LEESTOWN ROAD INDUSTRIAL PUMP STATION REPLACEMENT**

**Bid No. 40-2022**

---

PART 1	ADVERTISEMENT FOR BIDS
PART 2	INFORMATION FOR BIDDERS
PART 2a	GEOTECHNICAL DATA
PART 3	FORM OF PROPOSAL
PART 4	GENERAL CONDITIONS
PART 5	SPECIAL CONDITIONS
PART 6	CONTRACT AGREEMENT
PART 7	BONDS AND CERTIFICATES
PART 8	ADDENDA
PART 9	TECHNICAL SPECIFICATIONS
PART 10	APPENDICES



**PART 1**

**ADVERTISEMENT FOR BIDS**

**INDEX**

---

1.	INVITATION .....	AB-2
2.	DESCRIPTION OF WORK.....	AB-2
3.	OBTAINING PLANS, SPECIFICATIONS, AND BID DOCUMENTS .....	AB-2
4.	METHOD OF RECEIVING BIDS .....	AB-3
5.	METHOD OF AWARD.....	AB-3
6.	BID WITHDRAWAL .....	AB-3
7.	BID SECURITY .....	AB-3
8.	SUBMISSION OF BIDS.....	AB-3
9.	RIGHT TO REJECT.....	AB-4
10.	NOTIFICATION TO THE LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT FOR AFFIRMATIVE ACTION PLAN .....	AB-4
11.	NOTICE CONCERNING DBE GOAL .....	AB-4
12.	PRE-BID MEETING.....	AB-5
13.	CONSENT DECREE REQUIREMENTS .....	AB-5

**ADVERTISEMENT FOR BIDS**

## 1. INVITATION

Sealed proposals for the following work will be received by the Lexington-Fayette Urban County Government (LFUCG) via Ion Wave (<https://lexingtonky.ionwave.net>) until **2:00 pm**, local time, Thursday, May 19, 2022, for furnishing all labor and/or materials and performing all work as set forth in the Contract Documents prepared by and for Lexington-Fayette Urban County Government,

Division of Water Quality (OWNER). All forms and Contract Documents normally filled out and attached with bid submission shall be downloaded from Lynn Imaging's Planroom and may be viewed on Ion Wave. All notary requirements are waived for this solicitation. A copy of bid bond must be included with submission. Immediately following the scheduled closing time for reception of Bids, all proposals which have been submitted in accordance with the above will be opened electronically and a bid tab sheet will be posted on Ion Wave within approximately 30 mins.

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

## 2. DESCRIPTION OF WORK

The project includes providing all construction supervision, labor, materials, tools, test equipment necessary for **LEESTOWN ROAD INDUSTRIAL PUMP STATION REPLACEMENT**.

## 3. OBTAINING PLANS, SPECIFICATIONS, AND BID DOCUMENTS

Plans, Specifications, and Contract Documents may be obtained from the official bid document distributor, LYNN IMAGING, 328 Old Vine Street, Lexington, KY 40507, (859) 255-1021 or ([www.lynnimaging.com](http://www.lynnimaging.com)) and click on plan room for a non-refundable price of reproduction for each full set of plans and documents. Bids must be submitted through LFUCG's Ion Wave. Plans may also be purchased in digital download format.

Due to current environment and recommendations for social distancing, no Contract Documents may be examined in person.

## 4. METHOD OF RECEIVING BIDS

Bids will be received from Prime Contracting firms on a **Lump Sum and Line-Item Unit Price Basis**, for the Project. 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.

Bids should be submitted online via Ion Wave (<https://lexingtonky.ionwave.net>). A Letter of Instructions for establishing an IonWave account is included in the Appendix of the bid documents.

**5. METHOD OF AWARD**

The Contract, if awarded, will be to the lowest, qualified 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 / cashier's 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 certified check or cashier's check is also acceptable forms of bid security.

**8. SUBMISSION OF BIDS**

CONTRACTORS shall submit their Bids via Ion Wave not later than 2:00 p.m. (local time) Thursday, May 19, 2022. Bids will remain sealed until 2:00 p.m. (local time) Thursday, May 19, 2022, the official Bid closure time. Bids received after the scheduled closing time for receipt of Bids will not be considered.

**9. RIGHT TO REJECT**

The Purchasing Agent for the Lexington-Fayette Urban County Government reserves the right to reject any and all bids and to waive all informalities and/or technicalities where the best interest of the Lexington-Fayette Urban County Government may be served.

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

The successful bidder must submit with their bid the following items to the Lexington-Fayette Urban County Government:

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

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

All submissions should be directed to:

Lexington-Fayette Urban County Government  
Division of Purchasing  
200 East Main Street, 3<sup>rd</sup> Floor, Room 338  
Lexington, Kentucky 40507

#### **11. NOTICE CONCERNING MWDBE and Veteran GOALS**

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

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. The Lexington Fayette Urban County Government also has 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 as well as Veteran-Owned Small Businesses as subcontractors are recommended goals. Contractor(s) who fail to meet such goal 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 goals will be a consideration in the procurement process. Depending on the funding source, other DBE goals may apply.

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

Sherita Miller, Minority Business Enterprise Liaison  
Division of Central Purchasing  
Lexington-Fayette Urban County Government  
200 East Main Street, 3rd Floor, Room 338  
Lexington, Kentucky 40507  
[smiller@lexingtonky.gov](mailto:smiller@lexingtonky.gov)

**12. CONSENT DECREE REQUIREMENTS**

Consent Decree Requirements do not apply to this project.



## New Electronic Bidding System

Dear Vendor:

Effective September 1<sup>st</sup>, 2016, the Lexington-Fayette Urban County Government will be posting all bids, RFPs, RFQs and Quote Requests on a new electronic bidding system. To receive notifications about upcoming opportunities you **MUST** register on this new site.

You may register your company via the internet and view our current bid documents by following the directions below.

Visit our site at:

<https://lexingtonky.ionwave.net>

Click on "Supplier Registration" and follow the instructions to create a new user name and password on the site.

As a result of completing this registration, your company/firm will be added to the Lexington-Fayette Urban County Government's vendor list and will receive future invitations (via email notification) to bid on commodities/services for which you have expressed an interest in providing.

Should you have any questions, please do not hesitate to contact my office at 859-258-3320.

Sincerely,



Todd Slatin, Director  
Division of Central Purchasing



**PART 2**

**INFORMATION FOR BIDDERS**

**INDEX**

1.	RECEIPT AND OPENING OF BIDS .....	IB-2
2.	PREPARATION OF BID.....	IB-2
3.	SUBCONTRACTS.....	IB-2
4.	QUALIFICATION OF BIDDER.....	IB-2
5.	BID SECURITY .....	IB-3
6.	LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT .....	IB-4
7.	TIME OF COMPLETION AND LIQUIDATED DAMAGES .....	IB-4
8.	EXAMINATION OF CONTRACT DOCUMENTS AND SITE.....	IB-4
9.	ADDENDA AND INTERPRETATIONS.....	IB-5
10.	SECURITY FOR FAITHFUL PERFORMANCE .....	IB-5
11.	POWER OF ATTORNEY .....	IB-5
12.	TAXES AND WORKMEN'S COMPENSATION .....	IB-6
13.	LAWS AND REGULATIONS .....	IB-6
14.	EROSION AND SEDIMENT CONTROL AND PERMITS .....	IB-6
15.	PREVAILING WAGE LAW AND MINIMUM HOURLY RATES.....	IB-6
16.	AFFIRMATIVE ACTION PLAN .....	IB-6
17.	CONTRACT TIME.....	IB-7
18.	SUBSTITUTION OR "OR-EQUAL" ITEMS.....	IB-7
19.	ALTERNATE BIDS.....	IB-7
20.	SIGNING OF AGREEMENT.....	IB-8
21.	ASSISTANCE TO BE OFFERED TO DBE CONTRACTORS .....	IB-8

## PART II

### INFORMATION FOR BIDDERS

#### 1. 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 online through Ion Wave (<https://lexingtonky.ionwave.net>)** at the time and in the manner set forth in the Advertisement for Bids, at which time the bids will be opened electronically. The OWNER may consider informal any Bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all Bids. Any Bid may be withdrawn prior to the scheduled time for the opening of Bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be considered. No Bidder may withdraw a Bid within sixty (60) 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 OWNER assumes no responsibility for Bids that are not submitted electronically as indicated above. Bids that are not submitted online by the stated time and date will be rejected.

#### 2. PREPARATION OF BID

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

Bids should be submitted online via Ion Wave (<https://lexingtonky.ionwave.net>). A Letter of Instructions for establishing an IonWave account is included in the Appendix of the bid documents.

#### 3. 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 the Form of Proposal. 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.



#### 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, if requested by the bid forms, in the order in which they are listed in the Bid Form, but OWNER may accept or decline them in any order or combination. 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 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 and in good standing with the requirements and provisions of 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.
- D. Optional OWNER Requirements - The OWNER, at its discretion, may require the BIDDER/CONTRACTOR to provide: (1) a current detailed financial statement for a period including up to 3 prior years; (2) financial security or insurance in amounts and kinds acceptable to the OWNER to meet the financial responsibility requirements for the CONTRACTOR to indemnify the OWNER. (3) Additional information and/or DBE work force data, as well as DBE participation data.

**Each bidder agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.**

**5. BID SECURITY**

- A. Each bid must be accompanied by a bid bond prepared on a Form of Bid Bond and attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the OWNER, in the amount of 5% of the bid. Such bid bond will be returned to the unsuccessful bidder(s) only upon written request to the Director of Central Purchasing within seven (7) days of opening of bids. Bid bond shall be made payable to the Lexington-Fayette Urban County Government. Bid security is not required for projects under \$50,000.
- B. Bonds shall be placed with an agent licensed in Kentucky with surety authorized to do business within the state. When the premium is paid for such coverage, the full commission payable shall be paid to such local agent who shall not divide such commission with any person other than a duly licensed resident local agent.

**6. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT**

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

**7. TIME OF COMPLETION AND LIQUIDATED DAMAGES**

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 \$400 per day as 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 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 paragraph 8; 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.

## 9. 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.

## 10. SECURITY FOR FAITHFUL PERFORMANCE

- A. Simultaneously with his delivery of the executed Contracts, the CONTRACTOR shall furnish a surety bond or bonds as security for the faithful performance of this Contract and for payment of all persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract, as specified in the General Conditions. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the OWNER and authorized to do business in the Commonwealth of Kentucky.
- B. All bonds required by this Contract and laws of this State shall be placed with agents licensed in the State of Kentucky. When the premium is paid for such coverage's, the full commission shall be paid to such local agent who shall not divide such commission with any person other than a duly licensed resident local agent.
- 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). Each document will be for 100% of the Contract Bid Amount.**

**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, such as old age pension, social security, or annuities measured by wages. Each shall carry Workmen's Compensation Insurance to the full amounts as required by Statutes and shall include the cost of all foregoing items in the 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 or state wage rates and regulations, if required for this Project, will be as described in the Special Conditions.

**16. AFFIRMATIVE ACTION PLAN**

The successful Bidder must submit with their bid, the following items to the Urban County Government:

1. Affirmative Action Plan of the firm
2. Current Work Force Analysis Form
3. Good Faith Effort Documentation

4. List of Disadvantaged Business Enterprise Subcontractors and the Dollar Value of each Subcontract

A Work Force Analysis 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, Kentucky 40507

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 Form of Proposal and the Agreement.

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. 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.

19. **ALTERNATE BIDS**

**Bidders shall submit alternate bids/proposals only if and when such alternate bids/proposals have been specifically requested in an Invitation for Bids.** If alternate bids/proposals are requested in an Invitation for Bids, the form of submission 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 TO DISADVANTAGED BUSINESS ENTERPRISE (MWDBE) CONTRACTORS**

**A. Outreach for MWDBE(s)**

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

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

Sherita Miller, 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](mailto:smiller@lexingtonky.gov)

**B. Bid Bond Assistance for MWDBE(s)**

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

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

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

Sherita Miller, 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](mailto:smiller@lexingtonky.gov)

D. MWDBE and Veteran Subcontractors

The LFUCG will, upon request, assist prime contractors in the procurement of eligible DBE subcontractors in an effort to achieve 10% minimum MWDBE and 3% minimum veteran goal.

For a list of eligible subcontractors, 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](mailto:smiller@lexingtonky.gov)

**SECTION 00320 – GEOTECHNICAL DATA**

**1.01 GENERAL**

See attached *Geotechnical Engineering Exploration* report, titled *Leestown Industrial Pump Station*, dated January 25, 2022, by L.E. Gregg Associates.

END OF SECTION





**Geotechnical Engineering  
Exploration**

**Project:**

**Leestown Road Pump Station  
Lexington, Kentucky**

**Prepared for:**

**Bell Engineering**

**January 25, 2022**



January 25, 2022

Jonathan Rehner  
Bell Engineering  
2480 Fortune Drive, Suite 350  
Lexington, KY 40509

**RE: Report of Geotechnical Exploration  
Leestown Road Pump Station  
Lexington, Kentucky  
L.E. Gregg Project Number: 2021063**

Mr. Rehner,

L.E. Gregg Associates is pleased to present our report for the geotechnical exploration performed at the above referenced site. The attached report presents a review of the project information provided to us, a description of the site and subsurface conditions encountered, as well as any foundation and earthwork recommendations for the proposed project. This field exploration for this study was performed on December 9<sup>th</sup>, 2021.

Unless prior arrangements are made, any remaining soil samples will be discarded shortly after the issue date of this report. Rock cores will be retained for a period of 12 months and then discarded.

We appreciate the opportunity to assist you on this project. If we can be of further service on this or other projects, please contact us.

Respectfully,

**L.E. GREGG ASSOCIATES**

A handwritten signature in blue ink, appearing to read 'Steven Mortimer'.

Steven Mortimer, P.E.  
Senior Engineer

A handwritten signature in blue ink, appearing to read 'Jason Ainslie'.

Jason Ainslie, P.E.  
President

## TABLE OF CONTENTS

	<u>Page</u>
<b>1.0 INTRODUCTION .....</b>	<b>1</b>
1.1 PURPOSE OF EXPLORATION.....	1
<b>2.0 PROJECT INFORMATION.....</b>	<b>1</b>
2.1 BACKGROUND INFORMATION.....	1
2.2 SITE SURFACE CONDITIONS.....	1
2.3 SITE GEOLOGY.....	2
2.4 LABORATORY TESTING .....	3
<b>3.0 EXPLORATION FINDINGS .....</b>	<b>3</b>
3.1 SUBSURFACE CONDITIONS .....	3
3.2 SEISMIC SITE CLASSIFICATION .....	5
<b>4.0 GEOTECHNICAL RECOMMENDATIONS.....</b>	<b>6</b>
4.1 GEOTECHNICAL CONSIDERATIONS .....	6
4.2 FOUNDATIONS .....	8
4.3 SITE PREPARATION AND GRADING .....	9
4.4 FILL PLACEMENT.....	9
4.5 DRAINAGE.....	10
4.6 SLOPE RECOMMENDATIONS .....	10
4.7 BELOW GRADE WALLS.....	10
4.8 LATERAL EARTH PRESSURES .....	12
4.9 KARST REGION CONSTRUCTION RECOMMENDATIONS .....	12
<b>5.0 BASIS FOR RECOMMENDATIONS .....</b>	<b>13</b>
Key to Symbols and Descriptions	
Appendix A – Logs of Borings	
Appendix B – Site Location Map and Drawings	
Appendix C – Seismic Site Class/Design Information	

## **1.0 INTRODUCTION**

### **1.1 PURPOSE OF EXPLORATION**

The purpose of this exploration was to determine the general subsurface conditions existing at the project site through a program of controlled drilling, sampling, and testing; and to evaluate these findings with respect to the foundation concept, design, and currently accepted engineering practices. The purpose and scope of services were discussed with Bell Engineering and outlined in L.E. Gregg proposal P21-096, dated November 10, 2021. More specifically, the objectives are:

1. Determine the textures, thicknesses, consistencies and general physical properties of the soil strata encountered at the boring locations, along with the depths to and elevations of the underlying bedrock surface beneath the proposed structure.
2. Determine the general geologic conditions existing at the site.
3. Determine the detailed characteristics of the underlying bedrock if rock is encountered at a depth where it may be considered an economical choice as the bearing medium.
4. Determine the existing surface and subsurface water conditions at the site and their relation to design, construction, and service of the proposed project.

## **2.0 PROJECT INFORMATION**

### **2.1 BACKGROUND INFORMATION**

Project information was provided in a request for proposal to L.E. Gregg Associates from Bell Engineering. The proposed project is for the addition of two 8 ft. diameter wet wells at the existing Leestown Road Pump Station located at 172 Trade Street in Lexington, Kentucky. The wet wells will bear approximately 20 ft. beneath the existing ground surface.

### **2.2 SITE SURFACE CONDITIONS**

The project site is located near the existing Leestown Road Pump Station located at 172 Trade Street, off an access road for the Amazon Warehouse. At the time of drilling, the existing ground surface was grass covered and bordered by trees and underbrush.

### **2.3 SITE GEOLOGY**

Geologic information was referenced from the Geologic map of the Lexington West quadrangle, Fayette and Scott Counties, Kentucky, 1967. Rocks underlying the area are of Lower to Middle Ordovician age and classified as the Lower Part of the Lexington Limestone. The Lower Part of the Lexington Limestone in this area consists of the Cane Run Bed and the Grier Limestone Member.

The Cane Run Bed consists of limestone which is light gray to light brownish gray, microgranular, and argillaceous. Dense limestone nodules and boulders occur in convolute beds, locally. Chert occurs as nodules and thin beds in the upper few feet and the top of the unit is a chert marker bed. The unit interfingers with and grades into lower part of the Tanglewood Limestone Member.

The Grier Limestone Member consists of 2 intervals above and five intervals below the Cane Run Bed.

#### 1st of 2 intervals above Cane Run Bed

Limestone, medium to medium dark gray, fine to medium grained, and fossiliferous with a few very thin shale layers in the upper few feet. Interfingers with and grades into the lower part of the Tanglewood Limestone Member.

#### 2nd of 2 intervals above Cane Run Bed

Limestone, medium to medium dark gray, fine to medium grained, and fossiliferous. Shale, medium dark gray and interbedded with limestone. The shale comprises about 30 percent of the unit. Interfingers with and grades into the lower part of the Tanglewood Limestone Member.

#### 1st of 5 intervals below Cane Run Bed

Limestone, medium to dark gray, microgranular to medium grained, and bioclastic. Shale, medium to olive gray occurring as sandy interbeds. The shale comprises about 15 percent of the unit. Unit interfingers with and grades into the lower part of the Tanglewood Limestone Member.

#### 2nd of 5 intervals below Cane Run Bed

Limestone, medium to dark gray, and bioclastic. Unit interfingers with and grades into the lower part of the Tanglewood Limestone Member.

3rd of 5 intervals below Cane Run Bed

Limestone, very light gray to dark gray, and rubbly. Unit consists of irregular medium and coarse grained limestone nodules in argillaceous limestone matrix. Shale partings separate some beds. Light gray bioclastic limestone interbeds that weather white occurs throughout unit.

4th of 5 intervals below Cane Run Bed

Limestone, light gray, microgranular, and argillaceous. Several thin beds of medium dark gray shale occur near the base.

5th of 5 intervals below Cane Run Bed

Limestone, medium-gray, nodular, and fossiliferous.

The karst potential in the vicinity of the site is characterized as karst intense. There are no mapped sinkholes located within the subject property; however, there are several located within the surrounding area. It should be noted that sinkholes are common in this region and that caverns can extend laterally and may be unobserved from the ground surface.

There are no known faults on the site; however, there are several named and unnamed faults surrounding Lexington. Faults are common geologic structures across the Commonwealth of Kentucky and have been mapped in many counties. These faults represent seismic activity that has occurred several million years ago at the latest and there has been no activity along these faults in recorded history. Seismic risk associated with these faults is considered to be very low.

## **2.4 LABORATORY TESTING**

The recovered soil samples were transported to L.E. Gregg's laboratory. Natural moisture content determinations (ASTM D2216), Atterberg limits (ASTM D4318), sieve analysis (ASTM D422), and USCS classifications (ASTM D2487) were conducted in general accordance with the American Society of Testing and Materials (ASTM) practices and standards.

## **3.0 EXPLORATION FINDINGS**

### **3.1 SUBSURFACE CONDITIONS**

#### **General**

Field testing procedures were performed in general accordance with ASTM practices, procedures, and standards. The borings were advanced using 4 in. solid flight augers. Samples were recovered in the undisturbed material below the tip of the auger using the standard drive sample technique in accordance with ASTM D 1586. A 2 in. O.D. (outside diameter) by 1 3/8 in. I.D. split-spoon sampler was driven a total of 18 in. with the number of blows of a 140 lb.

hammer falling 30 in. recorded for each 6 in. of penetration. The sum of the blows for the final 12 in. of penetration is referred to as the Standard Penetration Test (SPT) result, also known as the N-value, or blow count, which is recorded in blows per foot (bpf). Split spoon samples were generally recovered at 0.0, 1.5, 4.0, 6.5, 9.0 ft., and at 5.0 ft. intervals thereafter. These intervals may be adjusted in the field if gravel, boulders, shot rock, asphalt, or concrete surfaces are encountered. The boreholes were backfilled immediately with auger cuttings and/or granular material for safety considerations.

### **Soil Conditions**

The geotechnical exploration consisted of two (2) soil test borings, labeled B-1 and B-2. The boring locations were located in the field by Bell Engineering and L.E. Gregg staff. The approximate boring locations are shown on the boring layout in Appendix B.

The following subsurface descriptions are of a generalized nature in order to highlight the subsurface stratification features and material characteristics at the boring locations. The boring logs included in Appendix B of this report should be reviewed for specific information at each boring location. Information on actual subsurface conditions exists only at the specific boring locations and is relevant only to the time period that this exploration was performed. Variations may occur and should be expected at the site. All measurements listed below are approximate.

The subsurface conditions are described as follows:

**Topsoil** was encountered from the surface to a depth of 2 to 2.5 in.

**Fill Materials** consisting of lean clay and gravel were encountered in both borings from below the topsoil to 9 ft. The clay fill materials were silty, sandy, brown, firm to very stiff, and moist. Standard Penetration Test (SPT) "N"-values ranged from 5 to 24 bpf.

**Natural Soil** materials consisting of lean to fat clay materials were encountered from below the topsoil to refusal depths. The natural clay materials are generally silty and/or sandy, brown, firm to stiff, and moist. Standard Penetration Test (SPT) "N"-values ranged from 7 to 15 bpf.

**Table 1 – Summary of Drilling Depths**

Boring	*Elevation (ft.)	Refusal Depth (ft.)	Refusal Elevation (ft.)
B-1	882	17.3	864.7
B-2	883	22.2	860.8

*\*Elevations are taken from the Kentucky Digital Elevation Model (DEM) and are approximate.*

### **Rock Conditions**

Refusal was encountered in borings B-1 and B-2 at depths of 17.3 and 22.2 ft, respectively. Refusal generally indicates materials that cannot be penetrated with typical soil drilling methods. Therefore, refusal can indicate one or more of the following: coarse gravel, boulders, shot rock fill, buried concrete, weathered rock, thin rock seams, or the upper surface of sound, continuous bedrock. Core drilling is then required to determine the characteristics and soundness of the refusal materials. The refusal materials at B-2 and B-3 were cored according to ASTM D 2113, which utilizes a diamond studded bit fastened to the end of a hollow double tube core barrel. The assembly is lowered to refusal depth and the boring is flooded with water to control overheating and to bring the cuttings to the surface. As the drill is rotated at high speeds, the core bit advances into the refusal material and core samples are retained within the inner core barrel. These samples are removed after core runs of up to ten feet and placed in boxes for storage. The core samples were taken back to the laboratory where they were classified as to type of rock, percent recovery, and rock quality designation by an L.E. Gregg geologist or engineer. The percent core recovery (REC) is a ratio of the recovered sample length versus the total length attempted and is expressed as a percentage. The REC is used to assess the continuity of the refusal material. The rock quality designation (RQD) is obtained by summing up the length of core recovered, including only the portions that are greater than or equal to 4 inches, and dividing by the total length attempted. This is also expressed as a percentage and is used to assess the quality of the refusal material.

Boring B-1 was cored from the refusal depth of 17.3 ft. to 25 ft. The core indicated light to dark gray limestone interbedded with shale. The core had a recovery (REC) of 62% and a rock quality designation (RQD) of 34%, indicating competent bedrock of poor quality.

Boring B-2 was cored from the refusal depth of 22.2 ft. to 25 ft. The core also indicated light to dark gray limestone interbedded with shale. The core had a recovery (REC) of 100% and a rock quality designation (RQD) of 64%, indicating continuous bedrock of fair quality.

### **Water Conditions**

Water was not encountered in the borings or at the surface during the field exploration. Groundwater refers to any water that percolates through the soil and can refer to isolated or perched water pockets or water that occurs below the “water table”, which is a zone that remains saturated and water-bearing. The groundwater levels encountered during drilling may fluctuate significantly over time due to weather influences and should not be considered a true static groundwater level.

### **3.2 SEISMIC SITE CLASSIFICATION**

The Kentucky Building Code, Chapter 20 of ASCE 7-16, and the ASCE 7 Hazard Tool website were reviewed to determine the Seismic Site Classification for each site based on the following



coordinates, 38.072883°N, 84.547833°W. Based on review of geologic data, previous experience with similar projects, and subsurface conditions encountered, a **SEISMIC SITE CLASS "B"** is recommended for rock bearing foundations. We have assumed a Seismic Risk Category of II for the site.

Furthermore, using a Site Classification of **B**, we recommend the use of spectral response acceleration coefficients as follows:

0.2 second period:  $S_s = 0.170g$  and Soil Factor = 0.9

1.0 second period:  $S_1 = 0.083g$  and Soil Factor = 0.8

The design spectral response acceleration factors are as follows:

$S_{DS} = 0.102$

$S_{D1} = 0.044$

## 4.0 GEOTECHNICAL RECOMMENDATIONS

### 4.1 GEOTECHNICAL CONSIDERATIONS

#### General

Based on the provided information, the subsurface conditions encountered and past experience with similar projects, the site is suitable for the proposed development provided the following considerations are addressed. These considerations are briefly summarized below.

#### Undocumented Fill

Undocumented fill materials consisting of lean clay materials and gravel were encountered in one boring during the field exploration. Undocumented fills can contain zones of less compact materials which have the potential to settle under their own weight or under new loading. Fills placed in an uncontrolled or undocumented manner can present settlement issues from erratic differential settling of the fill. This settlement is dependent upon several factors such as fill thickness, degree of compaction (if any), fill contents, and age of the fill mass. We typically recommend complete removal of all undocumented fill within the footprint of proposed structures or within areas of slopes. If undocumented fills are not removed and are used as a bearing surface, the owner must be aware of the risks involved with construction over uncontrolled fills and must accept all risks and liability involved with this practice.

#### Silty and/or Sandy Clays

Natural and fill materials consisting of silty and/or sandy clays were encountered at the site. These materials can be sensitive to changing moisture conditions and can degrade under repetitive loading and unloading. Heavy equipment traffic during construction can cause these materials to break down. Care will need to be taken to consider traffic across the construction site and the contractor will need to consider changing moisture conditions during construction.

The owner and contractor should consider seasonal weather patterns for construction scheduling.

### **Excavation Sloping and/or Benching**

All excavation work must be performed in accordance with OSHA and local building code requirements. The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

### **Utility Trench Backfill**

All trench excavations should be completed with sufficient working space to permit construction as well as proper backfill placement and compaction. If utility trenches are backfilled with relatively clean granular material, they should be capped with at least 18 in. of lean clay fill in order to reduce the infiltration and conveyance of surface water through the trench backfill.

### **Karst Potential**

Karst potential in the location of the site is classified as intense. It should be noted that sinkholes are common in this region and that caverns can extend laterally and may be unobserved from the ground surface. It should also be noted that the rock formations underlying the site are known for horizontal and vertical solution cavities that may go unnoticed for long periods of time. There is a potential for karst features such as solution channels, rock pinnacles, or sinkholes to be encountered during construction.

### **Ground Water or Free Water**

Groundwater was not encountered during the exploration. Groundwater levels may fluctuate significantly over time due to weather influences. The available geological information and past experience with similar projects indicates that it is possible that during construction ground water could be encountered. Ground water and/or free water encroaching upon construction excavations should be removed by placing a sump near the source of seepage and then pumping from the sump. Should heavy seepage or ponding of water occur, then L.E. Gregg should be contacted.

### **Site Drainage**

Site drainage and adequate subgrade drainage are critical for performance of foundations. A surface drainage plan should be designed by a Civil Engineer or Landscape Architect. During construction, large quantities of water should not be allowed to accumulate on the site.

## **4.2 FOUNDATIONS**

### **General**

It is our understanding that the proposed structures will bear 20 ft. below the existing surface. Due to this and the refusal depths encountered, we would recommend that the structures bear on the underlying bedrock.

### **Design Considerations**

Rock bearing foundations should be placed within unweathered competent bedrock materials and should be designed for a maximum allowable bearing capacity of 10,000 pounds per square foot (psf). The bearing materials used should be uniform.

We recommend that isolated spread footings be a minimum of 24 in. by 24 in. The minimum thickness of both continuous and spread footings should be 12 in. As an alternative to bearing on competent bedrock, the foundation excavations may be trenched down to bedrock and backfilled with lean concrete to the bearing elevation. If this option is chosen, widen footing excavations by a minimum of six (6) inches on each side and backfill the foundation excavation from bedrock to the bearing elevation with lean concrete.

Excavate foundations down to competent bedrock. L.E. Gregg should observe the bearing surface once foundation excavations have been completed. Please note that foundation excavations may need to be deepened if the weathered bedrock is observed to be unsuitable as a bearing surface.

In order to check the continuity of the bedrock, a 2 to 3 inch diameter air hole should be drilled in the footprint of each structure. The hole should then be "probed" by a qualified geotechnical technician to check for any soft compressible seams, coal or other discontinuities. If this check indicates a discontinuous or compressible seam in the rock, the drilled hole should be excavated deeper. Significant deviations from the specified or anticipated conditions should be reported to the owner's representative and to the foundation designer.

### **Construction Considerations**

All vegetation, topsoil, unsuitable fill soil (if required), loose rock fragments greater than 6 in., construction debris, water, and other debris should be removed from the proposed construction areas before concrete placement. Any trench excavations should have adequate shoring per

OSHA requirements. The foundation support and/or foundation side walls should be protected from freezing weather, severe drying, and water ponding. Positive drainage should be provided to direct surface runoff away from excavations. The foundation elements should not be formed so that concrete completely fills the opened excavations. Any areas that require rock removal to achieve bearing elevations should be cut a minimum of 24 in. below bearing elevations and backfilled with engineered fill.

#### **4.3 SITE PREPARATION AND GRADING**

All vegetation, topsoil, unsuitable fill soil (if required), loose rock fragments greater than 6 in., construction debris, and other debris should be removed from the proposed construction areas. After completion of stripping operations, we recommend that the subgrade be proofrolled with a fully-loaded, tandem-axle dump truck or other pneumatic-tired construction equipment of similar weight. The geotechnical engineer or their representative should observe proofrolling. Areas judged to perform unsatisfactorily should be undercut and replaced with structural soil fill or remediated at the geotechnical engineer's recommendation.

#### **4.4 FILL PLACEMENT**

Material considered suitable for use as structural fill should be clean soil free of organics, trash, or other deleterious materials, and contain no rock fragments greater than 6 in. in any one dimension. Preferably, structural soil fill material should have a standard Proctor maximum dry density of 90 pounds per cubic foot (pcf) or greater and a plasticity index (PI) of 25 percent or less. All material to be used as structural fill should be tested by the geotechnical engineer to confirm that it meets the project requirements before being placed.

Structural fill should be placed in loose, horizontal lifts not exceeding 8 in. thick. Each lift should be compacted per Table 2 below and within the range of minus (-) 2 percent to plus (+) 2 percent of the optimum moisture content. Each lift should be tested by geotechnical personnel to confirm that the contractors' method is capable of achieving the project requirements before placing any subsequent lifts. Any areas which have become soft or frozen should be removed before additional structural fill is placed. One in place density test should be performed a minimum of every 5,000 ft<sup>2</sup> for each 8 in. lift. Adequate surface drainage should be provided during all site grading and fill placement operations.

**Please note that compaction efforts can be difficult to achieve using conventional construction methods during wet weather.**

**Table 2 – Fill Placement (ASTM D 698)**

<b>Location</b>	<b>Maximum Dry Density (%)</b>
<b>Footings and Floor Slabs</b>	<b>98.0</b>
<b>Pavement Areas</b>	<b>95.0</b>
<b>Landscape Areas</b>	<b>85.0</b>

#### **4.5 DRAINAGE**

To reduce the potential for undercut and construction induced sinkholes, water should not be allowed to collect in the foundation excavations, on floor slab areas, or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, subsurface water, or surface runoff. Engineered fill or concrete should not be placed in excavations containing standing water or over-softened soils. Positive site surface drainage should be provided to reduce infiltration of surface water around the perimeter of structures and beneath floor slabs. The grades should be sloped away from structures and surface drainage should be collected and discharged such that water infiltration is not permitted.

#### **4.6 SLOPE RECOMMENDATIONS**

##### **Cut Slopes**

Permanent soil cut slopes are typically recommended to be no steeper than 2H:1V. If steeper slopes are required, they will depend on existing conditions, materials, and will need to be reviewed on a case-by-case basis. The upper two (2) ft. of all cut slopes should be graded to 2:1 in order to reduce the potential for sloughing and erosion. Temporary cut slopes may be constructed for retaining walls, below grade walls, etc. and should follow OSHA excavation standards. Rock cut slopes should conform to the guidance listed in the Kentucky Transportation Cabinet (KYTC) Geotechnical Manual.

##### **Fill Slopes**

Permanent fill slopes should be no steeper than 2H:1V. Steeper slopes may be feasible if reinforcement is used in the design/construction. The fill material should be placed and compacted in horizontal lifts according to the project specifications and plans. The slope should be constructed by overbuilding the slope face and then cutting it back to the design grade. New fill material should be properly benched into the existing slopes as shown in the diagram below. Fill slopes should not be constructed or extended horizontally by placing fill on an existing slope face and/or compacted by track walking.

#### **4.7 BELOW GRADE WALLS**

The following parameters are recommended for below grade wall design and construction:

##### **Soil Backfill**

- Plasticity Index of the backfill material should be less than 25;
- Provide temporary bracing if the walls cannot accommodate construction phase stresses;
- Provide adequate drainage at the rear of the wall;

- Table 3 presents Equivalent Fluid Pressures (EFP), and Earth Pressure coefficients for active, at rest and passive conditions;

**Table 3 – Soil Backfill**

Condition	EFP (pcf)	Coefficients
Active	38	$K_a = 0.36$
At Rest	56	$K_o = 0.53$
Passive	291	$K_p = 2.77$

- The data presented in Table 3 are based on the following assumptions:
  - The backfill “on-site” material is classified as “CL” by the USCS;
  - Backfill material exhibits an angle of shear resistance of 28 degrees or greater;
  - Backfill material possibly exhibits a maximum dry density of 105.0 pcf or greater;
  - Retaining wall analysis assumes a level backfill slope;
  - Retaining wall analysis assumes that the wall will be designed as a vertical wall with respect to the retained soil;
  - Retaining wall analysis assumes the wall will be designed as a smooth wall with no friction.

**Granular Backfill**

- Provide temporary bracing if the wall cannot accommodate construction phase stresses;
- Table 4 presents conditions possibly exhibited by the backfill, earth pressure design parameters for Equivalent Fluid Pressures (EFP), and Earth Pressure coefficients;

**Table 4 – Granular Backfill**

Condition	EFP (pcf)	Coefficients
Active	30.0	$K_a = 0.25$
At Rest	50.0	$K_o = 0.38$

- The data presented in Table 4 is based on the following assumptions:
  - Retaining wall analysis assumes a level slope backfill;
  - Retaining wall analysis assumes that the wall will be designed as a vertical wall with respect to the retained granular backfill;
  - Retaining wall analysis assumes the wall will be designed as a smooth wall with no friction;
  - The backfill material is classified as “GW” or “GP” by the USCS (No. 57 stone is preferred);
  - Backfill material exhibits an angle of shear resistance of 38 degrees or greater.

#### 4.8 LATERAL EARTH PRESSURES

The Kentucky Building Code (KBC), current edition, Table 1806.2, provides guidelines for allowable lateral pressure for use in foundation design. The following table summarizes the allowable lateral pressures.

**Table 5 – Presumptive Load-Bearing Values (KBC/IBC Table 1806.2)**

Type of Material	Vertical Foundation Pressure (psf)	Lateral Bearing Pressure (psf/ft below natural grade)	Lateral Sliding Resistance	
			Coefficient of friction <sup>a</sup>	Cohesion (psf) <sup>b</sup>
Crystalline bedrock	12,000	1,200	0.70	-
Sedimentary and foliated rock	4,000	400	0.35	-
Sandy gravel and/or gravel (GW and GP)	3,000	200	0.35	-
Sand, silty sand, clayey sand, silty gravel, and clayey gravel (SW, SP, SM, SC, GM, and GC)	2,000	150	0.25	-
Clay, sandy clay, silty clay, clayey silt, silt, and sandy silt (CL, ML, MH, and CH)	1,500	100	-	130

a. Coefficient to be multiplied by the dead load

b. Cohesion value to be multiplied by the contact area, as limited by Section 1806.3.2

The values for lateral bearing pressure located above in Table 5, may be adjusted when considering load combinations, including wind or earthquake loads as permitted by Section 1605.3.2 of the KYBC.

#### 4.9 KARST REGION CONSTRUCTION RECOMMENDATIONS

The underlying rock units are classified as karst intense. Close attention should be given during the construction process to identify any possible karst features or surface movement. Adequate drainage to minimize water infiltration into the subsurface during and after construction should be provided to lessen the risk of damage due to karst activity during construction. Any significant solution features or dropouts encountered during construction will require remediation and will need to be evaluated on a case-by-case basis. Sinkholes could be repaired by using the inverted cone method which involves excavating the material to find the throat or opening in the bedrock; then lining the excavation with a filter fabric, and backfilling with crushed aggregate, however, L.E. Gregg should be contacted to provide specific recommendations for remediation of any encountered karst features.

## **5.0 BASIS FOR RECOMMENDATIONS**

### **VARIATIONS**

Since any general foundation or subsurface exploration can examine and report only that information which is obtained from the borings and samples taken there from, and since uniformity of subsurface conditions does not always exist, the following is recommended. If, during construction, any latent soil, bedrock, or water conditions are encountered that were not observed in the borings, contact L.E. Gregg so that the site may be inspected to identify any necessary modifications in the design or construction of the foundation.

### **OTHER INTERPRETATIONS**

The conclusions and recommendations submitted in this report apply to the proposed project only. They are not applicable to on-site, subsequent construction, adjacent or nearby projects. In the event that conclusions or recommendations based on this report and relating to any other projects are made by others, such conclusions and recommendations are not the responsibility of L. E. Gregg Associates. The recommendations provided are based in part on project information provided to L.E. Gregg and only apply to the specific project and site discussed in this report. If the project information section in this report contains incorrect information or if additional information is available, the correct or additional information should be conveyed to L.E. Gregg for review.

It is recommended that this complete report be provided to the various design team members, the contractors, and the project owner. Potential contractors should be informed of this report in the "instructions to bidders" section of the bid documents. The report should not be included or referenced in the actual contract documents.

### **STANDARD OF CARE**

The services provided by L. E. Gregg Associates for this exploration have been performed in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances.



**APPENDIX A**  
**Logs of Borings**



**PROJECT:** Leestown Road Pump Station **PROJECT NO.:** 2021063  
**CLIENT:** Bell Engineering **DATE:** 12/9/21  
**LOCATION:** 172 Trade Street, Lexington, KY **ELEVATION:** 882  
**DRILLER:** Strata Group, LLC **LOGGED BY:** M Vernon  
**DRILLING METHOD:** 4" SFA  
**DEPTH TO WATER > INITIAL:**  Dry **AFTER 24 HOURS:**  **CAVING >**  C

**BORING No. B-1**

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	Soil and Sampler Symbols, Blows	Sample No.	TEST RESULTS				Shear Strength (tsf)	
					Plastic Limit Water Content -	Liquid Limit	NM	PL		LL
882	0	Topsoil - 0.0-0.2 Fill - lean clay with gravel, silty, sandy, brown, firm to very stiff, moist		1	10	30				8
				2	10	30				10
877	5			3	10	30				17
				4	10	30				17
872	10	Lean-Fat clay, brown, firm to stiff, moist		5	10	30				8
867	15			6	10	30				15
862	20	Auger refusal at 17.3 ft. Begin core recovery. Limestone interbedded with shale, light to dark gray with dark gray banding.	 REC = 62% ROD = 34%							
857	25	Core recovery terminated at 25.0 ft.								
852	30									
847	35									

Figure



**PROJECT:** Leestown Road Pump Station **PROJECT NO.:** 2021063  
**CLIENT:** Bell Engineering **DATE:** 12/9/21  
**LOCATION:** 172 Trade Street, Lexington, KY **ELEVATION:** 883  
**DRILLER:** Strata Group, LLC **LOGGED BY:** M Vernon  
**DRILLING METHOD:** 4" SFA  
**DEPTH TO WATER > INITIAL:**  $\nabla$  Dry **AFTER 24 HOURS:**  $\nabla$  **CAVING >** C

**BORING No. B-2**

This information pertains only to this boring and should not be interpreted as being indicative of the site.

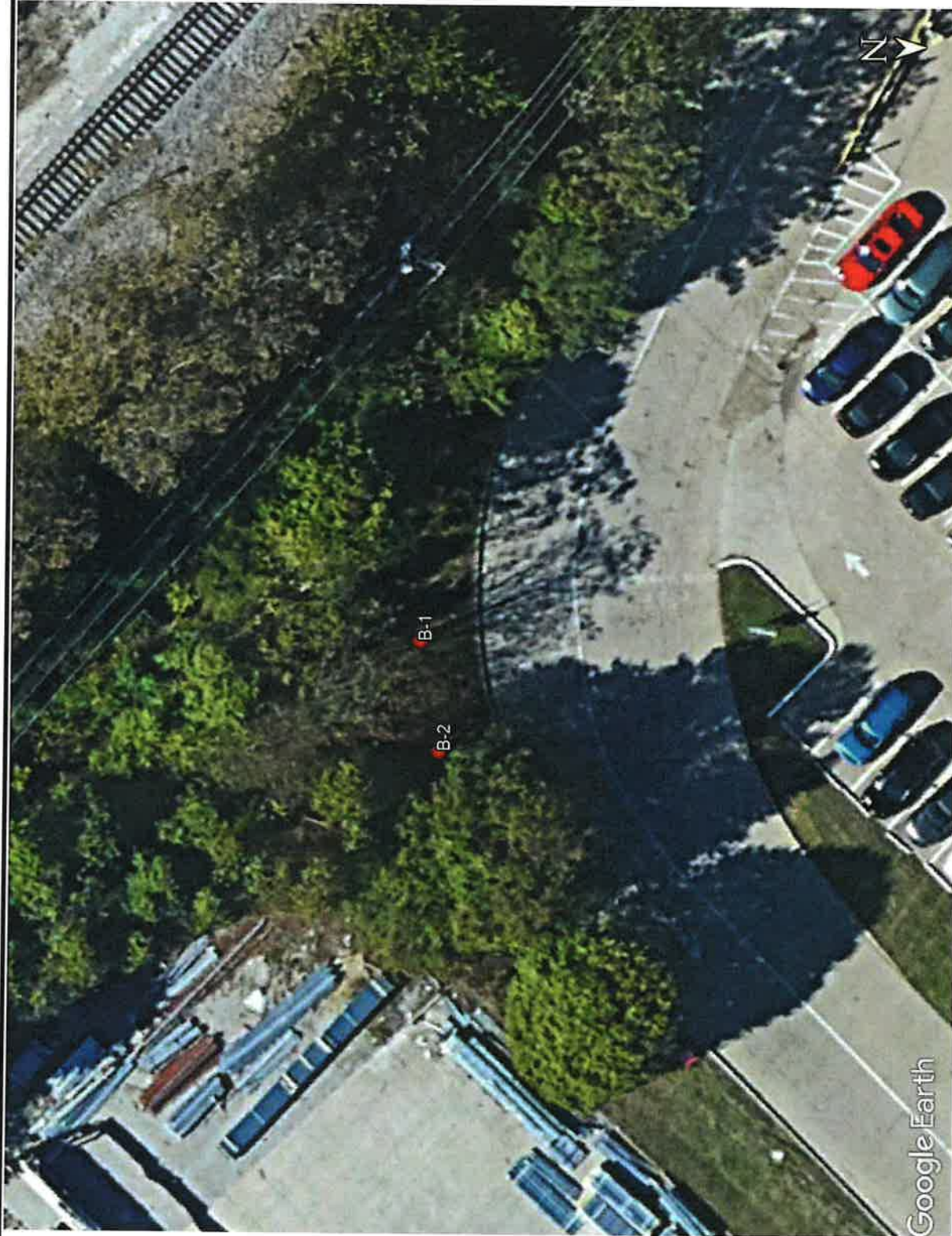
ELEVATION (feet)	DEPTH (feet)	Description	Soil and Sampler Symbols, Blows	Sample No.	TEST RESULTS				Shear Strength (tsf)	
					Plastic Limit Water Content - ●	Liquid Limit	NM	PL		LL
883	0	Topsoil - 0.0-0.2 Fill - lean clay with gravel, silty, sandy, brown, firm to very stiff, moist		1, 2	10-20	30-40				5, 13
878	5			3, 4	10-20	30-40				16, 24
873	10	Lean-Fat clay, brown, firm to stiff, moist		5	10-20	30-40				7
868	15			6	10-20	30-40				11
863	20	Weathered rock		7	10-20	30-40				28
858	25	Auger refusal at 22.2 ft. Begin core recovery. Limestone interbedded with shale, light to dark gray with dark gray banding. Core recovery terminated at 25.0 ft.	 REC = 100% RQD = 64%							
853	30									
848	35									

Figure

**APPENDIX B**

**Site Location Map  
Drawings**





**Leestown Road Pump Station  
Lexington, Kentucky**

**L.E. Gregg Associates, Inc.  
2456 Fortune Drive, Suite 155  
Lexington, Kentucky 40509**



**Project #2021063**

**Boring Layout**

**APPENDIX C**  
**Seismic Design Information**

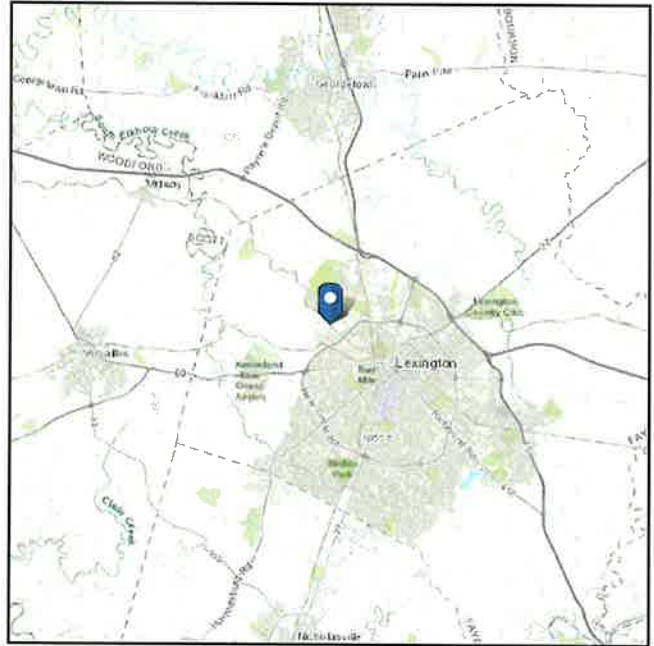
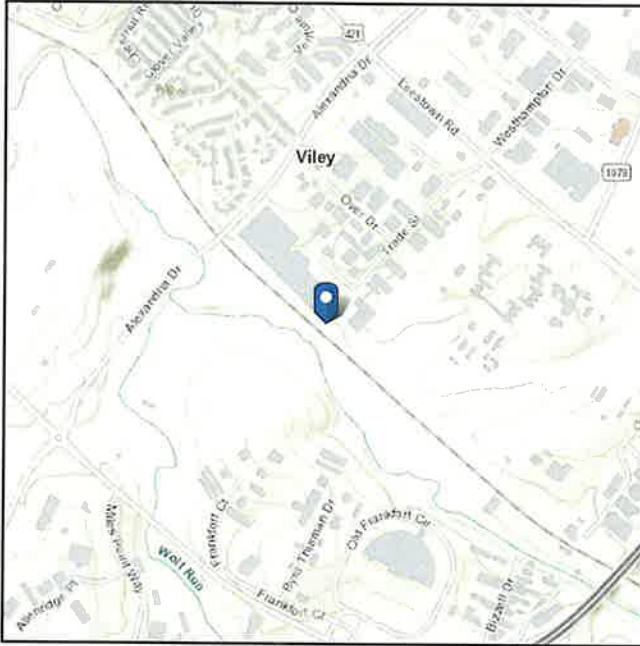


# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** B - Rock

**Elevation:** 876.18 ft (NAVD 88)  
**Latitude:** 38.072883  
**Longitude:** -84.547833

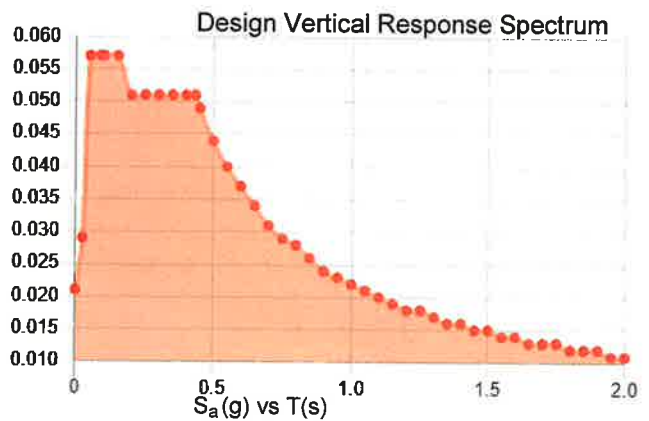
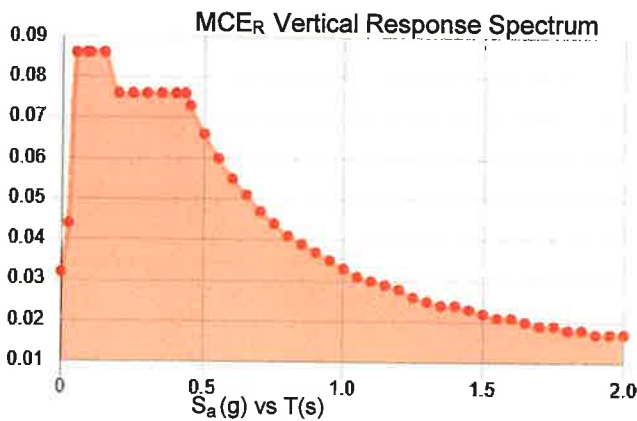
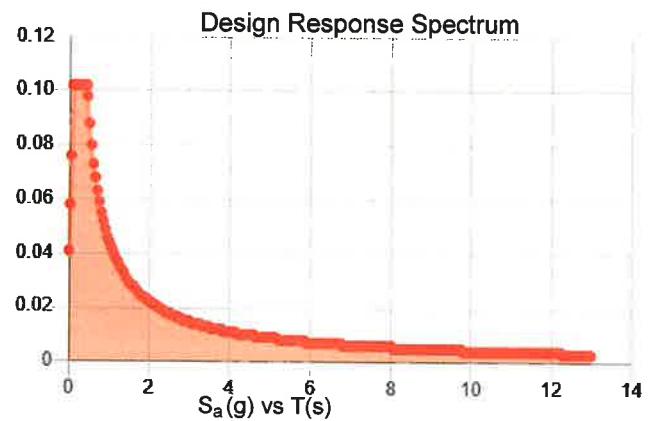
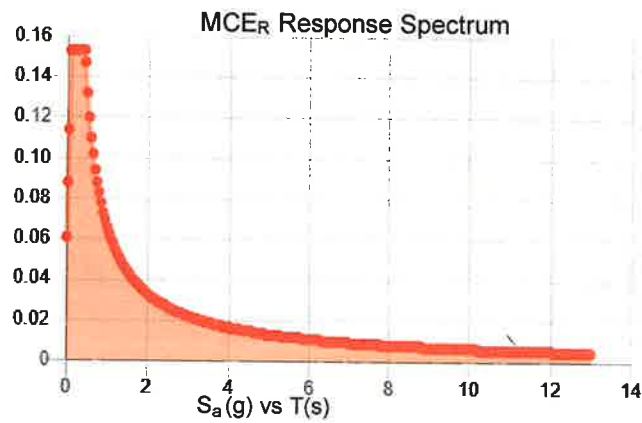


**Site Soil Class:** B - Rock

**Results:**

$S_S$ :	0.17	$S_{D1}$ :	0.044
$S_1$ :	0.083	$T_L$ :	12
$F_a$ :	0.9	PGA :	0.084
$F_v$ :	0.8	PGA <sub>M</sub> :	0.076
$S_{MS}$ :	0.153	$F_{PGA}$ :	0.9
$S_{M1}$ :	0.066	$I_e$ :	1
$S_{DS}$ :	0.102	$C_v$ :	0.7

**Seismic Design Category** A



**Data Accessed:** Tue Jan 25 2022

**Date Source:**

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.



The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

**PART III**  
**Invitation to Bid No. 40-2022**

**LEESTOWN ROAD INDUSTRIAL PUMP STATION REPLACEMENT**

**1. FORM OF PROPOSAL**

Place: Lexington, Kentucky

Date:

The following Form of Proposal shall be followed exactly in submitting a proposal for this Work.

This Proposal Submitted by NAC HEAVY HWY INC

(Hereinafter called "Bidder"), organized and existing under the laws of the State of KENTUCKY, doing business as 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 **Leestown Road Industrial Pump Station Replacement** 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 on or before a date to be specified in the Notice to Proceed and to fully complete the project within the time provided in the Purchase Order or Work Orders issued by the OWNER. BIDDER further agrees to pay liquidated damages, the sum of \$400 for each consecutive calendar day thereafter.

The Bidder hereby acknowledges receipt of the following addenda:

Addendum No. 1 Date 05/13/2022

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.

2. **LEGAL STATUS OF BIDDER**

Bidder NAC HEAVY HWY INC

Date 05/17/2022

\* 1. A corporation duly organized and doing business under the laws of the State of KENTUCKY, for whom BRIAN NASH, bearing the official title of OWNER, 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)

N/A

\* 3. An individual, whose signature is affixed to this Bid/Proposal (please print name)

N/A

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

3. BIDDERS AFFIDAVIT

Comes the Affiant, NAC HEAVY HWY, and after being first duly sworn, states under penalty of perjury as follows:

1. His/her name is BRIAN NASH and he/she is the individual submitting the bid or is the authorized representative of NAC HEAVY HWY, 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.
  5. 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 a contract to the Bidder will not violate any provision of the campaign finance laws of the Commonwealth.
  6. 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."
  7. 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 conduct is of that nature or that the circumstance exists.
- Further, Affiant sayeth naught.

(Affiant)

STATE OF Kentucky  
COUNTY OF Madison

The foregoing instrument was subscribed, sworn to and acknowledged before me by Brian Nash on this the 18<sup>th</sup> day of May, 2022.

My Commission expires: Michelle B Miller



NOTARY PUBLIC, STATE AT LARGE

**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.

All pricing must be submitted correctly in Ionwave to reflect the correct total of your bid. Contractors are responsible for this if items are entered incorrectly your bid will be rejected. Please pay close attention to how the units are specified and enter the unit amounts. Ionwave will calculate the totals and the total bid amount.

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.

<b>BID ITEM NO.</b>	<b>UNIT DESCRIPTION</b>	<b>UNIT</b>	<b>APPROX QTY.</b>	<b>UNIT PRICE WITH WRITTEN DESCRIPTION</b>	<b>TOTAL</b>
1	Mobilization	LS	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
2	Demobilization	LS	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
3	Bonds and Insurance	LS	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
4	Erosion and Sediment Control and Conformance with SWPPP	LS	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
5	Connection to Existing Sewer, 8-Inch Sewer	EA	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
6	Concrete Structure Safeloading	LS	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE



7	Manhole Abandonment	EA	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
8	General Site Improvement, Including Grading, DGA Installed Around Pump Station, Fencing, Sliding Gate, Complete	LS	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
9	Bituminous Concrete: Private Parking Lots/Driveways	TON	80	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
10	Manhole, 4-Foot Diameter	EA	3	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
11	Gravity Sewer Line, 8-Inch PVC	LS	224	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
12	Force Main Pipe, 6-Inch Ductile Iron	LF	120	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
13	Reconnect Existing Gravity Sewer to New Manhole, 8-Inch	EA	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
14	Comminutor Vault, Including Comminutor, Rails, Hatch, Installed, Complete	LA	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
15	New Pump Station, Including Wetwells, Pumps, Guide Rails, Valve Vault, Piping, Valves, Controls, and All Electrical Appurtenances for a Functioning Pump Station, Complete	EA	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
16	Plug Valve, 8-Inch	EA	3	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
17	Tie-In to Existing 6-Inch Force Main, Including Bypass Pumping	LS	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
18	Freezeproof Yard Hydrant, Complete	LS	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE



19	1-Inch Polyethylene Water Service Line, Trenching and Backfill	LF	320	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
20	Water Service Connection, Including New Tap Application Form, Fees, Plumbing Inspections, as Shown on the Plans, Complete	LS	1	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
21	Dense Graded Aggregate (DGA), Extra, as Directed by Engineer	Ton	10	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
22	No. 9 Crushed Stone, Extra, as Directed by Engineer	Ton	10	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
23	No. 57 Crushed Stone, Extra, as Directed by Engineer	Ton	10	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
24	No. 2 Crushed Stone, Extra, as Directed by Engineer	Ton	10	SUBMIT IN IONWAVE ONLY	IONWAVE WILL CALCULATE
<b>TOTAL BASE BID (Items 1 thru 24)</b>					
<b>TOTAL BID AMOUNT</b>					

TOTAL OF ALL BID PRICES FOR **Leestown Road Industrial Pump Station Replacement** (Items 1 through 24) in words and figures. In case of discrepancy, the amount shown in words will govern.

\_\_\_\_\_ (\$ \_\_\_\_\_).

Submitted by:

NAC HEAVY HWY

*Firm*

310 CUTTERS HILL COURT

*Address*

LEXINGTON KY 40509

*City, State & Zip*

***Bid must be signed:  
(original signature)***

*Signature of Authorized Company Representative – Title*

BRIAN NASH

*Representative/s Name (Typed or Printed)*

859-333-1154

*Area Code – Phone – Extension*

*Fax #*

BRIAN@NACHEAVYHWY.COM

*E-Mail Address*

**OFFICIAL ADDRESS:**

310 CUTTERS HILL COURT

LEXINGTON KY 40509

(Seal if Bid is by Corporation)

**By signing this form, you agree to ALL terms, conditions, and associated forms in this bid package**

**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: NAC HEAVY HIGHWAY, INC.
- 2. Permanent Place of Business: KENTUCKY
- 3. When Organized: 1994
- 4. Where Incorporated: Kentucky
- 5. Construction Plant and Equipment Available for this Project:

TRACKHOE WITH BREAKER	_____	_____
RT CRANE	_____	_____
BACKHOE	_____	_____
TRACKHOE	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

(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: *Thomas J. Mitchell* (Representative of Surety)  
THOMAS J. MITCHELL, 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**

**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 **TEN**

No. 0 21452

**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
WILLIAM A. KANTLEHNER, III	ANDREW G. WINDHORST, JR.	ALL
THOMAS J. MITCHELL	ROSS E. JOHNSON	\$100,000,000
RYAN P. MITCHELL	ANDREA CORTES	
DIANE L. PHELPS	WILLIAM A. KANTLEHNER, IV	
CHRISTOPHER E. VON ALLMEN	ELIZABETH DAWSON	

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 14TH day of JULY 2020

Attest

GREAT AMERICAN INSURANCE COMPANY



*My L C B*

Assistant Secretary

*Mark V Vicario*

Divisional Senior Vice President

STATE OF OHIO, COUNTY OF HAMILTON - ss:

MARK VICARIO (877-377-2405)

On this 14TH day of JULY 2020

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 Comm. Expires  
May 18, 2025

*Susan A Kohorst*

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 Divisional 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 19th day of May 2022



*My L C B*

Assistant Secretary

CATALPA FARMS PUMP STATION #2	CATALPA FARMS	\$547,218
REDBIRD PUMP STATION	CLAY CO	\$62,824
BGAD WTP RECAP	MADISON CO	\$1,168,300
LAGOON PROJECT	MADISON CO	\$161,000
WATERLINE ICMI PH II	MADISON CO	\$1,358,808

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

<u>NAME</u>	<u>LOCATION</u>	<u>CONTRACT SUM</u>
NONE		

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

<u>NAME</u>	<u>POSITION DESCRIPTION</u>	<u>NO. OF YEARS WITH BIDDER</u>
KEVIN HAGGARD	PROJECT MANAGER	20
BARRY BRYANT	JOB SUPERINTENDANT	27
SHAWN DAWES	SUPERINTENDANT	25

11. DBE Participation on current bonded projects under contract:

<u>SUBCONTRACTORS (LIST)</u>	<u>PROJECT (SPECIFIC TYPE)</u>	<u>DBE</u>	<u>% of WORK</u>
NONE			

(USE ADDITIONAL SHEETS IF NECESSARY)

12. We acknowledge that, if we are the apparent low Bidder, we may be required to submit to the OWNER within 7 calendar days following the Bid Opening, a sworn statement regarding all current work on hand and under contract, and a statement on the OWNER'S form of the experience of our officers, office management and field management personnel. Additionally, if requested by the OWNER, we will within 7 days following the request submit audited financial statements and loss history for insurance claims for the 3 most recent years (or a lesser period stipulated by the OWNER).

**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.

<u>BRANCH OF WORK - LIST EACH</u>	<u>SUBCONTRACTOR</u>	<u>DBE</u>	<u>% of Work</u>
<u>MAJOR ITEM</u> Such as: Grading, bituminous paving, concrete, seeding and protection, construction staking, etc.			<u>Yes/No</u>
1. <u>ELECTRIC</u>	Name: <u>ISC ELECTRIC INC</u>	<u>NO</u>	
	Address: <u>3825 GLADMAN WAY LEXINGTON KY 40514</u>		
2. <u>EXCAVATION</u>	Name: <u>GOOCH CONSTRUCTION</u>	<u>NO</u>	
<u>PIPE/VALVE/SILT CONTROL FENCE</u>	Address: <u>206 EDGEWOOD DR NICHOLASVILLE KY 40356</u>		
3. _____	Name: <u>KHAYES LIMITED</u>	<u>YES</u>	<u>10%</u>
	Address: <u>301 UNITED COURT STE 9 LEXINGTON KY 40509</u>		
4. _____	Name: _____		
	Address: _____		
5. _____	Name: _____		
	Address: _____		
6. _____	Name: _____		
	Address: _____		
7. _____	Name: _____		
	Address: _____		

(Attach additional sheet(s) if necessary.)

7. **Lexington-Fayette Urban County Government  
MWDBE PARTICIPATION GOALS**

A. 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

- 1) A Minority-Owned Business Enterprise (MBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by persons of African American, Hispanic, Asian, Pacific Islander, American Indian or Alaskan Native Heritage.
- 2) A Woman-Owned Business Enterprise (WBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by one or more women.



- 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
  - c. Attended LFUCG Central Purchasing Economic Inclusion Outreach event

- d. Attended pre-bid meetings that were scheduled by LFUCG to inform MWDBEs and/or Veteran-Owned businesses of subcontracting opportunities
- e. Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and MWDBE firms and Veteran-Owned businesses.
- 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 MWDBE 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.
- h. 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.
- i. Followed up initial solicitations by contacting MWDBEs and Veteran-Owned Businesses to determine their level of interest.
- j. Provided the interested MWDBE 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 MWDBE 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 reasonably 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.***



# LEXINGTON

## MINORITY BUSINESS ENTERPRISE PROGRAM

Sherita Miller, MPA  
Minority Business Enterprise Liaison  
Division of Central Purchasing  
Lexington-Fayette Urban County Government  
200 East Main Street  
Lexington, KY 40507  
[smiller@lexingtonky.gov](mailto:smiller@lexingtonky.gov)  
859-258-3323

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

To that end the city council adopted and implemented Resolution 484-2017–A Certified Minority, Women and Disadvantaged Business Enterprise ten percent (10%) minimum goal and a three (3%) minimum goal for Certified Veteran-Owned Small Businesses and Certified Service-Disabled Veteran–Owned Businesses for government contracts.

The resolution states the following definitions shall be used for the purposes of reaching these goals (a full copy is available in Central Purchasing):

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

***Certified Minority Business Enterprise (MBE)*** – a business in which at least fifty-one percent (51%) is owned, managed and controlled by an ethnic minority (i.e. African American, Asian American/ Pacific Islander, Hispanic Islander, Native American/ Native Alaskan Indian) as defined in federal law or regulation as it may be amended from time-to-time.

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

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

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

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

To comply with Resolution 484-2017, prime contractors and minority, women and veteran owned businesses must enroll in the new Diverse Business Management Compliance system, <https://lexingtonky.diversitycompliance.com/>

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

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



# LEXINGTON

## LFUCG MWDBE PARTICIPATION FORM Bid/RFP/Quote Reference # Bid No. 40-2022

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. **Failure to submit a completed form may cause rejection of the bid.**

MWDBE Company, Name, Address, Phone, Email	MBE WBE or DBE	Work to be Performed	Total Dollar Value of the Work	% Value of Total Contract
1. K HAYES LIMITED 301 UNITED COURT STE 9 LEXINGTON KY 40509	MBE	PIPE/VALVE/SILT CONTROL/FENCE	\$137,000	10%
2.				
3.				
4.				

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

NAC HEAVY HWY INC

Company

05/17/2022

Date

Company Representative

OWNER

Title



# LEXINGTON

## LFUCG MWDBE SUBSTITUTION FORM

Bid/RFP/Quote Reference # Bid No. 40-2022

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.

NAC HEAVY HWY INC

Company

05/17/2022

Date



Company Representative

OWNER

Title



# LEXINGTON

## MWDBE QUOTE SUMMARY FORM

Bid/RFP/Quote Reference # Bid No40-2022

The undersigned acknowledges that the minority and/or veteran subcontractors listed on this form did submit a quote to participate on this project. Failure to submit this form may cause rejection of the bid.

<b>Company Name</b> NAC HEAVY HWY INC	<b>Contact Person</b> BRIAN NASH
<b>Address/Phone/Email</b> 310 CUTTERS HILL COURT LEXINGTON KY 40509 859-333-1154	<b>Bid Package / Bid Date</b> BID#40-2022 05/19/2022

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)	MBE * AA HA AS NA Female	Veteran
KHAYS LIMITED 301 HAYES COURT STE 9 LEXINGTON KY 40509	KHAYE HAYES	859-333-8887	05/19/2022	PIPE/VALVE/SECT CONTROL/FENCE	PHONE/EMAIL	1,12,000	MBE	

(MBE 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.

NAC/HH  
Company

Company Representative

05/19/2022  
Date

OWNER  
Title





# LEXINGTON

## 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 #** Bid No. 40-2022

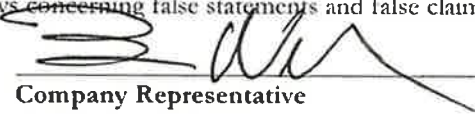
**Total Contract Amount Awarded to Prime Contractor for this Project** \_\_\_\_\_

<b>Project Name/ Contract #</b> LFUCG LEESTOWN ROAD INDUSTRIAL PUMP STATION	<b>Work Period/ From:</b> _____ <b>To:</b> _____
<b>Company Name:</b> NACHH	<b>Address:</b> 310 CUTTER HILL COURT LEXINGTON KY 40509
<b>Federal Tax ID:</b> 61-1276754	<b>Contact Person:</b> BRIAN NASH

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.

NACHH  
**Company**  
05/17/2022  
**Date**

  
**Company Representative**  
OWNER  
**Title**

**LFUCG STATEMENT OF GOOD FAITH EFFORTS**  
**Bid/RFP/Quote # Bid No. 40-2022**

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 MWDBE and Veteran-Owned business enterprises 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 and Veteran-Owned businesses to participate.

Included documentation of advertising in the above publications with the bidder's good faith efforts package

Attended LFUCG Central Purchasing Economic Inclusion Outreach event

Attended pre-bid meetings that were scheduled by LFUCG to inform MWDBEs and/or Veteran-Owned Businesses of subcontracting opportunities

Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and MWDBE firms and Veteran-Owned businesses

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

Contacted organizations that work with MWDBE companies for assistance in finding certified MWDBE 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.

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 and Veteran-Owned businesses to determine their level of interest.

Provided the interested MWDBE firm and/or Veteran-Owned business 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 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

\_\_\_ 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 reasonably 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.

NAC HEAVY HWY  
**Company** \_\_\_\_\_  
05/17/2022  
**Date** \_\_\_\_\_

  
**Company Representative** \_\_\_\_\_  
**OWNER**  
**Title** \_\_\_\_\_

8. **AUTHENTICATION OF BID AND STATEMENT OF NON-COLLUSION AND CONFLICT OF INTEREST**

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

1. That I am the Bidder (if the Bidder is an individual), a partner of the Bidder (if the Bidder is a partnership), or an officer or employee of the bidding corporation having authority to sign on its behalf (if the Bidder is a corporation);
2. That the attached bid has been arrived at by the Bidder independently, and has been submitted without collusion with, and without any agreement, understanding or planned common course of action, with any other contractor, vendor of materials, supplies, equipment or services described in the Invitation to Bid, designed to limit independent bidding or competition;
3. That the contents of the bid or bids have not been communicated by the Bidder or its employees or agents to any person not an employee or agent of the Bidder or its surety on any bond furnished, with the bid or bids, and will not be communicated to any such person, prior to the official opening of the bid or bids;
4. That the Bidder is legally entitled to enter into the contracts with the Lexington-Fayette Urban County Government, and is not in violation of any prohibited conflict of interest;
5. (Applicable to corporation only) That as a foreign corporation, we are registered with the Secretary of State, Commonwealth of Kentucky, and authorized to do business in the State of KY or, that as a domestic corporation, we are in good standing with the Secretary of State, Commonwealth of Kentucky X. Check the statement applicable.
6. This offer is for 60 calendar days from the date this bid is opened. In submitting the above, it is expressly agreed that, upon proper acceptance by the Lexington-Fayette Urban County Government of any or all items bid above, a contract shall thereby be created with respect to the items accepted.
7. That I have fully informed myself regarding the accuracy of the statements made in this statement.
8. That I certify that Subcontractors have not and will not be awarded to any firm(s) that have been debarred from noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964 As Amended, Executive Order 11246 As Amended or any other Federal Law.

9. **STATEMENT OF EXPERIENCE**

NAME OF INDIVIDUAL: BRIAN NASH

POSITION/TITLE: OWNER

STATEMENT OF EXPERIENCE:

TWENTY SEVEN YEARS OF EXPERIENCE AS A GENERAL CPNTRACTOR AND  
~~PREVIOUSLY 10 YEARS AS A PROJECT MANAGER. RESUME OF PROJECTS~~  
AVAILABLE UPON REQUEST.

---

---

NAME OF INDIVIDUAL: KEVIN HAGGARD

POSITION/TITLE: PROJECT MANAGER

STATEMENT OF EXPERIENCE:

TWENTY YEARS OF EXPERIENCE AS A PROJECT MANAGER. RESUME OF PROJECTS  
~~AVAILABLE UPON REQUEST.~~

---

---

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's, Affirmative Action officials, and field management personnel. (Attach separate sheets if necessary.)**

## 10. 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.*

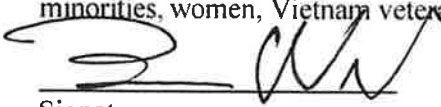
The Lexington-Fayette Urban County Government practices Equal Opportunity in recruiting, hiring and promoting. It is the Government's intent to affirmatively provide employment opportunities for those individuals who have previously not been allowed to enter into the mainstream of society. Because of 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 benefactor of the Federal funds. it is both against the Urban County Government policy and illegal for the Government to let contracts to companies which knowingly or unknowingly practice discrimination in their employment practices. Violation of the above mentioned ordinances may cause a contract to be canceled and the contractor may be declared ineligible for future consideration.

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

Bidders

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

  
Signature

NAC HEAVY HWY  
Name of Business

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

The Kentucky equal Employment Opportunity Act of 1978 (KRS 45.560-45.640) requires that any count, 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 contract 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 – 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.*

It is recommended that all of the provisions quoted above to be included as special conditions in each contract. In the case of a contract exceeding \$250,000, the contractor is required to furnish evidence that his work-force in Kentucky is representative of the available work-force in the area from which he draws employees, or to supply an Affirmative Action plan which will achieve such representation during the life of the contract.

11. **EQUAL EMPLOYMENT OPPORTUNITY AFFIRMATIVE ACTION POLICY**

It is the policy of NAC HEAVY HWY 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.

**12. WORKFORCE ANALYSIS FORM**

Name of Organization: NAC HEAVY HWY INC

Categories	Total	White (Not Hispanic or Latino)		Hispanic or Latino		Black or African American (Not Hispanic or Latino)		Native Hawaiian and Other Pacific Islander (Not Hispanic or Latino)		Asian (Not Hispanic or Latino)		American Indian or Alaskan Native (not Hispanic or Latino)		Two or more races (Not Hispanic or Latino)		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Administrators																	
Professionals	2																2
Superintendents	2																2
Supervisors	1																1
Foremen																	
Technicians	3																3
Protective Service																	
Para-Professionals																	
Office/Clerical			1														
Skilled Craft	2																2
Service/Maintenance																	
<b>Total:</b>		10	1														10

Prepared by: BRIAN NASH - OWNER  
 (Name and Title)

Date: 05 / 17 / 2022

**13. EVIDENCE OF INSURABILITY**

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

NAC HEAVY HWY

Employee ID: 601-1276734  
 Phone: 859-333-1154

Names Insured: \_\_\_\_\_  
 Address: 310 CUTTERS HILL COURT LEXINGTON KY 40509  
 Project to be insured: LFUCG LEESTOWN ROAD INDUSTRIAL PUMP STATION #40-2022

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 per occ & \$2,000,000 aggregate	Westfield Ins Co	A	XV
SC-3, Section 2, Part 4.1 - see provisions	AUTO	\$2,000,000/per occ.	\$ 1,000,000	Westfield Ins Co	A	XV
SC-3, Section 2, Part 4.1 - see provisions	WC	Statutory w /endorsement as noted	\$ 4,500,000/\$4,500,000	Kentucky Associated General Contractors	A-	VIII
Umbrella			\$4,000,000	Westfield Ins Co	A	XV

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.

A J Gallagher Risk Management Services \_\_\_\_\_  
 Agency or Brokerage  
 1601 Alliant Avenue \_\_\_\_\_  
 Street Address  
 Louisville KY 40299-6338 \_\_\_\_\_  
 City State Zip  
 502-415-7000 \_\_\_\_\_  
 Telephone Number  
 Thomas J Mitchell \_\_\_\_\_  
 Name of Authorized Representative  
 Senior Director Construction Practice \_\_\_\_\_  
 Title  
 Authorized Signature  
 5-18-2022 \_\_\_\_\_  
 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.**

**14. DEBARRED FIRMS**

**PROJECT NAME:** Leestown Road Industrial Pump Station Replacement

**BID NUMBER:** 40-2022

**LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT  
LEXINGTON, KY**

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

All bidders shall complete the attached certification in duplicate and submit both copies to the Owner with the bid proposal. The Owner (grantee) shall transmit one copy to the Lexington-Fayette Urban County Government, Division of Community Development, within fourteen (14) days after bid opening.

The undersigned hereby certifies that the firm of NAC HEAVY HWY has not and will not award a subcontract, in connection with any contract award to it as the result of this bid, to any firm that has been debarred for noncompliance with the Federal labor Standards, Title VI of the civil Rights Act of 1964, Executive Order 11246 as amended or any Federal Law.

NAC HEAVY HWY INC

\_\_\_\_\_  
Name of Firm Submitting Bid

  
\_\_\_\_\_  
Signature of Authorized Official

OWNER  
\_\_\_\_\_  
Title

5/17/2022  
\_\_\_\_\_  
Date

**15. 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: NAC HEAVY HWY

Project: LFUCG LEESTWON ROAD INDUSTRIAL PUMP STATION #40-2022

Printed Name and Title of Authorized Representative: BRIAN NASH - OWNER

Signature: 

Date: 05/17/2022

**AMENDMENT 1—  
CERTIFICATION OF COMPLIANCE FOR AMERICAN RESCUE PLAN ACT  
EXPENDITURES**

The Lexington-Fayette Urban County Government (“LFUCG”) may classify the subject matter of this bid as an expenditure under the American Rescue Plan Act of 2021. Expenditures under the American Rescue Plan Act of 2021 require evidence of the contractor’s compliance with Federal law. Therefore, by the signature below of an authorized company representative, you certify that the information below is understood, agreed, and correct. 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.

**The bidder agrees and understands that in addition to all conditions stated within the attached bid documents, the following conditions will also apply to any Agreement entered between bidder and LFUCG, if LFUCG classifies the subject matter of this bid as an expenditure under the American Rescue Plan Act. The bidder further certifies that it can and will comply with these conditions, if this bid is accepted and an Agreement is executed:**

1. Any Agreement executed as a result of acceptance of this bid may be governed in accordance with 2 CFR Part 200 and all other applicable Federal law and regulations and guidance issued by the U.S. Department of the Treasury.

2. Pursuant to 24 CFR 85.43, any Agreement executed as a result of acceptance of this bid can be terminated if the contractor fails to comply with any term of the award. This Agreement may be terminated for convenience in accordance with 24 CFR 85.44 upon written notice by LFUCG. Either party may terminate this Agreement with thirty (30) days written notice to the other party, in which case the Agreement shall terminate on the thirtieth day. In the event of termination, the contractor shall be entitled to that portion of total compensation due under this Agreement as the services rendered bears to the services required. Either party may terminate this Agreement for good cause shown with forty-five (45) days written notice, which shall explain the party’s cause for the termination. If the parties do not reach a settlement before the end of the 45 days, then the Agreement shall terminate on the forty-fifth day.

3. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

- (1) Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- (2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- (3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about,



discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

- (4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part, and the contractor may be declared ineligible for further government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- (8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

Provided, however, that in the event a contractor becomes involved in or is threatened with litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

4. If fulfillment of the contract requires the contractor to employ mechanic's or laborers, the contractor further agrees that it can and will comply with the following:

- (1) *Overtime requirements: No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such a workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such a workweek.*

- (2) *Violation: liability for unpaid wages; liquidated damages.* In the event of any violation of the clause set forth in paragraph (1) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.
- (3) *Withholding for unpaid wages and liquidated damages.* LFUCG shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.
- (4) *Subcontracts.* The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower-tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.
5. *The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.*
6. *The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency Regional Office.*
7. *The contractor shall include these requirements in numerical paragraphs 5 and 6 in each subcontract exceeding \$100,000 financed in whole or in part with American Rescue Plan Act funding.*
8. *The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.*
9. *The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency Regional Office.*
10. *The contractor shall include these requirements in numerical paragraphs 8 and 9 in each subcontract exceeding \$100,000 financed in whole or in part with American Rescue Plan Act funds.*
11. *The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.*

12. The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency regional office.

13. The contractor shall include these requirements in numerical paragraphs 11 and 12 in each subcontract exceeding \$100,000 financed in whole or in part with American Rescue Plan Act funds.

14. The contractor shall include this language in any subcontract it executes to fulfill the terms of this bid: "the sub-grantee, contractor, subcontractor, successor, transferee, and assignee shall comply with Title VI of the Civil Rights Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C. § 2000d et seq.), as implemented by the Department of the Treasury's Title VI regulations, 31 CFR Part 22, which are herein incorporated by reference and made a part of this contract (or agreement). Title VI also includes protection to persons with 'Limited English Proficiency' in any program or activity receiving federal financial assistance, 42 U.S.C. § 2000d et seq., as implemented by the Department of the Treasury's Title VI regulations, 31 CFR Part 22, and herein incorporated by reference and made a part of this contract or agreement."

15. Contractors who apply or bid for an award of \$100,000 or more shall file the required certification that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency. Each tier certifies to the tier above that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-federal funds that takes place in connection with obtaining any federal award. Such disclosures are forwarded from tier to tier, up to the recipient. The required certification is included here:

- a. The undersigned certifies, to the best of his or her knowledge and belief, that:
  - (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
  - (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.
- b. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

  
Signature

05/17/2022

Date

END OF SECTION



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
5/4/2022

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).

<b>PRODUCER</b> Arthur J. Gallagher Risk Management Services, Inc 1601 Alliant Avenue Louisville KY 40299		<b>CONTACT NAME:</b> Becky Chowning <b>PHONE (A/C, No, Ext):</b> 502-415-7021 <b>FAX (A/C, No):</b> 502-415-7001 <b>E-MAIL ADDRESS:</b> Becky_Chowning@ajg.com	
<b>INSURED</b> NAC Heavy Highway, Inc 310 Cutters Hill Court Lexington KY 40509		<b>INSURER(S) AFFORDING COVERAGE</b> <b>NAIC #</b>	
		<b>INSURER A:</b> Westfield Insurance Company      24112	
		<b>INSURER B:</b> Kentucky AGC Self Insurers Fund	
		<b>INSURER C:</b>	
		<b>INSURER D:</b>	
		<b>INSURER E:</b>	
		<b>INSURER F:</b>	

**COVERAGES**      **CERTIFICATE NUMBER:** 854999926      **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	<input checked="" type="checkbox"/> <b>COMMERCIAL GENERAL LIABILITY</b> <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC OTHER:	Y		TRA4782783	4/4/2022	4/4/2023	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 500,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COM/OP AGG \$ 2,000,000 \$
A	<input checked="" type="checkbox"/> <b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY	Y		TRA4782783	4/4/2022	4/4/2023	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	<input checked="" type="checkbox"/> <b>UMBRELLA LIAB</b> <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$			TRA4782783	4/4/2022	4/4/2023	EACH OCCURRENCE \$ 4,000,000 AGGREGATE \$ 4,000,000 \$
B	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A	7092	1/1/2022	1/1/2023	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 4,500,000 E.L. DISEASE - EA EMPLOYEE \$ 4,500,000 E.L. DISEASE - POLICY LIMIT \$ 4,500,000
A	Leased/rented equip			TRA4782783	4/4/2022	4/4/2023	Per Item \$ 1,000,000

**DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)**  
RE: Division of Water Quality for Leestown Road Industrial Pump Station, Replacement Bid #40-2022

Lexington-Fayette Urban County Government is Additional Insured, on a Primary & Non-Contributory basis, including on-going and completed operations, as required by written contract, as respects General Liability and Automobile Liability policies. 30 days notice of cancellation shall be given to the Certificate Holder. 10 days for non-payment of premium.

**CERTIFICATE HOLDER**      **CANCELLATION**

Lexington-Fayette Urban County Government Division of Water Quality 200 East Main Street 3rd Floor, Room 338 Lexington KY 40507	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 
---	---





# GREAT AMERICAN INSURANCE COMPANY OHIO

## BID BOND

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

**CONTRACTOR:**  
*(Name, legal status and address)*  
NAC Heavy Highway, Inc.  
310 Cutters Hill Court  
Lexington, KY 40509

**SURETY:**  
*(Name, legal status and principal place of business):*  
Great American Insurance Company  
301 East 4th Street  
Cincinnati, OH 45202-4201

**OWNER:**  
*(Name, legal status and address)*  
Lexington-Fayette Urban County Government  
Division of Water Quality  
200 East Main Street, 3rd Floor, Room 338  
Lexington, KY 40507

**BOND AMOUNT:** \$ Five Percent (5%) of the amount of the bid----

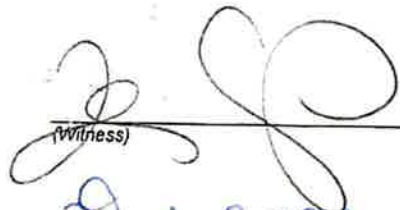
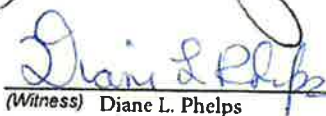
**PROJECT:**  
*(Name, location or address, and Project number, if any)*  
Leestown Road Industrial Pump Station Replacement Bid # 40-2022

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 requirements 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 19th day of May, 2022.

  
*(Witness)*  
  
*(Witness)* Diane L. Phelps

Nac Heavy Highway, Inc.  
*(Principal)*  *(Seal)*  
*(Title)*  
GREAT AMERICAN INSURANCE COMPANY  
*(Surety)*  *(Seal)*  
*(Attorney-in-Fact)* Thomas J. Mitchell, Attorney-in-Fact

**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 TEN

No. 0 21452

**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
WILLIAM A. KANTLEHNER, III	ANDREW G. WINDHORST, JR.	ALL
THOMAS J. MITCHELL	ROSS E. JOHNSON	\$100,000,000
RYAN P. MITCHELL	ANDREA CORTES	
DIANE L. PHELPS	WILLIAM A. KANTLEHNER, IV	
CHRISTOPHER E. VON ALLMEN	ELIZABETH DAWSON	

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 14TH day of JULY 2020



*Steph L C. B.*  
Assistant Secretary

GREAT AMERICAN INSURANCE COMPANY

*Mark V Vicario*  
Divisional Senior Vice President

MARK VICARIO (877-377-2405)

STATE OF OHIO, COUNTY OF HAMILTON - ss:

On this 14TH day of JULY 2020

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 Comm. Expires  
May 18, 2025

*Susan A Kohorst*

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 Divisional 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 19th day of May 2022



*Steph L C. B.*  
Assistant Secretary

**PART 4**

**GENERAL CONDITIONS**

**TABLE OF CONTENTS**

Article Number	Title	Page
1.	DEFINITIONS	GC-6
2.	PRELIMINARY MATTERS	GC-10
3.	CONTRACT DOCUMENTS: INTENT, CONFLICTS, AMENDING AND REUSE	GC-11
4.	AVAILABILITY OF LANDS; PHYSICAL CONDITIONS, REFERENCE POINTS	GC-13
5.	CONTRACTOR'S RESPONSIBILITIES	GC-16
6.	OTHER WORK	GC-26
7.	OWNER'S RESPONSIBILITIES	GC-27
8.	ENGINEER'S STATUS DURING CONSTRUCTION	GC-28
9.	CHANGES IN THE WORK	GC-30
10.	CHANGE OF CONTRACT PRICE	GC-32
11.	CHANGE OF CONTRACT TIME	GC-38
12.	WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS, CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK	GC-39
13.	PAYMENTS TO CONTRACTOR AND COMPLETION	GC-42
14.	SUSPENSION OF WORK AND TERMINATION	GC-46
15.	MISCELLANEOUS	GC-48



## DETAILED TABLE OF CONTENTS OF GENERAL CONDITIONS

1. Definitions
2. Preliminary Matters
  - 2.1 Delivery of Bonds
  - 2.2 Copies of Documents
  - 2.3 Commencement of Contract Time; Notice to Proceed
  - 2.4 Starting the Project
  - 2.5 Before Starting Construction
  - 2.6 Submittal of Schedules
  - 2.7 Preconstruction Conference
  - 2.8 Finalizing Schedules
3. Contract Documents, Intent, Conflicts, Amending, and Reuse
  - 3.1 General
  - 3.2 Intent
  - 3.3 Conflicts
  - 3.4 Amending and Supplementing Contract Documents
  - 3.5 Reuse of Documents
4. Availability of Lands, Physical Conditions, Reference Points
  - 4.1 Availability of Lands
  - 4.2 Physical Conditions
  - 4.3 Physical Conditions - Underground Facilities
  - 4.4 Reference Points
5. CONTRACTOR'S Responsibilities
  - 5.1 Supervision
  - 5.2 Superintendence
  - 5.3 Labor
  - 5.4 Start-Up and Completion of Work
  - 5.5 Materials and Equipment
  - 5.6 Adjusting Progress Schedule
  - 5.7 Substitutes or "Or-Equal" Items
  - 5.8 Subcontractors, Suppliers and Others
  - 5.9 Patent Fees and Royalties
  - 5.10 Permits
  - 5.11 Laws and Regulations
  - 5.12 Taxes
  - 5.13 Use of Premises

- 5.14 Record Drawings
- 5.15 Shop Drawings and Samples
- 5.16 Continuing the Work
- 5.17 Erosion and Sediment Control
  
- 6. Other Work
  - 6.1 Related Work at Site
  - 6.2 Other Contractors or Utility Owners
  - 6.3 Delays Caused By Others
  - 6.4 Coordination
  
- 7. OWNER'S Responsibilities
  - 7.1 Communications
  - 7.2 Data and Payments
  - 7.3 Lands, Easements, and Surveys
  - 7.4 Change Orders
  - 7.5 Inspections, Tests, and Approvals
  - 7.6 Stop or Suspend Work
  
- 8. ENGINEER'S Status During Construction
  - 8.1 OWNER'S Representative
  - 8.2 Visits to Site
  - 8.3 Project Representation
  - 8.4 Clarification and Interpretations
  - 8.5 Authorized Variations in Work
  - 8.6 Rejecting Defective Work
  - 8.7 Shop Drawings
  - 8.8 Change Orders
  - 8.9 Payments
  - 8.10 Determinations for Unit Prices
  - 8.11 Decisions on Disputes
  - 8.12 Limitations on ENGINEER'S Responsibilities
  
- 9. Changes in the Work
  - 9.1 OWNER May Order Changes
  - 9.2 Claims
  - 9.3 Work Not in Contract Documents
  - 9.4 Change Orders
  - 9.5 Notice of Change

- 10. Change of Contract Price
  - 10.1 Total Compensation
  - 10.2 Claim for Increase or Decrease in Price
  - 10.3 Value of Work
  - 10.4 Cost of the Work
  - 10.5 Not to Be Included in Cost of the Work
  - 10.6 CONTRACTOR'S Fee
  - 10.7 Itemized Cost Breakdown
  - 10.8 Cash Allowance
  - 10.9 Unit Price Work
  
- 11. Change of Contract Time
  - 11.1 Change Order
  - 11.2 Justification for Time Extension
  - 11.3 Time Limits
  
- 12. Warranty and Guarantee; Tests and Inspections.  
Correction, Removal or Acceptance of Defective Work
  - 12.1 Warranty and Guarantee
  - 12.2 Access to Work
  - 12.3 Tests and Inspections
  - 12.4 OWNER May Stop Work
  - 12.5 Correction or Removal of Defective Work
  - 12.6 One Year Correction Period
  - 12.7 Acceptance of Defective work
  - 12.8 Owner May Correct Defective Work
  
- 13. Payments to CONTRACTOR and Completion
  - 13.1 Schedule of Values
  - 13.2 Application for Progress Payments
  - 13.3 CONTRACTOR'S Warranty of Title
  - 13.4 Review of Application for Progress Payments
  - 13.5 Partial Utilization
  - 13.6 Final Inspection
  - 13.7 Final Application for Payment
  - 13.8 Final Payment and Acceptance
  - 13.9 CONTRACTOR'S Continuing Obligation
  - 13.10 Waiver of Claims

14. Suspension of Work and Termination

- 14.1 OWNER May Suspend Work
- 14.2 OWNER May Terminate
- 14.3 CONTRACTOR'S Services Terminated
- 14.4 Payment After Termination
- 14.5 CONTRACTOR May Stop or Terminate

15. Miscellaneous

- 15.1 Claims for Injury or Damage
- 15.2 Non-Discrimination in Employment
- 15.3 Temporary Street Closing or Blockage
- 15.4 Percentage of Work Performed by Prime CONTRACTOR
- 15.5 Clean-up
- 15.6 General
- 15.7 Debris Disposal

END OF SECTION

## PART IV

### GENERAL CONDITIONS

#### 1. DEFINITIONS

Wherever used in these General Conditions or the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof.

**1.1 Addenda**

Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bid Documents or the Contract Documents.

**1.2 Agreement**

The written agreement between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

**1.3 Application for Payment**

The form accepted by ENGINEER which is to be used by CONTRACTOR in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

**1.4 Bid**

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

**1.5 Bidder**

An individual, partnership, or corporation, who submit a Bid for a prime contract with the OWNER, for the Work described in the proposed Contract Documents.

**1.6 Bonds**

Bid, performance and payment bonds and other instruments of security.

**1.7 Calendar Day**

A calendar day of twenty-four hours measured from midnight to the next midnight shall constitute a day.

**1.8 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 Time, issued on or after the Effective Date of the Agreement.

- 1.9 Contract Documents**  
The Advertisement for Bidders, Information for Bidders, 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 Bonds, these General Conditions, the Special Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements.
- 1.10 Contract Unit Price**  
The monies payable by OWNER to CONTRACTOR under the Contract Documents as stated in the Agreement. Unit Prices are to be firm for the term of this Contract.
- 1.11 Contract Time**  
The number of consecutive calendar days between the date of issuance of the Notice to Proceed and the contract completion date.
- 1.12 CONTRACTOR**  
The person, firm or corporation with whom OWNER has entered into the Agreement.
- 1.13 Defective**  
An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER'S recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER).
- 1.14 Drawings**  
The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by ENGINEER and are referred to in the Contract Documents.
- 1.15 Effective Date of the Agreement**  
The date indicated in the Agreement on which it becomes effective.
- 1.16 ENGINEER**  
The Lexington-Fayette Urban County Government Division of Water Quality or its authorized representative.
- 1.17 Field Order**  
A documented order issued by ENGINEER which orders minor changes in the Work, but which does not involve a change in the Contract Price or the Contract Time.

**1.18 Giving Notice**

Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

**1.19 Laws and Regulations**

Laws, rules, regulations, ordinances, codes and/or orders.

**1.20 Notice of Award**

The written notice by OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions enumerated therein, within the time specified, OWNER will sign and deliver the Agreement.

**1.21 Notice to Proceed**

A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR'S obligations under the Contract Documents.

**1.22 OWNER**

The Lexington-Fayette Urban County Government, LFUCG Construction Management, or authorized representative of LFUCG.

**1.23 Partial Utilization**

Placing a portion of the Work in service for the purpose for which it is intended (or related purpose) before reaching Completion for all the Work.

**1.24 Project**

The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

**1.25 Inspector**

The authorized representative of the ENGINEER who is assigned to the site or any part thereof.

**1.26 Shop Drawings**

All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.

- 1.27 Specifications**  
Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.
- 1.28 Standard Specifications**  
The "Standard Specifications for Road and Bridge Construction", Transportation Cabinet, Department of Highways, Commonwealth of Kentucky, current edition. MUTCD shall refer to the "Manual of Uniform Traffic Control Devices.
- 1.29 Subcontractor**  
An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.
- 1.30 Special Conditions**  
The part of the Contract Documents which amends or supplements these General Conditions.
- 1.31 Supplier**  
A manufacturer, fabricator, supplier, distributor, materialman or vendor.
- 1.32 Underground Facilities**  
All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.
- 1.33 Unit Price Work**  
Not applicable
- 1.34 Work**  
The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.
- 1.35 Time Period**  
When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.



## **2. PRELIMINARY MATTERS**

### **2.1 Delivery of Bonds**

When the CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER, such Bonds, Insurance Certificate, and Power of Attorney as CONTRACTOR may be required to furnish.

### **2.2 Copies of Documents**

OWNER shall furnish to CONTRACTOR up to three copies (unless otherwise specified in the Special Conditions) of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

### **2.3 Commencement of Contract Time; Notice to Proceed**

The Contract Time will commence to run on the day specified in the Notice to Proceed.

### **2.4 Starting the Project**

CONTRACTOR shall start to perform the Work on the date when the Contract Time commences to run, but no Work shall be done at the site prior to the date on which the Contract Time commences to run.

### **2.5 Before Starting Construction**

Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to the OWNER any conflict, error or discrepancy which CONTRACTOR may discover, and shall obtain a written interpretation or clarification from OWNER and ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Contract Documents, unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

### **2.6 Submittal of Schedules**

Within ten days after the effective date of the Agreement (unless otherwise specified) CONTRACTOR shall submit to ENGINEER for review:

**2.6.1** an estimated progress schedule indicating the starting and completion dates of the various stages of the Work;

**2.6.2** a preliminary schedule of Shop Drawing submissions; and

**2.6.3** a preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will

subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by CONTRACTOR at the time of submission.

**2.7 Preconstruction Conference**

Before CONTRACTOR starts the Work at the proposed site, a conference attended by CONTRACTOR, ENGINEER, OWNER/LFUCG CONSTRUCTION MANAGEMENT, EEO-Affirmative Action Officer, and other appropriate parties will be held to discuss the following issues: (1) The scheduling of the Work to be completed; (2) The procedures for handling shop drawings and other submittals; (3) The processing of applications for payment; (4) The establishment of an understanding among the involved parties in regard to the proposed project; and (5) The establishment of procedures for effectively implementing the LFUCG's 10% minimum DBE goals.

**2.8 Finalizing Schedules**

At least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, OWNER, ENGINEER, and others as appropriate will be held to finalize the schedules submitted in accordance with paragraph 2.6. The finalized progress schedule will be acceptable to OWNER and ENGINEER as providing orderly progression of the Work to completion within the Contract Time, but such acceptance will neither impose on OWNER or ENGINEER responsibility for the progress or scheduling of the Work nor relieve CONTRACTOR from full responsibility thereof. The finalized schedule of Shop Drawing submissions will be acceptable to ENGINEER as providing a workable arrangement for processing the submissions. The finalized schedule of values will be acceptable to OWNER as to form and substance.

**3. CONTRACT DOCUMENTS: INTENT, CONFLICTS, AMENDING AND REUSE**

**3.1 General**

The Contract Documents comprise the entire agreement between OWNER and CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.

**3.2 Intent**

It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied, whether or not specifically called for. When words which have a well-known technical or trade

meaning are used to describe Work, materials or equipment such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or laws or regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to ENGINEER, or any of ENGINEER'S consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 8.12.3 or 8.12.4. Clarifications and interpretations of the Contract Documents shall be issued by OWNER and ENGINEER as provided in paragraph 8.4.

### **3.3 Conflicts**

If, during the performance of the Work, CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, CONTRACTOR shall so report to OWNER in writing at once, and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification from the OWNER and ENGINEER; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Contract Documents unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

In resolving such conflicts, errors and discrepancies, the documents shall be given precedence in the following order:

1. Agreement
2. Field and Change Orders
3. Addenda
4. Special Conditions
5. Instruction to Bidders
6. General Conditions
7. Specifications and Drawings

Figure dimension on drawings shall govern over scale dimensions and detailed Drawings shall govern over general Drawings.

**3.4 Amending and Supplementing Contract Documents**

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 means of a Change Order or a Field Order. Contract Price and Contract Time may only be changed by a Change Order.

**3.5 Reuse of Documents**

Neither CONTRACTOR nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER shall have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER; and they shall not reuse any of them on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaptation by ENGINEER.

**4. AVAILABILITY OF LANDS; PHYSICAL CONDITIONS, REFERENCE POINTS**

**4.1 Availability of Lands**

OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise provided in the Contract Documents. If CONTRACTOR believes that any delay in OWNER'S furnishing these lands, rights-of-way or easements entitles CONTRACTOR to an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Article 11. OWNER and ENGINEER shall determine if the claim is legitimate or not. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

**4.2 Physical Conditions**

**4.2.1 Explorations and Reports**

Reference is made to the Special Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such reports, but not upon non-technical data, interpretations or opinions contained therein or for the completeness thereof for CONTRACTOR'S purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to subsurface conditions at the site.

**4.2.2 Existing Structures**

Reference is made to the Special Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph

4.3 which are at or contiguous to the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such drawings, but not for the completeness thereof for CONTRACTOR'S purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to physical conditions in or relating to such structures.

4.2.3 Report of Differing Conditions  
If CONTRACTOR believes that:

4.2.3.1 any technical data on which CONTRACTOR is entitled to rely as provided in paragraphs 4.2.1 and 4.2.2 is inaccurate, or

4.2.3.2 any physical conditions uncovered or revealed at the site differ materially from that indicated, reflected or referred to in the Contract Documents,

CONTRACTOR shall, promptly after becoming aware thereof and before performing and WORK in connection therewith (except in an emergency) notify OWNER and ENGINEER in writing about the inaccuracy or difference.

4.2.4 ENGINEER'S Review  
OWNER and ENGINEER will promptly review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto and advise CONTRACTOR of OWNER'S findings and conclusions.

4.2.5 Possible Document Change  
If the OWNER and ENGINEER conclude that there is a material error in the Contract Documents or that because of newly discovered conditions a change I the Contract Documents is required, a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the inaccuracy or difference.

4.2.6 Possible Price and Time Adjustments  
In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, or any combination thereof, will be allowable to the extent that they are attributable to any such inaccuracy or difference.

**4.3 Physical Conditions-Underground Facilities**

4.3.1 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 or by others. Unless it is otherwise expressly provided in the Special Conditions:

4.3.1.1 OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and,

4.2.1.2 CONTRACTOR shall have full responsibility for reviewing and checking all such information and data; for locating all underground facilities shown or indicated in the Contract Documents; for coordination of the Work with the owners of such underground facilities during construction; and for the safety and protection thereof and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Price.

4.3.2 Not Shown or Indicated

If an underground facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of, CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency), identify the owner of such Underground Facility and give written notice thereof to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the underground facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, CONTRACTOR shall be responsible for the safety and protection of such underground facility. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any underground facility that was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of.

**4.4 Reference Points**

OWNER shall provide engineering surveys to establish reference points for construction which in ENGINEER'S judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work (unless otherwise specified), shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to OWNER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations and shall be responsible for the accurate replacement or relocation of such reference points by a Registered Land Surveyor.

## **5. CONTRACTOR'S RESPONSIBILITIES**

### **5.1 Supervision**

CONTRACTOR shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall assure that all CONTRACTOR personnel (including subcontractors, etc.) conduct themselves in a courteous and respectful manner toward the OWNER, ENGINEER, and the general public. Failure to comply with this condition of the Contract will result in immediate suspension of the Work. Following a review by the Commissioner of Public Works, the Contract may be terminated (see GC section 14). CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is indicated in and required by the Contract Documents. CONTRACTOR shall be responsible to see that the finished Work complies accurately with the Contract Documents.

### **5.2 Superintendence**

CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR'S representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

### **5.3 Labor**

CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER'S written consent given after prior written notice to the OWNER.

### **5.4 Start-Up and Completion of Work**

Unless otherwise specified, CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work and shall install, maintain and remove all equipment of the construction, other utensils or things, and be responsible for the safe, proper and lawful construction,

maintenance and use of same, and shall construct in the best and most workmanlike manner, a complete job and everything incidental thereto, as shown on the plans, stated in the specifications, or reasonably implied therefrom, all in accordance with the contract documents.

## **5.5 Materials and Equipment**

All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by OWNER and/or ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to ENGINEER, or any of ENGINEER'S consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 8.12.3 or 8.12.4.

### **5.5.1 Not Clearly Specified or Indicated**

In all instances where materials specified are obtainable in different sizes, weights, trade grades, qualities or finishes, etc., whose weights, trade grades, qualities or finishes, etc., are not clearly specified or indicated on the Drawings, the CONTRACTOR shall notify the ENGINEER of all such instances at least five (5) days in advance of receiving the proposals. The Engineer will then determine which size, weight, trade grade, quality, finish, etc., is required.

### **5.5.2 Coordination of Work**

The CONTRACTOR shall see that for his own Work and for the work of each subcontractor, proper templates and patterns necessary for the coordination of the various parts of the Work are prepared. The CONTRACTOR shall furnish or require the Subcontractor to furnish such duplicates as will enable the Subcontractors to fit together and execute fully their respective portions of the Work.

## **5.6 Adjusting Progress Schedule**

CONTRACTOR shall submit to OWNER for acceptance (to the extent indicated in paragraph 2.8) adjustments in the progress schedule to reflect the impact thereon of new developments; these will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the Contract Documents applicable thereto.



## 5.7 Substitutes or “Or-Equal” Items

### 5.7.1 General

Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier, the naming of the item is intended to establish the type, function, and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by OWNER and ENGINEER if sufficient information is submitted by CONTRACTOR to allow OWNER and ENGINEER to determine that the material or equipment proposed is equivalent or equal to that named. The procedure for review by OWNER and ENGINEER will include the following. Requests for review of substitute items of material and equipment will not be accepted by OWNER and ENGINEER from anyone, other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall make written application to OWNER and ENGINEER for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice CONTRACTOR’S achievement of completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by OWNER and ENGINEER in evaluating the proposed substitute. OWNER and ENGINEER may require CONTRACTOR to furnish at CONTRACTOR’S expense additional data about the proposed substitute.

### 5.7.2 Substitutes

If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to OWNER and ENGINEER, if CONTRACTOR submits sufficient information to allow OWNER and ENGINEER to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The

procedure for review by OWNER and ENGINEER will be similar to that provided in paragraph 5.7.1 as applied by OWNER and ENGINEER.

5.7.3 OWNER and ENGINEER'S Approval

OWNER and ENGINEER will be allowed a reasonable time within which to evaluate each proposed substitute. OWNER and ENGINEER will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without OWNER and ENGINEER'S prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at CONTRACTOR'S expense a special performance guarantee or other surety with respect to any substitute. OWNER will record time required by OWNER and ENGINEER and OWNER and ENGINEER'S consultants in evaluating substitutions proposed by CONTRACTOR and in making changes in the Contract Documents occasioned thereby. Whether or not OWNER and ENGINEER accepts a proposed substitute, CONTRACTOR shall reimburse OWNER for the charges of OWNER and ENGINEER and OWNER and ENGINEER'S consultants for evaluating each proposed substitute.

**5.8 Subcontractors, Suppliers, and Others**

5.8.1 Acceptable to OWNER and ENGINEER

CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization (including those acceptable to OWNER and ENGINEER as indicated in paragraph 5.8.2), whether initially or as a substitute, against whom OWNER or ENGINEER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

5.8.2 Objection After Due Investigation

If the Contract Documents require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials and equipment) to be submitted to OWNER in advance of the specified date prior to the Effective Date of the Agreement for acceptance by OWNER and ENGINEER and if CONTRACTOR has submitted a list thereof, OWNER'S or ENGINEER'S acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the bidding documents or the Contract Documents) of any such Subcontractor, Supplier or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute. No acceptance by OWNER or ENGINEER of any such Subcontractor, Supplier or other person or

organization shall constitute a waiver of any right of OWNER or ENGINEER to reject defective Work.

5.8.3 Contractor Responsible for Acts of Subcontractors

The CONTRACTOR shall perform on the site, and with its own organization, work equivalent to at least fifty (50) percent 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 OWNER determines that the reduction would be to the advantage of the Lexington-Fayette Urban County Government.

The CONTRACTOR shall, at the time he submits his proposal for the Contract, notify the OWNER in writing of the names of Subcontractors proposed for the Work. He shall not employ any Subcontractor without the prior written approval of the OWNER.

CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR'S own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.

5.8.4 Division of Specifications

The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

5.8.5 Agreement Between Contractor and Subcontractors

All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER.

5.8.6 Statements and Comments by CONTRACTOR

Neither the CONTRACTOR, his employees, nor his subcontractors shall at any time make any statement or comment as to the project scope, nature, intention, design, or construction

method to any third party or parties without the explicit written consent of the OWNER.

Any third party requesting such information shall be referred to the OWNER or his representative.

Should there be any change from the original intent of the project as a result of any statement or comment by the contractor, his employees or subcontractors, contractor shall be held liable for any change in the scope, nature, design, or construction method and shall bear the full cost for the previously mentioned changes.

**5.9 Patent Fees and Royalties**

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.

**5.10 Permits**

Unless otherwise provided in the Special conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER and ENGINEER 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. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

**5.11 Laws and Regulations**

**5.11.1 CONTRACTOR to Comply**

CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR'S compliance with any Laws and Regulations.

**5.11.2 Specifications and Drawings at Variance**

If CONTRACTOR observes that the Specifications or Drawings are at variance with any Laws or Regulations, CONTRACTOR shall give OWNER prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 3.4. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such Laws, or Regulations, and without such notice to OWNER, CONTRACTOR shall bear all costs arising therefrom; however, it shall not be CONTRACTOR'S primary responsibility to make certain

that the Specifications and Drawings are in accordance with such Laws and Regulations.

#### **5.12 Taxes**

CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work. Any party, firm or individual submitting a proposal pursuant to invitation must have paid all taxes owed to the Lexington-Fayette Urban County Government at the time the proposal is submitted and must maintain a "current" status in regard to those taxes throughout the Contract. If applicable, business must be licensed in Fayette County.

#### **5.13 Use of Premises**

##### **5.13.1 Project Site**

CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the staging areas or work site areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the Work. Should any claim be made against OWNER or ENGINEER by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim by arbitration or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold OWNER and ENGINEER harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any such other party against OWNER or ENGINEER to the extent based on a claim arising out of CONTRACTOR'S performance of the Work.

##### **5.13.2 Clean Up**

During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work, CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by OWNER. CONTRACTOR shall restore to original condition all property not designated for alteration by the Contract Documents.

5.13.1 Loading of 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.

**5.14 Record Drawings**

CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Change Orders, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during construction. These record documents together with all approved samples and a counterpart of all approved Shop Drawings will be available to OWNER and ENGINEER for reference. Upon completion of the Work, these record documents, samples and Shop Drawings will be delivered to the OWNER. All retainage shall be withheld until As-Built Marked-Up drawings and Record Drawings satisfactory to the OWNER are received, accepted, and delivered to the LFUCG Pump Stations Operations manager.

**5.15 Shop Drawings and Samples**

5.15.1 Shop Drawing Submittals

After checking and verifying all field measurements and after complying with applicable procedures specified, CONTRACTOR shall submit to OWNER and ENGINEER for review and approval in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.8), or for other appropriate action if so indicated in the Special Conditions, five copies (unless otherwise specified) of all Shop Drawings, which will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR'S responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as OWNER and ENGINEER may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable ENGINEER to review the information as required.

5.15.2 Sample Submittals

CONTRACTOR shall also submit to OWNER and ENGINEER for review and approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that CONTRACTOR has satisfied CONTRACTOR'S responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.

5.15.3 Review by CONTRACTOR

Before submission of each Shop Drawing or sample, CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.

5.15.4 Notice of Variation

At the time of each submission, CONTRACTOR shall give OWNER and ENGINEER specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each Shop Drawing submitted to OWNER and ENGINEER for review and approval of each such variation.

5.15.5 ENGINEER'S Approval

ENGINEER will review and approve with reasonable promptness Shop Drawings and samples, but ENGINEER'S review and approval will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make corrections required by OWNER and ENGINEER and shall return the required number of corrected copies of Shop Drawings and submit, as required, new samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by OWNER and ENGINEER on previous submittals.

5.15.6 Responsibility for Errors and Omissions

ENGINEER'S review and approval of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called OWNER and ENGINEER'S attention to each such variation at the time of submission as required by paragraph 5.15.4 and OWNER and ENGINEER has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample approval; nor will any approval by OWNER and ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the

Shop Drawings or from responsibility for having complied with the provisions of paragraph 5.15.3.

**5.15.7 Cost of Related Work**

Where a Shop or sample is required by the Specifications, any related Work performed prior to OWNER and ENGINEER'S review and approval of the pertinent submission will be the sole expense and responsibility of CONTRACTOR.

**5.16 Continuing the Work**

CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolutions of any disputes or disagreements, except as permitted by paragraph 14.5 or as CONTRACTOR and OWNER may otherwise agree in writing.

**5.17 Erosion and Sediment Control**

**5.17.1 General Environmental Requirements**

The CONTRACTOR and Subcontractors performing work on projects on behalf of the OWNER shall 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.

Any fines or penalties resulting from the failure to comply with the terms of the federal, state or local permits or perform necessary corrective action are solely the obligation of the CONTRACTOR.

**5.17.2 Stormwater Pollution Prevention**

A. The CONTRACTOR shall exercise due care to prevent or minimize any damage to any stream or wetland from pollution by debris, sediment or other material. The operation of equipment and/or materials in a jurisdictional wetland is expressly prohibited. Water that has been used for washing or processing, or that contains oils, sediments or other pollutants shall not be discharged from the job site. Such waters shall be collected and properly disposed of by the CONTRACTOR in accordance with applicable local, state and federal law.

B. The CONTRACTOR is solely responsible for securing all required state and local permits associated with stormwater discharges from the project including, but not necessarily limited to the KY Notice of Intent to Disturb (NOI) for Coverage of Storm Water Discharges Associated with Construction Activities under the KPDES Storm Water General Permit KYR100000 and the LFUCG Land Disturbance Permit. Permit application preparation and all required documentation are the responsibility of the



CONTRACTOR. The CONTRACTOR is solely responsible for maintaining compliance with the stormwater pollution prevention plan or erosion and sediment control plan and ensuring the following:

- a. That the Stormwater Pollution Prevention Plan (SWPPP) or erosion control plan is current and available for review on site;
- b. That any and all stormwater inspection reports required by the permit are conducted by qualified personnel and are available for review onsite; and
- c. That all best management practices (BMPs) are adequately maintained and effective at controlling erosion and preventing sediment from leaving the site.

C. The CONTRACTOR shall provide the necessary equipment and personnel to perform any and all emergency measures that may be required to contain any spillage or leakage and to remove materials, soils or liquids that become contaminated. The collected spill material shall be properly disposed at the CONTRACTOR's expense.

D. Upon completion of the work and with the concurrence of the OWNER, the CONTRACTOR must file a Notice of Termination (NOT) of Coverage Under the KPDES General Permit for Storm Water Discharges Associated with Construction Activity with the appropriate local and state authorities.

E. Any fines or penalties resulting from the failure to comply with the terms of the state or local stormwater permits or perform necessary corrective action are solely the obligation of the CONTRACTOR.

## **6. OTHER WORK**

### **6.1 Related Work at Site**

OWNER may perform other work related to the Project at the site by OWNER'S own forces, have other work performed by utility owners or let other direct contracts therefor which shall contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to CONTRACTOR prior to starting any such other work; and, if such performance will involve additional expense to CONTRACTOR or requires additional time, a Change Order to the Contract will be negotiated.

### **6.2 Other Contractors or Utility Owners**

CONTRACTOR shall afford each utility owner and other contractor who is a party to such a direct contract (or OWNER, if OWNER is performing the additional work with OWNER'S employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with

theirs. CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of OWNER 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.

**6.3 Delays Caused by Others**

If any part of CONTRACTOR'S Work depends for proper execution or results upon the work of any such other contractor or utility owner (or OWNER), CONTRACTOR shall inspect and promptly report to OWNER in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. CONTRACTOR'S failure so to report will constitute an acceptance of the other work as fit and proper for integration with CONTRACTOR'S Work except for latent or non-apparent defects and deficiencies in the other work.

**6.4 Coordination**

If OWNER contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Special Conditions, and the specific matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided, in the Special Conditions.

**7. OWNER'S RESPONSIBILITIES**

**7.1 Communications**

OWNER shall issue all communications to CONTRACTOR through LFUCG CONSTRUCTION MANAGEMENT.

**7.2 Data and Payments**

OWNER shall furnish the data required of OWNER under the Contract Documents promptly after they are due.

**7.3 Lands, Easements, and Surveys**

OWNER'S duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4. Paragraph 4.2 refers to OWNER'S identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions at the site and in existing structures which have been utilized by ENGINEER in preparing the Drawings and Specifications.

**7.4 Change Orders**

OWNER is obligated to execute Change Orders as indicated in paragraph 9.4.

**7.5 Inspections, Tests and Approvals**

OWNER'S responsibility in respect to certain inspections, tests and approvals is set forth in paragraph 13.3.

**7.6 Stop or Suspend Work**

In connection with OWNER'S right to stop Work or suspend Work, see paragraph 12.4 and 14.1 Paragraph 14.2 deals with OWNER'S rights to terminate services of CONTRACTOR under certain circumstances.

**8. ENGINEER'S STATUS DURING CONSTRUCTION**

**8.1 OWNER'S Representative**

LFUCG CONSTRUCTION MANAGEMENT will be OWNER'S primary 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 and shall not be extended without written consent of OWNER and ENGINEER.

**8.2 Visits to Site**

ENGINEER will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. ENGINEER'S efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform to the Contract Documents. On the basis of such visits and on-site observations, ENGINEER will assist the OWNER with determining the progress of the Work and will assist the OWNER in avoiding defects and deficiencies in the Work.

**8.3 Project Representation**

The OWNER will provide an Inspector to observe the performance of the Work. If OWNER designates another agent to represent OWNER at the site, the duties, responsibilities and limitations of authority of such other person will be as provided in the Special Conditions.

**8.4 Clarifications and Interpretations**

OWNER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as OWNER and ENGINEER may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

**8.5 Authorized Variations in Work**

OWNER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order.

**8.6 Rejecting Defective Work**

ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective and will also have authority to require special inspection or testing of the Work as provided in paragraph 12.3, whether or not the Work is fabricated, installed or completed.

**8.7 Shop Drawings**

In connection with ENGINEER'S responsibility for Shop Drawings and samples, see paragraphs 5.15.1 through 5.16 inclusive.

**8.8 Change Orders**

In connection with ENGINEER'S responsibilities as to Change Orders, see Articles 10, 11 and 12.

**8.9 Payments**

In connection with ENGINEER'S responsibilities with respect to Applications for Payment, etc., see Article 13.

**8.10 Determinations for Unit Prices**

OWNER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR.

OWNER will review with CONTRACTOR the OWNER'S preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise).

**8.11 Decision on Disputes**

OWNER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and claims under Articles 10 and 11 in respect of changes in the Contract Price or Contract Time will be referred initially to OWNER in writing with a request for a formal decision in accordance with this paragraph, which OWNER and ENGINEER will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter will be delivered to OWNER promptly (but in no event later than thirty days) after the occurrence of the event giving rise thereto, and written supporting data will be submitted to OWNER within sixty days after such occurrence unless OWNER allows an additional period of time to ascertain more accurate data in support of the claim.

## **8.12 Limitations on Engineer's Responsibilities**

### **8.12.1 CONTRACTOR, Supplier, or Surety**

Neither ENGINEER'S authority to act under this Article 8 or elsewhere in the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

### **8.12.2 To Evaluate the Work**

Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper", or "satisfactory" or adjectives or like "effect" or "import" are used to describe a requirement, direction, review or judgment of ENGINEER as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign ENGINEER any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 8.12.3 or 8.12.4.

### **8.12.3 CONTRACTOR'S Means, Methods, Etc.**

ENGINEER will not be responsible for CONTRACTOR'S means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and ENGINEER will not be responsible for CONTRACTOR'S failure to perform or furnish the Work in accordance with the Contract Documents.

### **8.12.4 Acts of Omissions of CONTRACTOR**

ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

## **9. CHANGES IN THE WORK**

### **9.1 OWNER May Order Change**

Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the Work; these will be authorized by a Change Order. Upon receipt of such notice, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

**9.2 Claims**

Claims for an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be allowed as a result of a Change Order will be settled as provided for in Article 10 or Article 11.

**9.3 Work Not in Contract Documents**

CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraph 3.4, except in the case of an emergency and except in the case of uncovering Work as provided in paragraph 12.3.4.

**9.4 Change Orders**

OWNER and CONTRACTOR shall execute appropriate Change Orders covering:

9.4.1 changes in the Work which are ordered by OWNER pursuant to paragraph 9.1, are required because of acceptance of defective Work under paragraph 12.7 or corrective defective Work under paragraph 12.8, or are agreed to by the parties;

9.4.2 changes in the Contract Price or Contract Time which are agreed to by the parties; and

9.4.3 changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by OWNER and ENGINEER pursuant to paragraph 8.11; 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 5.16.

**9.5 Notice of Change**

If notice 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 Time) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR'S responsibility, and the amount of each applicable Bond will be adjusted accordingly.

## **10. CHANGE OF CONTRACT PRICE**

### **10.1 Total Compensation**

The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in the Contract Price.

### **10.2 Claim for Increase or Decrease in Price**

The Contract Price may only be changed by a Change Order. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the CONTRACTOR to the OWNER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within sixty days after such occurrence (unless OWNER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by CONTRACTOR'S written statement that the amount claimed covers all known amounts (direct, indirect, and consequential) to which the CONTRACTOR is entitled as a result of the occurrence of said event.

### **10.3 Value of Work**

The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

#### **10.3.1 Unit Prices**

Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of paragraphs 10.9.1. through 10.9.3, inclusive).

#### **10.3.2 Lump Sum**

By mutual acceptance of a lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 10.6.2.1).

#### **10.3.3 Cost Plus Fee**

On the basis of the Cost of the Work (determined as provided in paragraphs 10.4 and 10.5) plus a CONTRACTOR'S fee for overhead and profit (determined as provided in paragraphs 10.6 and 10.7).

#### **10.4 Cost of the Work**

The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project; shall include only the following items; and shall not include any of the costs itemized in paragraph 10.5:

##### **10.4.1 Payroll Costs**

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. 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' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by OWNER.

##### **10.4.2 Materials and Equipment Costs**

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 all returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

##### **10.4.3 Subcontractor Costs**

Payments made by CONTRACTOR to the Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of ENGINEER, which bids will be accepted. If a 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 shall be determined in the same manner as CONTRACTOR'S Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.



#### 10.4.4 Special Consultant Costs

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.

#### 10.4.5 Supplemental Costs

10.4.5.1 The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR'S employees incurred in discharge of duties connected with the Work.

10.4.5.2 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.

10.4.5.3 Rentals of all construction equipment and machinery and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of ENGINEER, and the costs of transportation, loading, unloading, installation, dismantling and removal shall be in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

10.4.5.4 Sales, consumer, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

10.4.5.5 Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

10.4.5.6 Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by CONTRACTOR in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property

insurance established by OWNER), provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR'S fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid a fee proportionate to that stated in paragraph 10.6.2 for services.

10.4.5.7 The cost of utilities, fuel and sanitary facilities at the site.

10.4.5.8 Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

10.4.5.9 Cost of premiums for additional Bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by OWNER.

## **10.5 Not to Be Included in Cost of the Work**

The term Cost of the Work shall not include any of the following:

### **10.5.1 Costs of Officers and Executives**

Payroll costs and other compensation of CONTRACTOR'S officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR'S principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 10.4.1 or specifically covered by paragraph 10.4.4 - all of which are to be considered administrative costs covered by the CONTRACTOR'S fee.

### **10.5.2 Principal Office**

Expenses of CONTRACTOR'S principal and branch offices other than CONTRACTOR'S office at the site.

10.5.3 Capital Expense

Any part of CONTRACTOR'S capital expenses, including interest on CONTRACTOR'S capital employed for the Work and charges against CONTRACTOR for delinquent payments.

10.5.4 Bonds and Insurance

Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 10.4.5.9 above).

10.5.5 Costs Due to Negligence

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.

10.5.6 Other Costs

Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 10.4.

**10.6 Contractor's Fee**

The CONTRACTOR'S Fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:

10.6.1 a mutually acceptable fixed fee; or if none can be agreed upon,

10.6.2 a fee based on the following percentages of the various portions of the Cost of the Work:

10.6.2.1 for costs incurred under paragraphs 10.4.1 and 10.4.2, the CONTRACTOR'S fee shall be fifteen percent;

10.6.2.2 for costs incurred under paragraph 10.4.3, the CONTRACTOR'S fee shall be five percent; and if a subcontract is on the basis of Cost of the Work Plus a fee, the maximum allowable to CONTRACTOR on account of overhead and profit of all Subcontractors shall be fifteen percent;

10.6.2.3 no fee shall be payable on the basis of costs itemized under paragraphs 10.4.4, 10.4.5 and 10.5;

10.6.2.4 the amount of credit to be allowed by CONTRACTOR to OWNER for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR'S Fee by an amount equal to ten percent of the net decrease; and

10.6.2.5 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 10.6.2.1 through 10.6.2.4, inclusive.

#### **10.7 Itemized Cost Breakdown**

Whenever the cost of any Work is to be determined pursuant to paragraph 10.4 or 10.5, CONTRACTOR will submit in form acceptable to OWNER and ENGINEER an itemized cost breakdown together with supporting data.

#### **10.8 Cash Allowances**

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 done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to OWNER, CONTRACTOR agrees that:

##### **10.8.1 Materials and Equipment**

The 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

##### **10.8.2 Other Costs**

CONTRACTOR'S costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

##### **10.8.3 Change Order**

Prior to final payment, an appropriate Change Order will be issued as recommended by ENGINEER to the OWNER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

#### **10.9 Unit Price Work**

##### **10.9.1 General**

Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all

Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by OWNER in accordance with Paragraph 8.10.

10.9.2 Overhead and Profit

Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR'S overhead and profit for each separately identified item.

10.9.3 Claim for Increase in Unit Price

Where the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement and there is no corresponding adjustment with respect to any other item of Work and if CONTRACTOR believes that CONTRACTOR has incurred additional expense as a result thereof, CONTRACTOR may make a claim for an increase in the Contract Price in accordance with Article 10.

**11. CHANGE OF CONTRACT TIME**

**11.1 Change Order**

The Contract Time may only be changed by a Change Order. Any claim for an extension or shortening of the Contract Time shall be based on written notice delivered to OWNER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within sixty days after such occurrence (unless OWNER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by OWNER in accordance with paragraph 8.11. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph 11.1.

**11.2 Justification for Time Extensions**

The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of CONTRACTOR if a claim is made therefore as provided in paragraph 11.1. Such delays shall include, but not be limited to, acts or neglect by OWNER or others performing additional work as contemplated by Article 6, or to fires, floods, labor disputes, epidemics, abnormal weather conditions or acts of God.

**11.3 Time Limits**

All time limits stated in the Contract Documents are of the essence to the Agreement. The provisions of this Article 11 shall not exclude recovery for damages (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs) for delay by either party.

**12. WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

**12.1 Warranty and Guarantee**

CONTRACTOR warrants and guarantees to OWNER and ENGINEER that all Work will be in accordance with the Contract Documents and will not be defective. All defective Work, whether or not in place, may be rejected, corrected or accepted as provided in this Article 12.

**12.2 Access to Work**

ENGINEER and ENGINEER'S representatives, other representatives of OWNER, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide proper and safe conditions for such access.

**12.3 Tests and Inspections**

**12.3.1 Timely Notice**

CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests or approvals.

**12.3.2 Requirements and Responsibilities**

The OWNER may require such inspection and testing during the course of the Work as he/she deems necessary to ascertain and assure the integrity and acceptable quality of the materials incorporated and the work performed. Inspection presence may be either full-time or intermittent, and neither the presence nor absence at any time of the OWNER or the OWNER'S INSPECTOR shall relieve the CONTRACTOR of sole responsibility for the acceptability and integrity of the Work or any part thereof.

The costs of sampling, testing, and inspection on-site to ascertain acceptability of the Work and materials will be borne by the OWNER except as otherwise provided. The OWNER will select a testing laboratory to perform such sampling and testing. Sampling and/or testing required by the CONTRACTOR or necessitated by failure of Work or materials to meet the above acceptability test shall be at the expense of the CONTRACTOR.

Inspection services may be performed by the employees of the OWNER or by others selected or designated by the OWNER.

Sampling and/or testing required for manufacturing quality and/or process control, for certification that raw mineral materials or manufactured products are the quality specified in the contract, or to assure the acceptability for incorporation into the Work shall be borne by the CONTRACTOR or the material supplier.

Cost for inspection, sampling, testing, and approvals required by the laws or regulations of any public body having competent jurisdiction shall be borne by the CONTRACTOR or the material supplier.

Sampling and testing will be in accord with pertinent codes and regulations and with appropriate standards of the American Society of Testing Materials or other specified standards.

**12.3.3 On-Site Construction Test and Other Testing**

All inspections, tests or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to OWNER and CONTRACTOR (or by ENGINEER if so specified).

**12.3.4 Covered Work**

If any Work (including the work of others) that is to be inspected, tested or approved is covered without written concurrence of OWNER, it must, if requested by OWNER, be uncovered for observation. Such uncovering shall be at CONTRACTOR'S expense unless CONTRACTOR has given OWNER timely notice of CONTRACTOR'S intention to cover the same and OWNER has not acted with reasonable promptness in response to such notice.

**12.3.5 CONTRACTOR'S Obligation**

Neither observations by OWNER, nor inspections, tests or approvals by others shall relieve CONTRACTOR from CONTRACTOR'S obligations to perform the Work in accordance with the Contract Documents.

**12.4 OWNER May Stop the Work**

If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any other party.

**12.5 Correction or Removal of Defective Work**

If required by OWNER, CONTRACTOR shall promptly, as directed, either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by OWNER, remove it from the site and replace it with non-defective Work. CONTRACTOR shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

**12.6 One Year Correction Period**

If within one year after the date of Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER'S written instructions, either correct such defective Work, or, if it has been rejected by OWNER, remove it from the site and replace it with non-defective Work. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by CONTRACTOR. In special circumstances where a particular item of equipment is placed in continuous service before 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 or by Change Order.

**12.7 Acceptance of Defective Work**

If, instead of requiring correction or removal and replacement of defective Work, OWNER prefers to accept it, OWNER may do so. CONTRACTOR shall bear all direct, indirect and consequential costs attributable to OWNER'S evaluation of and determination to accept such defective Work (such costs to be reviewed by ENGINEER as to reasonableness and to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals).

**12.8 OWNER May Correct Defective Work**

If CONTRACTOR fails within a reasonable time after written notice of OWNER to proceed to correct and to correct defective Work or to remove and replace rejected Work as required by OWNER in accordance with paragraph 12.5, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph OWNER shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the site, take possession of all or part of the Work, and suspend CONTRACTOR'S services related thereto, take possession of



CONTRACTOR'S tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR, but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER'S representatives, agents and employees such access to the site as may be necessary to enable OWNER to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of OWNER in exercising such rights and remedies will be charged against CONTRACTOR in an amount approved as to reasonableness by OWNER and ENGINEER, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of CONTRACTOR'S defective Work. CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by OWNER of OWNER'S rights and remedies hereunder.

### **13. PAYMENTS TO CONTRACTOR AND COMPLETION**

#### **13.1 Schedule of Values**

The schedule of values established as provided in paragraph 2.8 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to OWNER. Progress payments on account of Unit Price Work will be based on the number of units completed.

#### **13.2 Application for Progress Payment**

At least ten days before each progress payment is scheduled (but not more often than once a month), CONTRACTOR shall submit to OWNER 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, charges, security interests and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER'S interest therein, all of which will be satisfactory to OWNER. OWNER shall, within thirty (30) calendar days of presentation to him of an approved Application for Payment, pay CONTRACTOR the amount approved by OWNER and ENGINEER. Monthly progress payments shall be ninety (90) percent of the sum obtained by applying the respective bid unit prices to the approved estimated quantities of work completed by the Contractor during the

preceding month. The remaining ten (10) percent will be held by the Owner, as retainage. At such time as the OWNER deems appropriate-based on the quality of work performed, progress of cleanup, and other pertinent factors-the rate of retainage, or the total amount retained, may be reduced; although, any reduction in retainage, below the ten (10) percent level, is made solely at the OWNER'S discretion. All remaining retainage held will be included in the final payment to the Contractor.

### **13.3 CONTRACTOR'S Warranty of Title**

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.

### **13.4 Review of Applications for Progress Payment**

#### **13.4.1 Submission of Application for Payment**

ENGINEER will, 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.

#### **13.4.2 ENGINEER'S Recommendation**

ENGINEER may refuse to recommend the whole or any part of any payment, if, in ENGINEER'S opinion, it would be incorrect to make such representations to OWNER. ENGINEER may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in ENGINEER'S opinion to protect OWNER from loss because:

13.4.2.1 the Work is defective, or completed Work has been damaged requiring correction or replacement;

13.4.2.2 the Contract Price has been reduced by Written Amendment or Change Order;

13.4.2.3 OWNER has been required to correct defective Work or complete Work in accordance with paragraph 12.8; or

13.4.2.4 of ENGINEER'S actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.2.1 through 14.2.9 inclusive.

### **13.5 Partial Utilization**

OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and has been completed. If CONTRACTOR agrees, CONTRACTOR will certify to OWNER that said part of the Work is complete and request that a Certificate of Completion be issued for that part of the Work.

### **13.6 Final Inspection**

Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, OWNER and ENGINEER will make a final inspection with 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 remedy such deficiencies.

### **13.7 Final Application for Payment**

After CONTRACTOR has completed all such corrections to the satisfaction of OWNER and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in paragraph 5.14) and other documents-all as required by the Contract Documents, and after OWNER has indicated that the Work is acceptable (subject to the provisions of paragraph 13.10), CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to OWNER) of all Liens arising out of or filed in connection with the Work. In lieu thereof and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full; an affidavit of CONTRACTOR that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER'S property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment. If any Subcontractor or Supplier fails to furnish a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

### **13.8 Final Payment and Acceptance**

#### **13.8.1 ENGINEER'S Approval**

If, on the basis of ENGINEER'S observation of the Work during construction and final inspection, and ENGINEER'S review of the final Application for Payment and accompanying documentation-all as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR'S other obligations under the Contract Documents have been fulfilled, ENGINEER will, after review of the final Application for Payment, indicate in writing ENGINEER'S recommendation

of payment and present the Application to OWNER for payment. Thereupon ENGINEER will give written notice to OWNER and CONTRACTOR that the Work is acceptable, subject to the provisions of paragraph 13.10. Otherwise, ENGINEER will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application.

**13.8.2 Delay in Completion of Work**

If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, OWNER shall, upon receipt of CONTRACTOR'S final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 10 of Part II, Information for Bidders, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to OWNER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

**13.9 CONTRACTOR'S Continuing Obligation**

CONTRACTOR'S obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by ENGINEER, nor the issuance of a certificate of Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Work or any part thereof by OWNER, nor any act of acceptance by OWNER nor any failure to do so, nor any review and approval of a Shop Drawing or sample submission, nor any correction of defective Work by OWNER will constitute an acceptance of Work not in accordance with the Contract Documents or a release of CONTRACTOR'S obligation to perform the Work in accordance with the Contract Documents (except as provided in paragraph 13.10).

**13.10 Waiver of Claims**

The making and acceptance of final payment will constitute:

- 13.10.1** a waiver of all claims by OWNER against CONTRACTOR, except claims arising from unsettled Liens, from defective Work appearing after final inspection or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however, it will not constitute a waiver by OWNER of any rights in respect of CONTRACTOR'S continuing obligations under the Contract Documents; and

**13.10.2** a waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

## **14. SUSPENSION OF WORK AND TERMINATION**

### **14.1 OWNER May Suspend Work**

OWNER may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety 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 allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if CONTRACTOR makes an approved claim therefor as provided in Articles 10 and 11.

### **14.2 OWNER May Terminate**

The OWNER may terminate the Work upon the occurrence of any one or more of the following events:

**14.2.1** if CONTRACTOR commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if CONTRACTOR takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency;

**14.2.2** if a petition is filed against CONTRACTOR under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against CONTRACTOR under any other federal or state law in effect at the time relating to bankruptcy or insolvency;

**14.2.3** if CONTRACTOR makes a general assignment for the benefit of creditors;

**14.2.4** if a trustee, receiver, custodian or agent of CONTRACTOR is appointed under applicable law or under contract, whose appointment or authority to take charge of property of CONTRACTOR is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of CONTRACTOR'S creditors;

**14.2.5** if CONTRACTOR admits in writing an inability to pay its debts generally as they become due;

**14.2.6** if CONTRACTOR persistently fails 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 2.8 as revised from time to time);

**14.2.7** if CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;

**14.2.8** if CONTRACTOR disregards the authority of ENGINEER, or

**14.2.9** if CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents;

OWNER may, after giving CONTRACTOR (and the surety) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of CONTRACTOR, 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), 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 finish the Work as OWNER may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) such excess will be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER will be reviewed as to reasonableness by ENGINEER and incorporated in a Change Order, but when exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

**14.2.10** If safety violations are observed and brought to the Contractors attention and Contractor fails to take immediate corrective measures any repeat of similar safety violations, Owner will order an immediate termination of contract. Note: it is the Contractor's responsibility to know proper safety measures as they pertain to construction and OSHA.

**14.2.11** This contract may be canceled by either party thirty (30) days after delivery by canceling party of written notice of intent to cancel to the other contracting party.

**14.2.12** This contract may be canceled by the Lexington-Fayette Urban County Government if it is determined that the Bidder has failed to perform under

the terms of this agreement, such cancellation to be effective upon receipt of written notice of cancellation by the Bidder.

**14.3 CONTRACTOR'S Services Terminated**

Where CONTRACTOR'S services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

**14.4 Payment After Termination**

Upon seven days' written notice to CONTRACTOR, OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Agreement. In such case, CONTRACTOR shall be paid for all Work executed and any expense sustained plus reasonable termination expenses, which will include, but not be limited to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs).

**14.5 CONTRACTOR May Stop Work or Terminate**

If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within sixty days after it is submitted, or OWNER fails for sixty days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days' written notice to OWNER and ENGINEER, terminate the Agreement and recover from OWNER payment for all Work executed and any expense sustained plus reasonable termination expenses. In addition, and in lieu of terminating the Agreement, if ENGINEER has failed to act on an Application for Payment or OWNER has failed to make any payment as aforesaid, CONTRACTOR may upon seven days' written notice to OWNER and ENGINEER stop the Work until payment of all amounts then due. The provisions of this paragraph shall not relieve CONTRACTOR of the obligations under paragraph 5.16 to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with OWNER.

**15. MISCELLANEOUS**

**15.1 Claims for Injury or Damage**

Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 15.1 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

**15.2 Non-Discrimination in Employment**

The CONTRACTOR shall comply with the following requirements prohibiting discrimination:

**15.2.1** That no person (as defined in KRS 344.010) shall bid on Lexington-Fayette Urban County Government construction projects, or bid to furnish materials or supplies to the Lexington-Fayette Urban County Government, if, within six months prior to the time of opening of bids, said person shall have been found, by declaratory judgment action in Fayette Circuit Court, to be presently engaging in an unlawful practice, as hereinafter defined. Such declaratory judgment action may be brought by an aggrieved individual or upon an allegation that an effort at conciliation pursuant to KRS 344.200 has been attempted and failed, by the Lexington-Fayette County Human Rights Commission.

**15.2.2** That it is an unlawful practice for an employer:

**15.2.2.1** to fail or refuse to hire, or to discharge any individual or otherwise to discriminate against an individual, with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, sex, age, or national origin; or

**15.2.2.2** to limit, segregate or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee because of such individual's sex, race, color, religion, age, or national origin.

**15.2.3** That it is an unlawful practice for an employer, labor organization, or joint-labor management committee controlling apprenticeship or other training or retraining, including on-the-job training programs to discriminate against an individual because of his race, color, religion, sex, age, or national origin in admission to, or employment in, any program established to provide apprenticeship or other training.

**15.2.4** That a copy of this Ordinance shall be furnished all suppliers and made a part of all bid specifications.

**15.2.5** This Ordinance shall take effect after it is signed, published, and recorded, as required by law.



**15.3 Temporary Street Closing or Blockage**

The CONTRACTOR will notify the OWNER at least 72 hours prior to making any temporary street closing or blockage. This will permit orderly notification to all concerned public agencies. Specific details and restrictions on street closure or blockage are contained in the Special Conditions.

**15.4 Percentage of Work Performed by prime CONTRACTOR**

The CONTRACTOR shall perform on site, and with its own organization, Work equivalent to at least fifty (50%) percent 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 OWNER determines that the reduction would be to the advantage of the OWNER.

**15.5 Clean-up**

Cleanup 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.

**15.6 General**

The duties and obligations imposed by these General Conditions 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 by paragraphs 12.1, 12.3.5, 13.3, and 15.2 and all of the rights and remedies available to OWNER and ENGINEER thereunder, 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.

**15.7 Debris Disposal**

For all LFUCG projects any 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.

END OF SECTION

**PART 5**  
**SPECIAL CONDITIONS**  
**INDEX**

1	BLASTING.....	SC-2
2	RISK MANAGEMENT PROVISIONS – INSURANCE AND INDEMNIFICATION .....	SC-3
3	WAGE SCALE (if applicable).....	SC-6

1. **BLASTING**

**Blasting is not to be utilized for excavation on this project. All excavation is to be by mechanical means.**

2.

**RISK MANAGEMENT PROVISIONS  
INSURANCE AND INDEMNIFICATION**

---

**INDEMNIFICATION AND HOLD HARMLESS PROVISION**

- (1) It is understood and agreed by the parties that Contractor hereby assumes the entire responsibility and liability for any and all damages to persons or property caused by or resulting from or arising out of any act or omission on the part of Contractor or its employees, agents, servants, owners, principals, licensees, assigns or subcontractors of any tier (hereinafter "CONTRACTOR") under or in connection with this agreement and/or the provision of goods or services and the performance or failure to perform any work required thereby.
- (2) CONTRACTOR shall indemnify, save, hold harmless and defend the Lexington-Fayette Urban County Government and its elected and appointed officials, employees, agents, volunteers, and successors in interest (hereinafter "LFUCG") from and against all liability, damages, and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest, defense costs and reasonable attorney's fees that are in any way incidental to or connected with, or that arise or are alleged to have arisen, directly or indirectly, from or by CONTRACTOR's performance or breach of the agreement and/or the provision of goods or services provided that: (a) it is attributable to personal injury, bodily injury, sickness, or death, or to injury to or destruction of property (including the loss of use resulting therefrom), or to or from the negligent acts, errors or omissions or willful misconduct of the CONTRACTOR; and (b) not caused solely by the active negligence or willful misconduct of LFUCG.
- (3) In the event LFUCG is alleged to be liable based upon the above, CONTRACTOR shall defend such allegations and shall bear all costs, fees and expenses of such defense, including but not limited to, all reasonable attorneys' fees and expenses, court costs, and expert witness fees and expenses, using attorneys approved in writing by LFUCG, which approval shall not be unreasonably withheld.
- (4) These provisions shall in no way be limited by any financial responsibility or insurance requirements and shall survive the termination of this agreement.
- (5) The work and services performed hereunder involve a CONSENT DECREE as further explained in Part 1-Advertisement for Bids, provision 13. These provisions are incorporated herein by reference as if expressly stated.
- (6) LFUCG is a political subdivision of the Commonwealth of Kentucky. CONTRACTOR acknowledges and agrees that LFUCG is unable to provide indemnity or otherwise save, hold harmless, or defend the CONTRACTOR in any manner.

**FINANCIAL RESPONSIBILITY**

BIDDER/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 above Indemnity provisions and these other risk management provisions.

**INSURANCE REQUIREMENTS**

YOUR ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW, AAND YOU MAY NEED TO CONFER WITH YOUR INSURANCE AGENTS, BROKERS, OR CARRIERS TO DETERMINE IN ADVANCE OF SUBMISSION OF A RESPONSE THE AVAILABILITY OF THE INSURANCE COVERAGES AND ENDORSEMENTS REQUIRED HEREIN. IF YOU FAIL TO COMPLY WITH THE INSURANCE REQUIREMENTS BELOW, YOU MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

**Required Insurance Coverage**

BIDDER/CONTRACTOR shall procure and maintain for the duration of this 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 LFUCG in order to protect LFUCG 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:

<b><u>Coverage</u></b>	<b><u>Limits</u></b>
General Liability aggregate (Insurance Services Office Form CG 00 01)	\$1 million per occurrence, \$2 million 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	\$500,000.00

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). LFUCG shall be named as an 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 LFUCG.
- 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 LFUCG.
- 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 LFUCG.

- f. LFUCG shall be provided at least 30 days advance written notice via certified mail, return receipt requested, in the event any of the required policies are canceled or non-renewed.
- g. Said coverage shall be written by insurers acceptable to LFUCG and shall be in a form acceptable to LFUCG. Insurance placed with insurers with a rating classification of no less than Excellent (A or A-) and a financial size category of no less than VIII, as defined by the most current Best's Key Rating Guide shall be deemed automatically acceptable.
- h. Owner requests that the Bidder obtain an Umbrella Liability endorsement to the CGL policy for a limit of liability of \$ NA and that this CGL policy endorsement be renewed for one (1) year after completion of this project.

#### Renewals

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

#### Deductibles and Self-Insured Programs

**IF YOU INTEND TO SUBMIT A SELF-INSURANCE PLAN IT MUST BE FORWARDED TO LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DIVISION OF RISK MANAGEMENT, 200 EAST MAIN STREET, LEXINGTON, KENTUCKY 40507 NO LATER THAN A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO THE RESPONSE DATE.**

Self-insurance programs, deductibles, and self-insured retentions in insurance policies are subject to separate approval by Lexington-Fayette Urban County Government's Division of Risk Management, upon review of evidence of BIDDER/CONTRACTOR's financial capacity to respond to claims. Any such programs or retentions must provide LFUCG with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance coverage. If BIDDER/CONTRACTOR satisfies any portion of the insurance requirements through deductibles, self-insurance programs, or self-insured retentions, BIDDER/CONTRACTOR agrees to provide Lexington-Fayette Urban County Government, Division of Risk Management, the following data prior to the final acceptance of bid and the commencement of any work:

- a. Latest audited financial statement, including auditor's notes.
- b. Any records of any self-insured trust fund plan or policy and related accounting statements.
- c. Actuarial funding reports or retained losses.
- d. Risk Management Manual or a description of the self-insurance and risk management program.
- e. A claim loss run summary for the previous five (5) years.
- f. Self-Insured Associations will be considered.

Safety and Loss Control

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

Verification of Coverage

BIDDER/CONTRACTOR agrees to furnish LFUCG with all applicable Certificates of Insurance signed by a person authorized by the insurer to bind coverage on its behalf prior to final award, and if requested, shall provide LFUCG copies of all insurance policies, including all endorsements.

Right to Review, Audit and Inspect

CONTRACTOR understands and agrees that LFUCG may review, audit and inspect any and all of its records and operations to ensure compliance with these Insurance Requirements.

**DEFAULT**

BIDDER/CONTRACTOR understands and agrees that the failure to comply with any of these insurance, safety, or loss control provisions shall constitute default and that LFUCG 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 BIDDER/CONTRACTOR for any such insurance premiums purchased, or suspending or terminating the work.

3. **WAGE SCALES** – not applicable to this project.

END OF SECTION



**PART 6**

**CONTRACT AGREEMENT**

**INDEX**

1. SCOPE OF WORK
2. TIME OF COMPLETION AND LIQUIDATED DAMAGES
3. ISSUANCE OF WORK ORDERS
4. THE CONTRACT SUM
5. PROGRESS PAYMENTS
6. ACCEPTANCE AND FINAL PAYMENT
7. THE CONTRACT DOCUMENTS
8. EXTRA WORK
9. CONSENT DECREE REQUIREMENTS
10. ENUMERATION OF SPECIFICATIONS AND DRAWINGS

## PART VI

### CONTRACT AGREEMENT

THIS AGREEMENT, made on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between **Lexington-Fayette Urban County Government**, acting herein called "OWNER" and \_\_\_\_\_ **NAC Heavy Highway, Inc.**, doing business as ~~\*(an individual)~~ ~~(a partnership)~~ (a corporation) located in the City of \_\_\_\_\_, County of \_\_\_\_\_, and State of \_\_\_\_\_, hereinafter called "CONTRACTOR."

WITNESSETH: That the CONTRACTOR and the OWNER in consideration of One Million, Two Hundred Thousand Eighty-Three, and Fifty-Two Dollars and no/100 Cents (\$1,283,052.00) quoted in the proposal by the CONTRACTOR, dated May 19, 2022, hereby agree to commence and complete the construction described as follows:

#### 1. SCOPE OF WORK

The CONTRACTOR shall furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, and the Special Conditions of the Contract, the Specifications and Contract Documents therefore as prepared by Bell Engineering, for the Leestown Road Industrial Pump Station Replacement.

#### 2. TIME OF COMPLETION AND LIQUIDATED DAMAGES

The time period estimated and authorized by the OWNER for the proper execution of the Work by the Contract, in full, is hereby fixed as ONE HUNDRED FIFTY (150) calendar days for Substantial Completion and ONE HUNDRED EIGHTY (180) calendar days to final completion. The time shall begin ten (10) days after the CONTRACTOR is given the Notice to Proceed with the Work. **TIME IS OF THE ESSENCE IN THE PERFORMANCE OF THIS AGREEMENT AND CONTRACTOR SHALL BE LIABLE AND RESPONSIBLE FOR DAMAGES SUFFERED BY OWNER AS A RESULT OF THE DELAY CAUSED BY CONTRACTOR.**

Should the contractor fail or refuse to complete the work within the time specified in his Proposal and/or Contract (or extension of time granted by the owner), the Contractor shall pay liquidated damages in an amount of FOUR HUNDRED DOLLARS (\$400.00) per day. The amount of liquidated damages shall in no event be considered as a penalty, nor other than an amount agreed upon by the Contractor and the Owner for damages, losses, additional engineering, additional resident representation and other cost that will be sustained by the owner, if the Contractor fails to complete the work within the specified time. Liquidated damages will be applied on a rate per day for each and every calendar day (Sundays and holidays included) beyond the Contract expiration date stipulated in the Contract Documents, considering all time extension granted. **These Liquidated Damages are in addition to any other damages/fees/penalties that are incurred as a result of Consent Decree requirements.**

**3. ISSUANCE OF WORK ORDERS**

Notice to begin Work will be given in whole or for part of the Work as determined by the OWNER pending the availability of funds. The order of construction will be as determined by the OWNER and ENGINEER, after consultation with the CONTRACTOR and the OWNER.

**4. THE CONTRACT SUM**

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

**5. PROGRESS PAYMENTS**

The OWNER shall make payments on account of the Contract, as provided in accordance with the General Conditions, as estimated by the ENGINEER, less the aggregate of previous payments.

**6. ACCEPTANCE AND FINAL PAYMENT**

Final payment shall be due within ninety (90) days after completion of the Work, provided the Work be then fully completed and the Contract fully accepted.

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 Work 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 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.

**7. THE CONTRACT DOCUMENTS**

The Advertisement for Bids, Information for Bidders, the General Conditions, Performance and Payment Bonds, Contract Agreement, Special Conditions, Technical Specifications, any and all Addenda, and Proposal, and Plan Drawings form the Contract, and they are fully a part of the Contract as if hereto attached or herein repeated.

**8. EXTRA WORK**

The OWNER, without invalidating the Contract, may order extra work or make changes by altering, adding to or deducting from the Work, the Contract Sum being adjusted accordingly. All such Work shall be executed and paid for in accordance with the General Conditions, which is a part of this Contract.

## **CONSENT DECREE REQUIREMENTS (NOT APPLICABLE TO THIS PROJECT)**

**8.1** 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.

**8.2** **TIME IS OF THE ESSENCE IN THE PERFORMANCE OF THIS AGREEMENT.** 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 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.

**8.3** The provisions of this Section and the various rates of compensation for CONTRACTOR’s services provided for elsewhere in this Agreement have been agreed to in anticipation of the orderly and continuous progress of the PROJECT through completion.

**8.4** 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 PROJECT 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. Section 9.6 of this Agreement (Disputes) shall apply in the event the parties cannot agree upon an extension of time.

In the event that the overall delay resulting from the above-described causes is sufficient to prevent complete performance of the Agreement 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. Section 9.6 of this Agreement shall apply in the event the parties cannot agree upon an adjustment of fee.

**8.5** 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 as provided in Section 9.2, above. Section 9.6 of this Agreement (Disputes) 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.

**8.6 DISPUTES**

Except as otherwise provided in this Agreement, 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 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 in accordance with the directions of the OWNER.

**9. THE FOLLOWING IS AN ENUMERATION OF THE SPECIFICATIONS AND DRAWINGS (CONTRACT DOCUMENTS):**

**SPECIFICATIONS**

<b>SECTION NO.</b>	<b>TITLE</b>		<b>PAGES</b>
1	Advertisement for Bids	AB	1 thru 5
2	Information for Bidders	IB	1 thru 9
3	Form of Proposal	P	1 thru 43
4	General Conditions	GC	1 thru 51
5	Special Conditions	SC	1 thru 6
6	Contract Agreement	CA	1 thru 6
7	Performance and Payment Bonds	PB	1 thru 7
8	Addenda	AD	1 thru 1
9	Technical Specifications		
	01001	General Specifications	1 thru 12
	02110	Site Clearing and Grubbing	1 thru 2
	02140	Dewatering	1
	02235	Crushed Stone and Dense Graded Aggregate (DGA)	1 thru 3
	02270	Geotextiles	1 thru 2
	02370	Erosion and Sediment Control	1 thru 43
	02371	Storm Water Pollution Prevention Plan (SWPPP)	1 thru 18
	02510	Concrete Paving	1 thru 4
	02610	Water and Sewage Force Main Pipe	1 thru 43
	02700	Sewer and Drain Pipe	1 thru 41
	02830	Fencing	1 thru 10
	02930	Sodding and Seeding	1 thru 7

	03301	Cast-in-Place Concrete (Minor Structures)	1 thru 4
	05520	Metal Fabrications	1 thru 11
	05540	Castings	1 thru 3
	11312	Submersible Sewage Pumps and Accessories	1 thru 8
10	Appendices	AP	1 thru 1

IN WITNESSETH WHEREOF, the parties hereto have executed this Contract as of the date and year above written.

(Seal)

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

ATTEST:

\_\_\_\_\_  
 Clerk of the Urban County Council

BY: \_\_\_\_\_  
 MAYOR

\_\_\_\_\_  
 (Witness)

\_\_\_\_\_  
 (Title)

(Seal)

NAC Heavy Highway, Inc.  
 (Contractor)

\_\_\_\_\_  
 (Secretary)\*

BY: \_\_\_\_\_

\_\_\_\_\_  
 (Witness)

\_\_\_\_\_  
 (Title)

310 Cutters Hill Court, Lexington, Kentucky 40509  
 (Address and Zip Code)

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 Contract.

**PART VII**

**BONDS AND CERTIFICATES**

1.01 PERFORMANCE BOND

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that

NAC Heavy Highway, Inc.  
(Name of CONTRACTOR)

310 Cutters Hill Court, Lexington, Kentucky 40509  
(Address of CONTRACTOR)

a \_\_\_\_\_ corporation \_\_\_\_\_ hereinafter  
(Corporation, Partnership, or Individual)

called Principal, and Great American Insurance Company  
(Name of Surety)

301 East 4<sup>th</sup> Street, Cincinnati, Ohio 45202  
(Address of Surety)

hereinto called Surety, are held and firmly bound unto

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

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

One Million Two Hundred Eighty-Three Thousand and Fifty-Two dollars (\$1,283,052.00),  
for the payment of whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors,  
and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into an Agreement (Contract) with OWNER for the  
**Leestown Road Industrial Pump Station Replacement**, LFUCG Bid No. **40-2022**, in accordance with Contract  
Documents prepared by **Bell Engineering** and dated **February 2022**, which Agreement (Contract) is by reference  
made a part hereof, and is hereinafter referred to as the Agreement (Contract).

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

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



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

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

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

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

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

which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, 2022.

ATTEST:

\_\_\_\_\_  
Principal

\_\_\_\_\_  
(Principal) Secretary

By: \_\_\_\_\_ (s)

\_\_\_\_\_  
310 Cutters Hill Court  
Address

\_\_\_\_\_  
Lexington, Kentucky 40509

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

\_\_\_\_\_  
Surety

ATTEST:

By: \_\_\_\_\_  
Attorney-in-Fact

\_\_\_\_\_  
(Surety) Secretary

\_\_\_\_\_  
Address

(SEAL)

\_\_\_\_\_  
Witness to Surety

Title: \_\_\_\_\_  
Surety

\_\_\_\_\_  
Address

By: \_\_\_\_\_

Title: \_\_\_\_\_

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

1.02 PAYMENT BOND

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that

NAC Heavy Highway, Inc.

(Name of CONTRACTOR)

310 Cutters Hill Court, Lexington, Kentucky 40509

(Address of CONTRACTOR)

a \_\_\_\_\_ corporation hereinafter  
(Corporation, Partnership, or Individual)

called Principal, and Great American Insurance Company  
(Name of Surety)

301 East 4<sup>th</sup> Street, Cincinnati, Ohio 45202

(Address of Surety)

hereinto called Surety, are held and firmly bound unto

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

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

One Million Two Hundred Eighty-Three Thousand and Fifty-Two dollars (\$1,283,052.00),  
for the payment of whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors,  
and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into an Agreement (Contract) with OWNER for the  
Leestown Road Industrial Pump Station Replacement, LFUCG Bid No. 40-2022 in accordance with Contract  
Documents prepared by Bell Engineering and dated February 2022, which Agreement (Contract) is by reference  
made a part hereof, and is hereinafter referred to as the Agreement (Contract).

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

1. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor material, or both, used or reasonably required for use in the performance of the Agreement (Contract), labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Agreement (Contract).
2. The above named Principal and Surety hereby jointly and severally agree with the OWNER that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such

sum or sums as may be justly due claimant and have execution thereon. The OWNER shall not be liable for the payment of any costs or expenses of any such suit.

3. No suit or action shall be commenced hereunder by any claimant:
  - (a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: The Principal, the OWNER, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the Work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the Work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, OWNER, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.
  - (b) After the expiration of one (1) year following the date on which Principal ceased Work on said Agreement (Contract), it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.
  - (c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.
4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against aid improvement, whether or not claim for the amount of such lien be presented under and against this bond.

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

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

ATTEST:

\_\_\_\_\_  
Principal

\_\_\_\_\_  
(Principal) Secretary

By: \_\_\_\_\_ (s)

\_\_\_\_\_  
Address

\_\_\_\_\_

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

\_\_\_\_\_

\_\_\_\_\_  
Surety

ATTEST:

By: \_\_\_\_\_  
Attorney-in-Fact

\_\_\_\_\_  
(Surety) Secretary

\_\_\_\_\_  
Address

\_\_\_\_\_

(SEAL)

\_\_\_\_\_  
Witness to Surety

Title: \_\_\_\_\_  
Surety

\_\_\_\_\_  
Address

By: \_\_\_\_\_

\_\_\_\_\_

Title: \_\_\_\_\_

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

1.03 EROSION AND SEDIMENT CONTROL PERFORMANCE BOND

EROSION AND SEDIMENT CONTROL PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that

NAC Heavy Highway, Inc.  
(Name of CONTRACTOR)

310 Cutters Hill Court, Lexington, Kentucky 40509  
(Address of CONTRACTOR)

a \_\_\_\_\_ corporation \_\_\_\_\_ hereinafter  
(Corporation, Partnership, or Individual)

called Principal, and Great American Insurance Company  
(Name of Surety)

301 East 4<sup>th</sup> Street, Cincinnati, Ohio 45202  
(Address of Surety)

hereinto called Surety, are held and firmly bound unto

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

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

[3% of Total Bid Price] \_\_\_\_\_ dollars (\$ \_\_\_\_\_), for the payment of whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into an Agreement (Contract) with OWNER for the Leestown Road Industrial Pump Station Replacement, LFUCG Bid No. 40-2022 in accordance with Contract Documents prepared by Bell Engineering and dated February 2022, which Agreement (Contract) is by reference made a part hereof, and is hereinafter referred to as the Agreement (Contract).

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

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

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

- 1. Complete the installation, maintenance, and removal of the soil erosion and sediment controls and final stabilization of the site during the full period of land disturbance in accordance with the Agreement (Contract), the LFUCG Land Disturbance Permit, Chapter 16 Article X Division 5 of the LFUCG Code of Ordinances, Chapter 11 of the LFUCG Stormwater Manual, and the KPDES General Permit for Stormwater Discharges Associated with Construction Activities (KYR10).

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

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

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

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

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

ATTEST:

\_\_\_\_\_  
Principal

\_\_\_\_\_  
(Principal) Secretary

By: \_\_\_\_\_ (s)

\_\_\_\_\_  
Address

\_\_\_\_\_

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

\_\_\_\_\_

\_\_\_\_\_  
Surety

ATTEST:

By: \_\_\_\_\_  
Attorney-in-Fact

\_\_\_\_\_  
(Surety) Secretary

\_\_\_\_\_  
Address

\_\_\_\_\_

(SEAL)

\_\_\_\_\_  
Witness to Surety

Title: \_\_\_\_\_  
Surety

\_\_\_\_\_  
Address

By: \_\_\_\_\_

\_\_\_\_\_

Title: \_\_\_\_\_

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



1.04 WARRANTY BOND

WARRANTY BOND

KNOW ALL MEN BY THESE PRESENTS, that

NAC Heavy Highway, Inc.

(Name of CONTRACTOR)

310 Cutters Hill Court, Lexington, Kentucky 40509

(Address of CONTRACTOR)

a \_\_\_\_\_ corporation \_\_\_\_\_ hereinafter  
(Corporation, Partnership, or Individual)

called Principal, and Great American Insurance Company  
(Name of Surety)

301 East 4<sup>th</sup> Street, Cincinnati, Ohio 45202

(Address of Surety)

hereinto called Surety, are held and firmly bound unto

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

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

\_\_\_\_\_ dollars (\$ \_\_\_\_\_),

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

WHEREAS, Principal by written agreement is entering into an Agreement (Contract) with OWNER for the Leestown Road Industrial Pump Station Replacement, LFUCG Bid No. 40-2022 in accordance with Contract Documents prepared by Bell Engineering and dated February 2022, which Agreement (Contract) is by reference made a part hereof, and is hereinafter referred to as the Agreement (Contract).

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

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

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

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

IN WITNESS WHEREOF, this instrument is executed in \_\_\_\_\_ counterparts, each of  
(number)

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

ATTEST:

\_\_\_\_\_  
Principal

\_\_\_\_\_  
(Principal) Secretary

By: \_\_\_\_\_ (s)

\_\_\_\_\_  
Address

\_\_\_\_\_

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

\_\_\_\_\_

\_\_\_\_\_  
Surety

ATTEST:

By: \_\_\_\_\_  
Attorney-in-Fact

\_\_\_\_\_  
(Surety) Secretary

\_\_\_\_\_  
Address

\_\_\_\_\_

(SEAL)

\_\_\_\_\_  
Witness to Surety

Title: \_\_\_\_\_  
Surety

\_\_\_\_\_  
Address

By: \_\_\_\_\_

\_\_\_\_\_

Title: \_\_\_\_\_

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

**POWER OF ATTORNEY**

(to be inserted)

## 1.05 RISK MANAGEMENT PROVISIONS INSURANCE AND INDEMNIFICATION

### A. DEFINITIONS

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

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

1. "Contractor" means the contractor and its employees, agents, servants, owners, principals, licensees, assigns and subcontractors of any tier.
2. "Owner" means the Lexington-Fayette Urban County Government and its elected and appointed officials, employees, agents, boards, consultants, assigns, volunteers and successors in interest.

### B. INDEMNIFICATION AND HOLD HARMLESS PROVISION

1. It is understood and agreed by the parties that Contractor hereby assumes the entire responsibility and liability for any and all damages to persons or property caused by or resulting from or arising out of any act or omission on the part of Contractor under or in connection with this agreement and/or the provision of goods or services and the performance or failure to perform any work required thereby.
2. Contractor shall indemnify, save, hold harmless and defend the Owner from and against all liability, damages, and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest, defense costs and reasonable attorney's fees that are in any way incidental to or connected with, or that arise or are alleged to have arisen, directly or indirectly, from or by Contractor's performance or breach of the agreement and/or the provision of goods or services provided that: (a) it is attributable to personal injury, bodily injury, sickness, or death, or to injury to or destruction of property (including the loss of use resulting therefrom), or to or from the negligent acts, errors or omissions or willful misconduct of the Contractor; and (b) not caused solely by the active negligence or willful misconduct of the Owner.
3. In the event the Owner is alleged to be liable based upon the above, Contractor shall defend such allegations and shall bear all costs, fees and expenses of such defense, including but not limited to, all reasonable attorneys' fees and expenses, court costs, and expert witness fees and expenses, using attorneys approved in writing by the Owner, which approval shall not be unreasonably withheld.
4. These provisions shall in no way be limited by any financial responsibility or insurance requirements, and shall survive the termination of this Agreement (Contract).
5. The Work and services performed hereunder may involve a Consent Decree as further explained in of Section 00100, provision 1.13 of these specifications. The provisions of that provision are incorporated herein by reference as if expressly stated.
6. Owner is a political subdivision of the Commonwealth of Kentucky. Contractor acknowledges and agrees that the Owner is unable to provide indemnity or otherwise save, hold harmless, or defend the Contractor in any manner.

C. FINANCIAL RESPONSIBILITY

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.

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

The policies above shall contain the following conditions:

- a. All Certificates of Insurance forms used by the insurance carrier shall be properly filed and approved by the Department of Insurance for the Commonwealth of Kentucky (DOI). Owner shall be named as additional insured in the General Liability Policy and Commercial Automobile Liability Policy using the Kentucky DOI approved forms.
- b. The General Liability Policy shall be primary to any insurance or self-insurance retained by Owner.
- c. The General Liability Policy shall include a Products and Completed Operations endorsement or Premises and Operations Liability endorsement unless it is deemed not to apply by Owner.
- d. The General Liability Policy shall include an Explosion-Collapse Underground (XCU) endorsement.
- e. The General Liability Policy shall include a Pollution Liability and/or Environmental Casualty endorsement unless it is deemed not to apply by Owner.
- f. Owner shall be provided at least thirty (30) days advance written notice via certified mail, return receipt requested, in the event any of the required policies are canceled or non-renewed.

- g. Said coverage shall be written by insurers acceptable to Owner and shall be in a form acceptable to Owner. Insurance placed with insurers with a rating classification of no less than Excellent (A or A-) and a financial size category of no less than VIII, as defined by the most current Best's Key Rating Guide shall be deemed automatically acceptable.
- h. Owner requires that the Bidder obtain an Umbrella Liability endorsement to the CGL policy for a limit of liability of \$\_\_\_\_\_ and that this CGL policy endorsement be renewed for one (1) year after completion of this project.

2. Renewals

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

3. Deductibles and Self-Insured Programs

**IF CONTRACTOR INTENDS TO SUBMIT A SELF-INSURANCE PLAN, IT MUST BE FORWARDED TO LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DIVISION OF RISK MANAGEMENT, 200 EAST MAIN STREET, LEXINGTON, KENTUCKY 40507 NO LATER THAN A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO BID OPENING DATE.**

Self-insurance programs, deductibles, and self-insured retentions in insurance policies are subject to separate approval by Lexington-Fayette Urban County Government's Division of Risk Management, upon review of evidence of Contractor's financial capacity to respond to claims. Any such programs or retentions must provide Owner with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance coverage. If Contractor satisfies any portion of the insurance requirements through deductibles, self-insurance programs, or self-insured retentions, Contractor agrees to provide Lexington-Fayette Urban County Government, Division of Risk Management, the following data prior to the final acceptance of Bid and the commencement of work:

- a. Contractor's latest audited financial statement, including auditor's notes.
- b. Any records of any self-insured trust fund plan or policy and related accounting statement.
- c. Actuarial funding reports or retained losses.
- d. Risk Management Manual or a description of self-insurance and risk management program.
- e. A claim loss run summary for the previous five (5) years.
- f. Self-Insured Associations will be considered.

4. Safety and Loss Control

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

5. Verification of Coverage

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

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).

**1.06 CERTIFICATE OF LIABILITY INSURANCE**

**(Insert Contractor's Certificate)**

- END OF SECTION -



**PART 8**

**ADDENDA**

**Leestown Road Industrial Pump Station Replacement**

**Bid No. 40-2022**

All addenda issued during the bidding of the Project will be reproduced in the signed Contract Documents, on the pages following this heading sheet.

<u>Addendum Number</u>	<u>Title</u>	<u>Date</u>
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

**PART 10**

**APPENDICES**

B. Pump Station Drawdown Report

Start up drawdown Information

Location \_\_\_\_\_ Date \_\_\_\_\_

Contractor \_\_\_\_\_ Testing rep \_\_\_\_\_

Pump Size \_\_\_\_\_ Pump Voltage \_\_\_\_\_ FLA \_\_\_\_\_

Station Design Points	GPM	Fthd
1 Pump		
2 Pumps		

Recorded	GPM	Fthd	Start elev.	Stop elev.	Amps	Volume
Pump 1						
Pump 2						

	GPM	Fthd	Start elev	Stop elev	Amps	Volume
2 Pumps						

Ground tests

	T1-G	T2-G	T3-G	T1-T2	T1-T3	T2-T3
Pump 1						
Pump 2						

Notes

---



---



---



---



---



---



---



---

## Technical Specifications

01001	General Specifications	1 thru 12
01580	Project Identification and Signs	1 thru 3
02110	Site Clearing and Grubbing	1 thru 2
02140	Dewatering	1
02235	Crushed Stone and Dense Graded Aggregate (DGA)	1 thru 3
02270	Geotextiles	1 thru 2
02370	Erosion and Sediment Control	1 thru 43
02371	Storm Water Pollution Prevention Plan (SWPPP)	1 thru 18
02510	Concrete Paving	1 thru 4
02610	Water and Sewage Force Main Pipe	1 thru 45
02700	Sodding and Seeding	1 thru 7
02830	Fencing	1 thru 10
03301	Cast-in-Place Concrete (Minor Structures)	1 thru 4
05520	Metal Fabrications	1 thru 12
05540	Castings	1 thru 3
11312	Submersible Sewage Pumps and Accessories	1 thru 8
11900	Open-Channel Grinders, Grinding, and Shredding Equipment	1 thru 12
16020	Pumping Station Electrical	1 thru 18
16900	Control Panels	1 thru 8

**CONTRACT DOCUMENTS AND  
TECHNICAL SPECIFICATIONS**

**Leestown Road Industrial Pump Station  
Replacement**

**Lexington-Fayette Urban County  
Government  
Division of Water Quality**

**LFUCG Bid No. 40-2022**

***PREPARED BY:***

**BELL ENGINEERING  
2480 FORTUNE DRIVE, SUITE 350  
LEXINGTON, KENTUCKY 40509**

**April 2022  
Bid Set**

## **GENERAL/TECHNICAL SPECIFICATIONS**

**SECTION 01001  
GENERAL SPECIFICATIONS**

**1.0 DESCRIPTION OF THE WORK AND DESIGNATION OF OWNER**

These Specifications and accompanying Drawings describe the work to be done and the materials to be furnished for the construction of the project entitled **Leestown Road Industrial Park Pump Station Replacement**.

All references to the OWNER in these Specifications, Contract Documents and plans shall mean the **Lexington-Fayette Urban County Government, Division of Water Quality**.

A standard project sign indicating the Contractor, OWNER, and ENGINEER shall be erected on the project site after review and approval by the OWNER and ENGINEER, and before mobilization.

The term "OWNER" shall refer to **LFUCG CONSTRUCTION MANAGEMENT, LFUCG, or other duly authorized representative of the LFUCG**.

**2.0 AVAILABLE FUNDS**

The attention of all Bidders is directed to the fact that funds will be made available for the award of the contract through local (LFUCG) funds.

**3.0 TIME OF COMPLETION**

The time allowed for the completion of this contract is 180 calendar days. Substantial completion is to be achieved within 150 calendar days. The time allowed for completion shall begin at midnight, local time, on the date which the OWNER, or his authorized representative, the ENGINEER, shall instruct the Contractor in writing to start work, but no later than 10 days after Notice to Proceed.

Additional time will be allowed the Contractor to cover approved over-runs or additions to the contract in the same proportion that the said over-run or addition in net monetary value bears to the original amount; the total of said additional time to be computed to the nearest whole calendar day.

**4.0 LIQUIDATED DAMAGES**

It is understood that time is of the essence for this contract, and that the OWNER will sustain damages, monetary and otherwise, in the event of delay in completion of the work hereby contracted.

Therefore, if the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the OWNER, then the Contractor does hereby agree, as a part of the consideration for the awarding of these contracts, to pay to the OWNER the amount specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the work.

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, and said amount is agreed to be the amount of damages which the OWNER would sustain and said amount shall be retained from time to time by the OWNER from current periodical estimates.

Liquidated damages are fixed at \$400 per calendar day of over-run beyond the date set for completion, or authorized extension thereof.

## **5.0 INSURANCE**

Insurance is to be furnished by the Contractor for the benefit of the OWNER, Contractor, and Subcontractors as their interests may appear. The minimum amounts of insurance coverage to be furnished under these contracts, in accordance with the applicable provisions of the General Conditions, are listed in Section 00800, Article SC-5.04.

All policies written for and applicable to the contract of which this Specification is a part shall provide for a minimum of fifteen (15) days written cancellation notice with notice to be given both to the OWNER and the ENGINEER. The OWNER and ENGINEER shall be included as additional insured parties.

## **6.0 BID, PERFORMANCE AND PAYMENT BONDS**

The Contractor shall furnish a bid Bond in the amount of 5% of the bid amount. A bid bond form is provided, but other industry standard bid bond forms may be utilized (I.e. EJCDC, AIA, RD, etc.).

The Contractor shall furnish separate performance and payment bonds issued by an approved bonding company in an amount at least equal to one hundred percent (100%) of the contract price, as security for the faithful performance of this contract and for the payment of persons performing labor and furnishing materials in connection with this contract. These bonds shall be executed by a company authorized to do business in the State of Kentucky and shall be signed or countersigned by a Kentucky resident agent. Bonds shall remain in effect for one year after date of final acceptance of the work.



## **7.0 SITE DIMENSIONS**

All Contractors furnishing materials and equipment for this contract shall obtain exact dimensions at the site. Scale or figure dimensions on the drawings and details show the correct size under ideal conditions and shall not, under any circumstances, be so construed as to relieve the Contractor from responsibility for taking measurements at the site and furnishing materials or equipment of the correct size.

The Contractor is responsible for all staking and layout on the project site.

## **8.0 DAMAGE TO EQUIPMENT STORED AND/OR IN PLACE PRIOR TO INITIAL OPERATION**

Any equipment damaged or which has been subjected to possible damage by reason of inundation, improper storage and/or protection during the construction period of project, shall be handled only as follows:

- a) Be replaced with new equipment.
- b) With approval of the OWNER and ENGINEER, be returned to the manufacturer of the equipment, or his authorized repair agency, for inspection and repair provided, however, that such repair after inspection will place the equipment in new condition, and restore the manufacturer's guarantee the same as for new equipment.

## **9.0 SALVAGED MATERIALS AND EQUIPMENT**

All materials and/or equipment to be removed from existing facilities and not specifically specified to be re-used shall remain the property of the OWNER. Such materials and/or equipment shall be delivered to a site by the Contractor as directed by the OWNER.

The use of second hand and/or salvaged materials will not be permitted, unless specifically provided for in the detailed specifications. Materials and equipment shall be new when turned over to the OWNER.

## **10.0 TEMPORARY FACILITIES**

- a) Construction yard shall be located on job site. Provide security and safety protection.
- b) The obtaining of all utilities for construction, including power and water, shall be the responsibility of the Contractor, and he shall bear the cost of all utilities

used for construction. Cost of all connections and facilities for use of utilities shall be borne by the Contractor.

- c) Contractor shall construct and maintain, in a sanitary condition, sanitary facilities for his employees and also employees of his subcontractors. At completion of the contract work these sanitary facilities shall be properly disposed of as directed by the Engineer.
- d) Temporary construction for safety measures, trench protection, etc., shall be erected in accordance with the General Conditions.
- e) The obtaining of all utilities for construction, including power and water, shall be the responsibility of the Contractor, and he shall bear the cost of all utilities used for construction. Cost of all connections and facilities for use of utilities shall be borne by the Contractor.

## **11.0 PROPERTY PROTECTION**

Care is to be exercised by the Contractor in all phases of construction to prevent damage and injury to the OWNER'S or other property.

In connection with work performed on "private property" (property other than that belonging to the OWNER), the Contractor shall confine his equipment, the storage of materials, and the operation of his workmen to the limits indicated on the plans, or to lands and right-of-way provided for the project by the OWNER, and shall take every precaution to avoid damage to the private property owner's buildings, grounds, trees, vegetation, and facilities. Where construction of sewer lines is in close proximity to mature trees and existing structures and facilities, the Contractor shall use a trench box or other similar means to minimize the necessary trench width required for installation, and shall utilize smaller sized excavation equipment to minimize the potential for collateral damage to adjacent property.

Fences, hedges, shrubs, trees, etc. within the construction limits shall be carefully removed, preserved, and replaced when the construction is completed. Where ditches or excavations cross lawns, the sod shall be removed carefully and replaced when the backfilling has been completed. If sod is damaged or not handled properly, it shall be replaced with new sod equal to existing sod at the Contractor's expense. Grassed areas, other than lawns, shall be graded, fertilized and seeded when construction is completed. When construction is completed the private property owner's facilities and grounds shall be restored to as good or better condition than prior to commencement of construction as quickly as possible at the Contractor's expense.

## **12.0 CONFLICT WITH OR DAMAGE TO EXISTING UTILITIES AND FACILITIES**

Insofar as location data is available to the ENGINEER, existing underground utilities (such as waterlines, sewer lines, gas lines, telephone conduits, etc.) are accurately located on the drawings. Due, however, to the approximate nature of much of this data, the location of any particular facility cannot be certified to be correct. In general, locations and elevations shown are approximate only.

Before proceeding with the work, the Contractor shall confer with all public or private companies, agencies, or departments that own and operate utilities in the vicinity of the construction work. The purpose of the conference is to verify the location of, and possible interference with, the existing utilities that are shown on the Plans, arrange for necessary suspension of service, and make arrangements to locate and avoid interference with all utilities that are not shown on the Plans.

## **13.0 CONTROL OF EROSION**

The Contractor shall be responsible for control of siltation and erosion from the project work. Control shall include all necessary ditching, silt fencing, mulching, etc., to prevent migration of soils to curb inlets, drainageways, and adjacent properties. The OWNER shall incur no extra costs from such work. Contractor is responsible for obtaining a KYDOW Storm Water Permit if required.

## **14.0 MEASUREMENT AND PAYMENT**

### **14.1 MEASUREMENT OF QUANTITIES**

All Work completed under the Agreement will be measured by the ENGINEER according to United States standard measure.

14.1.1 Unless otherwise specified, measurement of concrete quantities will include only that volume within the neat lines as shown on the Plans or as altered by the ENGINEER to fit field conditions. The prismatic formula will be used in computing the volumes of structures, or portions of structures, having end sections of unequal areas.

14.1.2 All items which are measured by the linear foot, such as pipe, will be measured along the centerline distance of the installed item with no allowance for connections, fittings or laps at connections.

14.1.3 In computing volumes of excavation, borrow and embankments, the average end-area method will be used. For the purpose of ascertaining quantities, it is agreed that the planimeter shall be considered an instrument of precision adapted to the measurement of areas.

## 14.2 LUMP SUM

When a complete structure, structural unit, constructed item, etc., (in effect, "lump sum" work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings, accessories, and appurtenances necessary for complete installation and a fully operable system or unit.

## 14.3 PLAN QUANTITIES

When the plan quantities for a specific portion of the Work are designated as the pay quantities in the Contract Documents, they shall be the final quantities for which payment for such specific portion of the Work will be made, unless the dimensions of said portions of the Work shown on the plans are revised by the Engineer. When revised dimensions result in an increase or decrease in the quantities of such Work, the final quantities for payment will be revised in the amount represented by the authorized changes in dimensions.

## 14.4 ACTUAL QUANTITIES

When actual quantities for a specific portion of the Work are designated as the pay quantities in the Contract Documents, they shall be the final quantities for which payment for such specific portion of the Work will be made. The actual quantities will be determined by the difference in field measurements and cross sections before and after construction.

## 14.5 SCOPE OF PAYMENT

The contract unit prices whether based on lump sum, plan quantities or actual quantities for the various bid items of the Contract Documents shall be considered full compensation for all labor, materials, supplies, equipment, tools, and all things of whatever nature required for the complete incorporation of the item into the Work the same as though the items were to read "in Plan" unless the Contract Documents provide otherwise.

## 14.6 PAYMENTS

Estimates for payment, partial payments and final payments shall be in accordance with and follow procedures set forth in the General Conditions and Supplementary Conditions.

## 15.0 **ACCESS / ROADS / MAINTENANCE OF TRAFFIC**

15.1 The Contractor, Contractor's employees and all trucks delivering equipment, supplies or materials to the project shall not block traffic, and the Contractor shall maintain emergency access to all commercial and residential

locations in the project area at all times. Contractor shall employ traffic control measures in accordance with KYDOH and LFUCG Traffic Division standards to maintain safe traffic conditions during construction of the project.

## **16.0 TESTING LABORATORY SERVICES**

### **16.1 GENERAL**

16.1.1 Work Included. From time to time during progress of the Work, the OWNER may require that testing be performed to determine that materials provided for the Work meet the specified requirements; such testing includes, but is not necessarily limited to:

- 1) Material Compaction
- 2) Cast-In-Place Concrete

16.1.2 Related Work Described Elsewhere. Requirements for testing may be described in various Sections of these Specifications; where no testing requirements are described, but the OWNER decides that testing is required, the OWNER may require testing to be performed under current pertinent standards for testing.

16.1.3 Selection of Testing Laboratory. The OWNER will select a testing laboratory.

16.1.4 Codes and Standards. Testing, when required, will be in accordance with all pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.

16.1.5 Product Handling. The Contractor shall promptly process and distribute all required copies of test reports for which he is responsible and related instructions to ensure all necessary retesting and/or replacement of materials with the least possible delay in progress of the Work.

### **16.2 PAYMENT FOR TESTING SERVICES**

16.2.1 Initial Services. The Contractor will pay for all initial testing services required by the OWNER.

16.2.2 Retesting. When initial tests indicate non-compliance with the Contract Documents, all subsequent retesting made necessary by the non-compliance shall be performed by a testing laboratory selected by the Contractor and approved by the ENGINEER and the costs thereof will be paid directly by the Contractor.

16.2.3 CONTRACTOR'S Convenience Testing. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

## 16.3 EXECUTION

16.3.1 Cooperation with Testing Laboratory. Representatives of the testing laboratory shall have access to the Work at all times. The Contractor shall provide facilities for such access in order that the laboratory may properly perform its functions.

### 16.3.2 Schedules for Testing.

16.3.2.1 Establishing Schedule. By advance discussion with the testing laboratory selected by the Owner, the Contractor shall allow for the time required for the laboratory to perform its tests and to issue each of its findings. The Contractor shall allow for this time within the construction schedule.

16.3.2.2 Revising Schedule. When changes of construction schedule are necessary during construction, the Contractor shall coordinate all such changes of schedule with the testing laboratory as required.

16.3.2.3 Adherence to Schedule. When the testing laboratory is ready to test according to the determined schedule but is prevented from testing or taking specimens due to incompleteness of the Work, all extra costs for testing attributed to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

16.3.3 Taking Specimens. All specimens and samples for testing, unless otherwise provided in these Contract Documents, will be taken by the testing laboratory; all sampling equipment and personnel will be provided by the testing laboratory; and all deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

## 17.0 **SUBMITTALS AND SUBSTITUTIONS**

### 17.1 GENERAL

17.1.1 Work Included. Wherever possible throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined either by manufacturer's name and catalog number or by reference to recognized industry standards. To ensure that the specified products are furnished and installed in accordance with design intent, procedures have been established for advance submittal of design data and for its review and approval or rejection by the Engineer.

### 17.1.2 Related Work Described Elsewhere.

17.1.2.1 Contractual requirements for submittals are described in the General Conditions and Supplementary Conditions (if applicable).

17.1.2.2 Individual submittals required are described in the pertinent sections of these Specifications.

## 17.2 SUBSTITUTIONS

17.2.1 OWNER and ENGINEER'S Approval Required. The Agreement is based on the materials, equipment, and methods described in the Contract Documents. The OWNER and ENGINEER will consider proposals for substitution of materials, equipment, and methods only when such proposals are accompanied by full and complete technical data and all other information required by the OWNER and ENGINEER to evaluate the proposed substitution. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved for this Work by the OWNER and ENGINEER.

17.2.2 "Or Equal". Where the phrase "or equal" occurs in the Contract Documents, do not assume that material, equipment, or methods will be approved as equal by the OWNER and ENGINEER unless the item has been specifically approved for this Work. The decision of the OWNER and ENGINEER shall be final.

17.2.3 Availability of Specified Items. The Contractor shall verify prior to bidding that all specified items will be available in time for installation during orderly and timely progress of the Work. In the event the specified item or items will not be so available, the Contractor shall notify the Engineer prior to receipt of Bids.

## 17.3 IDENTIFICATION OF SUBMITTALS

The Contractor shall completely identify each submittal and re-submittal by showing at least the following information:

- 1) Name and address of submitter, plus name and telephone number of the individual who may be contacted for further information.
- 2) Name of project as it appears in these Specifications.
- 3) Drawing number and Specifications Section number to which the submittal applies.
- 4) Whether this is an original submittal or resubmittal.

## 17.4 COORDINATION OF SUBMITTALS

17.4.1 General. Prior to submittal for ENGINEER'S review, the Contractor shall use all means necessary to fully coordinate all material, including the following procedures:

- 1) Determine and verify all field dimensions and conditions, materials, catalog numbers, and similar data.
- 2) Coordinate as required with all trades and with all public agencies involved.
- 3) Secure all necessary approvals from public agencies and others and signify by stamp, or other means, that they have been secured.
- 4) Clearly indicate all deviations from the Contract Documents.

17.4.2 Grouping of Submittals. Unless otherwise specifically permitted by the ENGINEER, the Contractor shall make all submittals in groups containing all associated items; the ENGINEER may reject partial submittals as not complying with the provisions of the Contract Documents.

## 17.5 TIMING OF SUBMITTALS

The Contractor shall make all submittals far enough in advance of schedule dates of installation to provide all required time for reviews, for securing necessary approvals, for possible revision and re-submittal, and for placing orders and securing delivery. In scheduling, allow at least five full working days for the ENGINEER'S review following his receipt of the submittal.

## 18.0 **INSTALLATION REQUIREMENTS**

Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the respective manufacturers, unless otherwise specified.

## 19.0 **PROOF OF COMPLIANCE**

Whenever the Contract Documents require that a product be in accordance with Federal specification, ASTM designation, ANSI specification, or other association standard, the Contractor shall present an affidavit from the manufacturer certifying that the product complies therewith. Where requested or specified, the Contractor shall submit supporting test data to substantiate compliance.



## **20.0 PROJECT RECORD DOCUMENTS**

20.1 As the Work progress, the Contractor shall keep a complete and accurate record of changes or deviations from the Contract Documents and the Shop Drawings, indicating the Work as actually installed. Changes shall be neatly and correctly shown on the respective portion of the affected document, using blackline prints of the Drawings affected, or the Specifications, with appropriate supplementary notes. This record set of Drawings, Shop Drawings, and Specifications shall be kept at the job site for inspection by the OWNER and ENGINEER.

20.2 The records above shall be arranged in order, in accordance with the various sections of the Specifications, and properly indexed. Prior to application for final payment, and as a condition to its approval by the OWNER and ENGINEER, deliver the record Drawings and Specifications, arranged in proper order, indexed, and endorsed as hereinbefore specified.

20.3 No review or receipt of such records by the ENGINEER or OWNER shall be a waiver of any deviation from the Contract Documents or the Shop Drawings or in any way relieve the Contractor from his responsibility to perform the Work in accordance with the Contract Documents and the Shop Drawings to the extent they are in accordance with the Contract Documents.

## **21.0 PROJECT MEETINGS**

The Contractor's Superintendent for the Work shall attend project meetings as required by either the OWNER/LFUCG CSNSTRUCTION MANAGEMENT, or ENGINEER.

## **22.0 VIDEO TAPE**

The Contractor, before proceeding with any work, shall make or have made a video of all areas where work is to be performed and a copy of this video shall be furnished to the OWNER to review for completeness. This video shall be utilized as backup and reference for claims and cleanup.

## **23.0 DAILY REPORTS**

The project inspector, as designated by the OWNER, will keep a daily record of materials and equipment installed. This daily report will be used by the OWNER and the ENGINEER to determine the payments due to the Contractor. The Contractor shall sign the inspector's daily report each day. Should the contractor disagree with the inspector's report, the differences shall be resolved before the end of the next day, with the Contractor signing the daily report.

## **24.0 FINAL ADJUSTMENT OF QUANTITIES**

Upon completion of the project, a final adjusting change order will be written to reconcile the differences between the bid quantities and the actual quantities installed, if applicable. This final adjusting change order will be determined based on the inspector's daily reports, and any changes to the project scope directed by the OWNER.

## **25.0 HOURS OF WORK**

Recognizing that this project is in existing residential areas, the Contractor's guidelines for hours of work are as follows:

Monday – Friday	7:00 AM until 6:00 PM
Saturday	9:00 AM until 6:00 PM
Sunday	No Work to Be Performed

Working during hours other than those specified requires prior approval by the OWNER, but may be allowed under special circumstances.

## **26.0 PERMITS**

The Contractor is responsible for the cost and for obtaining all permits required by federal, state, and local laws and regulations. Permits needed for this project include, but are not limited to, the following:

- LFUCG Land Disturbance Permit
- ~~LFUCG Building Permit (fencing)~~
- LFUCG Erosion Control Permit
- ~~LFUCG Traffic Engineering Lane Closure Permit~~
- KYDOW Storm Water Permit

Copies of these, and any other permits, will be kept at the project site, posted on the project information board, and available for inspection by agents of the regulatory entities.

**END SECTION 01001**

01001-12

## **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: One.

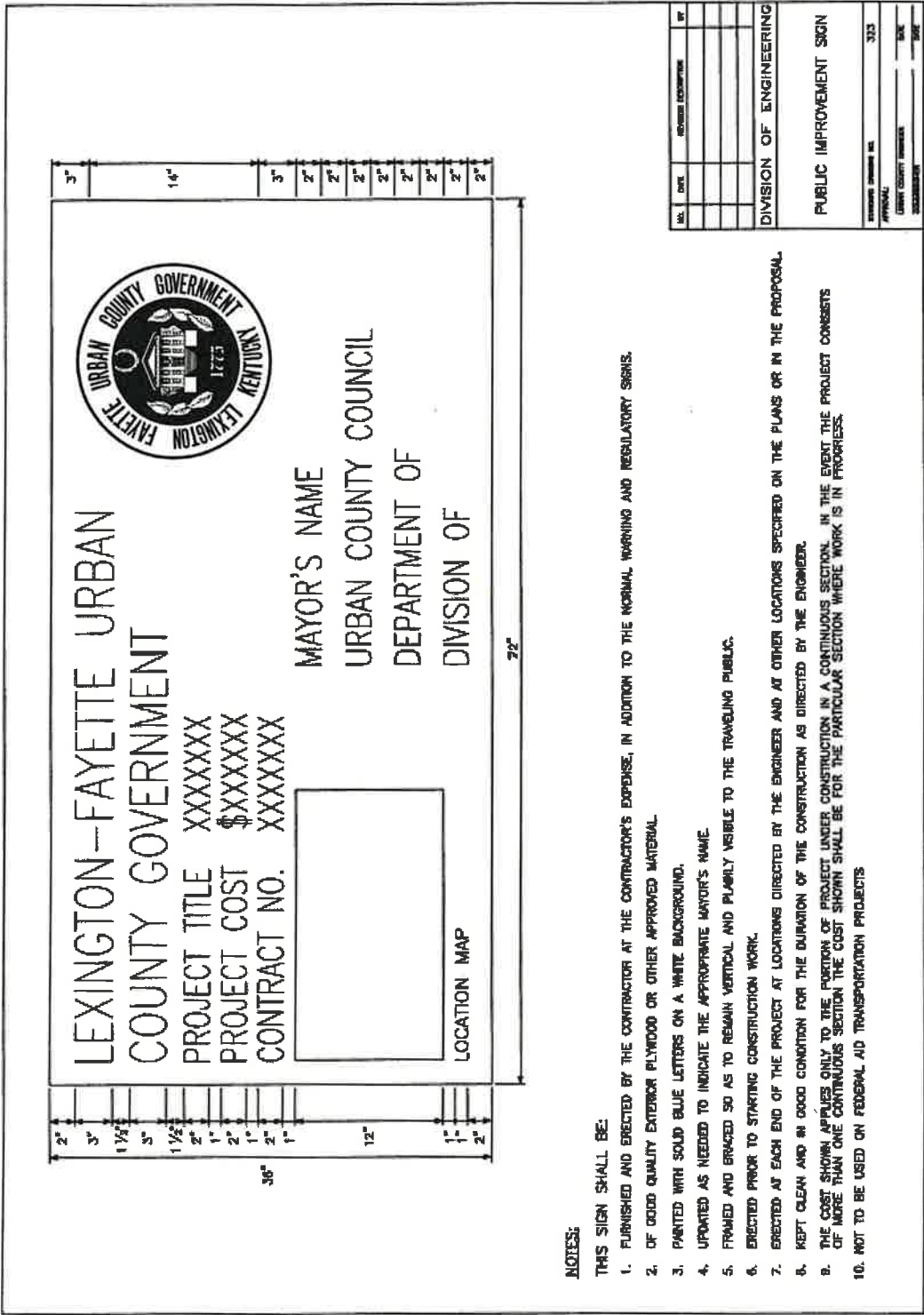
### **PART 3 - EXECUTION**

#### **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.



**NOTES:**

THIS SIGN SHALL BE:

1. FURNISHED AND ERECTED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE, IN ADDITION TO THE NORMAL WARNING AND REGULATORY SIGNS.
2. OF GOOD QUALITY EXTERIOR PLYWOOD OR OTHER APPROVED MATERIAL.
3. PAINTED WITH SOLID BLUE LETTERS ON A WHITE BACKGROUND.
4. UPDATED AS NEEDED TO INDICATE THE APPROPRIATE MAYOR'S NAME.
5. FRAMED AND BRACED SO AS TO REMAIN VERTICAL AND PLAINLY VISIBLE TO THE TRAVELING PUBLIC.
6. ERECTED PRIOR TO STARTING CONSTRUCTION WORK.
7. ERECTED AT EACH END OF THE PROJECT AT LOCATIONS DIRECTED BY THE ENGINEER AND AT OTHER LOCATIONS SPECIFIED ON THE PLANS OR IN THE PROPOSAL.
8. KEPT CLEAN AND IN GOOD CONDITION FOR THE DURATION OF THE CONSTRUCTION AS DIRECTED BY THE ENGINEER.
9. THE COST SHOWN APPLIES ONLY TO THE PORTION OF PROJECT UNDER CONSTRUCTION IN A CONTINUOUS SECTION. IN THE EVENT THE PROJECT CONSISTS OF MORE THAN ONE CONTINUOUS SECTION THE COST SHOWN SHALL BE FOR THE PARTICULAR SECTION WHERE WORK IS IN PROGRESS.
10. NOT TO BE USED ON FEDERAL AID TRANSPORTATION PROJECTS

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

PUBLIC IMPROVEMENT SIGN

DESIGNER: \_\_\_\_\_ DATE: \_\_\_\_\_

APPROVAL: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED: \_\_\_\_\_ DATE: \_\_\_\_\_



**WORKING HARD**  
**TO IMPROVE YOUR NEIGHBORHOOD**  
Your Sanitary Sewer Fees Are Making Lexington A Better Place To Live



[lexingtonky.gov](http://lexingtonky.gov)

END OF SECTION

**SECTION 02110**  
**SITE CLEARING AND GRUBBING**

**PART 1 GENERAL**

1.01 WORK INCLUDED

- A. Furnish all labor and equipment required and perform all clearing, grubbing and stripping of topsoil complete as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Earth and rock work are included in Section 02200.

1.03 SUBMITTALS

- A. None required for this Section.

**PART 2 PRODUCTS**

None in this Section.

**PART 3 EXECUTION**

3.01 GENERAL

- A. The proposed building sites, paved areas, areas designated for ditches and channel changes, borrow pits, etc., (except any portions thereof that may be reserved) shall be cleared of all trees, timber, brush, stumps, rubbish and other debris. All this material, unless otherwise specified, shall be removed and disposed of away from the site.
- B. Open burning is not allowed in Fayette County except for agricultural operations.
- C. Where clearing is to be done, stumps shall be grubbed where embankments are less than 5 feet in height, where the profile indicates excavation, in all areas designated for the construction of other facilities and in borrow areas. In all other areas the stumps may be cut off even with the ground. In areas to be grubbed, all stumps and roots must be removed.
- D. No debris will be allowed to be left under or in the embankments.
- E. In felling trees near tracks, structures and wire lines, necessary precaution must be exercised in order to prevent damage to wire lines, structures, the facilities of others, or obstruct tracks.
- F. No extra payment for clearing and grubbing shall be included in the lump sum bid.

40-2022 (02/2022)

3.02 TREES

- A. Trees (3-inch caliper and larger) shall not be disturbed by construction without written permission from the OWNER, except in those areas to be cleared. Trees disturbed by construction shall be replaced by the CONTRACTOR with same size and type at no additional cost to the OWNER.

**END OF SECTION**

\*\*\*

02110-2

40-2022 (02/2022)

## SECTION 02140

### DEWATERING

#### PART 1 GENERAL

##### 1.01 WORK INCLUDED

- A. Furnish all labor and equipment required to dewater all excavations. Dewatering of all excavations shall be the responsibility of the CONTRACTOR, and no additional compensation will be allowed for same unless specifically included as a bid item.
- B. Leaking pipes and structures are to be anticipated on this project. For this reason, no additional payment will be made for dewatering associated with leakage from any existing facility.

##### 1.02 RELATED WORK

- A. Earthwork is included in Section 02200.
- B. Crushed stone and DGA are included in Section 02235.
- C. Erosion and sedimentation control is included in Sections 02170 and 02173.

##### 1.03 SUBMITTALS

- A. None.

#### PART 2 PRODUCTS

None in this Section.

#### 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. Dewatering shall include proper removal of any and all liquid, regardless of source, from the excavation and the use of all practical means available to prevent surface runoff from entering any excavation.

**END OF SECTION**

\*\*\*



**SECTION 02235**

**CRUSHED STONE AND DENSE GRADED AGGREGATE (DGA)**

**PART 1 GENERAL**

**1.01 SCOPE OF WORK**

- A. Furnish and install crushed stone aggregates and DGA as indicated on the Drawings and/or required in the Specifications for such uses as surfaces and/or bases of roads, parking areas and walkways; temporary and permanent traffic bound surfacing over trenches; permanent traffic bound roadway surface maintenance; replacement of unsuitable material; and other miscellaneous applications required in the work.
- B. Various sizes, types and quality of crushed stone aggregates are specified in this Section depending on applicability which may be specified in detail in other sections of these Specifications.
- C. The ENGINEER may require the use of crushed stone aggregates for purposes other than those specified in this or other Specification sections if such use is advisable in his opinion. Payment for crushed stone aggregate shall be by negotiation unless agreed pricing has been previously established.

**1.02 RELATED WORK**

- A. Dewatering is included in Section 02140.
- B. Earthwork is included in Section 02200.

**1.03 SUBMITTALS**

- A. Testing Service shall submit required test reports directly to the ENGINEER with copy to CONTRACTOR.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Crushed stone aggregate shall meet the applicable requirements for the intended use in accordance with Section 805 of the Kentucky Transportation Cabinet, Department of Highways, Standard Specifications for Road and Bridge Construction.
- B. Unless otherwise referred to on the Drawings or in these Specifications, crushed stone aggregate shall be graded size No. 57 according to the table below.
- C. When referred to on the Drawings or in these Specifications, dense graded aggregate (DGA) shall have a sand equivalent value of not less than 25 and shall be graded according to the table below.
- D. Coarse aggregate gradations referred to by number size on the Drawings or in these Specifications shall conform to the following table (as copied from the

40-2022 (02/2022)

above Kentucky Transportation Cabinet Specifications, Table 805.07, 1994 Edition):

**TABLE I - SIZES OF COARSE AGGREGATES - KENTUCKY**

Size	Max. Size Square Openings (1)	AMOUNTS FINER THAN EACH LABORATORY SIEVE (SQUARE OPENINGS) PERCENTAGE BY WEIGHT																	
		100 (4)	90 (3 1/2)	75 (3)	63 (2 1/2)	50 (2)	37.5 (1-1/2)	25 (1)	19 (3/4)	12.5 (1/2)	9.5 (3/8)	4.75 (No. 4)	2.36 (No. 8)	2 (No. 10)	1.18 (No. 16)	600 (3) (No. 30)	425 (3) (No. 40)	150 (3) (No. 100)	75 (3) (No. 200)
1	90 (3 1/2)	100	90-100		25-60		0-15		0-5										
2	63 (2 1/2)			100	90-100	35-70	0-15		0-5										
23	63 (2 1/2)			100		40-90		0-15		0-5									
3	50 (2)				100	90-100	35-70	0-15		0-5									
357	50 (2)				100	95-100		35-70		10-30		0-5							
4	37.5 (1-1/2)					100	90-100	20-55	0-15		0-5								
467	37.5 (1-1/2)					100	95-100		35-70		10-30	0-5							
5	25 (1)						100	90-100	20-55	0-10	0-5								
57	25 (1)						100	95-100		25-60		0-10	0-5						
610	25 (1)						100	85-100		40-75		15-40							
67	19 (3/4)							100	90-100		20-55	0-10	0-5						
68	19 (3/4)							100	90-100		30-65	5-25	0-10		0-5				
710	19 (3/4)							100	80-100		30-75	0-30							
78	12.5 (1/2)								100	90-100	40-75	5-25	0-10		0-5				
8	9.5 (3/8)									100	85-100	10-30	0-10		0-5				
9-M	9.5 (3/8)									100	75-100	0-25	0-5						
10	4.75 (No. 4)										100	85-100						10-30	
11	4.75 (No. 4)										100	40-90	10-40					0-5	
DGA(2)	19 (3/4)							100	70-100		50-80	30-65				10-40			2-10
GRAVEL BASE(2)	37.5 (1-1/2)				100							25-65					6-30	5-20	
CSB(2)	50 (2)			100		90-100		60-95		30-70	15-55				5-20				0-8

(1) Nominal size in mm (inches), unless otherwise shown (2) Gradation performed by wet sieve KM 64-420 (3) micrometers

**E. Testing**

1. Unless otherwise required in this Section, the ENGINEER shall determine the tests required for crushed stone aggregates according to Section 805. The CONTRACTOR shall be responsible, initially and periodically at no cost to the OWNER, to deliver materials proposed for use or being used in the work to a testing laboratory selected by the OWNER. This provision shall apply to any other aggregate tests required in this Section.
2. The OWNER shall be responsible to pay the laboratory testing costs. However, once a material has been tested and accepted for use, the CONTRACTOR shall be responsible throughout the job to use materials which are equal in all respects and from the same source as that accepted material delivered to the testing laboratory.
3. The CONTRACTOR shall pay for additional tests ordered by the ENGINEER after acceptance of tested materials when such tests show the quality of materials has become deficient or when the CONTRACTOR requests a change of material supplier and/or source.
4. The ENGINEER shall request tests on Form HKB DE-16 "Requisition for Material and Design Mix Tests."

40-2022 (02/2022)

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

#### **A. Compacted Crushed Stone Aggregate**

1. Crushed stone shall be placed in uniform layers not greater than 6 inches deep and shaped by power equipment to required lines, grades, cross sections, and depths. No minimum compacted density, method of compaction, or compaction equipment is required since a nominal amount of compaction effort with vibration can establish the desired intergranular locking of the aggregate under controlled placement depth. Acceptable compaction can be achieved with pneumatic-tired and tracked equipment and rollers.
2. All compaction operations shall be performed to the satisfaction of the ENGINEER.
3. Crushed stone shall be placed in those areas as shown on the Drawings and as may be directed by the ENGINEER.

#### **B. Compacted Dense Graded Aggregate (DGA)**

1. Dense graded aggregate shall be plant mixed with water, transported in such a manner as to deliver the mix to the project without loss or segregation, spread, and compacted to produce a density throughout not less than 84 percent of solid volume. Minimum dry density for compacted limestone DGA shall be 139 pounds per cubic foot when S.G. of limestone is 2.65.
2. Density tests shall be required in such number as determined by the ENGINEER. Density tests shall be made by the sand cone method or by nuclear gauges. The CONTRACTOR shall furnish all necessary labor, equipment and materials for making the density tests under observations of the ENGINEER.
3. In the event compacted material does not meet the required density of an area, the CONTRACTOR shall either continue compaction efforts or rework the entire area until the required density is obtained. If material has to be removed and reworked, the ENGINEER shall determine if removed material can be remixed and used again for fill.
4. All compacted DGA fill shall be included in the CONTRACTOR'S lump sum bid unless otherwise indicated on the Drawings.

**END OF SECTION**

\*\*\*

**SECTION 02270**

**GEOTEXTILES**

**PART 1 GENERAL**

**1.01 SCOPE OF WORK**

- A. Provide all labor, materials, equipment and services required to install geotextiles as shown on the Contract Drawings and as specified herein.

**1.02 RELATED WORK**

[Per project spec. writer]

**1.03 SUBMITTALS**

- A. The CONTRACTOR shall submit to the ENGINEER in accordance with Section 00700 of the Specifications detailed material, performance and installation information on the geotextile fabric proposed for use. The ENGINEER shall review the submittal for acceptability prior to shipment of the fabric to the job site.

**PART 2 PRODUCTS**

**2.01 MATERIAL**

- A. The geotextile fabric shall consist of long chain polymeric filaments of either polyester or polypropylene formed into a stable network. Fabric shall be tear and puncture resistant and maintain the following minimum physical properties, when wet or dry, and be inert to commonly encountered chemicals in the soil.
- B. The geotextile fabric shall meet the following minimum requirements:

<b>Property</b>	<b>Requirement</b>	<b>Specification</b>
Weight	4.0± 0.5 oz./sq.yd.	---
Grab Tensile	110 lbs.	ASTM D 1682-64 (1975)
Modulus	900 lbs.	ASTM D 1682-64 (1975)
Trapezoidal Tear	40 lbs.	ASTM D 2263-68
Mildew, Rot Resistance	100%	---
Coeff. of Permeability (K)	1 x 10 <sup>-3</sup> cm/sec.	EURM-100

- C. The fabric shall be TYPAR Style 3401 as manufactured by DuPont, Wilmington, Delaware; Bidim as manufactured by Monsanto Textiles Co., St. Louis, Missouri, or equal, unless otherwise specified or shown on the Drawings.

40-2022 (02/2022)

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. The fabric shall be installed as recommended by the manufacturer for the application specified and/or shown on the Drawings. Manufacturer's printed instructions shall be strictly followed including storage of fabric rolls; subgrade preparation to prevent puncture; unrolling and positioning fabric; installing loosely to allow for settlement without rupture under crushed rock and riprap fills; and fabric lap distances which shall be a minimum of 1 foot unless otherwise required.

**END OF SECTION**

\*\*\*

02270-2

**SECTION 02370**

**EROSION AND SEDIMENT CONTROL**

**PART 1 - GENERAL**

**1.01 SCOPE OF WORK**

- A. The Contractor shall furnish all labor, materials, and equipment required for installing, maintaining, amending, and removing temporary soil erosion, sediment, and pollutant controls as shown in the Erosion and Sediment Control Plan or Stormwater Pollution Prevention Plan (hereinafter referred to generally as the SWPPP) and as specified herein and as required by the LFUCG Land Disturbance Permit, Chapter 16-Article X, Division 5 of the LFUCG Code of Ordinances, and the KPDES General Permit for Stormwater Discharges Associated with Construction Activities (KYR10).
- B. The Contractor shall take all site management measures necessary to minimize erosion and contain sediment, construction materials (including excavation and backfill), and pollutants (such as chemicals, fuels, lubricants, bitumen, raw sewage, and other harmful waste) on the site, and prevent them from being discharged offsite or into or alongside any body of water or into natural or man-made conveyances leading thereto.
- C. The Contractor shall at all times minimize land disturbance and the period of time that the disturbed area is exposed without stabilization practices. In “critical areas” (within 25 feet of a perennial or intermittent stream, wetland, sinkhole, inlet or other waterbody) erosion prevention measures such as working during dry periods, use of sediment controls, and use of erosion control mats/blankets, mulch, or straw blown in and stabilized with tackifiers or by treading, etc. shall be implemented on disturbed areas within 24 hours or “as soon as practical” after completion of disturbance/grading or following cessation of activities.
- D. Temporary erosion controls include, but are not limited to sodding, mulching, seeding, providing erosion control blankets and turf reinforcement mats on all disturbed surfaces including waste area surfaces and stockpile and borrow area surfaces; covering small disturbed areas with tarps or other materials; scheduling work to minimize erosion; and providing diversion or interceptor ditches to minimize the discharge of sediment.
- E. Temporary sedimentation controls include, but are not limited to, silt fences, rock check dams, berms, traps, barriers, fiber logs, storm drain inlet filters, and appurtenances on sloped surfaces to minimize the discharge of sediment.

- F. Contractor is responsible for providing and maintaining effective temporary erosion and sediment control measures prior to and during construction or until final controls become effective and the site is stabilized in accordance with state and local requirements.
- G. Prior to construction, the Contractor shall obtain an LFUCG Land Disturbance Permit and shall obtain coverage under the KPDES General Permit for Stormwater Discharges Associated with Construction Activities (KYR10) (see Article 3.24 in this Section) if required. The Contractor shall be responsible for placement of pollutant, erosion, and sedimentation controls as shown in the Stormwater Pollution Prevention Plan (SWPPP) prior to excavation, fill, or grade work. If during the course of construction, the state and/or LFUCG determine additional controls are required, the Contractor shall furnish, install, and maintain additional seeding, mulch, blankets, sediment barriers, diversion or other ditches, and/or other controls as necessary to control pollution, erosion, and sedimentation to the satisfaction of the regulatory agency.
- H. The Contractor shall inspect and repair all erosion and sedimentation controls as follows:
  - 1. At least once every seven (7) calendar days, and
  - 2. Within 24 hours after any storm event of 0.5 inch or greater.
- I. Final stabilization practices on those portions of the project where land disturbance activities have permanently ceased shall be initiated within fourteen (14) days of the date of cessation of land disturbance activities. Temporary stabilization for those portions of the project where land disturbance has temporarily ceased (e.g., temporary seeding, mulching, etc.) shall be initiated within fourteen (14) days of the date of cessation of land disturbance activities.
- J. Erosion and Sediment Control prevention measures shall be installed prior to removal of vegetation, grading, and/or stripping of topsoil. The Contractor is responsible for preparing and submitting the Kentucky Division of Water Notice of Intent and attachments and obtaining state permit approval, if applicable, prior to the beginning of any construction activities.

## **1.02 PERMITS AND NOTIFICATION REQUIREMENTS**

- A. The Contractor is responsible to submit a Stormwater Pollution Prevention Plan (SWPPP) for inclusion with permit applications. The Contractor may elect one of the following options to meet this requirement:

1. Utilize the SWPPP (which includes the Erosion and Sediment Control Plan) provided in the Construction Drawings and prepared by the Owner's Engineer as a basis for an updated SWPPP, and take sole responsibility for updating and implementing the SWPPP, or
  2. Provide a SWPPP, including an Erosion and Sediment Control Plan, prepared by a professional engineer licensed in the Commonwealth of Kentucky, meeting all of the requirements of KYR10, Chapter 11 of the LFUCG Stormwater Manual, and Chapter 16-Article X, Division 5 of the LFUCG Code of Ordinances.
- B. If applicable (i.e., for projects with a disturbed area of one acre or more), the Contractor shall submit a KPDES Notice of Intent specifically for Construction Activities (NOI-SWCA) and receive notification of coverage before beginning any site disturbance, and shall implement erosion, sediment, and pollution control measures as may be required by state, local and federal agencies. Contractor shall submit a signed Notice of Intent form and required attachments to the Division of Water at least seven (7) days prior to beginning of construction activity. See Article 3.24 in this Section for detailed requirements.
- C. A Land Disturbance Permit shall be obtained from the Lexington-Fayette Urban County Government Division of Engineering. See Article 3.25 in this Section for detailed requirements.
- D. The Contractor shall comply with all additional requirements of LFUCG. It is the Contractor's responsibility to provide evidence to the Owner that all permits, including those associated with construction across or along a stream channel, if applicable, have been obtained prior to initiation of construction. Some permits are obtained during the design phase of the project. Typically, they should be included in the contract documents.

### **1.03 RELATED WORK**

- A. Section 02371 – Stormwater Pollution Prevention Plan (SWPPP)

## **PART 2 – PRODUCTS**

### **2.01 MULCH**

- A. Mulch or erosion control blankets / turf reinforcement mats (see Section 2.08) shall be used as a soil stabilization measure for any disturbed area inactive (i.e., not undergoing grading or excavation) for 14 days or longer. Areas requiring stabilization during December through February shall receive only mulch held in place with bituminous material. Mulching, blankets, or mats shall be used whenever permanent or temporary seeding is used. The anchoring of mulch, blankets, and



mats shall be in accordance with the Construction Drawings except all mulch placed in December through February shall be anchored with bituminous materials regardless of the slope. Permanent mulches or mats shall be used in conjunction with planting trees, shrubs, and other ground covers that do not provide adequate soil stabilization.

- B. Straw shall come from wheat, rye, or barley and may be spread by hand or machine. Straw shall be anchored. Straw shall be applied at two tons per acre or 90 pounds per 1,000 square feet. Straw shall be free from weeds and coarse matter.
- C. Wood chips are appropriate for areas with less than five percent slopes, and do not require tacking. Wood chips shall be applied at 270 cubic yards per acre or 6 cubic yards per 1,000 square feet and approximately 2 inches deep. Wood chips shall be treated with 20 pounds of nitrogen per acre or shall be treated with 12 pounds slow-release nitrogen per ton to prevent nutrient deficiency in plants.
- D. Bark chips or shredded bark are appropriate for areas with less than five percent slopes, and shall be applied at 70 cubic yards per acre or 1.5 to 2 cubic yards per 1,000 square feet and about one-half inch thick. Bark does not require additional nitrogen fertilizer.
- E. Manufacturer's recommendations shall be followed during application of manufactured wood fiber and recycled paper sold as mulch materials applied in a hydroseeder slurry with binders/tackifiers. Recycled paper (newsprint) or wood fiber shall be mixed at 50 pounds per 100 gallons of water and applied according to manufacturer's recommendations and model of hydroseeder in use.
- F. Liquid mulch binders/tackifiers shall be applied according to manufacturer's recommendations. Chemical soil stabilizers or soil binders/tackifiers/emulsions shall not be used alone. Recommended buffer distances between applied products and waterbodies shall be strictly followed.
- G. Gravel or stone aggregate may be used in relatively small areas when incorporated into an overall landscaping plan. Before the gravel or crushed stone is applied, it shall be washed.

## **2.02 TEMPORARY SEED**

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

**2.03 PERMANENT SEED**

- A. Permanent seeding shall be applied within 14 days after final grade has been reached, except during December through February. Permanent seeding shall also be applied on any areas that will not be disturbed again for a year even if final grades have not been reached. The use of mulch and erosion control blanket or turf reinforcement matting with permanent seeding shall be in accordance with applicable sections of this Specification. "Seed mats" may be used for permanent seeding in accordance with manufacturers' recommendations.
- B. Permanent seeding shall be used on disturbed areas where permanent, long-lived vegetative cover is needed to stabilize the soil and on rough graded areas that will not be brought to final grade for one year or more.
- C. The area to be seeded shall be protected from excess run-on and runoff as necessary with diversions, grassed waterways, terraces, or sediment ponds.
- D. Contractor shall use the following Permanent Seed Mix, with the following exceptions:
  - a. If a property owner landscaping agreement differs from this specification, the property owner landscaping agreement shall be followed on that property, or
  - b. The area to be seeded is within 25 feet of a stream bank, in which case Contractor shall follow the seed mix provided in Section 02378, or
  - c. The Construction Drawings identify a different seed mix.

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

<b>Common Name</b>	<b>%</b>	<b>lbs per 1,000 sq. ft.</b>
Tall Fescue (turf type)	75	3.75
Annual Rye	15	0.75
Bluegrass	10	0.50
TOTAL	100%	5

- E. Vegetative cover alone shall not be used to provide erosion control cover and prevent soil slippage on a soil that is not stable due to its structure, water movement, or excessive slope.
- F. Permanent seeding may be done at any time except December through February.

- G. Soil material shall be capable of supporting permanent vegetation and have at least 25 percent silt and clay to provide an adequate amount of moisture holding capacity. An excessive amount of sand will not consistently provide sufficient moisture for good growth regardless of other soil factors.
- H. Fertilizer shall be applied at a rate determined by a soil test obtained by the Contractor. Fertilizer shall not be applied within 50 feet of a stream or other waterbody. Lime shall be applied at a rate of 100 pounds per 1,000 square feet or two tons per acre of agricultural ground limestone, unless soil test results indicate differently.

#### **2.04 SOD**

- A. Sod shall be used for disturbed areas that require immediate vegetative cover, *e.g.*, the area surrounding a drop inlet in a grassed waterway, the design flow perimeter of a grassed waterway that will convey flow before vegetation can be established, and the inlet of a culvert. Sod may be installed throughout the year. "Seed mats" and seed with geotextiles may be used in place of sod when done in accordance with manufacturers' recommendations.
- B. Contractor shall use tall fescue sod, unless another species is specified in the Construction Drawings or unless the property owner landscaping agreement differs from this specification.
- C. Sod shall not be used to provide erosion control and prevent soil slippage on a soil that is not stable due to its structure, water movement, or excessive slope.
- D. Sod shall be installed within 48 hours of digging and removal from the field. Sod should not be used on slopes steeper than 2H:1V. If it is to be mowed, installation should be on slopes no greater than 3H:1V.
- E. Soil material shall be capable of supporting permanent vegetation and shall consist of at least 25 percent silt and clay to provide an adequate amount of moisture holding capacity. An excessive amount of sand will not consistently provide sufficient moisture for the sod regardless of other soil factors.
- F. Fertilizer shall be applied at a rate determined by a soil test obtained by the Contractor. Fertilizer shall not be applied within 50 feet of a stream or other waterbody. Lime shall be applied at a rate of 100 pounds per 1,000 square feet or two tons per acre of agricultural ground limestone, unless soil test results indicate differently.
- G. The sod shall consist of strips of live, vigorously growing grasses. The sod shall be free of noxious and secondary noxious weeds and shall be obtained from good, solid, thick-growing stands. The sod shall be cut and transferred to the job in the largest continuous pieces that will hold together and are practical to handle.

- H. The sod shall be cut with smooth clean edges and square ends to facilitate laying and fitting. The sod shall be cut to a uniform thickness of not less than three-fourth inch measured from the crown of the plants to the bottom of the sod strips for all grasses except bluegrass. Bluegrass sod shall be cut to a uniform thickness of not less than one and one-half inches.
- I. The sod shall be mowed to a height of not less than two inches and no more than four inches prior to cutting.
- J. The sod shall be kept moist and covered during hauling and preparation for placement on the sod bed.
- K. Sod shall be kept watered after installation until the project is considered substantially complete.

## **2.05 ROAD/PARKING STABILIZATION**

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

## **2.06 CONSTRUCTION ENTRANCE**

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

## **2.07 DUST CONTROL**

- A. Dust control measures shall be implemented on the site.
- B. Construction activities shall be phased to minimize the total area unstabilized at any given time, thereby reducing erosion due to air and water movement.
- C. Construction roads shall be watered as needed to minimize dust.
- D. Existing trees, shrubs, and ground cover shall be retained as long as possible during the construction. Initial land clearing should be conducted only in those areas to be regraded or where construction is to occur. Areas to be cleared only for new vegetation or landscaping shall be stabilized with seed and mulch immediately following clearing.

- E. Vegetative cover is the most effective means of dust and erosion control, when appropriate. See sections on Temporary Seed, Permanent Seed, Mulch, and Sod of this Specification.
- F. When areas have been regraded and brought to final grade, they shall be stabilized using temporary or permanent seed and mulch or other measures.
- G. Mulch with mulch binders may be used as an interim dust control measure in areas where vegetation may not be appropriate.
- H. See sections on Temporary Seed, Permanent Seed, Sod, Mulch, Road/Parking Stabilization, and Construction Entrance of this Specification.

## **2.08 EROSION CONTROL BLANKETS AND TURF REINFORCEMENT MATS**

- A. Mulch netting, erosion control blankets (ECBs), or turf reinforcement matting (TRM) shall be used on sloping areas as indicated in the Construction Drawings. Mats or nets and permanent seeding may be used as an alternate to sod for culvert entrances and grassed waterways when selected and installed in accordance with manufacturer's recommendations. TRMs shall be used at the water line to control toe erosion along stream banks and wave action in wet ponds. Erosion control blankets may be used to stabilize small ditches and swales and on recently planted slopes to protect seedlings until they become established.
- B. Effective ECB and TRM installation shall require firm, continuous contact between the materials and the soil. If there is no contact, the material will not hold the soil and erosion will occur underneath the material.
- C. ECBs or TRMs shall be used in critical areas such as banks along waterways where concentrated flows are expected. Manufacturer's specifications shall be followed.
- D. ECBs, TRMs, and netting shall be suitable for their intended purpose and shall be used as indicated in the Construction Drawings.
- E. The ECB shall have a minimum useful life span of two (2) years. The material shall consist of interlocking, curled wood fibers and be capable of withstanding shear stresses up to 2.25 pounds per square foot and a velocity of nine (9) feet per second. The acceptable ECB shall be Curlex II as manufactured by American Excelsior Company or approved equal.
- F. Product Documentation

The manufacturer shall provide the Engineer or other designated party with the QA/QC certifications for each shipment of ECB/TRM. The certification shall be signed by a responsible party employed by the manufacturer such as the QA/QC

Manager, Production Manager, or Technical Services Manager. The QA/QC certifications shall include:

- a. ECB/TRM lot and roll numbers (with corresponding shipping information)
- b. Manufacturer's test data for raw materials used in the production
- c. Manufacturer's test data for finished production.

**G. Product Labeling**

- a. Prior to shipment, the Manufacturer shall affix a label to each roll identifying the following characteristics:
- b. Product identification information (manufacturer name and address, brand name, product code)
- c. Lot number and roll number
- d. Roll length and width
- e. Total roll weight.

**H. Packaging**

1. The ECB/TRM shall be wound around a cardboard core to facilitate handling. The core is not intended to support the roll for lifting but should be sufficiently strong to prevent collapse during transit.
2. All rolls shall be labeled and bagged in packaging that is resistant to photodegradation by ultraviolet light.

**I. The Contractor shall furnish the following to the Engineer:**

1. Manufacturer's quality assurance/quality control certifications for each shipment to verify that the materials supplied for the project are in accordance with the requirements of this specification.
2. Manufacturer's warranty covering materials and workmanship.

**2.09 TEMPORARY DIVERSION DITCH**

- A. Temporary diversion ditches shall be used to collect sediment-laden runoff from disturbed areas and direct it to a sediment pond where applicable. Temporary ditches are those expected to be in use for less than one year. Temporary diversion and/or other ditches require stabilization, with seed, blankets, mats, or mulch.
- B. Temporary diversion ditches shall have stable outlets. The combination of conditions of site, slopes, and soils should be so that the ditch can be maintained throughout its planned life.

- C. Temporary diversion ditches shall not be constructed below high sediment-producing areas unless land treatment practices or structural measures, designed to prevent damaging accumulations of sediment in the channels, are installed with or before the diversion.
- D. A typical diversion cross section consists of a channel and a supporting ridge. In the case of an excavated-type diversion, the natural ground serves as the diversion ridge. Diversion cross sections shall be adapted to the equipment that will be used for their construction and maintenance.
- E. The channel may be parabolic or trapezoidal in shape. V-shaped ditches shall not be constructed.
- F. Diversions shall be located so that water will empty onto an established area such as a stable watercourse, waterway, or structure.
- G. Any high sediment-producing area above a diversion shall be controlled by good land use management or by structural measures to prevent excessive sediment accumulation in the diversion channel.
- H. Temporary diversions above steep slopes or across graded rights-of-way shall have a berm with a minimum top width of 2 feet, side slopes of 2:1 or flatter and a minimum height of 18 inches measured from the channel bottom.
- I. Diversions installed to intercept flow on graded rights-of-way shall be spaced 200 to 300 feet apart.
- J. A level lip spreader shall be used at diversion outlets discharging onto areas already stabilized by vegetation.

#### **2.10 LEVEL SPREADER**

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

#### **2.11 PERMANENT CONSTRUCTED WATERWAY**

- A. Permanent constructed waterways shall be used to divert stormwater runoff from upland undisturbed areas around or away from areas to be disturbed during construction. A waterway expected to be in place for at least one year shall be



considered permanent. Permanent waterways shall be lined with sod or permanent seeding and nets, ECBs, or TRMs.

## **2.12 PIPE SLOPE DRAIN**

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

## **2.13 IMPACT STILLING BASIN**

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

## **2.14 CHECK DAM**

- A. Check dams shall be limited to use in small, open channels that drain 10 acres or less.
- B. Check dams shall not be used in streams.
- C. Check dams can be constructed of stones, coir logs, or wood fiber logs.
- D. If used, check dams shall be constructed prior to the establishment of vegetation.
- E. The maximum height at the center of a check dam shall be three feet above the ground on which the rock is placed.

- F. The center of the portion of the check dam above the flat portion of the channel shall be at least 1 foot lower than the outer edges. The outer edges of the check dam shall extend up the side slopes of the channel to a point 3 feet in elevation above the center portion of the check dam or to the top of the side slopes.
- G. The maximum spacing between rock check dams in a ditch should be such that the toe of the upstream dam is at the same elevation as the top of the next downstream dam.
- H. The spacing of coir and wood fiber check dams is one log every 100 feet for velocities of 5 fps, 50 feet for velocities between 5 and 7.5 fps, and 25 feet for velocities greater than 10 fps, unless otherwise shown in the Construction Documents.
- I. Stone check dams shall be constructed of KYTC Class II channel lining.
- J. Coir log or wood fiber log check dams shall be constructed of a single log with a diameter of at least 20 inches.

## **2.15 SEDIMENT TRAP**

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

## **2.16 SEDIMENT POND**

- A. A sediment pond shall be installed at the outlet of a disturbed area of 5 acres or more. The maximum drainage area for a single pond is 100 acres.

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

**2.17 SILT FENCE**

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

<u>PHYSICAL PROPERTY</u>	<u>REQUIREMENTS</u>
Filtering Efficiency	80% (minimum)
Tensile Strength at 20%	50 pounds/linear inch (minimum)
Flow Rate	0.3 gallons/square foot/minute (minimum)

- D. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0°F to 120°F.
- E. Posts for synthetic fabric silt fences shall be either 2-inch by 2-inch wood or 1.33 pounds per linear foot steel with a minimum length of 5 feet. Steel posts shall have projections for fastening wire to them. Posts shall be no more than 6 feet apart.
- F. Wire fence reinforcement for silt fences shall be a minimum of 36 inches in height, a minimum of 14 gauge and shall have a mesh spacing of no greater than 6 inches.

## **2.18 STORM DRAIN INLET PROTECTION**

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

## **2.19 FILTER STRIP**

- A. Filter strips shall be used on each side of permanent constructed channels.
- B. Filter strips shall only be used to remove sediment from overland flow. Filter strips are not effective in removing sediment from concentrated flows.
- C. If vegetative filters are proposed as a sediment control device and they do not already exist, they shall be planted and established prior to initiating land disturbing activities.

- D. The minimum filter strip width shall be 50 feet for streams, wetlands, and sinkholes. The minimum filter strip width shall be ten feet for constructed waterways.
- E. Where a post development floodplain or wet weather conveyance is being protected, filter strips shall be provided on each side. When a wetland or sinkhole is being protected, filter strips shall be provided around the perimeter.
- F. Contractor shall construct the filter strips as shown on the Construction Drawings.
- G. Existing grass or grass/legume mixtures used as filter strips shall be dense and well established, with no bare spots. When establishing new seeding, consideration shall be given to wildlife needs and soil conditions on the site. The following chart provides a list of alternative grass and grass/legume mixtures:

**SEEDING MIXTURE AND SITE SUITABILITY CHART**

Seeding Mixture	Rate lbs/acre	Soil Suitability
Alfalfa <i>Or</i> Red Clover <i>Plus</i> Timothy <i>Or</i> Orchardgrass <i>Or</i> Bromegrass	10  10  4  6  6	Well-Drained
Ladino <i>Plus</i> Timothy <i>Or</i> Orchardgrass <i>Or</i> Bromegrass	0.5  4  6  8	Wet or Well-Drained

Notes:

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

## **2.20 STREAM CROSSING**

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

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

- D. All stream crossings shall be constructed in such a manner as to avoid flooding or excessive inconvenience or damage to adjacent areas, roadways, properties, or structures.
- E. When using a culvert crossing, the top of the compacted earth fill shall be covered with at least six inches of KYTC No. 2 stone.
- F. KYTC No. 2 stone shall also be used for the stone pads forming the crossing approaches.

## **2.21 PUMP-AROUND FLOW DIVERSION**

- A. A pump-around flow diversion shall be used to divert flow around construction activities occurring in a stream when those activities are reasonably expected to cause the erosion of sediment or deposition of sediment in the stream.
- B. Check dams to form the diversion shall span the banks of the stream. Maintain 1-foot freeboard (minimum) on the upstream and downstream checks.

40-2022 (02/2022)

- C. Check dams may be constructed of sandbags or may be a water-filled bladder such as an Aqua-Barrier.
- D. The dewatering flow from the work area shall be treated in a sediment-trapping device prior to discharge to the stream.
- E. Sandbags shall be woven polypropylene bags with approximate dimensions of 18-1/2 inches by 28 inches. Contractor shall tie the ends of filled bags closed using either draw strings or wire ties.

## **2.22 CONSTRUCTION DEWATERING**

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

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- A. Erosion and sediment control practices shall be consistent with the requirements of Chapter 11 of the LFUCG Stormwater Manual and other state and local regulatory agencies and in any case shall be adequate to minimize erosion of disturbed and/or regraded areas and discharge of sediment from the site.
- B. Contractor is responsible for notifying and obtaining coverage from the Kentucky Division of Water concerning inclusion under the KPDES General Permit for Stormwater Discharges Associated with Construction Activities.
- C. Gravity sewer lines, force mains, and water lines that cross streams shall be constructed by methods that maintain normal stream flow and allow for a dry excavation. Water pumped from the excavation shall be contained and allowed to settle prior to reentering the stream, or filtered through a sediment removal device. Excavation equipment and vehicles shall operate outside of the flowing portion of the stream. Spoil material from the line excavation shall not be allowed to enter the flowing portion of the stream. Clean Water Act Section 401 and 402 requirements enforced by the US Army Corps of Engineers and the Kentucky Division of Water and the provisions of this condition shall apply to all types of utility line stream crossings.
- D. Removal of riparian vegetation in the utility line right-of-way shall be limited to that necessary for equipment access. Effective erosion and sedimentation control measures shall be employed at all times during the project to prevent degradation of Waters of the Commonwealth. Site regrading and reseeding shall be accomplished with 14 days after disturbance.

### 3.02 MULCH

- A. Seed shall be applied prior to mulching except where seed is to be applied as part of a hydroseeder slurry containing mulch.
- B. Lime and fertilizer (where needed) shall be incorporated and surface roughening accomplished as needed prior to mulching in accordance with applicable sections of this Specification.
- C. Mulch materials shall be spread uniformly by hand or mechanically so the soil surface is covered. During or immediately following application, the mulch shall be anchored or otherwise secured to the ground according to one of the following methods:
  - 1. Mechanical – Use a disk, crimper, or similar type tool set straight to punch or anchor the mulch material into the soil.
  - 2. Mulch Tackifiers/Nettings/Emulsions – Use according to the manufacturer's recommendations. This is a superior method in areas of water concentration to hold mulch in place.
  - 3. Wood Fiber – Wood fiber hydroseeder slurries may be used to tack straw mulch. This combination treatment is well suited to steep slopes and critical areas, and severe climate conditions.
- D. Mulch shall be anchored using a mulch anchoring tool, a liquid binder/tackifier, or mulch nettings. Nets and mats shall be installed to obtain firm, continuous contact between the material and the soil. Without such contact, the material is useless and erosion occurs.
- E. A mulch anchoring tool is a tractor-drawn implement that is typically used for anchoring straw and is designed to punch mulch approximately two inches into the soil surface. Machinery shall be operated on the contour and shall not be used on slopes steeper than 3H:1V.
- F. When using liquid mulch binders and tackifiers, application shall be heaviest around edges of areas and at crests of ridges and banks to prevent wind blow. Remainder of area shall have binders/tackifiers spread uniformly in accordance with manufacturer's recommendations.
- G. When using a mulch net, it shall be used in conjunction with an organic mulch and shall be installed immediately after the application and spreading of the mulch
- H. Erosion control blankets and turf reinforcement mats are considered protective mulches and may be used alone on erodible soils and during all times of year.



Blankets and mats shall be installed in accordance with manufacturer's recommendations.

- I. Mulched areas shall be inspected at least weekly and after each rainfall of one-half inch or more. When mulch material is found to be loosened or removed, the mulch cover shall be replaced within 48 hours.

### **3.03 TEMPORARY SEED**

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

### **3.04 PERMANENT SEED**

- A. During site preparation, topsoil shall be stockpiled for use in establishing permanent vegetation.

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

### **3.05 SOD**

- A. The area to be sodded shall be protected from excess runoff, as necessary, with appropriate BMPs.
- B. Prior to sodding, the soil surface shall be cleared of all trash, debris, and stones larger than one inch in diameter, and of all roots, brush, wire, and other objects that would interfere with the placing of the sod.

- C. Compacted soils shall be broken up sufficiently to create a favorable rooting depth of six to eight inches.
- D. Lime and fertilizer (if needed) shall be worked into the soil with a disk harrow, springtooth harrow, or other suitable field equipment to a depth of four inches.
- E. After the lime and fertilizer have been applied and just prior to the laying of the sod, the soil in the area to be sodded shall be loosened to a depth of one inch. The soil shall be thoroughly dampened immediately after the sod is laid if it is not already in a moist condition.
- F. No sod shall be placed when the temperature is below 32°F. No frozen sod shall be placed nor shall any sod be placed on frozen soil.
- G. When sod is placed during the periods of June 15 to September 1 or October 15 to March 1, it shall be covered immediately with a uniform layer of straw mulch approximately one-half inch thick or so the green sod is barely visible through the mulch.
- H. Sod shall be carefully placed and pressed together so it will be continuous without any voids between the pieces. Joints between the ends of strips shall be staggered.
- I. On gutter and channel sodding, the sod should be carefully placed on rows or strips at right angles to the centerline of the channel (*i.e.*, at right angles to the direction of flow). The edge of the sod at the outer edges of all gutters shall be sufficiently deep so that surface water will flow over onto the top of the sod.
- J. On steep graded channels, each strip of sod shall be staked with at least two stakes not more than 18 inches apart.
- K. On slopes 3H:1V or steeper, or where drainage into a sod gutter or channel is one-half acre or larger, the sod shall be rolled or tamped and then chicken wire, jute, or other netting shall be pegged over the sod for protection in the critical areas. The netting and sod shall be staked with at least two stakes not more than 18 inches apart. The netting shall be stapled on the side of each stake within two inches of the top of the stake. The stake should then be driven flush with the top of the sod.
- L. When stakes are required, the stakes shall be wood and shall be approximately ½ inch by ¾ inch by 12 inches. They shall be driven flush with the top of the sod with the flat side against the slope and on an angle toward the slope.
- M. Sod shall be tamped or rolled after placing and then watered. Watering shall consist of a thorough soaking of the sod and of the sod bed to a depth of at least 4 inches. The sod should be maintained in a moist condition by watering for a period of 30 days.

- N. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week to maintain moist soil to a depth of 4 inches. Watering shall be done during the heat of the day to prevent wilting. After the first week, sod shall be watered as necessary to maintain adequate moisture content.
- O. The first mowing of sod shall not be attempted until the sod is firmly rooted. No more than one-third of the grass leaf shall be removed by the initial and subsequent cuttings. Grass height shall be maintained between 2 inches and 3 inches.
- P. Where sod does not establish properly, the sod should be replaced immediately. Areas requiring resodding should be prepared in the same manner as the original installation.

### **3.06 ROAD/PARKING STABILIZATION**

- A. The roadbed or parking surface shall be cleared of all vegetation, roots, and other objectionable material.
- B. All roadside ditches, cuts, fills, and disturbed areas adjacent to parking areas and roads shall be stabilized with appropriate temporary or permanent vegetation according to the applicable sections of this Specification.
- C. Geotextile filter fabric shall be applied beneath the stone for additional stability in accordance with fabric manufacturer's specifications.
- D. Both temporary and permanent roads and parking areas may require periodic top dressing with new gravel. Seeded areas adjacent to the roads and parking areas shall be checked regularly to ensure that a vigorous stand of vegetation is maintained. Roadside ditches and other drainage structures shall be checked once each week to ensure that they do not have silt or other debris that reduces their effectiveness.

### **3.07 CONSTRUCTION ENTRANCE**

- A. Vegetation, roots, and all other obstructions shall be cleared in preparation for grading. Prior to placing geotextile (filter fabric), the entrance shall be graded and compacted to 80% of standard proctor density.
- B. To reduce maintenance and loss of aggregate, the geotextile shall be placed over the existing ground before placing the stone for the entrance. Stone shall be placed to depth of 6 inches or greater for the entire width and length of the stabilized construction entrance.
- C. If wash racks are used, they shall be installed according to manufacturer's specifications.

- D. The stabilized construction entrance shall be inspected once each week and after there has been a high volume of traffic or a storm event greater than 0.2 inches.
- E. The entrance shall be maintained in a condition that will prevent tracking or flow of sediments onto public rights-of-way. This may require periodic top dressing with additional stone, as conditions demand, and repair and/or cleanout of any structures used to trap sediment.
- F. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains shall be removed immediately.

**3.08 DUST CONTROL**

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

**3.09 EROSION CONTROL BLANKETS AND TURF REINFORCEMENT MATS**

- A. Blankets and mats shall be installed according to the manufacturer's recommendations. In the event that the manufacturer's recommendations conflict with any requirement of this Specification, the most conservative requirement, in terms of protection of public health and the environment, shall govern.
- B. Placement
  - 1. The blankets and mats shall be unrolled in the direction of surface water flow.
  - 2. When using two blankets or mats side by side, the seams shall not be placed in the center of a channel but shall be offset by a minimum of one (1) foot.

3. Blankets and mats shall be stapled in place using U-shaped staples of the size, and at the prescribed intervals and arrangement, specified by the manufacturer.
4. When blankets or mats are laid side by side, they shall be stapled so as to anchor the edge of each roll.
5. The overlap of blankets and mats shall be in accordance with the manufacturer's recommendations.
6. If blanket/mat is unrolled along (parallel) to the contour installation must begin at the lower elevation and progress up slope with the upper blanket overlapping the lower as with roofing shingles.

**C. Damage Repair**

1. The patch material used for the repair of a hole or tear shall be the same type of material as the damaged blanket/mat.
2. The patch shall extend at least 12 inches beyond any portion of the damaged blanket/mat.
3. The repair patch shall be stapled in place as per manufacturer's recommendations.

**3.10 TEMPORARY DIVERSION DITCH**

- A. All dead furrows, ditches or other depressions to be crossed shall be filled before construction begins, or as part of construction, and the earth fill used to fill the depressions shall be compacted using the treads of the construction equipment. All old terraces, fencerows, or other obstructions that will interfere with the successful operation of the diversion shall be removed.
- B. The base for the diversion ridge shall be prepared so that a good bond is obtained between the original ground and the fill material. Vegetation shall be removed and the base shall be thoroughly disked prior to placement of fill.
- C. The earth materials used to construct the earth fill portions of the diversions shall be obtained from the diversion channel or other approved source.
- D. The earth fill materials used to construct diversions shall be compacted by running the construction equipment over the fill in such a manner that the entire surface of the fill will be traversed by not less than one tread track of the equipment.

- E. When an excess of earth material results from cutting the channel cross section and grade, it shall be deposited adjacent to the supporting ridge unless otherwise directed.
- F. The completed diversion shall conform to the cross section and grade shown on the Construction Drawings.
- G. Temporary or permanent seeding and mulch (or blanket/mat) shall be applied to the berm or ditch immediately following its construction. Contractor shall triple-seed areas below the flow line, and shall use erosion control blankets or turf reinforcement mats as needed.
- H. Bare and vegetated diversion channels shall be inspected regularly to check for points of scour or bank failure; rubbish or channel obstruction; rodent holes, breaching, or settling of the ridge; and excessive wear from pedestrian or construction traffic.
- I. Damaged channels or ridges shall be repaired at the time damage is detected. Sediment deposits shall be removed from diversion channels and adjoining vegetative filter strips regularly.
- J. Diversions shall be reseeded as needed to establish vegetative cover.

### **3.11 LEVEL SPREADER**

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

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

### **3.12 PERMANENT CONSTRUCTED WATERWAY**

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

### **3.13 PIPE SLOPE DRAIN**

- A. The pipe slope drain shall be placed on undisturbed or well-compacted soil.



- B. Soil around and under the entrance section shall be hand-tamped in 4-inch to 8-inch lifts to the top of the dike to prevent piping failure around the inlet.
- C. Filter fabric shall be placed under the inlet and extended 5 feet in front of the inlet and be keyed in 6 inches on all sides to prevent erosion.
- D. Backfilling around and under the pipe with stable soil material hand compacted in lifts of 4 inches to 8 inches shall be done to ensure firm contact between the pipe and the soil at all points.
- E. The pipe slope drain shall be secured to the slope using stakes at intervals of 10 feet or less.
- F. All slope drain sections shall be securely fastened together and have watertight fittings.
- G. The pipe shall be extended beyond the toe of the slope and discharged at a non-erosive velocity into a stabilized area or to a sediment trap or pond.
- H. The pipe slope drain shall have a minimum slope of 3 percent or steeper.
- I. The height at the centerline of the earth dike shall range from a minimum of 1.0 foot over the pipe to twice the diameter of the pipe measured from the invert of the pipe. It shall also be at least 6 inches higher than the adjoining ridge on either side. At no point along the dike will the elevation of the top of the dike be less than 6 inches higher than the top of the pipe.
- J. All areas disturbed by installation or removal of the pipe slope drain shall be immediately stabilized.
- K. The pipe slope drain shall be inspected after every rainfall and at least weekly. Any necessary repairs shall be made immediately.
- L. Contractor shall check to see that water is not bypassing the inlet and undercutting the inlet or pipe. If necessary, Contractor shall install headwall or sandbags.
- M. Contractor shall check for erosion at the outlet point and shall check the pipe for breaks or clogs. Contractor shall install additional outlet protection if needed and immediately repair the breaks and clean any clogs.
- N. Contractor shall not allow construction traffic to cross the pipe slope drain and shall not place any material on it.
- O. If a sediment trap has been provided, it shall be cleaned out when the sediment level reaches 1/3 the design volume.

- P. The pipe slope drain shall remain in place until the slope has been completely stabilized or up to 30 days after permanent slope stabilization.

### **3.14 IMPACT STILLING BASIN**

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

### **3.15 CHECK DAM**

- A. Stone shall be placed by hand or mechanically as necessary to achieve complete coverage of the ditch and to ensure that the center of the dam is at least 1 foot lower than the outer edges. Stone shall also be placed to extend 3 feet in elevation above the center portion of the check dam or to the top of the channel side slopes.
- B. Coir and wood fiber logs shall be laid on the channel bottom.
- C. Check dams shall be removed when their useful life has been completed. In temporary ditches and swales, check dams shall be removed and the ditch filled in when it is no longer needed. In permanent channels, check dams shall be removed when a permanent lining can be installed. In the case of grass-lined ditches, check dams shall be removed when the grass has matured sufficiently to protect the ditch or swale. The area beneath the check dams shall be seeded and mulched or sodded (depending upon velocity) immediately after check dams are removed.
- D. If stone check dams are used in grass-lined channels that will be mowed, care shall be taken to remove all stone from the channel when the dam is removed. This shall include any stone that has washed downstream.
- E. Regular inspections shall be made to ensure that the check dam is in good working order and the center of the dam is lower than the edges. Erosion caused by high flows around the edges of the dam shall be corrected immediately, and the dam shall be extended beyond the repaired area.
- F. Check dams shall be checked for sediment accumulation after each rainfall. Sediment shall be removed before or when it reaches one-third of the original height.
- G. Check dams shall remain in place and operational until the drainage area and channel are completely stabilized, or up to 30 days after the permanent site stabilization is achieved.

### 3.16 SEDIMENT TRAP

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

### 3.17 SEDIMENT POND

- A. The foundation area shall be cleared of all trees, stumps, roots, brush boulders, sod, and debris. All channel banks and sharp breaks shall be sloped to no steeper than 1:1. All topsoil containing excessive amounts of organic matter shall be removed. The surface of the foundation area shall be thoroughly scarified before placement of the embankment material.
- B. A cutoff trench shall be backfilled with suitable material. The trench shall be kept free of standing water during backfill operations.
- C. The pipe conduit barrel shall be placed on a firm foundation. Selected backfill material shall be placed around the conduit in layers, and each layer shall be compacted to at least the same density as the adjacent embankment. All compaction within 2 feet of the pipe spillway shall be accomplished with hand-operated tamping equipment.

- D. All borrow areas outside the pond and in the drainage area shall be graded and left in such a manner that water will not be ponded.
- E. The material placed in the fill shall be free of all sod, roots, frozen soil, stones more than 6 inches in diameter, and other objectionable material. The placing and spreading of the fill material shall occur in approximately 6-inch horizontal layers or of such thickness that the required compaction can be obtained with the equipment used. Each layer shall be compacted in a way that will result in achieving 95 percent of the maximum standard dry density.
- F. The distribution and gradation of materials throughout the fill shall be such that there will be no lenses, pockets, stakes, or layers of material differing substantially in texture or gradation from the surrounding material. Where it is necessary to use materials of varying texture and gradation, the more impervious material shall be placed in the upstream and center portions of the fill.
- G. The moisture content of fill material shall be such that the required degree of compaction can be obtained with the equipment used.
- H. Fill shall not be placed on frozen, slick, or saturated soil.
- I. The topsoil material saved in the site preparation shall be placed as a top dressing on the surface of the emergency spillways, embankments, and borrow areas. It shall be evenly spread.
- J. A protective cover of herbaceous vegetation shall be established on all exposed surfaces of the embankment, spillway, and borrow areas to the extent practical under prevailing soil and climatic conditions.
- K. Seedbed preparation, seeding, fertilizing, and mulching shall comply with the applicable sections of this Specification.
- L. Any material excavated from the pond shall be placed in one of the following ways so that its weight will not endanger the stability of the side slopes and where it will not be washed back into the pond by rainfall:
  - 1. uniformly spread to a depth not exceeding 3 feet and graded to a continuous slope away from the pond.
  - 2. uniformly placed or shaped reasonably well with side slopes assuming the natural angle of repose for the excavated material behind a berm width not less than 12 feet.
- M. Sediment shall be removed from the pond when the capacity is reduced to one third of the design volume. Contractor shall follow the methods for disposing of sediment removed from the pond as shown in the Construction Drawings.

### 3.18 SILT FENCE

- A. This Article provides construction specifications for silt fences using synthetic fabric. See the Construction Drawings for additional detail.
- B. Posts shall be spaced a maximum of 6 feet apart at the barrier location and driven securely into the ground (minimum of 12 inches). When necessary because of rapid runoff, post spacing shall not exceed 6 feet.
- C. A trench shall be excavated at least 6 inches wide and 6 inches deep along the line of posts and upslope from the barrier.
- D. Where used, the wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy-duty wire staples at least 1 inch long, tie wires or hog rings. The wire shall extend into the trench a minimum of 2 inches and shall not extend more than 36 inches above the original ground surface.
- E. The filter fabric shall be stapled or wired to the fence, and 12 inches of the fabric shall be extended into the trench. The fabric shall not extend more than 30 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
- F. At joints, filter fabric shall be lapped with terminating posts with a minimum overlap of 3 feet.
- G. The trench shall be backfilled and soil compacted over the filter fabric.
- H. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.
- I. Silt fences and filter barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately. Knocked down fences shall be repaired at the end of each day.
- J. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and if the barrier is still necessary, the fabric shall be replaced promptly.
- K. Sediment deposits shall be removed after each storm event or when deposits reach approximately one-third the height of the barrier.
- L. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded.
- M. Silt fences shall be replaced every 6 months.

N. Silt fence shall terminate in a “J” hook to prevent bypassing at the end of a row.

### **3.19 STORM DRAIN INLET PROTECTION**

A. All storm drains receiving sediment-laden flows from disturbed areas shall be protected. Approved inlet protection methods include net or sand bags filled 2/3 with rock, geotextile filtration products, and Contractor-fabricated structures.

B. For a silt fence drop inlet protection structure, the following specifications apply:

1. For stakes, Contractor shall use 2 x 4-inch wood (preferred) or equivalent metal with a minimum length of 3 feet.
2. Stakes shall be evenly spaced around the perimeter of the inlet a maximum of 3 feet apart and securely driven into the ground, approximately 18 inches deep.
3. To provide needed stability to the installation, Contractor shall frame with 2 x 4-inch wood strips around the crest of the overflow area at a maximum of 1.5 feet above the drop inlet crest and shall brace diagonally.
4. Contractor shall place the bottom 12 inches of the fabric in a trench and backfill the trench with at least 4 inches of crushed stone or 12 inches of compacted soil.
5. Contractor shall fasten fabric securely to the stakes and frame. Joints shall be overlapped to the next stake.

C. For sod drop inlet protection, sod shall be placed to form a turf mat covering the soil for a distance of 4 feet from each side of the inlet structure. Soil preparation and sod placement shall be in accordance with the section entitled Sod.

D. For gravel curb inlet protection, the following specifications apply:

1. Wire mesh with ½-inch openings shall be placed over the curb inlet opening so that at least 12 inches of wire extends across the concrete gutter from the inlet opening.
2. KYTC No. 2 Coarse Aggregate shall be piled against the wire so as to anchor it against the gutter and inlet cover and to cover the inlet opening completely.
3. This type of device shall never be used where overflow may endanger an exposed fill slope. Consideration shall also be given to the possible effects of ponding on traffic movement, nearby structures, working areas, and adjacent property.

E. For block and gravel curb inlet protection, the following specifications apply:

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

### **3.20 FILTER STRIP**

- A. When planting filter strips, Contractor shall prepare seedbed, incorporate fertilizer based on a soil test, and apply mulch consistent with the seeding sections of this Specification. Fertilizer shall not be applied within 50 feet of a stream or other waterbody. Filter strips using areas of existing vegetation shall be over seeded, as necessary, with the specified mixtures to obtain an equivalent density of vegetation. The over seeding shall be accomplished prior to any land disturbing activities.
- B. Filter strips shall be inspected regularly to ensure that a healthy vegetative growth is maintained. Any bare spots or spots where sediment deposition could lead to the destruction of vegetation shall be repaired.
- C. Filter strips shall be fertilized once each year in the fall.
- D. Irrigation shall be used as necessary to maintain the growth of the vegetation in the filter strip.
- E. Sediment shall be removed when it becomes visible in the filter.
- F. Construction traffic shall not be driven on or over filter strips.

### **3.21 STREAM CROSSING**

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

### **3.22 PUMP-AROUND FLOW DIVERSION**

- A. Operations shall be scheduled such that diversion installation, in-stream excavation, in-stream construction, stream restoration, and diversion removal are completed during low-flow conditions and as quickly as possible. Contractor shall not construct in a stream when rainfall is expected during the time excavation will be occurring in the stream.



- B. Check dams shall be installed across the stream during low flow conditions.
- C. Stream flow shall be pumped around the check dams. Outlet protection shall be installed as required at the discharge point.
- D. Contractor shall dewater the work area and pump into a sediment trapping device.
- E. Contractor shall complete construction activities across the stream.
- F. Contractor shall restore the streambed and banks.
- G. Contractor shall remove sandbags and shut down pumping operation. (Salvage sandbags for future use if multiple stream crossings are required on the project.) Contractor shall remove all sandbags from the stream, including damaged and empty bags.
- H. Pumps shall be manned around-the-clock when the pump-around diversion is in the stream.
- I. This control provides short-term diversion of stream flow (typically 1 day to 3 days). Additional sandbags or pumps may be required to maintain 1-foot freeboard on the sandbag checks if flow conditions change.
- J. Contractor shall add sandbags as required to seal leaks in check dams.

### **3.23 CONSTRUCTION DEWATERING**

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

### **3.24 KPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES**

- A. The Contractor is responsible for electronically filing the appropriate state Notice of Intent (NOI-SWCA) letter at least seven (7) days prior to start of construction activity. The Notice of Intent (NOI) is a Kentucky Pollution Discharge Elimination System (KPDES) permit application as provided by the Kentucky Revised Statutes, Chapter 224. This application is required to be submitted for construction projects that disturb one or more acres of land.

- B. The NOI requires the inclusion of the descriptions of (but is not limited to) the following items:
1. Names and designated uses of any receiving waters
  2. Anticipated number and locations of discharge points
  3. Identification of planned construction in or along a waterbody
- C. A topographic map showing project boundaries, areas to be disturbed, locations of anticipated discharge points and receiving waters is also required to be submitted with the NOI.
- D. If the construction site is near a designated “High Quality/Impaired Waters” or a “Cold Water Aquatic Habitat Waters, Exceptional Waters, Outstanding National/State Resource Waters,” additional items and/or individual permits will be required.
- E. The NOI form requires an SIC code. The link to the SIC codes is <http://www.osha.gov/pls/imis/sicsearch.html>. The following are the typical construction SIC codes utilized:
- 1542 – Building Construction, nonresidential, except industrial and warehouses
  - 1623 – Water Main Construction, Sewer Construction
  - 1629 – Water and Wastewater Treatment Plant Construction
  - 1711 – Water Pump Installation
  - 1781 – Drilling Water Wells
- F. The Contractor is responsible for implementing the approved Stormwater Pollution Prevention Plan (SWPPP) prior to commencement of site disturbance. The SWPPP shall include erosion prevention measures and sediment and pollutant control measures which are installed and maintained to minimize discharges of sediments and other pollutants from a 2-year, 24-hour storm event. The SWPPP shall be kept at the site and available for review by LFUCG and state officials.
- G. The Contractor is responsible for the description of procedures to maintain erosion and sediment control measures during the period of construction.
- H. The Contractor is responsible for identifying each Contractor and Subcontractor who will install each SWPPP erosion and sediment control measure.
- I. Each Contractor and Subcontractor shall sign a statement certifying the awareness of the requirements of the SWPPP-related documents. Certification is attached at the end of this section.

- J. The Contractor shall not start land disturbing activities until written permit coverage is obtained from the Kentucky Division of Water.
- K. The inspection by qualified personnel, provided by the Contractor, of the site as follows:
  - 1. at least once every seven (7) calendar days, and
  - 2. within 24 hours after any storm event of 0.5 inch or greater
- L. The Contractor is responsible for completing and maintaining the required Self-Inspection Forms. A sample is included in this specification Section.
- M. Amendments to the approved SWPPP shall be made and implemented as necessary through the course of the construction project if inspections or investigations by the Contractor's inspector, site staff, or by local, state, or federal officials determine that the existing sediment control measures, erosion control measures, or other site management practices are ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the construction site. All plan amendments shall be noted on the copy of the SWPPP maintained at the project site. Plan amendments that involve engineering design shall be prepared by an engineer licensed in Kentucky.
- N. The Contractor shall submit the Notice of Termination (NOT) form to the Kentucky Division of Water, the LFUCG Division of Water Quality, and the LFUCG Division of Engineering when final stabilization has been achieved on all portions of the site and the erosion/sediment controls have been removed.
- O. All subcontractors shall be required to comply with the requirements of the state permit and the Stormwater Pollution Prevention Plan (SWPPP).
- P. Where to submit:
  - 1. Complete KPDES FORM NOI-SW at the following website:  
<https://dep.gateway.ky.gov/eForms/default.aspx?FormID=7>
  - 2. Do not initiate work until receiving approval from the Kentucky Division of Water.
  - 3. A complete copy of the NOI submittal shall also be provided to the following for approval/coverage verification:

Division of Water Quality  
125 Lisle Industrial Avenue, Suite 180  
Lexington, KY 40511

Division of Engineering  
Lexington-Fayette Urban County Government  
101 E. Vine St.  
4<sup>th</sup> Floor  
Lexington, KY 40507

### **3.25 LFUCG Land Disturbance Permit**

- A. The Contractor shall obtain a Land Disturbance Permit from the LFUCG Division of Engineering, after the LFUCG Division of Water Quality inspects the installation of the best management practices as required by the Stormwater Pollution Prevention Plan (SWPPP). The site grading plan shall show the original and finish grade contours. The grading plan shall be in conformance with the SWPPP and shall clearly show the initial phase of best management practices to be installed.
- B. The Land Disturbance Permit checklist appears on the following page. It can be obtained from:

Division of Engineering  
Lexington-Fayette Urban County Government  
101 E. Vine St.  
4<sup>th</sup> Floor  
Lexington, KY 40507  
(859) 258-3410  
Attn: Land Disturbance Permit Section  
<https://www.lexingtonky.gov/new-development>

- C. All excess earthen/rock materials hauled off the site to a location in Fayette County shall be hauled to a site permitted by the Kentucky Division of Water and the LFUCG. The haul site shall be permitted in accordance with these specifications.

40-2022 (02/2022)

**LFUCG Land Disturbance Permit Application & Erosion and Sediment Control Plan Checklist**

v23Feb2018

Permittee (Owner or Contractor):					Date:
Contact Person:					Contact Phone:
Site Address:					Zone:
Contractor Name:			Reg #:		Contractor Phone:
Mailing Address:					Email:

Permitting Information and ESC Plan Narrative	Yes	No	N/A	Page#	Notes
KY DOW Construction NOI / KYR10 Permit					Required for disturbance $\geq$ 1 acre
US ACE Section 404 Permit					Required for stream crossings, wetland fills
KY DOW Stream Construction Permit / WQ Certif.					Required for stream crossings / encroachment
FEMA LOMR or CLOMR					If applicable
Project description and purpose					Brief summary
Land cover, soils, percent impervious area					Pre and post construction
Land cover / land use of adjacent property					Can designate on plan sheets
Work schedule with start/end dates					Sequencing, clearing, grading, revegetation
Phasing plan for large projects					25 acre limit on total disturbed area
BMP installation schedule					Can be included on plan sheets (see below)
Inspection and BMP maintenance schedule					Every 7 days, or every 14 days and after 1/2" rain
Material storage, waste & litter pollution prevention					Covered, away from drainage system, etc.
Fueling / vehicle maintenance pollution prevention					Conducted away from drainage system, etc.
Spill prevention, control, and countermeasures					If reportable quantities present at the site
Dust control plan					Consider if neighbors are present
Stabilized site exit inspection plan					For keeping offsite pavement clear of soil/debris
Stabilization plan and schedule for site areas					Seed/mulch/etc. within 14 days of inactivity
<b>ESC Plan Site Map and Drawing Detail</b> (See LFUCG Stormwater Manual for BMP Design and Installation Information)					
Plans stamped by a licensed professional					Required for engineered plan components
Location of the project; property lines					Include small locational map; street address
Limits of construction, disturbed area location/size					Flag off "no disturbance" areas
Topography and drainage patterns (pre and post)					1" = 50 ft; 2 ft contours
Buildings, utilities, paved areas, ditches, culverts					Show stormwater inlets within 100 ft of site
Retention ponds, detention basins, sediment traps					Stabilize immediately after construction
Access and haul roads					Consider dust control where neighbors present
Stabilized exit (50 ft #2 rock pad, shaker rack, etc.)					Must drain to a sediment control BMP
Silt fence or etc. at downslope perimeters					Super silt fence along critical areas
Diversion ditches/berms above disturbed areas					Stabilize immediately after construction
Protection for post-construction BMPs					Keep sediment out of post-construction BMPs
Slope stabilization (seed with mulch/blanket/mat)					See Figure 11-1 in Stormwater Manual
Inlet protection measures					Specify type(s) and location(s)
Outlet erosion protection measures					Specify type(s) and location(s)
Ditch stabilization (sod, or seed with blanket/mat)					Stabilize immediately after construction
Sediment basins (> 5 ac) and traps (< 5 ac)					Stabilize immediately after construction
Dewatering sites and methods					Must use sediment controls
50 ft natural vegetated buffer for all critical areas					Applies to streams, wetlands, sinkholes
Stream crossings					Crossing type, detail; USACE 404 permit req'd
Stockpile areas, equipment storage/fueling areas					Keep away from drainage system if possible
Waste and concrete wash water storage/disposal					Show initial area; can be moved as needed
<b>LFUCG Use Only: Review Date:</b>					<b>Status - In Compliance:</b> Yes No
<b>Reviewed By:</b>					<b>Additional Info Needed:</b> Yes No
<b>Comments / Missing Items:</b>					<b>Department:</b> DOE DWQ DES

Kentucky Best Management Practices Plan • Construction Site Inspection Report				
Company:		Site:		County:
Site Operator:				Date:
Receiving Water:		Total Site Area (acres):	# Disturbed Acres:	
Inspector Name:		Inspector Qualifications:		
Inspection Type: Weekly or ½ Inch Rain		Days Since Last Rainfall _____	# Inches of Last Rainfall: _____	
Field Inspection Observations				
BMP Category	Compliance			Field Indicators for Compliance
	Yes	No	N/A	
Project Operations				<p>Notice of Intent (KPDES permit) and other local/state permits on file</p> <p>BMP Plan on site and available for review</p> <p>Project timing/schedule and activities following BMP Plan</p> <p>Weekly inspection and rain-event reports on BMPs available for review</p> <p>Diversions, silt checks/traps/basins, and silt fences/barriers installed prior to clearing</p> <p>Grading and clearing conducted in phases to minimize exposed soil areas</p> <p>No vegetation removal or operations in stream or sinkhole buffer area (25-50 ft min)</p> <p>Rock pad in place on all construction site exits leading to paved roads</p> <p>No sediment, mud, or rock on paved public roads in project area</p> <p>Dust control if needed when working in residential areas during dry conditions</p>
Drainage Management				<p>Upland runoff diverted around bare soil areas with vegetated/lined ditches/berms</p> <p>Drainage channels exiting the site are lined with grass/blanket/rock and stabilized</p> <p>Discharges from dewatering operations cleaned in silt fence enclosure or other filter</p> <p>No muddy runoff leaving site after rains up to 1½ inches</p>
Erosion Protection				<p>Exposed soil seeded/mulched after 2 weeks if no work is planned for the next 7 days</p> <p>Soils on steep slopes seeded/mulched/blanketed as needed to prevent rutting</p>
Sediment Barriers				<p>Silt fence, rock filter, or other sediment barrier below all bare soil areas on slopes</p> <p>Barrier installed across slope on the contour, trenched in, posts on downhill side</p> <p>Multiple sediment barriers at least 125 ft apart on unseeded slopes steeper than 4:1</p> <p>J-hook interceptors along silt fence where heavy muddy flows run along fencing</p> <p>No visible undercutting or bypassing or blowout of sediment barrier</p> <p>Accumulated sediment is less than halfway to the top of sediment barrier</p>
Slope Protection				<p>Slopes tracked, disked, or conditioned after final grade is established</p> <p>Slopes seeded, mulched, or blanketed within 21 days, no unmanaged rills or gullying</p> <p>Heavy downslope flows controlled by lined downdrain channels or slope drain pipes</p> <p>No muddy runoff from slopes into streams, rivers, lakes, or wetlands</p>
Inlet Protection				<p>Inlet dam/device or filtration unit placed at all inlets receiving muddy flows</p> <p>No visible undercutting, bypassing, or blowout of inlet protection dam or device</p> <p>Accumulated sediment is less than halfway to the top of the inlet protection dam/device</p>
Outlet Protection				<p>High flow discharges have rock or other flow dissipaters of adequate sizing at outlet</p> <p>Culvert outlets show no visible signs of erosion/scour, bank failure, or collapse</p>
Ditch and Channel Stabilization				<p>No unmanaged channel bank erosion or bottom scouring visible within or below site</p> <p>Ditches with slopes more than 3% have check dams spaced as needed, if not grassed</p> <p>Ditch check dams tied in to banks, with center 4" lower than sides, and no bypassing</p> <p>Ditches with slopes of up to 5% are thickly seeded with grass (minimum requirement)</p> <p>Ditches 5% to 15% are lined with thick grass and erosion control blankets as needed</p> <p>Ditches 15% to 33% are lined with thick grass and matting or other approved product</p> <p>Ditches exceeding 33% are paved or lined with rock or other approved product</p>





**CONTRACTOR AND SUBCONTRACTOR CERTIFICATIONS**

***SWPPP Files, Updates, and Amendments***

This SWPP Plan and related documents (e.g., NOI, inspection reports, US ACE permits, etc.) will be kept on file at the construction site by \_\_\_\_\_ (name and title). The SWPPP will be updated by the Owner and/or Site Manager to reflect any and all significant changes in site conditions, selection of BMPs, the presence of any unlisted potential pollutants on site, or changes in the Site Manager, contractor, subcontractors, or other key information. Updates and amendments will be made in writing within 7 days and will be appended to the original BMP Plan and available for review.

***Stormwater Pollution Prevention Plan Certification***

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Title: \_\_\_\_\_

I certify under penalty of law that I understand the terms and conditions of the general KPDES permit that authorizes the storm water discharges associated with the construction site activity identified as part of this certification.

**Subcontractor Certification**

The subcontractors below certify under penalty of law that they understand the terms and conditions of the general KPDES permit that authorizes the storm water discharges associated with the construction site activity identified as part of this certification.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Title: \_\_\_\_\_

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Title: \_\_\_\_\_

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Title: \_\_\_\_\_



**SECTION 02371**

**STORM WATER POLLUTION PREVENTION PLAN (SWPPP)**

**PART 1 - 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.

**STORMWATER POLLUTION  
PREVENTION PLAN**

**for**

**CONSTRUCTION ACTIVITIES**

**for**

**LEESTOWN ROAD INDUSTRIAL PUMP STATION REPLACEMENT**

**Prepared for:**

**LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT**

**DIVISION OF WATER QUALITY**

**125 LISLE INDUSTRIAL AVENUE**

**SUITE 180**

**LEXINGTON, KY 40511**

**Prepared by:**

**BELL Engineering**

**2480 Fortune Drive**

**Suite 350**

**Lexington, KY 40509**

**Phone: 859-278-5412**

**Fax: 859-278-2911**

**October 2021**

## Table of Contents

### **A. Written Storm Water Pollution Prevention Plan**

- Project Name and Location
- Operator's Name and Address
- Engineer's Name and Address
- Contractor's name and Address
- Project Start and End Dates
- Project Description
- Site Area and Disturbed Acreage
- Name of Receiving Waters
- Sequence of Major Activities
- Potential Sources of Pollutants
- Erosion and Sediment Controls
  - Stabilization Practices (Permanent)
  - Stabilization Practices (Temporary)
  - Structural Practices (Permanent)
  - Structural Practices (Temporary)
- Site Runoff Management
- Other Controls
- Compliance with Federal, State, and Local Regulations
- Inspection and Maintenance Procedures
- Inspection and Maintenance Report Forms
- Control of Non-Storm Water Discharges
- Materials Management Plan
  - Materials Covered
  - Material Management Practices
  - Spill Prevention and Response Procedures

### **B. Site Map**

### **C. Approved Erosion and Sedimentation Control Plan and Details**

### **D. Signed Commonwealth of Kentucky KPDES Notice of Intent (NOI) and Correspondence with USACE Regarding 404 Permit**

### **E. Confirmation of NOI Delivery**

### **F. Copy of Letter (or other documentation) from the NOI Processing Center Authorizing Permit Coverage**

**PROJECT NAME AND LOCATION**

Leestown Road Industrial Pump Station Replacement  
172 Trade Street  
Lexington, Kentucky 40511

A general location map (i.e., USGS quadrangle map) with enough detail to identify the location of the construction site, direction of storm water flow, the receiving waters of the site, location of off-site material, waste, borrow, and equipment storage areas, surface waters and wetlands, storm water discharge locations and other areas as required by the Commonwealth of Kentucky is included in the Design Drawings.

**OPERATOR'S NAME AND ADDRESS**

Lexington-Fayette Urban County Government  
Division of Water Quality  
125 Lisle Industrial  
Suite 180  
Lexington, Kentucky 40511  
(859) 425-2400

**ENGINEER'S NAME AND ADDRESS**

Bell Engineering  
Jonathan S. Rehner, P.E.  
2480 Fortune Drive, Suite 350  
Lexington, Kentucky 40509  
(859) 278-5412  
[jrehner@hkbell.com](mailto:jrehner@hkbell.com)

**CONTRACTOR'S NAME AND ADDRESS**

Name: \_\_\_\_\_  
Contact: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

**PROJECT START AND END DATES**

Start: \_\_\_\_\_  
End: \_\_\_\_\_

## **ADDITIONAL INFORMATION**

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.

Contractor may also choose to prepare its own SWPPP and submit to LFUCG for approval. No additional payment will be allowed for the Erosion and Sediment Control and conformance with SWPPP pay item.

## **PROJECT DESCRIPTION**

This project will consist of construction activities relating to the demolition of the existing Dry Pit Leestown Road Industrial Pump Station and replacing it with a new submersible pump station. The new station will include dual wet wells, a single valve vault and new pumps and control panel. Existing pavement will be removed and replaced with new pavement.

## **SITE AREA AND DISTURBED ACREAGE**

The project area consists of approximately 10,200 square feet (0.23 acres).

## **SEQUENCE OF MAJOR ACTIVITIES**

The Contractor will be responsible for implementing the following erosion control and storm water management control measures. The Contractor may designate these tasks to certain subcontractors as he sees fit, but the ultimate responsibility for implementing these controls and ensuring their proper functioning remains with the Contractor. The order of activities will be as follows (*refer to the Erosion Control Details on the Erosion Prevention and Sediment Control Plan sheet for details*):

### Erosion Control/Construction Phasing

- A. Attend a pre-construction meeting with Owner and Engineer prior to any street disturbance. Contractor shall sign Form A within the SWPPP prior to any street disturbance.
- B. Place stream protection (as needed) and silt fencing at designated areas shown on the Construction Drawings and where deemed necessary by the resident project representative prior to construction commencing.
- C. Remove full depth pavement in designated area. Spoil material to be loaded into trucks and removed from site.
- D. Begin removal of existing structures and pipe. After, begin trench excavation for pipe installation and structure installation. As the trench is excavated, spoil materials to be loaded into trucks and removed from site.
- E. Once pipe and structures are installed, trench shall be backfilled completely with stone

and capped per LFUCG Standard Drawings.

- F. File Notice of Termination for KPDES KYR10 with the Kentucky Division of Water once stabilization is complete.

#### **NAME OF RECEIVING WATERS**

The no name tributary to the east of the project dumps into Town Branch. The areas to be disturbed enter the tributary via sheet flow.

#### **POTENTIAL SOURCES OF POLLUTANTS**

Potential sources of pollutants include sediment from structure and pipe installation, oil/fuel/grease from equipment, and trash/debris. This project will include bypass pumping of sanitary sewer, lending to the potential of contamination.

#### **EROSION AND SEDIMENT CONTROLS**

**All Erosion and Sediment Control details shall be referenced from Section 02370 – Erosion and Sediment Control of the Technical Specifications and includes the SWPPP technical requirements and specifications.**

##### Stabilization Practices (Permanent)

- A. Land clearing activities shall be done only in areas where removal, demolition, replacement, or installation will be performed and shall be staged to occur as the as the project progresses.
- B. Restoration of all areas to the prior conditions.
- C. Permanent seeding and mulching of exposed areas as specified on the Construction Drawings.
- D. Vegetation preservation outside the permanent easement.

##### Stabilization Practices (Temporary)

None

##### Structural Practices (Permanent)

No permanent structural practices will be installed for this project.

##### Structural Practices (Temporary)

Structural practices for this site include:

Silt Fence

## **SITE RUNOFF MANAGEMENT**

Sediment will be prevented from leaving the site to the maximum extent practicable. Storm water will be treated using the above-described best management practices. Inlet protection shall be installed in accordance with the Construction Drawings. No detention shall be provided due to the nature of the construction.

## **OTHER CONTROLS**

### **Off-Site Vehicle Tracking**

The streets adjacent to the project corridor will be inspected daily and swept as necessary to remove any excess mud, dirt, or rock tracked from trenching and sediment removal activities. Dump trucks hauling material from the construction site will be covered with a tarpaulin. The job site superintendent will be responsible for seeing that these procedures are followed.

### **Excavation Spoil Materials**

Excavation spoil materials are generated during the excavation of the trench. Sediment removal material will be relocated to the designated stockpile area to be graded and permanently reseeded. Any material deemed unsuitable shall be loaded into dump trucks and removed from the site. A copy of the receiving site's permit must be included in this SWPPP for spoil materials transported off site.

## **COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS**

The Contractor will obtain copies of any and all local and state regulations which are applicable to storm water management, erosion control, and pollution minimization at this job site and will comply fully with such regulations. The Contractor will submit written evidence of such compliance if requested by the Operator or any agent of a regulatory body. The Contractor will comply with all conditions of the KPDES Construction General Permit, including the conditions related to maintaining the SWPPP and evidence of compliance with the SWPPP at the job site and allowing regulatory personnel access to the job site and to records in order to determine compliance. The selected contractor will be required to submit the Notice of Intent (NOI) to the Kentucky Division of Water (KDOW) prior to construction. The Contractor shall meet all conditions required by the MS4 Operator.

## **INSPECTION AND MAINTENANCE PROCEDURES**

The following inspection and maintenance practices will be used to maintain erosion and sediment controls and stabilization measures.

1. All control measures will be inspected at least every seven (7) calendar days and within 24 hours following a rainfall event of 0.5 inches or greater as specified in this document.
2. All measures will be maintained in good working order; if repairs or other measures are found to be necessary, they will be initiated within 24 hours of report.
3. Built up sediment will be removed from the inlet protection when it reaches one-third the height of the protection. Inspections will be made of the inlet protection measures to ensure that they are in good working order.
4. A maintenance inspection report will be made after each inspection. Copies of the report forms to be completed by the inspector are included in this SWPPP.
5. The job site superintendent will be responsible for selecting and training the individuals who will be responsible for these inspections, maintenance, and repair activities, and filling out inspection reports.
6. Personnel selected for the inspection and maintenance responsibilities will receive training from the job site superintendent. They will be trained in all the inspection and maintenance practices necessary for keeping the sediment controls that are used onsite in good working order. They will also be trained in the completion of, initiation of actions required by, and the filing of the inspection forms. Documentation of this personnel training will be kept onsite with the SWPPP.
7. Disturbed areas will be inspected for evidence of or potential for pollutants entering stormwater systems.
8. Report to Kentucky Department of Environmental Protection within 24 hours any noncompliance with the SWPPP that will endanger public health or the environment. Follow up with a written report within 5 days of the noncompliance event. The following events require 24-hour reporting: a) any unanticipated bypass which exceeds any effluent limitation in the permit, b) any upset which exceeds any effluent limitation in the permit, and c) a violation of a maximum daily discharge limitation for any of the pollutants listed by the EPA in the permit to be reported within 24 hours. The written submission must contain a description of the noncompliance and its cause; the period of the noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
9. Releases of hazardous substances or oil in excess of reportable quantities (as established under 40 CFR 110, 40 CFR 117, or 40 CFR 302) must reported. Form G-1 provides further details on the notification and reporting process.

## **INSPECTION AND MAINTENANCE REPORT FORMS**

Once installation of any required or optional erosion control device or measure has been implemented, at least once every seven (7) calendar days or within 24 hours following a rainfall event of 0.5 inches or greater as specified in KYR10. Inspections for this project shall occur at least once every seven (7) calendar days. If the specified schedule for



inspections is changed, a modification report shall be filed. The Modification Reports can be found in this SWPPP. Inspections of each measure shall be performed by a Qualified Inspector. Inspectors shall have training in stormwater construction management such as KEPSC, CEPSC, CPSWQ, TNEPSC, CESSWI, or other similar training. Inspectors to inventory and report the condition of each measure and ensure sediment control measures are in good working order, shall use the forms found in this SWPPP.

These report forms shall become an integral part of the SWPPP and shall be made readily accessible to governmental inspection officials, the Operator's Engineer, and the Operator for review upon request during visits to the project site. In addition, copies of the reports shall be provided to any of these persons, upon request, via mail or facsimile transmission. Inspection and maintenance report forms are to be maintained by the permittee for five years following the stabilization of the site.

## **CONTROL OF NON-STORM WATER DISCHARGES**

Certain types of discharges are allowable under the Kentucky Department of Environmental Protection General Permit for construction Activity, and it is the intent of this SWPPP to allow such discharges. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The contractor shall ensure that all non-storm water discharge is filtered and/or that sediment and silt from the construction is removed before water enters the receiving water body. The control measures that have been outlined previously in this SWPPP will be strictly enforced to ensure that no contamination of these non-storm water discharges takes place. The following non-storm water discharges are allowed by the Kentucky Department of Environmental Protection and may occur at the job site:

- Waters used for vehicle washing where detergents are not used
- Water used for dust control
- Potable water including uncontaminated waterline flushing
- Pavement wash waters where spills or leaks or toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used
- Landscape irrigation
- Clean, non-turbid water-well discharges of groundwater
- Construction dewatering provided the requirements of the KPDES permit are met

## **MATERIALS MANAGEMENT PLAN**

### **MATERIALS COVERED**

The following materials or substances are expected to be present onsite during construction:

Concrete/Additives/Wastes  
Construction wastes  
Petroleum based products

## MATERIAL MANAGEMENT PRACTICES

The following are in the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff. The job site superintendent will be responsible for ensuring that these procedures are followed.

### A. Good Housekeeping

The following good housekeeping practices will be followed onsite during the construction project.

1. An effort will be made to store only enough products required to do the job
2. All materials stored onsite will be stored in a neat, orderly manner and, if possible, under a roof or in a containment area. At a minimum, all containers will be stored with their lids on when not in use. Drip pans shall be provided under all dispensers.
3. Products will be kept in their original containers with the original manufacturer's label in legible condition.
4. Substances will not be mixed with one another unless recommended by the manufacturer.
5. Whenever possible, all of a product will be used up before disposing of the container.
6. Manufacturer's recommendations for proper use and disposal will be followed.
7. The job site superintendent will be responsible for daily inspections to ensure proper use and disposal of materials.

### B. Hazardous Products

These practices will be used to reduce the risks associated with hazardous materials. Material Safety Data Sheets (MSDS's) for each substance with hazardous properties that is used on the job site will be obtained and used for the proper management of potential wastes that may result from these products. An MSDS will be posted in the immediate area where such product is stored and/or used and another copy of each MSDS will be maintained in the SWPPP file at the job site construction trailer office. Each employee who must handle a substance with hazardous properties will be instructed on the use of MSDS sheets and the specific information in the applicable MSDS for the product he/she is using, particularly regarding spill control techniques.

1. Products will be kept in original containers with the original labels in legible condition.
2. Original labels and material safety data sheets (MSDS's) will be procured and

used for each material.

3. If surplus product must be disposed of, manufacturer's or local/state/federal recommended methods for proper disposal will be followed.

#### C. Hazardous Waste

All hazardous waste materials will be disposed of by the Contractor in the manner specified by local, state, and/or federal regulations and by the manufacturer of such products. The job site superintendent, who will also be responsible for seeing that these practices are followed, will instruct site personnel in these practices.

#### D. Product Specific Practices

The following product specific practices will be followed on the job site.

##### 1. Petroleum Products

All onsite vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers that are clearly labeled. **Any petroleum storage tanks stored onsite will be located within a containment area that is designed with an impervious surface between the tank and the ground. The secondary containment must be designed to provide a containment volume that is equal to 110% of the volume of the largest tank.** Drip pans shall be provided for all dispensers. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations. The location of any fuel tank(s) and/or equipment storage areas must be identified on the Construction Drawings, Sheets SA-1 through SA-15, by the contractor once the location(s) has been determined.

##### 2. Paints, Paint Solvents, and Cleaning Solvents

All containers will be tightly sealed and stored when not in use. Excess paint and solvents will not be discharged to the storm sewer system but will be properly disposed of according to manufacturer's instructions or state and federal regulations.

#### E. Sanitary Wastes

All sanitary waste will be collected from the portable units a minimum of three times per week by a licensed portable facility provider in complete compliance with local and state regulations.

All sanitary waste units will be located in an area where the likelihood of the unit contributing to storm water discharges is negligible. If required, additional BMPs must be implemented, such as sandbags around the base, to prevent wastes from contributing to storm water discharges.

#### F. Contaminated Soils

Any contaminated soils (resulting from spills of materials with hazardous properties) that may result from construction activities will be contained and cleaned up immediately in accordance with the procedures given in the materials Management Plan and in accordance with applicable state and federal regulations.

#### Spill Prevention and Response Procedures

The Contractor will train all personnel in the proper handling and cleanup of spilled materials. No spilled hazardous materials or hazardous wastes will be allowed to come in contact with storm water discharges. If such contact occurs, the storm water discharge will be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of such contaminated storm water. It shall be the responsibility of the job site superintendent to properly train all personnel in spill prevention and clean up procedures.

- A. In order to minimize the potential for a spill of hazardous materials to come into contact with storm water, the following steps will be implemented:
1. All materials with hazardous properties (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete curing compounds and additives, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.
  2. The minimum practical quantity of all such materials will be kept on the job site.
  3. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the storage site.
  4. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.
- B. In the event of a spill, the following procedures should be followed:
1. All spills will be cleaned up immediately after discovery.
  2. The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with the hazardous substances.
  3. The project manager and the Engineer of Record will be notified immediately.

Spills of toxic or hazardous materials will be reported to the appropriate federal, state, and/or local government agency, regardless of the size of the spill. Spills of amounts that exceed Reportable Quantities of certain substances specifically mentioned in federal regulations (40 CFR 110, 40 CFR 117, and 40 CFR 302) must be immediately reported to the EPA National Response Center, telephone 1-800-424-8802 and the Kentucky Environmental Response team at 1-800-928-2380.

4. The job site superintendent will be the spill prevention and response coordinator. He will designate the individuals who will receive spill prevention and response training. These individuals will each become responsible for a particular phase of prevention and response. The names of these personnel will be posted in the material storage area and in the office trailer onsite.

SIGNED NOI TO BE PLACED HERE ONCE  
COMPLETED BY THE CONTRACTOR

NOI DELIVERY CONFIRMATION TO BE PLACED HERE  
ONCE COMPLETED BY THE CONTRACTOR

NOI PERMIT COVERAGE AUTHORIZATION

TO BE PLACED HERE ONCE

RECEIVED BY THE CONTRACTOR



## Construction Site Inspection Report

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

### Field Inspection Observations

BMP Category	Compliance			Field Indicators for Compliance
	Poor	Fair	Good	
Project Operations				Notice of Intent (KPDES permit) and other local/state permits on file ESC/SWPPP on site and available for review; project activities compliant with plan Weekly inspection and rain-event reports on BMPs available for review Diversions, silt checks/traps/basins, and silt fences/barriers installed prior to clearing Grading and clearing conducted in phases to minimize exposed soil areas No vegetation removal or operations in stream or sinkhole buffer area (25 ft min) Rock pad with underliner in place on all construction site exits leading to paved roads No sediment, mud, or rock on paved public roads in project area Dust control if needed when working in residential areas during dry conditions
Drainage Management				Upland runoff diverted around bare soil areas with vegetated/lined ditches/berms Drainage channels exiting the site are lined with grass/blanket/rock and stabilized Discharges from dewatering operations cleaned in silt fence enclosure or other filter No muddy runoff leaving site after rains up to 1½ inches
Erosion Protection				Exposed soil seeded/mulched after 2 weeks if no work is planned for the next 7 days Soils on steep slopes seeded/mulched/blanketed as needed to prevent rutting
Sediment Barriers				Silt fence, rock filter, or other sediment barrier below all bare soil areas on slopes Barrier installed across slope on the contour, trenched in, posts on downhill side Multiple sediment barriers at least 125 ft apart on unseeded slopes steeper than 4:1 J-hook interceptors along silt fence where heavy muddy flows run along fencing No visible undercutting or bypassing or blowout of sediment barrier Accumulated sediment is less than halfway to the top of sediment barrier
Slope Protection				Slopes tracked, disked, or conditioned after final grade is established Slopes seeded, mulched, or blanketed within 14 days, no unmanaged rills or gullying Heavy downslope flows controlled by lined downdrain channels or slope drain pipes No muddy runoff from slopes into streams, rivers, lakes, or wetlands
Inlet Protection				Inlet dam/device or filtration unit placed at all inlets receiving muddy flows No visible undercutting, bypassing, or blowout of inlet protection dam or device Accumulated sediment is less than halfway to the top of the inlet protection dam/device
Outlet Protection				High flow discharges have rock or other flow dissipaters of adequate sizing at outlet Culvert outlets show no visible signs of erosion/scour, bank failure, or collapse
Ditch and Channel Stabilization				No unmanaged channel bank erosion or bottom scouring visible within or below site Ditches with slopes more than 3% have check dams spaced as needed, if not grassed Ditch check dams tied in to banks, with center 4" lower than sides, and no bypassing Ditches with slopes of up to 5% are thickly seeded with grass (minimum requirement) Ditches 5% to 15% are lined with thick grass and erosion control blankets as needed Ditches 15% to 33% are lined with thick grass and matting or other approved product Ditches exceeding 33% are paved or lined with rock or other approved product

BMP Category	Compliance			Field Indicators for Compliance
	Poor	Fair	Good	
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 ESC Best 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**

<b>List of Stabilized Areas: Vegetation is Established; Ditches are Stabilized; No Exposed Soil</b>
<b>Other Notes or Observations:</b>
<b>Corrective Actions Taken and/or Proposed Revisions to ESC/SWPPP Plan:</b>

*I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.*

**Signature of Inspector:** \_\_\_\_\_

**Date:** \_\_\_\_\_

---

**Permitting, Inspection, and Enforcement Procedures for  
Erosion and Sediment Control on  
Division of Water Quality Capital Construction Projects**

Lexington-Fayette  
Urban County Government



May 2021

---

Permitting, Inspection, and Enforcement Procedures  
for Erosion and Sediment Control on Division of Water Quality  
Capital Construction Projects

**Date of Original Publication:**

October 2013

**Date of Current Publication:**

May 2021



This publication was developed by the Tetra Tech / Third Rock Consultants Stormwater Program Management Team under contract to LFUCG for purposes of implementing the stormwater provisions of its Clean Water Act Consent Decree and/or its Kentucky Division of Water (KDOW) Municipal Separate Storm Sewer System (MS4) Permit.

## **Permitting, Inspection, and Enforcement Procedures for Erosion, Sediment, and Stormwater Control on Division of Water Quality Capital Construction Projects**

### **DWQ Remedial Measures Plan Projects**

**DWQ RMP Program Manager:** Bob Peterson

**DWQ Program Management Consultant:** Hazen and Sawyer

**Construction Contract Administrators (CA):** DWQ Consultants

**Resident Project Representative (RPR):** DWQ Consultants

**ESC Plan Reviewer:** DWQ Stormwater Section – Amad Al-Humadi

**Land Disturbance Permit (LDP) Issuer:** DOE New Development

**Erosion and Sediment Control Compliance Inspector:** RPR

**Accela Data Entry:** DWQ Compliance & Monitoring (C&M) – Kevin Lyne

**Land Disturbance Permit (LDP) Permittee:** Contractor

### **DWQ Wastewater Treatment Plant Capital Projects**

**DWQ Plant Engineer:** Tiffany Rank

**DWQ Project Manager:** Varies

**Construction Contract Administrators (CA):** Rick Day, Rick Bowman

**Resident Project Representatives (RPR):** Varies

**ESC Plan Reviewer:** DWQ Stormwater Section – Amad Al-Humadi

**Land Disturbance Permit (LDP) Issuer:** DOE New Development

**Erosion and Sediment Control Compliance Inspector:** RPR

**Accela Data Entry:** DWQ Construction Management – Jody Scrivner

**Land Disturbance Permit (LDP) Permittee:** Contractor

### **DWQ Stormwater, Water Quality, and Capacity Assurance Capital Projects:**

**DWQ Section Managers:** Mark Sanders, Jennifer Carey, or Chris Begley

**DWQ Project Manager:** Varies

**Construction Contract Administrator (CA):** Rick Day

**Resident Project Representatives (RPR):** Rick Day or Bill Warren

**ESC Plan Reviewer:** DWQ Stormwater Section – Rick Day or Amad Al-Humadi

**Land Disturbance Permit (LDP) Issuer:** DOE New Development

**Erosion and Sediment Control Compliance Inspector:** RPR

**Accela Data Entry:** DWQ Construction Management – Jody Scrivner

**Land Disturbance Permit (LDP) Permittee:** Contractor

## Permitting Procedures

1. Contractor shall develop a Stormwater Pollution Prevention Plan / Erosion and Sediment Control Plan (SWPPP/ESC Plan). A SWPPP/ESC Plan template is on the LFUCG website at <https://www.lexingtonky.gov/new-development>. On some projects, the construction contract documents may contain a SWPPP/ESC Plan prepared by LFUCG's consultant for purposes of establishing bid quantities. If the Contractor chooses to use this SWPPP/ESC Plan to obtain the required permits, the Contractor takes sole responsibility for the content of the SWPPP/ESC Plan and the implementation of the plan during construction.
2. Contractor must submit an application for a Land Disturbance Permit to the LFUCG Division of Engineering before beginning project construction. The permit application is available at <https://aca3.accela.com/lexky/>.
3. For projects with a disturbed area of  $\geq 1$  acre, the contractor must submit a Notice of Intent (NOI) to the KY Division of Water (KDOW) and obtain KYR10 Permit coverage before beginning construction of any kind on the site. The NOI can be submitted electronically at <http://dep.ky.gov/formslibrary/Documents/KYR10PermitPage.pdf>.
4. Contractor cannot start project work until they have obtained the LFUCG Land Disturbance Permit and KYR10 Permit coverage (if applicable – see above).
5. Amad Al-Humadi will review the SWPPP/ESC Plan, confirm that the Contractor has obtained KYR10 Permit coverage (if applicable – see above), and authorize the Contractor to install the initial BMPs.
6. Contractor then installs the initial BMPs, prior to project work (general excavation, grading, etc.).
7. Amad Al-Humadi inspects the installation of the initial BMPs and authorizes DOE New Development to issue the Land Disturbance Permit. Contractor then begins the project.

## Contractor Responsibilities

### Contractor shall:

1. Develop a SWPPP/ESC Plan, or review and agree to use the SWPPP/ESC Plan prepared by LFUCG's consultant, or amend it as needed.
2. Attend a pre-construction conference with LFUCG.
3. Post the LFUCG Land Disturbance Permit and KYR10 Permit (if applicable) on the project sign at the site, and keep a copy of the SWPPP/ESC Plan on site and available for review.
4. Follow the SWPPP/ESC Plan; revise and redline it as conditions change on the site.
5. Install and maintain BMPs to prevent sediment from washing into streets, storm sewers, and streams. All runoff from disturbed areas must pass through a BMP before leaving the site.
6. Maintain a 50-foot vegetative buffer strip along perennial and intermittent streams (including impounded streams), wetlands, sinkholes, and inlets.
7. If work must be done within 50 feet of a perennial or intermittent stream, wetland, sinkhole, or inlet, complete work as soon as possible and stabilize the area within 24 hours after completing work.
8. Conduct an ESC inspection at least once every 7 calendar days and within 24 hours after each rainfall of 0.5 inches or greater (or 4 inches of snow or greater).
9. Complete and sign the inspection form after each inspection. Keep the completed inspection forms on site and available for review.
10. Stabilize inactive portions of the site with straw, blanket, seed, or other cover within 14 days of no activity, and provide permanent stabilization within 14 days of reaching final grade.
11. If the project has a KYR10 Permit, file a Notice of Termination with the KY Division of Water and forward to the LFUCG Division of Engineering and LFUCG Division of Water Quality when construction has been completed and the site is stabilized. Final stabilization is defined as follows from KYR10: "All soil disturbing activities at the site have been completed and either of the two following criteria are met – a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed."
12. Respond promptly to Verbal Warnings and Notices of Violation from LFUCG regarding correcting ESC problems.



## Inspection Procedures for the Resident Project Representative

### Weekly Field Inspections

1. Ensure the LFUCG Land Disturbance Permit and KYR10 Permit are posted at the site
2. Ensure SWPPP/ESC Plan is available for review
3. Ensure that the weekly and rain event completed inspection forms are available for review
4. Walk the perimeter of the entire site
5. Note downgradient controls:
  - Inspect ditches and sheet flow areas
  - Silt fences working?
  - Ditches vegetated / stabilized?
  - Significant sediment discharges?
6. Walk around internal disturbed areas
  - Idle for more than 14 days . . . stabilized?
7. Inspect all inlets and ditches
  - Inlets protected, ditches stabilized?
8. Check out material / fuel storage areas
  - Spills? Leaks? Leaching pollutants? Litter / waste managed?
9. Inspect concrete washout(s)
10. Inspect the construction entrance / exit
11. Inspect the 50-foot vegetative buffer strip adjacent to waterways. The buffer strip must be stabilized within 24 hours of any approved construction activity in the buffer strip.
12. Communicate inspection findings to Contractor, note issues that need attention
13. Complete the LFUCG inspection checklist
14. Submit an electronic copy of the completed checklist to the Project Manager and the Accela Data Entry Contact person on page 1.
15. Inspect the site the next working day after a storm event of 0.5 inches or greater. Complete the inspection checklist and submit a copy to the Project Manager

### Important Items for the Permittee / Contractor / RPR to Verify:

- Posted permits, plans, and inspection reports
- Graded / inactive areas stabilized with seed, mulch, blankets, mats, etc.
- Stabilized, non-eroding ditches
- Maintained silt fences and protected curb / drop inlets
- No mud on the street
- Trash and litter managed
- No disturbance in the 50-foot buffer zone adjacent to streams, wetlands, sinkholes, and inlets, unless approved; areas within the 50-foot buffer must be stabilized within 24 hours



## Enforcement Procedures

1. The Contractor will be paid for erosion and sediment control based upon a schedule of values established within the Measurement and Payment section of the specifications (e.g., 25% paid once initial ESCs have been installed and LDP obtained, 50% paid in equal monthly payments for maintenance over the construction period, 25% paid for removal of ESCs and final stabilization). The intent of this provision is to pay the Contractor for ESC maintenance for each month that the BMPs are maintained and functioning properly.
2. The RPR shall follow the attached ***Compliance Assistance Guidance for DWQ Capital Project RPRs*** and implement the **Escalating Enforcement Process** described below.

**Table 1 – ESC Escalating Enforcement Process**

DWQ Capital Project	Escalating Enforcement Process
Remedial Measures Program	The RPR shall escalate the issue to the RMP Program Manager and RMP Program Management Consultant’s Project Manager
Wastewater Treatment Plants Stormwater Section MS4/Water Quality Section Sanitary Sewers Capacity Assurance Program	The RPR shall escalate the issue to the DWQ Section Manager and the DWQ Construction Contract Administrator

3. DWQ will use all available means in the contract to obtain compliance, including:
  - a. withholding payment
  - b. notifying the Contractor that LFUCG intends to initiate the process for declaring that the Contractor is in default of the contract and specifying a deadline for addressing the ESC deficiencies
  - c. initiating the process for calling the ESC Performance Bond
  - d. issuing Notices of Violation (NOVs)
  - e. stopping work

## Compliance Assistance Guidance for DWQ Capital Project RPRs

Observed Condition	Verbal Warning to Correct within 3-5 days (See Note 1)	Verbal Warning to Correct within 24 hours (See Note 1)	Escalate the Issue Immediately in Accordance with Table 1
Construction Entrance to Public Road	Rock pad poorly installed/maintained	Rock pad not installed	
	Small amount of sediment on road	Rock pad completely covered with soil	
Unstabilized Areas	Flat inactive disturbed areas not stabilized in 14 days	Significant amount of sediment on road Ditches not stabilized immediately after construction	
	Disturbed, inactive slopes above waterways, wetlands, floodplains, critical areas <sup>2</sup> not stabilized within 24 hours	Disturbed, inactive slopes not stabilized within 14 days	Disturbed, inactive slopes above waterways, wetlands, floodplains, critical areas <sup>2</sup> not stabilized within 24 hours
Inlet Protection	Sediment needs to be removed around inlet protection	Curb inlet protection not in place or improperly installed	Discharge of concrete wash water, chemicals, other pollutants into inlets, streams, wetlands, etc.
Silt Fencing	Does not match SWPPP/ESC Plan but critical areas <sup>2</sup> and roads are protected	Silt fence not installed per plan and critical areas <sup>2</sup> and roads are not protected	
	Does not comply with Stormwater Manual but is functional	Blowouts have occurred with discharge of sediment to critical areas <sup>2</sup>	Large quantities of sediment in critical areas <sup>2</sup>
Soil Stockpiles	Needs maintenance/repair, but is not near an inlet or surface water	Not trenched in, is not functional	
	No perimeter controls, downstream BMPs in place	Silt fence needs repairs in critical areas <sup>2</sup> No perimeter controls, downstream BMPs not in place	
Permit Violations		Permit expired	Site not permitted (No LDP or KDOW NOI)
		Permit not posted or available on site	
		Contact name/phone not posted	
		No self-inspection reports; reports not on site	
		Self-inspection reports not current SWPPP/ESC Plan not on site	
			Unapproved construction activities in 50-foot buffer zone around sinkholes, streams, wetlands, etc. Construction has started, BMPs not installed

1. Escalate the issue in accordance with Table 1 after the 2nd Verbal Warning.
2. Critical areas are areas within 25 feet of a stream, wetland, sinkhole, or inlet.

40-2022 (02/2022)

**SECTION 02510  
CONCRETE PAVING**

**PART 1 GENERAL**

**1.01 SCOPE OF WORK**

- A. Provide all labor, materials, equipment and services required to construct concrete street pavement, concrete sidewalks, and concrete curbs and gutters as shown on the Contract Drawings and as specified herein.

**1.02 RELATED WORK**

- A. Special sequence or schedule requirements (if any) are specified in Section 01010 - Summary of Work.
- B. Special requirements for materials and equipment are given in Sections C-700 and 01600.
- C. Grading and drainage of streets, roads and parking areas are as specified in Section 02400.
- D. Crushed stone bases, if required, are as specified in Section 02235.
- E. Concrete drainage structures are specified in Sections 03300 and 03400.
- F. Castings are specified in Section 05540.

**1.03 SUBMITTALS**

- A. Prebid submittals, if required, are specified in Section 00820 - Special Conditions.
- B. Shop drawings and other items needed to establish compliance with the Drawings and these Specifications shall be submitted to the ENGINEER in accordance with Section C-700.

**1.04 WARRANTY**

- A. Refer to Section C-700 for warranty requirements.

**PART 2 PRODUCTS**

**2.01 CONCRETE MATERIALS**

- A. Concrete and related materials are specified in Section 03300.

40-2022 (02/2022)

### **PART 3 EXECUTION**

#### **3.01 CONCRETE ROADWAY PAVING**

- A. Concrete surface paving shall meet the requirements of Section 501 of the Kentucky Transportation Cabinet, Department of Highways Standard Specifications for Road and Bridge Construction.
- B. Concrete base paving shall meet the requirements of Section 502 of the Kentucky Transportation Cabinet, Department of Highways Standard Specifications for Road and Bridge Construction.

#### **3.02 CONCRETE CURBS AND GUTTERS**

- A. Cast in place curbs and gutters and pre-cast curbs and gutters shall be as specified in Section 713 of the Kentucky Transportation Cabinet, Department of Highways Standard Specifications for Road and Bridge Construction.
- B. Concrete lip curbs and integral curbs shall be as specified in Section 714 of the Kentucky Transportation Cabinet, Department of Highways Standard Specifications for Road and Bridge Construction.

#### **3.03 CONCRETE SIDEWALKS AND STEPS**

##### **A. New Construction**

- 1. Concrete sidewalks and steps shall be dimensioned and reinforced as shown on the Drawings.
- 2. Sidewalks and steps shall be constructed on a prepared, compacted, smooth subgrade of uniform density formed by trenching or filling to the required elevation. Large boulders and ledge rock found in the subgrade shall be removed to a minimum depth of 6 inches below the subgrade elevation and the space shall be backfilled with suitable material which shall be thoroughly compacted by rolling or tamping. A 3-inch thick course of No. 9 coarse aggregate shall be placed on prepared subgrade prior to placing concrete walks. The CONTRACTOR shall furnish a template and shall check the finished subgrade prior to depositing concrete. The subgrade shall be moistened immediately prior to placement of concrete. Sidewalks may be placed by use of side forms or by use of an acceptable slip-form method.
- 3. All exposed edges and corners for sidewalks and steps shall be rounded to a 1/4-inch radius.
- 4. The surfaces of sidewalks shall be divided into rectangular areas by means of a jointer having a radius of 1/4-inch and forming a groove no less than 1 inch in depth for the full width of the walk, or the joints may be sawed if acceptable to the ENGINEER. The length of the rectangles formed shall not exceed the width of the sidewalk being constructed, unless otherwise directed.

40-2022 (02/2022)

5. The CONTRACTOR shall install 1/2-inch premolded expansion joints, specified in Section 03300, extending entirely through the sidewalk at intervals not to exceed 40 feet, unless the sidewalk is constructed integral with the curb, in which case the width of joints and spacing shall conform to that in the curb, or as otherwise directed. The edges of the sidewalk at all expansion joints shall be rounded with an acceptable edging tool to a 1/4-inch radius. One-half inch premolded expansion joint material shall be installed to the full depth of the sidewalk where the walk abuts any rigid structure or fixture such as curbs, columns, castings, buildings, light standard, etc.

#### B. Replacement Construction

1. Replacement construction shall be the same as required above for new construction except as hereinafter set forth.
2. Sidewalks shall be replaced to the same width, grade and thickness (3-1/2 inches minimum) as the original sidewalk, unless otherwise directed by the ENGINEER. In replacing concrete walks against edge of existing walks, the existing edges shall be sawed to straight edges and thoroughly cleaned. The new and existing walks shall be separated by 1/2-inch premolded expansion joint material cemented to the existing walk.
3. Concrete curb and gutter shall be protected by the CONTRACTOR and shall not be removed except in the event of solid rock excavation and/or conflict with existing utilities. Grass strips between sidewalks and curbs shall be reseeded in accordance with Section 02930 of these Specifications.
4. For unit price contracts, sidewalk replacement, including reinforcing and forms, will be paid for by the linear foot measured along the centerline of pipe so covered. The unit price bid shall include excavation to subgrade; preparation of subgrade; required base course, if any, as shown on the Drawings; expansion joints; marking and reseeded of grass strips when required; and replacing concrete to any width which the CONTRACTOR should find necessary to remove.
5. At the unit price bid for sidewalk replacement for unit price contracts, the CONTRACTOR will not be required to replace greater than 4-foot width, 4 inches thick. However, where a 4 foot or less width walk is cut longitudinally, the whole walk shall be replaced. If replacement over 4-foot width is required, the unit price per linear foot shall be increased, the increased width's proportion to 4 feet.

40-2022 (02/2022)

3.04 CROSSWALK MARKINGS

- A. Crosswalk marking shall meet the requirements Section 3B.18 of the Manual of Uniform Traffic Control Devices (MUTCD).

**END OF SECTION**

\*\*\*

Concrete Paving  
02510-4

**SECTION 02610**

**WATER AND SEWAGE FORCE MAIN PIPE**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. All pipe, fittings, and jointing materials shall be of one manufacturer unless different types are shown on the Drawings or otherwise accepted by the ENGINEER.

**1.02 SUBMITTALS**

**A. General**

- 1. Prior to the shipment of any water and/or sewage force main piping to the project site, the CONTRACTOR shall submit to the ENGINEER a bill of materials, shop drawings, and descriptive literature for all piping, in the number of copies listed in Section C-700 of these Specifications.

**B. Plant and Site Piping**

- 1. Submit shop drawings of all interior and exterior piping.
- 2. Submit testing and certifications for interior and exterior piping.

**C. Water Main and Sewage Force Main Projects**

- 1. Shop drawings for line work are not required unless project contains pumping station, valve vault piping or similar items.
- 2. Submit descriptive literature for all piping.
- 3. Submit testing and certifications for all piping.

**PART 2 PRODUCTS**

**2.01 MATERIALS-WATER MAIN AND SEWAGE FORCE MAIN PIPE**

**A. Ductile Iron Pipe-Mechanical and Rubber Slip Joint Type**

**1. Pipe**

**a. General**

- (1) Ductile iron pipe shall be furnished for all piping 3 inches and over in size designated "D.I." on Drawings and shall be designed in accordance with ANSI/AWWA C150/A21.50 and ANSI/AWWA C151/A21.51 specifications and supplements thereto.

40-2022 (02/2022)

b. Design Conditions

- (1) Pressure: Minimum 200 to 350 psi operating pressure, plus 100 psi water hammer allowance.
- (2) Trench Loading: Laying Condition Type 3, depth of cover as shown on Drawings.

c. Metal Design Strength PSI (Minimum)

Tensile Strength	60,000
Yield Strength	42,000
Percent Elongation	10

d. Minimum Nominal Thickness

- (1) Minimum design thicknesses for 200 through 350 psi operating pressures, depths of cover, trench loading and other conditions shall be per ANSI/AWWA C150/ A21.50 specifications.

e. Lengths

- (1) Pipe may be furnished in 18 or 20 foot nominal laying lengths.

f. Marking

- (1) The net weight, class or nominal thickness, and casting period shall be shown on each pipe. The manufacturer's mark, the year in which the pipe was produced, and the letters "DI" or "DUCTILE" shall be cast or stamped on the pipe.

g. Weighing

- (1) Each pipe shall be weighed before application of lining or coating other than standard coating and the weight shown on the outside or inside of the bell or spigot end.

h. Spigot End of Pipe

- (1) The spigot end of the pipe shall be free of blemishes and defects which, in the opinion of the ENGINEER, might be responsible for a poor fit with the rubber ring gasket and result in leakage.



40-2022 (02/2022)

2. Fittings

a. General

- (1) Ductile iron mechanical joint, restrained joint and fittings shall conform to ANSI/AWWA C110/A21.10 Standard for Gray Iron and Ductile Iron Fittings – 3-inch through 48-inch. Mechanical joints and push on joints shall also conform in all respects to ANSI/AWWA C111/A21.11.
- (2) Ductile iron compact fittings, meeting the requirements of ANSI/AWWA C153/A21.53, will also be accepted.
- (3) Fittings shall be 350 psi pressure rating for sizes through 24-inch and shall be 250 psi rating for sizes above 24 inches unless a higher operating pressure is shown on the Drawings, and in such cases the fitting pressure rating shall be equal to or above the operating pressure. The pressure rating for all compact fittings shall be 350 psi.
- (4) Fittings shall be ductile iron meeting the above requirements and shall be furnished complete with all joint accessories.

b. Lining and Coating

- (1) All fittings shall be lined and coated the same as adjacent pipe.

3. Joints

a. General

- (1) Pipe joints shall be mechanical joint, rubber ring slip joint or restrained joint as shown on the Drawings.
- (2) All items used for jointing pipe shall be furnished with the pipe. The joints shall be made with tools and lubricant in strict conformity with the manufacturer's instructions. Copies of the instructions shall be delivered to the ENGINEER at start of construction in sufficient numbers that will permit the ENGINEER to retain 3 copies.

b. Mechanical Joints

- (1) Mechanical joints are to be furnished according to ANSI/AWWA C111/A21.11. All pipe joints must be furnished complete with all accessories. Mechanical joint bolts and nuts shall be of alloy cast iron or alloy steel (Corten type such as U.S. Alloy) or equal. Rubber gaskets shall be made

of plain first grade rubber, free of imperfections and porosity. Hardness shall be 75 X 5 durometer.

c. Rubber Ring Slip Joint (Push On)

(1) Rubber ring slip joint shall be equal to ANSI/AWWA C111/A21.11. The joints shall be of the following materials and assembled in the sequence outlined below:

- (a) Rubber ring gasket compressed in groove in bell of pipe.
- (b) Beveled spigot end of pipe for initial centering into rubber gasket in bell.

d. Restrained Joints

(1) For Pipe

- (a) Restrained joint for push-on type bell with rubber O-ring shall meet the applicable requirements of ANSI/AWWA C 111/A21.11. The bell/spigot configuration for the restrained joint shall be such that restraint shall be provided for the joint based on a sustained pressure equal to the pressure class of the pipe.
- (b) The restrained joint shall allow the same deflection as standard push-on joint pipe.
- (c) Where field welding is required for restrained field cut pipe, the welder shall be properly instructed in the methods and materials for welding on ductile iron pipe.

(2) For Fittings

- (a) Where restrained joint fittings are called for, the bell configuration for the fittings shall be the same as for the pipe.
- (b) Where fittings with restrained joint bell configuration are not available, restrained materials for use with mechanical joint bell configurations shall be used as follows:
  - (i) Connect mechanical joint bell assemblies with stainless steel all-thread rods.
  - (ii) Install restraints glands on each side of the fitting. The restraining glands shall be "Meg-a-

Lug,” as manufactured by EBAA Iron Sales, Inc., of Eastland Texas; “Grip Ring,” as manufactured by Romac Industries, Inc., of Seattle, Washington; or equal.

e. Special Gaskets

- (1) Where a water main is located within a 200-foot radius of an underground storage tank (UST), special rubber gaskets shall be provided for the water main joints.
- (2) These gaskets shall be manufactured of “nitrile rubber” material or other acceptable material possessing superior resistance to deterioration from petroleum based products.
- (3) This requirement will apply to the gaskets supplied for mechanical joints, restrained joints, and push-on joints when located within the 200-foot radius of a UST.
- (4) The cost of the special gasket shall be incorporated into the cost of the installed pipe.

4. Lining and Coating

a. Water Service

- (1) All ductile iron pipe for water service shall have manufacturer's standard outside bituminous or asphaltic base coating and a cement lining and bituminous seal coat on the inside. Cement mortar lining and bituminous seal coat inside shall conform to ANSI/AWWA C104/A21.4.

b. Sewer Force Main Service

- (1) All ductile iron pipe for sewer force main service shall be bituminous coated outside and shall be cement lined with seal coat on the inside per the above specifications.

c. Bitumastic Finish Coat

- (1) Only a coal tar outside coating, or other compatible coating, shall be applied to pipe which is to receive a bitumastic finish coat.

B. Ductile Iron Pipe-Flanged, Grooved and Special Coupling

1. Pipe

a. Flanged Pipe

40-2022 (02/2022)

- (1) Flanged pipe shall be made in accordance with ANSI/AWWA C115/A21.15 Specifications, and shall be thickness Class 53.
- (2) Where plain ends of flanged and plain end pipe fit into mechanical joint bells, centrifugally cast pipe shall be used.

b. Grooved Pipe

- (1) Where flanged ductile iron pipe is shown on the Drawings, grooved joint piping may be substituted where acceptable to the ENGINEER.
- (2) Grooved joint piping shall conform to ANSI/AWWA Specification C 606.

2. Fittings

a. Flanged Pipe

- (1) Flanged joint fittings shall conform to ANSI/AWWA C110/A21.10 Standard for Gray Iron and Ductile Iron Fittings- 3-inch through 48-inch.
- (2) Fittings shall be 250 psi pressure rating for all sizes unless a higher operating pressure is shown on the Drawings and in such cases the fitting pressure rating shall be equal to or above the operating pressure.
- (3) Fittings shall be ductile iron meeting the above requirements and shall be furnished complete with all joint accessories.

3. Joints

a. General

- (1) Pipe joints shall be as shown on the Drawings.
- (2) All items used for jointing pipe shall be furnished with the pipe. The joints shall be made with tools and lubricant in strict conformity with the manufacturer's instructions. Copies of the instructions shall be delivered to the ENGINEER at start of construction in sufficient numbers that will permit the ENGINEER to retain 3 copies.

b. Flanged Pipe

- (1) All ductile iron flanged pipe shall have flanges faced and drilled, 125 pound in accordance with ANSI/AWWA C110/A21.10 unless otherwise specified.

40-2022 (02/2022)

- (2) Flanges may be cast integrally with the pipe or they may be screwed on specially designed long hub flanges, refaced across both face of flange and end of pipe.
- (3) Flanged joints are to be furnished according to ANSI/AWWA C115/A21.15 and shall be ductile iron only. Flanged joints shall have 1/8-inch rubber full face gaskets made especially for water pipe use. Bolts for ductile iron flanged pipe must be of standard sizes for pipe to be fitted, and must be black steel, machine bolts with heavy hexagon heads and nuts meeting ANSI B18.2.1 and ANSI B18.2.2, respectively. In unheated vaults, submerged and/or damp locations, bolts and nuts for ductile iron flanged pipe shall be stainless steel. Prior to stainless steel nuts being placed on stainless steel bolts, the bolt threads shall be coated with anti-seize.
- (4) The American Toruseal Flange Gasket Manufactured by American Cast Iron Pipe Company is an acceptable alternate to the above described gasket.

c. Grooved Pipe

- (1) Victaulic Style 31 couplings, or equal, with flush seal gaskets shall be used. Rigid cut grooves shall be used except where flexible couplings are shown on the Drawings. In such case, flexible cut grooves shall be substituted.

d. Special Coupling

- (1) Flexible couplings for flanged pipe shall be a mechanical joint cast to a special flanged joint using a neoprene O-ring in place of the usual 1/16-inch rubber ring gasket. The mechanical bell and special flanged joint piece shall be of ductile iron (ANSI/AWWA C110/A21.10) with bolt circle, bolt size and spacing conforming to ANSI/AWWA C110/A21.10 specifications. Mechanical joint follower flange shall be of ductile iron ASTM A 536 or malleable iron ASTM A 47, Grade 35018 or 32510, with high strength/weight ratio design. Bolts shall be fine grained high tensile malleable iron with malleable iron hexagon nut. Stainless steel bolts and nuts shall be used in vaults and wet wells. Where pressures may exceed 20 psi, anchor studs shall be included with spigots of pipes connected drilled to receive ends of studs.
- (2) At locations in flanged pipe where adaptors are not shown on the Drawings, the CONTRACTOR may, at his own cost and for flexibility of installation, use a coupling adapter after acceptance by the ENGINEER. In no event shall

unrestrained mechanical joints or dresser type couplings be substituted for flanged joints.

4. Lining and Coating

a. Flanged Pipe

- (1) Flanged pipe for water and wastewater service shall be cement lined and bituminous coated the same as written herein for ductile iron pipe, mechanical and rubber slip joint type.

b. Grooved Pipe

- (1) Lining and coating shall be as specified for flanged pipe.

C. Polyvinyl Chloride (PVC) Pipe (AWWA)

1. Pipe

a. Distribution Mains

- (1) This Specification covers 4-inch through 12-inch PVC pressure pipe made from Class 12454-B material as defined in ASTM D1784 and conforming with the outside diameter dimensions of ductile iron pipe and with wall thicknesses of DR series 14, 18 or 25.
- (2) The pipe shall be manufactured to meet the requirements of ANSI/AWWA Specification C900 and these Specifications. It shall be furnished in the size and pressure class as shown on the Drawings, and in 20-foot lengths.
- (3) The pipe shall have an integral bell end and gasket seal which is in compliance with the requirements of ASTM D 3139 and F 477.

b. Transmission and Distribution Mains

- (1) This Specification covers 14-inch through 48-inch PVC pressure pipe made from Class 12454-B material, as defined in ASTM D1784, and conforming with the outside diameter dimensions of ductile iron pipe. Wall thicknesses shall conform to DR Series 14, 18, 21, 25 or 26 as shown on the Drawings.
- (2) The pipe shall be manufactured to meet the requirements of ANSI/AWWA Specification C905 and these specifications. It shall be furnished in 20-foot lengths in the size and pressure class as shown on the Drawings.

40-2022 (02/2022)

(3) The pipe shall have an integral bell end and gasket seal which is in compliance with the requirements of ASTM D3139 and F477.

c. The marking of each piece shall include:

- (1) Nominal size and O.D. base.
- (2) PVC.
- (3) Dimension ratio number.
- (4) AWWA pressure class.
- (5) AWWA standard designation number.
- (6) Manufacturer's name or trademark and production record code.
- (7) Seal (mark) of the testing agency that verified the suitability of the pipe material for potable water service.

## 2. Fittings and Couplings

- a. Fittings for use with PVC pipe shall be ductile iron, slip-on or mechanical joint type.
- b. If couplings are required, they shall be of the elastomeric-gasket type and shall conform with ANSI/AWWA C900.

## D. Polyvinyl Chloride (PVC) Pipe (ASTM)

### 1. Pipe

- a. This Specification covers rigid polyvinyl chloride pipe and fittings, hereinafter called PVC pipe and PVC fittings, for sizes 3/4-inch through 12-inch.
- b. PVC pipe shall be extruded from Class 12454-B polyvinyl chloride material with a hydrostatic design stress of 2000 psi for water at 73.4 degrees Fahrenheit, designated as PVC 1120, meeting ASTM Specifications D 1784 for material. Three-fourths inch through 1-1/2 inch water service piping shall be PVC Schedule 40 as specified in ASTM D 1785. Two inch through 12-inch pipe for water and sewage force main service shall be SDR 21 for 200 psi allowable working pressure at 73.4 degrees Fahrenheit and a safety factor of 2.0, as specified in ASTM D 2241.
- c. The pipe shall be homogeneous throughout and free from cracks, holes, foreign inclusions or other defects. The pipe shall be as uniform as commercially practical in color.

40-2022 (02/2022)

- d. The workmanship, pipe dimensions and tolerances, outside diameters, wall thickness, eccentricity, sustained pressures, burst pressures, flattening, extrusion quality, marking and all other requirements of ASTM D 2241 shall be conformed with in all respects.
- e. Pipe shall be furnished in 20-foot lengths. The pipe shall be plain end with bell on one end. Male ends of pipe must be beveled on the outside.
- f. Pipe shall have a ring painted around the male end in such a manner as to allow field checking of setting depth of pipe in the socket. This requirement is made to assist construction superintendents and inspectors in visual inspection of pipe installation.
- g. Pipe must be delivered to job site by means which will adequately support it, and not subject it to undue stresses. In particular, the load shall be so supported that the bottom rows of pipe are not damaged by crushing. Pipe shall be unloaded carefully and strung or stored as close to the final point of placement as is practical.
- h. Pipe must not be exposed to the direct rays of the sun for an extended period of time. If pipe is not to be installed shortly after delivery to the job site, it must be stored in a shaded location.

2. Fittings

a. Ductile Iron

- (1) Ductile iron mechanical joint or push-in type fittings with appropriate adapters may be used with exterior PVC pipe. All such fittings shall be approved by the pipe manufacturer, and complete data sent to the ENGINEER, including the manufacturer's approval, for review.

3. Joints

a. Exterior Buried Pipe - Slip Joint Type

- (1) Exterior buried pipe shall be jointed with slip-type joints with rubber gaskets.
- (2) Pipe with bell end shall have all parts of the bell, including the gasket groove, made from the same extruded piece, integral with the pipe, and shall be thickened to meet standard dimension ratios of wall thickness to outside diameter. The gasket groove shall be constructed such that gasket rollout will not occur. Rubber gasketing shall conform to ASTM D 3139.



40-2022 (02/2022)

b. Interior - Solvent Weld

- (1) Interior pipe shall be jointed by solvent welds.
- (2) Since PVC welding solvent is engineered and formulated to perform with a given joint design, all solvent must be purchased from the manufacturer of the pipe.
- (3) The PVC welding solvent shall be compounded to conform with the socket fit and the weather conditions at the time of installation and be such as to assure minimum installation cost and a weld of maximum strength.

c. Couplings

- (1) Couplings shall be of the same material as the pipe and may be of the molded, or extruded type. They shall have a beveled entrance to prevent the wiping off of the lubricant from the male end of the pipe.
- (2) PVC couplings shall have a minimum rating of 200 psi for continuous operation at 73.4 degrees Fahrenheit.
- (3) The couplings shall have a positive pipe stop that will automatically and accurately position the pipe ends within the couplings. The pipe stop shall also permit the thermal expansion or contraction of the pipe ends.

E. Polyethylene Pipe for Water Mains and Force Mains

1. Pipe

a. General

- (1) Polyethylene pipe and fittings shall comply with the requirements of ASTM D 1248, D 1505, D 1693, D 1928, D 2657, D 3035, D 2837 and D 2321.

b. Resins

- (1) Only virgin polyethylene resins classified as Type III, Category 5, Grade P34 per ASTM D 3035 with densities of 0.955 p/cc maximum and melt index of 0.15 g/10 minutes maximum shall be used in the process of making the pipe. The resin shall contain antioxidants and be stabilized with carbon black.

c. Design

- (1) The pipe shall have a long-term strength rating of 1,600 psi or more and be resistant to environmental stress cracking

per procedure C of ASTM D 1928 for not less than 200 hours. The maximum allowable deflection is 5 percent with the pipe installed in accordance with these Specifications, using backfill material at 130 pounds per cubic foot, H-20 live load plus 50 percent impact but no internal pressure. The live load and impact may be disregarded in the calculations for trench conditions with 8 feet or more cover. Operating pressures are shown on the Drawings. Hydrostatic loading shall be considered when the pipe is to be installed below a permanent water table or body of water.

d. Wall Thickness Calculations

- (1) The pipe manufacturer shall furnish calculations to support the pipe wall thickness for these various conditions for the ENGINEER'S review/acceptance before the materials are sent to the job site.

e. Quality

- (1) No cracks, holes, foreign material, blisters or other deleterious faults are permitted in the polyethylene pipe. It shall be homogeneous throughout including the heat fused joint. Polyethylene pipe will not be installed containing gouges or cuts that penetrate more than 10 percent of the wall thickness.

f. Water Stops

- (1) The pipe manufacturer shall furnish a waterstop assembly for use with the pipe where the pipe passes through a structure wall so as to provide a watertight seal. The assembly shall be attached to the pipe with noncorroding materials.

g. Marking

- (1) Each length of polyethylene pipe shall contain the manufacturer's brand name, pipe size and other data to enable an accurate tracing of the raw material source. Polyethylene pipe will not be installed containing gouges or cuts that penetrate more than 10 percent of the wall thickness.

40-2022 (02/2022)

2. Joints

a. Fusion

- (1) Polyethylene pipe shall be joined by the heat fusion welding process. Welding equipment may be either gas fired or electric as the CONTRACTOR may select. The welding equipment must be capable of attaining the temperature recommended by the manufacturer for the particular polyethylene extrusion used on the project.
- (2) The fusion equipment shall have hydraulic controls and gauges for monitoring fusion pressures. Also, an engine powered facing unit to trim the irregularities of the pipe ends shall be provided. The heated and thermostatically controlled plate shall contain a temperature gauge for monitoring the heat temperature throughout the fusion process.

b. Flange Adapters

- (1) Threaded or solvent weld joints and connections are not permitted. Flange adapters as manufactured by the pipe supplier shall be used, butt-fused to the pipe and connected to other pipe material using a rubber gasket for sealing.

2.02 MATERIALS-SERVICE LINE PIPE

A. Copper Pipe and Fittings

1. Inside, Rigid with Solder Joint Connections

- a. Small piping inside structures shall consist of standard copper tubing for water; Type "L" for general plumbing purposes. All fittings shall be "solder joint connection" cast or wrought bronze for water service for inside diameter of pipe sizes given. All stops, valves, hose bibbs, and unions shall be made with same joints or threaded iron pipe standard, and be of brass or copper. Use 95-5 tin-antimony solder for "solder joints."
- b. Buried Copper Tubing with Compression Joints
  - (1) Small copper piping for buried service shall be of standard soft copper tubing for water service pipe, ASTM Specifications B 88, Type "K," with bronze fittings, stops, and valves having compression connections for flared copper tubing.

40-2022 (02/2022)

B. Polyethylene Pipe for Water Service

1. Pipe

- a. Polyethylene flexible pipe (I.P.O.D. or PVC O.D.) for sizes 2-inch through 3-inch water service piping shall be PE 3408, Type III, Grade P34 Class C, DR-9, OD Based for 200 psi working pressure at 73.4 degrees Fahrenheit, meeting ASTM Specification D 1248 for material, D 3350 for cell classification and AWWA C901 Specification for pipe.
- b. Polyethylene flexible pipe (copper pipe O.D.) for sizes 2-inch through 2-inch water service piping shall be PE 3408, Type III, Grade P34 Class C, DR, OD Based for 200 psi working pressure at 73.4 degrees Fahrenheit, meeting ASTM Specification D 1248 for material, D 3350 for cell classification and AWWA C901 Specification for pipe.
- c. Pipe shall meet all applicable provisions of the Commercial Standards and shall bear the National Sanitation Foundation (NSF) seal of approval.

2. Fittings

- a. Fittings shall be standard bronze fittings as specified for copper tubing in this Section of these Specifications.

C. Polyethylene Pipe for Gas Service

1. Pipe

a. General

- (1) All polyethylene pipe and tubing furnished under this Specification shall meet or exceed all applicable requirements of ASTM D 2513, "Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings." In addition to complying with the above standard, the pipe, tubing and fittings shall meet, be equivalent to or exceed the additional requirements herein specified.

b. Material Qualification

- (1) The polyethylene plastic compound to be extruded shall conform to the requirements as listed in ASTM D 1248 for Grade P23 (Type II, Grade 3), Class C, material, and ASTM D 3350 as listed for cell classification of 234433. The plastic compound shall be of virgin quality and has been listed by the Plastic Pipe Institute as a PE 2306 or PE 2406 designated compound.

40-2022 (02/2022)

c. Pipe Size, Dimensions and Tolerances

- (1) The polyethylene pipe and tubing shall meet all applicable dimensional requirements of ASTM D 2513 for SDR 11 rated pipe.

d. Marking

- (1) Marking of the tubing shall conform to the requirements listed in ASTM D 2513.

e. Packaging

- (1) Tubing shall be delivered in cardboard disposable reels or coils standard to the supplier.
- (2) Reels to be sequentially marked numerically as extruded with reference to quality control.

2. Fittings

- a. Fittings furnished under this Specification shall meet all applicable requirements of ASTM D 2683 "Socket-Type or Butt-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe" for use with SDR 11 polyethylene pipe.
- b. Fittings furnished for this project shall be manufactured by the same manufacturer as the pipe.

D. Black Steel Pipe and Fittings

1. Pipe for interior natural or bottle gas service shall be black steel pipe, Schedule 40, threaded connections for use inside buildings. Fittings shall be malleable iron.

2.03 SERVICE CONNECTIONS

A. General

1. All service connections shall be made by means of tees, factory tapped couplings, or bronze service clamps manufactured specifically for use with the pipe upon which it is to be installed. Whenever possible, corporation stops shall be placed in the service connection prior to conduction hydrostatic tests on the mains.

B. Service Clamps

1. Service clamps for use on ductile iron mains shall be bronze, double strap, Mueller BR 2 B Series, Ford, or equal.

40-2022 (02/2022)

2. Service clamps for use on PVC and polyethylene pipe shall be bronze, wide strap, 2 piece for 2-inch through 8-inch mains, Mueller H-01300 Series, Ford, or equal. For 10-inch and 12-inch mains, use Mueller 3-piece, H13000 Series, Ford, or equal.
3. The use of Dresser Style 294 plastic saddles will also be permitted for use on PVC or polyethylene mains.

2.04 WALL AND FLOOR SLEEVES WITH RUBBER MECHANICAL SEAL FOR CARRIER PIPE SIZES 2 INCHES THROUGH 48 INCHES

A. General

1. Sleeves shall be required for 2-inch through 48-inch carrier pipes penetrating poured concrete walls and floor slabs. The use of sleeves will require the use of rubber links, mechanical type seal assembly around the carrier pipe.
2. The CONTRACTOR shall determine the required inside diameter of each individual wall opening or sleeve before ordering, fabricating or installing. The inside diameter of each wall or floor sleeve shall be sized as recommended by the closure assembly manufacturer to fit the carrier pipe, and seal to assure a watertight joint. The CONTRACTOR shall follow the manufacturer's instructions for installing and tightening the seal to provide a watertight pipe penetration.

B. Description

1. The pipe closure assembly shall consist of a heavy wall welded or seamless steel pipe with 4 inches larger than sleeve O.D. continuous water stop plate, modular mechanical type interlocking synthetic rubber links shaped to continuously fill the annular space between the carrier pipe and wall or floor opening sleeve. Links shall be loosely assembled with stainless steel bolts to form a continuous sealing element of EPDM rubber belt around the carrier pipe with glass reinforced nylon plastic pressure plate under each bolt head and nut. Tightening of the bolts shall cause the sealing element to expand and provide absolute watertight seal between the carrier pipe and wall or floor sleeve. The entire closure assembly shall be tagged for location to match the nomenclature on the Drawings.
2. The sleeve shall be factory primed per Paint Specifications, Section 09900.

C. Manufacturers

1. Thunderline Corporation, Link-Seal Century Line Model CS-100, Model LS, FS, and WS. All models used shall be for Type S corrosive service, or equal.

40-2022 (02/2022)

## 2.05 SOURCE QUALITY CONTROL

### A. Ductile Iron Pipe (Mechanical Joint and Rubber Slip Joint Type)

1. Hydrostatic and physical properties acceptance tests shall be in accordance with ANSI/AWWA Specification C151/A21.51 for ductile iron pipe centrifugally cast in metal molds or sand lined molds for water or other liquids.
2. The ENGINEER shall be provided with sufficient copies of each of the tests for each Contract to permit the ENGINEER to retain 3 copies.
3. All items used for jointing pipe shall be tested before shipment.

### B. Polyvinyl Chloride (PVC) Pipe (AWWA)

1. The manufacturer shall furnish an affidavit that all delivered materials comply with the requirements of this Specification.
2. Each length of pipe shall be proof tested at four times its rated class pressure.

### C. Polyvinyl Chloride (PVC) Pipe (ASTM)

1. Samples of pipe and physical and chemical data sheets shall be submitted to the ENGINEER for review and acceptance before pipe is delivered to job.
2. Samples of solvents and the recommended instruction for their use must be submitted for the ENGINEER'S review and acceptance before delivery of solvent to the job.

### D. Polyethylene Pipe for Gas Service

1. General
  - a. A nominal physical properties list for the base compound shall be submitted and accepted as part of this Specification. Manufacturer shall certify that production materials used are in conformance with the published properties.
2. Quality Tests
  - a. The P.E. tubing shall be subjected to the applicable quality control tests outlined in Appendix X4, ASTM D 2513, "Recommended In-Plant Quality Control Program for Plastic Pipe and Fittings Intended for Use in Natural Gas Distribution Systems."
  - b. The polyethylene pipe and fittings shall also be tested for "Time-to-Failure of Plastic Pipe Under Constant Internal Pressure," ASTM D 1598, "Short-Time Hydraulic Failure Pressure of Plastic

40-2022 (02/2022)

Pipe, Tubing and Fittings," ASTM D 1599 and the long-term pressure test as noted in Appendix X2.2 of ASTM D 2513 using test method per ASTM D 2837.

3. Inspection
  - a. The OWNER reserves the right to inspect the product at the place of manufacture, or at the point of delivery and to reject any shipment which does not conform to these Specifications. Defective tubing shall be replaced by the CONTRACTOR, at no cost to the OWNER. Upon request, the manufacturer shall allow access to the ENGINEER during the extrusion of the specific lot purchased.
4. Qualification of Manufacturer
  - a. The manufacturer shall have adequate equipment and quality control facilities to continually produce finished tubing that will have the properties indicated herein.

E. Polyethylene Pipe for Water Mains and Force Mains

1. Results of tests on the raw materials and the polyethylene pipe in accordance with ASTM standards and the Plastic Pipe Institute shall be furnished along with catalogs and other descriptive literature in the number of copies required by the listing in Section C-700 before the materials are sent to the job site.

**PART 3 EXECUTION**

**3.01 TRENCH EXCAVATION-WATER AND SEWAGE FORCE MAINS**

**A. General**

1. Trenching shall include all clearing and grubbing, including all weeds, briars, trees and stumps encountered in the trenching, regardless of size. The CONTRACTOR shall dispose of any such material by burning, burial or hauling away or as noted on the Drawings, at no extra cost to the OWNER. Ornamental shrubs, hedges and small trees (3 inches in diameter or less) shall be removed, protected and replanted, at no extra cost to the OWNER.
2. Trenching also includes such items as railroad, street, road, sidewalk, pipe and small creek crossings; cutting, moving or repairing damage to fences, poles or gates and other surface structures, regardless of whether shown on the Drawings. The CONTRACTOR shall protect existing facilities against danger or damage while pipeline is being constructed and backfilled or from damage due to settlement of the backfill.
3. Materials encountered in excavation will be divided into 2 classes only: solid rock excavation and other materials. Solid rock excavation is defined as material requiring the use of specialty equipment for removal,



40-2022 (02/2022)

such as "hoe ramming," or the use of explosive materials for breakage prior to removal. Other materials shall include earth, loose rock, street or road surfacing and base concrete, and boulders less than 1/3 cubic yard in one piece.

4. In case of "unclassified excavation," as designated in the Drawings and/or Specifications, the price bid shall include earth, solid rock, roots, street or road surfacing and base concrete and boulders.
5. In case of "classified excavation," as designated in the Drawings and/or Specifications, the CONTRACTOR will be paid an additional cost for the removal of solid rock over that bid for other materials.
6. All excavation shall be open trenches, except where the Drawings call for tunneling, boring or jacking under structures, railroads, sidewalks, roads or highways.

#### B. Trees and Shrubs

1. Where pipelines run through wooded terrain, cutting of trees within limits of maximum permissible trench widths, as set forth in this article, will be permitted. However, cutting of additional trees on sides of trench to accommodate operating of trenching machine will not be permitted. The CONTRACTOR shall obtain specific permission of the OWNER before cutting any tree larger than 4 inches in diameter.

#### C. Highways, Streets and Railroads

1. Construction equipment injurious to paving encountered shall not be used. Curbs, sidewalks, and other structures shall be protected by the CONTRACTOR from damage by his construction equipment.
2. Where trenching is cut through paving which does not crumble on edges, trench edge shall be cut to at least 2 inches deep to straight and neat edges, before excavation is started, and care taken to preserve the edge to facilitate neat repaving.
3. The CONTRACTOR shall so coordinate his work as to produce a minimum of interference with normal traffic on highways and streets. He may, with the approval of the governing agency, close a street to traffic for such length of time considered necessary, provided persons occupying property abutting the street have an alternate route of access to the property which is suitable for their needs during the time of closure. It shall be the responsibility of the CONTRACTOR to give 24 hours advance notice to fire and police departments and to occupants of a street which will be closed, in a manner approved by the governing body.
4. The CONTRACTOR shall maintain road crossings in a passable condition for traffic until the final acceptance of the work, being paid only by unit price for crushed rock used, within limitations as hereinafter specified.

40-2022 (02/2022)

5. The amount of crushed stone placed shall be paid for at the unit price per ton up to the maximum limits of 225 pounds per linear foot of trench over which it is placed for pipe sizes through 16 inches, 300 pounds per linear foot for pipe sizes 18 inches through 24 inches and 400 pounds per linear foot for sizes 27 inches through 48 inches. The ENGINEER shall have control of thickness and width to be placed and paid for, and may order changes in depth and width as conditions dictate. No payment will be made for crushed rock surfacing required as a result of unnecessarily wide trenches, omission of sheeting and shoring, or damage by the CONTRACTOR'S equipment, or for maintenance of surface level.
6. Railroad and Highway Department requirements in regard to trenching, tunneling, boring and jacking shall take precedence over the foregoing general specifications and the tunneling and boring or jacking specifications, where they are involved. Where work is within railroad right-of-way, Railroad Protective Insurance shall be carried by the CONTRACTOR in the amounts required by the Railroad Company.
7. The insurance policy shall name the railroad as the insured and the original policy shall be delivered to the railroad after submitting same to the OWNER for review. The cost of flagmen required by the railroad and highway departments and railroad inspectors shall be paid by the CONTRACTOR.
8. Uneven surfaces or humps in the ground encountered and high driveways and road crossings shall be dug through to such depth that pipe may be laid to a reasonably even grade and have minimum cover at the low places. Such places requiring extra depths shall be included in the bid and no extra payment will be made for such extra depths required, which are evident from an examination of the ground before bidding, as required for 1 foot cover over valve nuts, or are indicated on the Drawings.

#### D. Existing Utilities

1. The CONTRACTOR shall determine, as far as possible in advance, the location of all existing sewer, culvert, drain, water, electric, telephone conduits, and gas pipes, and other subsurface structures and avoid disturbing same in opening his trenches. In case of sewer, water and gas services and other facilities easily damaged by machine trenching, same shall be uncovered without damage ahead of trenching machine and left intact or removed without permanent damage ahead of trenching and restored immediately after trenching machine has passed, without extra cost to the OWNER. The CONTRACTOR shall protect such existing facilities, including power and telephone poles and guy wires, against danger or damage while pipeline is being constructed and backfilled, or from damage due to settlement of his backfill. It shall be the responsibility of the CONTRACTOR to inform the customers of utilities of disruption of any utility service as soon as it is known that it has been or will be cut off.

40-2022 (02/2022)

2. The CONTRACTOR shall, at all times during trenching operations, carry a stock of pipe and fittings likely to be needed for replacement of pipelines to facilitate immediate repair.

E. Pipelines in Same Trench

1. Pipelines, force mains, and sewers laid in same trench shall, in all cases, be bedded on original earth, or other specified bedding materials, regardless of divergence in their elevations, unless otherwise specified. They shall never be laid in unsupported backfill or one above the other. The CONTRACTOR shall receive full trenching and backfilling unit prices for each pipeline, force main, and sewer so laid, the same as if laid in widely separated trenches.

F. Location of Proposed Pipelines

1. The location of pipelines and their appurtenances as shown are those intended for the final construction. However, conditions may present themselves before construction on any line is started that would indicate desirable changes in location. Also, development of property traversed may require location changes. In such cases, the OWNER reserves the right to make reasonable changes in line and structure locations without extra cost, except as may be determined by the application of the unit prices bid to the quantities actually involved. The OWNER is under no obligation to locate pipelines so that they may be excavated by machine.

G. Trench Requirements

1. All trenches must be dug neatly to lines and grades.
2. The opening of more than 500 feet of trench ahead of pipe laying and more than 500 feet of open ditch left behind pipe laying, before backfilling, will not be permitted, except upon written consent of the OWNER. No trench shall be left open or work stopped on same for a considerable length of time. In case of objectionable delay trench shall be refilled according to backfill specifications.
3. Where subgrade of trench has insufficient stability to support the pipeline and hold it to its original grade, the ENGINEER may order stabilization by various means. Exclusive of dewatering normally required for construction and instability caused by neglect of the CONTRACTOR, it shall be paid for at unit prices set up in the Contract, such as extra excavation, crushed rock for pipe bedding, concrete cradle or piling.
4. Excavation for pipe laying must be made of sufficient width to allow for proper jointing and alignment of the pipe, but not greater than the maximums permitted in the following table:

**MAXIMUM TRENCH WIDTH AT TOP OF PIPE**

<b>Nominal Pipe Size (Ins.)</b>	<b>Trench Width (Ins.)</b>	<b>Nominal Pipe Size (Ins.)</b>	<b>Trench Width (Ins.)</b>
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

5. Trenches in earth or rock shall be dug as shown on the Drawings and be sufficiently deep to insure a 30 inch or 36 inch minimum cover over water lines and force mains, as noted on the Drawings. Depths of trenching shall also be adequate for at least 1 foot minimum cover over valve nuts. In order to eliminate the necessity for digging bell holes into the trench subgrade by hand and to insure an earth cushion under the pipe for uniform bearing, trench depth shall be the cover requirement plus outside diameter of barrel of pipe plus the required bedding cushion. The cushion construction requirement shall also apply to tunnels.
6. Wherever it is deemed necessary by the ENGINEER to lay the pipes to an extra depth exceeding the depths required by the Drawings and Specifications and not apparent from unevenness of ground, the CONTRACTOR will be paid for such excavation under extra excavation in earth at the price bid per cubic yard, computed on the basis of maximum trench widths in the preceding table. In unclassified excavation contracts the same width limitations will apply.
7. Trench line stations and locations of accessories will be set ahead of the trenching. These will be set at least each 100 feet of pipeline. Trenches must be dug true to alignment of stakes. Alignment of trenches or pipes in trench must not be changed to pass around obstacles such as poles, fences and other evident obstructions without the permission of the ENGINEER. Lines will be laid out to avoid obstacles as far as possible, contingent with maintenance of alignment necessary to finding pipeline in the future and avoiding obstruction to future utilities.

**H. Damage to Existing Structures**

1. Hand trenching is required, at no extra payment, where undue damage would be caused to existing structures and facilities by machine trenching.
2. In case of damage to any existing structures, repair and restoration shall be made at once and backfill shall not be replaced until this is done. In all

cases, restoration and repair shall be such that the damaged structure will be in as good condition and serve its purpose as completely as before, and such restoration and repair shall be done without extra charge, except as set forth under the applicable provisions of the General and Special Conditions. Where there is the possibility of damage to existing utility lines by trenching machine, the CONTRACTOR shall make hand search excavation ahead of machine trenching, to uncover same, at no extra cost to the OWNER.

I. Excavation Unclassified

1. Excavation for pipelines shall be unclassified and the cost of all excavation of whatever nature and state, including solid rock, shall be included in the CONTRACTOR'S unit price bid for furnishing, trenching, laying and backfilling the pipe.
2. Excavation for structures such as manholes, pump stations, and vaults is likewise unclassified and the cost of all excavation of whatever nature and state, including solid rock, shall be included in the CONTRACTOR'S lump sum or unit price bid, as the case may be.

J. Dewatering of Trenches

1. Dewatering of trenches shall be considered a part of trenching, at no extra cost to the OWNER. Dewatering of trenches shall include groundwater and storm or sanitary sewage. Suitable pumping and other dewatering equipment is to be provided by the CONTRACTOR, to insure the installation of the pipeline structure in a dewatered trench and under the proper conditions. Dewatering shall include all practical means available for prevention of surface runoff into trenches and scouring against newly laid pipe.
2. Piles of excavated materials shall be trenched or temporarily piped to prevent, as far as practical, blockage of drainage ditches and gutters, and water carriage of excavated materials over street and highway surfaces.

3.02 LAYING WATER AND SEWAGE FORCE MAINS

A. General

1. Inspection of Materials
  - a. All pipe, fittings and accessories shall be subject to an inspection by the OWNER at the job site. Any damaged materials shall be repaired or replaced to the satisfaction of the OWNER. Should repairs to the piping materials be necessary, then same shall be made in the presence of the ENGINEER using proven methods prescribed by the pipe manufacturer.

40-2022 (02/2022)

- b. The OWNER'S inspection of materials shall in no way relieve the CONTRACTOR of his responsibility.

2. Laying Requirements

- a. Water and sewage force main pipe shall be laid to lines, cover or grades shown on the Drawings.
- b. Pipes must be swabbed out before lowering into trench. In the case of pipelines 4 inch through 20 inch, a swab must also be dragged through the pipe after it is in place. Larger size pipe shall be visually inspected for cleanliness and proper jointing.
- c. The points insisted upon in the laying of pipe will be: Proper alignment, evenness of width and depth of joints, perfection in jointing, and care of the pipe in handling.
- d. Precautions must be taken to prevent flotation of the pipe should water enter the trench prior to putting the pipeline into operation.
- e. In wet, yielding and mucky locations where pipe is in danger of sinking below grade or floating out of grade or alignment, or where the backfill materials are of such a fluid nature that such movements of the pipe might take place during the placing of the backfill, the pipe must be weighted or secured permanently in place by such means as will prove effective. If crushed rock fill beneath the pipe is necessary for stability, it will be paid for at the unit price bid per ton of such material in place except in cases where instability is caused by neglect of the CONTRACTOR.
- f. Whenever pipe laying is stopped, the end of the pipe shall be securely plugged with the manufacturer's standard plug held in place by bracing and/or blocking.
- g. Elbows, plugs, dead end valves, and tees shall be firmly blocked, as shown on the Drawings, to prevent internal pressure from springing the pipe from the intended alignment, with permanent materials solidly placed without covering pipe joints. Restrained type pipe joints may be substituted for thrust blocks with the ENGINEER'S permission. Pipe shall be free of all structures, other than manholes, vaults or planned entries into other structures.
- h. No pipe shall be laid resting on solid rock, blocking or other unyielding objects. Jointing before placing in the trench and subsequent lowering of more than one section jointed together may be allowed, subject to the ENGINEER'S permission.
- i. For PVC and polyethylene pipe, there shall be installed with the pipe #12 AWG insulated wire for the entire length of the pipeline. The wire shall be installed on top of the 12-inch initial backfill and

weighted at locations along the wire sufficient to prevent dislodgement during the backfilling process. The wire shall be accessible at valve boxes or at locator stations along the route of the pipeline, as shown on the Drawings.

- j. Concrete line markers shall be installed at property lines or at bends in the pipeline. Markers may be long markers or short markers as shown on the Drawings or as called for in these Specifications.
- k. Fiberglass line markers shall be installed at valve locations or at locations as shown on the Drawings. Fiberglass markers shall be Carsonite Utility Marker, Style No. 375, or approved equal. Markers shall be equipped with the OWNER'S standard logo.

3. Installing Water Pipe in Cover Pipe

- a. Installation of water pipe in cover pipe is covered in Section 02326 of these specifications.

B. Laying Ductile Iron Pipe

1. Bedding and Backfilling

- a. The laying condition shall be Type 3 specified in ANSI/AWWA C600. The pipe shall be bedded in 4 inches minimum loose soil and the hand placed loose soil backfill lightly consolidated to the top of the pipe. "Loose soil" or "select material" is defined as native soil excavated from the trench, free of rocks, foreign materials and frozen earth.
- b. The selected material shall be hand placed to a point 12 inches above the barrel of the pipe. After the specified backfill is hand placed, rock may be used in machine placed backfill in pieces no larger than 8 inches in any dimension and to an extent not greater than 1/2 the volume of the backfill materials used.
- c. The top 12 inches of backfill shall contain no rock over 1-1/2 inches in diameter nor pockets of crushed rock.
- d. Larger rock fill will be allowed in wide trenches where side slopes are low enough to prevent rock from dropping over pipeline. If additional earth is required, it must be obtained and placed by the CONTRACTOR. Filling with rock and earth shall proceed simultaneously, in order that all voids be filled with earth.
- e. If select material is not available from the trench excavation, or if the CONTRACTOR so desires, he may use crushed stone bedding and backfill to the top of the pipe at no extra cost to the OWNER.

40-2022 (02/2022)

- f. Sufficient space, limited to a maximum of 2 feet length, shall be left out of the specified earth or crushed stone bedding to facilitate proper jointing of the pipe.

2. Installation of Pipe

- a. Ductile iron pipe shall first be thoroughly cleaned at joints, then joined according to instructions and with tools recommended by the pipe manufacturer. Sufficient copies of the manufacturer's installation instructions shall be furnished the ENGINEER to permit the ENGINEER to retain 3 copies. One copy shall be available at all times at the site of the work.
- b. All pipes must be forced and held together or "homed" at the joints before bolting. Pipe must be aligned as each joint is placed, so as to present as nearly true, straight lines and grades as practical, and all curves and changes in grades must be laid in such manner that 1/2 of the maximum allowable deflection shown in the pipe manufacturer's catalog is not exceeded.
- c. Concrete blocking of fittings shall be as specified hereinafter in this Specification Section 02610.
- d. Cutting of pipe may be done by special pipe cutters as the CONTRACTOR may elect, but the CONTRACTOR will be held responsible for breakage or damage caused by careless cutting or handling. Cut edges of the pipe shall be made smooth and a bevel formed on the exterior of the pipe barrel when using rubber gasket type pipe.

C. Laying Copper Pipe and Fittings

1. Bedding and Backfilling

- a. The pipe shall be bedded in 4 inches minimum of loose soil and the hand placed backfill lightly consolidated to a depth of 12 inches above the top of the pipe. "Loose soil" or "select material" is defined as native soil excavated from the trench, free of rocks, foreign materials and frozen earth. The machine placed backfill may contain rock no larger than 8 inches in any dimension and to an extent no greater than twice the volume of backfill materials used. The top 12 inches of backfill shall contain no rocks over 1-1/2 inches in diameter nor pockets of crushed rock.

2. Installing Copper Pipe and Fittings

- a. Exterior copper pipe shall be laid of type K pipe, with brass compression fittings. Joints shall be neatly reamed and flared and joints drawn up firmly. Pipe shall have at least 30 inch cover. Joints



shall be tested and all leakage stopped before backfilling the pipe trench.

- b. Interior copper pipe shall be installed of Type L pipe, with sweat joint fittings. Pipe shall be tested and all leaks stopped before the system will be accepted. The pipe shall be free of dents and bends. The sweat joints shall present a neat appearance. All pipe shall be parallel to walls and floors with unions on all runs and branches. The pipe shall be secured to the walls and ceilings by clamps and hangers manufactured for the purpose. Strap hangers are not acceptable. Unions and valves shall be placed on each outlet to facilitate dismantling and shutting off.
- c. All copper pipe shall be installed by experienced workmen.

#### D. Installation of Flanged or Threaded Pipe and Fittings (Interior)

##### 1. Installation - General

- a. The CONTRACTOR shall thoroughly clean the pipe and fittings before starting erection. All scale, rust and dirt shall be removed by power brushing and/or solvent cleaning.
- b. The erection of piping requires that it progress from the equipment it is connected to, after the equipment has been accurately leveled and aligned, without putting a strain on same. The pipe shall be erected in a workmanlike manner with runs in the true horizontal or vertical plane or as shown on the Drawings.
- c. The piping shall be supported by standard pipe hangers or piers rather than by the equipment. The pipe shall be free of all openings in walls and slabs when the final position of the piping is attained and before sealing the annular space about the pipe.

##### 2. Flanged Joint Connection

- a. All flanged type connections shall be made using an acceptable gasket and bolts. The bolts shall be tightened evenly to compress the gasket. Care is to be taken not to distort the flanges and/or piping by overtightening the bolts. Final tightening of bolts shall be done with a properly adjusted torque wrench.

##### 3. Threaded Joint Connection

- a. All threads shall be full, complete and made with sharp dies. The ends of the pipe shall be reamed to remove all burrs and all threads must be free of rust and other foreign matter at the time the joint compound is applied. Joint thread compounds must be acceptable to the ENGINEER before use.

40-2022 (02/2022)

- b. Pipe threads shall be tapered and in accordance with API Standard 5B. Not more than 3 threads at each joint may be exposed after the connection is made.
  - c. Unions shall be included to allow for proper assembly and disassembly of each run of pipe. Provide a union on each run of pipe connecting to threaded valves, devices and equipment.
4. Interface with Other Products
- a. When a pipe transitions from ductile iron to pipe of another material, a transition fitting shall be used. The transition material shall be a dielectric material or insulator. For pressure applications above 20 psi the transition fitting shall be a Straub pipe joint, a Dresser type coupling, or equal. For low pressure or gravity applications, the transition fitting shall be a Straub pipe joint, a Dresser type coupling, a Fernco fitting, or equal. All transition couplings shall be approved by the ENGINEER prior to installation.

E. Laying Plastic Pipe

1. Bedding and Backfill - General
- a. The pipe shall be bedded in 4 inches minimum depth (for pipe sizes through 16 inches) of crushed rock meeting the requirements of Class I material as specified in ASTM D 2321, except the gradation shall be Kentucky Department of Highways standard size No. 9. For pipe sizes greater than 16 inches in diameter, the pipe bedding shall be a minimum depth of one-fourth the pipe diameter and be of the material and gradation specified previously.
  - b. Similar material shall be used for haunching up to the spring line of the pipe and it shall be worked under the haunch of the pipe to provide adequate side support. The crushed rock meeting the requirements of Class I (ASTM D 2321) shall then be hand placed to a point 12 inches above the top of the pipe. The remaining backfill, except for the top 12 inches which shall contain no rock over 1-1/2 inch diameter nor pockets of crushed rock, may be excavated material containing no rock over 8 inches in any dimension. Larger rock will be allowed in wide trenches where side slopes are low enough to prevent rock from dropping over pipeline. If additional earth is required, it must be obtained and placed by the CONTRACTOR. Filling with rock and earth shall proceed simultaneously, in order that all voids may be filled with earth.
  - c. Sufficient space, limited to a maximum of 2 feet length, shall be left out of the bedding to facilitate proper jointing of the pipe.

40-2022 (02/2022)

- d. No pipe shall be laid resting on solid rock, blocking, or other unyielding objects. Jointing before placing in the trench and subsequent lowering of more than one section may be allowed subject to the ENGINEER'S permission.
2. Installation of Polyvinyl Chloride (PVC) Pressure Pipe
    - a. Prior to laying, all PVC pipe shall be stored in a shaded place for protection from the direct rays of the sun. Pipe shall be distributed from storage as the work progresses as permitted by the ENGINEER.
    - b. The pipe, fittings, and valves shall be placed in the trench with care. Under no circumstances shall pipe or other materials be dropped or dumped into the trench. The pipe shall not be dragged in a manner which would cause scratching of the pipe surface. An excessive amount of scratching on the surface of the pipe will be considered cause for rejection.
    - c. Sufficient copies of the pipe manufacturer's instructions for installing the pipe and accessories shall be furnished the ENGINEER by the CONTRACTOR to permit the ENGINEER to retain 3 copies. A copy is to be available at the job site at all times.
    - d. Concrete blocking of fittings, as hereinafter specified, shall be required for PVC pipe with slip joints and rubber gaskets.
    - e. All dirt, dust and moisture shall be removed from the bell and spigot ends of pipes to be jointed. Insert gasket in bell. Apply the lubricant to spigot and gasket being careful to keep both ends free of dirt. The joint shall be homed to stop mark on spigot end of pipe. All jointing shall be done in accordance with pipe manufacturer's recommendations.
    - f. All cutting of the pipe shall be done in a neat and workmanlike manner with the least amount of waste of pipe involved and without damage to existing or new lines. A fine tooth saw, tubing cutter or similar tool can be used to cut the pipe. Cut must be square and ragged edges removed with a cutting tool and/or file. A bevel or taper on the exterior of each spigot is required.
  3. Installation of Polyethylene Pressure Pipe
    - a. Polyethylene pipe for water lines or force mains shall be joined using tools and equipment specifically manufactured for use with polyethylene pipe. Heat fusion temperature, heating time and cooling time shall be per the pipe manufacturer's requirements. Pouring of water on completed joints to speed cooling will not be allowed.

40-2022 (02/2022)

- b. The pipe shall be snaked into the trench, employing the natural snaking tendency of the pipe. All short radius bends shall be made with fittings rather than bending the pipe. The pipe will be rejected if it contains kinks and gouges or gouges/cuts penetrating to a depth of 10 percent of the wall thickness.
  - c. Sufficient copies of the pipe manufacturer's instructions for installing the pipe and accessories shall be furnished the ENGINEER by the CONTRACTOR to permit the ENGINEER to retain 3 copies. A copy is to be available at the job site at all time.
  - d. Because of the high coefficient of expansion of polyethylene, the pipe shall not be attached to rigid structures at the ends until at least 48 hours have elapsed after backfilling and the pipe temperature has had an opportunity to stabilize.
4. Installing Polyethylene Pipe for Water Service
- a. The pipe shall be bedded in 4 inches minimum of loose soil and the hand placed backfill lightly consolidated to a depth of 12 inches above the top of the pipe. "Loose soil" or "select material" is defined as native soil excavated from the trench, free of rocks, foreign materials and frozen earth. The machine placed backfill may contain rock no larger than 8 inches in any dimension and to an extent no greater than 2 the volume of backfill materials used. The top 12 inches of backfill shall contain no rocks over 1-1/2 inches in diameter nor pockets of crushed rock.
  - b. Polyethylene pipe for water services shall have the same outside diameter as copper tubing and shall be compatible for flared compression fittings. The joints to brass fittings shall be made by cutting the pipe with a tube cutter, keeping it clean and square, thence flaring the pipe and completing the joining in accordance with the manufacturer's instructions (a copy of the instructions shall be at the job site at all times). All joints shall be tested and all leakage stopped before backfilling the pipe trench.
  - c. The pipe shall be snaked into the trench, employing the natural snaking tendency of the pipe. All short radius bends shall be made with fittings rather than with the pipe alone. The pipe shall be bent to a radius of not less than 12 inches.
  - d. The pipe will be rejected if it contains kinks and gouges.
5. Installing Polyethylene Pipe for Gas Service
- a. The pipe shall be bedded in 4 inches minimum of loose soil and the hand placed backfill lightly consolidated to a depth of 12 inches above the top of the pipe. "Loose soil" or "select material" is defined as native soil excavated from the trench, free of rocks,

foreign materials and frozen earth. The machined placed backfill may contain rock no larger than 12 inches in any dimension and to an extent to greater than 2 the volume of backfill materials used. The top 12 inches of backfill shall contain no rocks over 1-1/2 inches in diameter nor pockets of crushed rock.

- b. Polyethylene pipe shall be joined by the heat fusion welding process. Welding equipment may be either gas fired or electric as the CONTRACTOR may select. The welding equipment must be capable of attaining the temperature recommended by the manufacturer for the particular polyethylene extrusion used on the project. Pouring of water on completed joints to speed cooling will not be allowed.
- c. Care shall be taken in lowering the pipe onto the earth bedding. The pipe shall be snaked into the trench, employing the natural snaking tendency of the pipe. All short radius bends shall be made with fittings rather than bending the pipe. The pipe will be rejected if it contains kinks and gouges.
- d. After the pipe is placed in the trench on the required bedding, stone free earth shall be placed to a minimum depth of 12 inches over the pipe. The remainder of the trench may then be machine backfilled with material excavated from the trench, except in no case shall rock spalls over 8 inches be permitted.
- e. All polyethylene pipe installed under this Contract shall have installed in the trench with the pipe #12 THW copper tracing wire. The wire may be taped along the top of the installed pipe or buried directly over the pipe in the 12 inch covering of earth.
- f. Where tie-in to existing steel main is made, the connection shall be made with special factory molded transition fittings. The polyethylene end of the polyethylene to steel transition shall be of the same material as that of the polyethylene pipe supplied. Compression type transition fittings for polyethylene gas mains will be allowed only for unusual conditions encountered during construction.
- g. Compression type fittings will be allowed for use on polyethylene service lines at locations such as curb valves and meter risers. It is the intent of this requirement that all other joining of polyethylene service line be joined by heat fusion.

#### F. Installation of Water Service Accessories

##### 1. Water Service Meters

- a. Water service meters and accessories shall be installed as shown on the Drawings, with meter box centered over the meter.

40-2022 (02/2022)

- b. The location of water service connections will be determined in the field, as the work progresses, thereby necessitating the use of pipe saddles and the appropriate tapping equipment. Earth backfill shall be thoroughly tamped around meter boxes to prevent subsequent movement.
    - c. All cost associated with providing water service is the responsibility of the CONTRACTOR.
  2. Air Valves and Corporation Stops
    - a. The location of air valve assemblies, while being noted on the Drawings, could possibly be shifted in actual construction. For this reason, the same statements relative to the methods of installation of meters and water service connections apply to the installation of air valve assemblies. Air valve assembly boxes shall be installed in the same manner as water meter boxes except that the box will be located slightly off center of the air valve, in order to give better access to the stopcock between the valve and water main.
    - b. Corporation stops, as shown on the Drawings, are required between the water main and the meter, and between the main and the air valve assembly.

#### G. Installation of Fire Hydrants

1. Fire hydrants shall be installed in the general location as shown on the Drawings. Exact location shall be determined in the field. Hydrants shall be set such that the lowest nozzle shall be high enough above the ground to allow the uninhibited 360° swing of a 15-inch hydrant wrench.
2. Hydrant drainage pits shall be excavated below the hydrant to the depth shown on the Drawings. Crushed stone drainage media shall be of the size shown on the Drawings. Hydrant shall be set vertical and anchored as hereinafter specified.
3. Hydrants installed on this project shall be anchored to prevent the hydrant from blowing off the feeder line when suddenly opened or closed. Likewise, the hydrant pilot valve shall be anchored to prevent blowoff when the hydrant is removed. The CONTRACTOR shall anchor the hydrant and pilot valve utilizing one of the following procedures:
  - a. Where the hydrant is located immediately adjacent to the water main, install all thread rods from the main line branch tee to the valve inlet and from the valve outlet to the mechanical joint of the hydrant inlet piece.
  - b. Provide locked mechanical joint and/or restrained joint piping from the main to the hydrant including the main line tee.

40-2022 (02/2022)

- c. Use method a or b from the water main to the pilot valve and provide a concrete thrust block on the hydrant.
  - d. Method b may not be used when the hydrant feed line is PVC pipe.
4. The additional cost of providing all-thread rods, locked mechanical joint pipe and fittings, restrained joint pipe and fittings, and/or the concrete thrust block at the hydrant shall be included in the CONTRACTOR'S unit price bid for the hydrant.

#### H. Blocking of Pipe at Bends and Ends

##### 1. Horizontal Bends

- a. Concrete backing and/or blocking required at bends in the horizontal plane shall be accomplished per detail on the Drawings. The square footage of blocking area shall be obtained from Tables "A" and "B" through the following procedure:

Step No. 1 - From Table "A," select type soil and bearing area factor for particular fitting to be blocked.

Step No. 2 - From Table "B," select multiplier to be used for the size pipe being blocked and its test pressure.

Step No. 3 - Calculate actual bearing area required by multiplying bearing area factor from Table "A" by multiplier from Table "B" (e.g., -16-inch tee with 250 psi test pressure in sandy clay- $9.42 \times 1.78 = 16.7$  S.F. of bearing area required). Bearing area shall in no case be less than the minimum shown in Table "B."

**TABLE "A"**

Type Soil	Soil Bearing Pressure (PSF)	Bearing Area Factor for Degree of Bend (Square Feet)				
		90°	Plug/Tee	45°	22 1/2°	11 1/4°
Sandy Clay	3,000	13.33	9.42	7.21	3.68	1.85
Hard Clay	6,000	6.66	4.71	3.61	1.84	0.92
Shale	12,000	3.33	2.36	1.80	0.92	0.46
Solid Rock	16,000	2.50	1.77	1.35	0.69	0.35

**TABLE "B"**

Pipe Dia. (In.)	Min. Bearing Area (S.F.)	Multiplier for Pipe Test Pressure (TP)						
		(TP) 350 psi	(TP) 300 psi	(TP) 250 psi	(TP) 200 psi	(TP) 150 psi	(TP) 100 psi	(TP) 50 psi
4	1.0	0.16	0.13	0.11	0.09	0.07	0.04	0.02
6	1.0	0.35	0.30	0.25	0.20	0.15	0.10	0.05
8	1.0	0.62	0.53	0.44	0.36	0.27	0.18	0.09
10	1.0	0.97	0.83	0.69	0.56	0.42	0.28	0.14
12	1.3	1.40	1.20	1.00	0.80	0.60	0.40	0.20
14	1.5	1.91	1.63	1.36	1.09	0.82	0.54	0.27
16	1.8	2.49	2.13	1.78	1.42	1.07	0.71	0.36
18	2.3	3.15	2.70	2.25	1.80	1.35	0.90	0.45
20	2.5	3.89	3.33	2.78	2.22	1.67	1.11	0.56
24	3.6	5.60	4.80	4.00	3.20	2.40	1.60	0.80
30	5.2	8.75	7.50	6.25	5.00	3.75	2.50	1.25
36	7.0	12.60	10.80	9.00	7.20	5.40	3.60	1.80
42	9.1	17.15	14.70	12.25	9.80	7.35	4.90	2.45
48	11.4	22.40	19.20	16.00	12.80	9.60	6.40	3.20
54	13.5	28.35	24.30	20.25	16.20	12.15	8.10	4.05
60	16.0	35.00	30.00	25.00	20.00	15.00	10.00	5.00

- b. Consideration will be given to the use of restrained type mechanical joint pipe and fittings in lieu of concrete blocking. Use of the restrained joint pipe and fittings is subject to review and acceptance by the ENGINEER of the locking-method and adequacy of design for pressures involved.

2. Vertical Bends

- a. The use of vertical bends in lieu of extra depth trenching shall be subject to permission by the ENGINEER.



- b. Where the CONTRACTOR elects to use vertical bends, or where vertical bends are called for on the Drawings, the CONTRACTOR shall submit the blocking design, including calculations, to the ENGINEER for review and acceptance. Anchorages shall be designed to resist thrusts caused by the internal test pressure in the pipe. Protection against corrosion shall be inherent in the design.

I. Supplemental Backfilling Information

1. General

- a. Excavated materials from trenches, tunnels, and structure excavation in excess of quantity required for trench backfill or site regrade, shall be disposed of by the CONTRACTOR. It shall be the responsibility of the CONTRACTOR to obtain location or permits for its disposal. The price bid for trench excavation and backfill, or site excavation and regrade, shall include the cost of disposition of excess excavated materials, as set forth herein, with no additional compensation being allowed for hauling.
- b. For water line and sewage force main contracts where sod is destroyed in areas maintained equivalent to residence yards, it shall be replaced on slightly ridged backfill on trench, and where destroyed in areas adjacent to the trench, it shall be replaced by the CONTRACTOR with fresh sod, all of which will be paid for at a unit price bid per foot of pipeline. The timing of resodding shall be controlled by the ENGINEER. Ground shall be prepared and fertilized as herewith specified for seeded areas. In small patches, supplying of 3 inches of topsoil and raking may be substituted for disking.
- c. For plant or site based contracts, sodding shall be placed to the extent shown on the Drawings. Refer to Section 02930 of these Specifications for detailed instructions for the placement of sod. The cost for sodding of site based areas shall be included in the lump sum bid for the project.
- d. Where pastures, thin grass or cover crops are destroyed by trenching, laying, backfilling, or tunneling operations, surface shall be prepared by disking, fertilizing, and seeding, as specified in Section 02930. Seeding and fertilizing shall be included in the price for trenching and backfilling. The timing of this operation shall be controlled by the ENGINEER. Requirements of the Department of Highways for reseeding shall take precedence over these Specifications where they are involved.
- e. No extra charge shall be made for backfilling of any kind, except as specified. Backfilling shall be included as a part of the price for trenching. No extra charge shall be made for supplying outside

materials for backfill except where fills above existing ground are necessary and payment is designated on Drawings or in Specifications. If backfilling of the trench or surface restoration is not properly completed, a proportionate part of the unit price for trenching shall be retained from payment estimates.

- f. Before completion of the Contract, all backfills shall be reshaped, holes filled, and surplus materials hauled away and all permanent walks, street, driveways, and highway paving and sod replacement (if such surface replacement items are included in the Contract) and reseeding performed.
- g. Backfill material must be uniformly ridged over trench, and excess hauled away. Ridged backfill shall be confined to the width of the trench and not allowed to overlap onto firm original earth, and its height shall not be in excess of needs for replacement of settlement of backfill.
- h. All rock, including crushed rock or gravel from construction, must be removed from yards and fields. Streets and walks shall be broomed to remove all earth and loose rock immediately following backfilling.

2. Special Requirements

- a. In case of street, highway, railroad, sidewalk and driveway crossings or within any roadway paving, or about manholes, valve and meter boxes located in such paving, the following backfill material and procedure is required.
- b. The pipe shall be bedded in 4 inches minimum depth (for pipe sizes through 16 inches) of crushed rock meeting the requirements of the Kentucky Department of Highways standard size No. 9. For pipe sizes greater than 16 inches in diameter, the pipe bedding shall be a minimum depth of 1/4 the pipe diameter and be of the material and gradation specified previously.
- c. Similar material shall be used for haunching up to the spring line of the pipe, and it shall be worked under the haunch of the pipe to provide adequate side support. The crushed rock shall then be hand placed to a point 12 inches above the top of the pipe.
- d. After the above bedding and selected backfill have been placed, fill trench to within 6 inches of the surface with Kentucky Department of Highways No. 57 crushed stone, uniformly distributed, or other gradation acceptable to the ENGINEER. In order to accommodate compacted temporary surfacing it may be necessary to bulkhead or otherwise confine the stone fill at the open end of the trench.

40-2022 (02/2022)

- e. Temporary surfacing of street, highway, railroad, sidewalk and driveway crossings, or within any roadway paving, or about manholes, valve and meter boxes located in such paving, shall consist of 6 inches compacted dense graded aggregate as specified under Section 02235 for temporary walkway or road surfacing, placed and compacted in the trench. Compaction shall be accomplished by methods which shall be sufficient to confine stone to the trench under normal traffic. Backfills shall be maintained easily passable to traffic at original paving level until acceptance of project or replacement of paving or sidewalks.
- f. Railroad Company and Department of Highways requirements in regard to backfilling will take precedence over the above general specifications where they are involved.

J. Cut-Ins, Tie-Ins, and Cutting and Plugging

- 1. The OWNER shall not be responsible for extra costs of cut-ins, tie-ins, cutting and plugging, due to water not being entirely cut off by the existing water main valves.
- 2. A cut-in is defined as the removal of one section of existing pipeline (2 cuts of pipe) and insertion of one or more new pipeline connections therein.
- 3. A tie-in is defined as the removal of an existing plug or cap and the connecting of the new pipeline into the existing pipeline or fitting or valve at the joint opened by such removal.
- 4. A cutting and plugging is defined as the cutting and installation of a plug in an existing line.

3.03 FIELD QUALITY CONTROL

A. Testing Polyvinyl Chloride (PVC) Pressure Pipe During Construction Period

- 1. Prior to pressure testing the pipe shall be center loaded with backfill to prevent arching and whipping under pressure. Center loading shall be done carefully so that joints will be completely exposed for examination during testing unless conditions warrant complete backfill before testing.
- 2. During the general construction period the following pressure testing procedure shall be followed (on sections that can be separately isolated):
  - a. After the PVC pipe is assembled in the trench a test of not more than 30 percent above the system's anticipated working pressure shall be applied with either air or water. After 2 consecutive tests have been performed without any failure, the CONTRACTOR at his option and with the ENGINEER'S permission may discontinue

testing until the system is completed. Testing shall then be performed as outlined herein in this Section.

B. Testing Polyethylene Pipe for Gas Service

1. After pipelines have been installed, backfilled and cleaned, the pipe shall be subjected to an air test of at least 50 psi. Where pipeline is expected to operate at or near 50 psi, the test pressure shall be as directed by the ENGINEER.

C. Testing Water and Sewage Force Main Piping for Leakage

1. The CONTRACTOR will be required to test all pipelines and appurtenances with water. The maximum test pressure, measured at the lowest elevation of the pipeline being tested, shall be the pressure class of the pipe unless a specific test pressure is shown on the Drawings.
2. Prior to testing, the line shall be filled with water and any entrapped air in the line removed. This may be accomplished at a service tap for water service or air release valve. In any case, the CONTRACTOR shall be responsible for removal of air from the system at no additional cost to the OWNER.
3. When the line or section being tested is pumped up to the required pressure, it shall be valved off from the pump and a pressure gauge placed in the line. The pressure drop in the line, if any, shall be noted. If no pressure drop is noted in 4 hours, the ENGINEER, at his discretion, may accept the line or section as being tested, or he may require the test run the full 24 hours.
4. At the end of the 24 hour test period, the pressure shall be recorded. If there is a drop in pressure, the CONTRACTOR will be required to pump the section being tested up to initial test pressure and maintain that pressure for 24 hours, measuring the amount of water required to accomplish this. The line will not be accepted until the leakage shall prove to be less than 10 gallons per inch diameter per mile of pipe per 24 hours. The 24 hour test shall be charted by timed pressure recorder.
5. Should there be leakage over the allowable amount, the CONTRACTOR will be required to locate and repair the leaks and retest the section.
6. If the leakage of a section of pipeline being tested is below the allowable amount, but a leak is obvious, in the opinion of the ENGINEER, due to water at the surface of the ground, or any other means of determining a leak, the CONTRACTOR will be required to repair those leaks.
7. The CONTRACTOR shall furnish meter and suction tank, pipe test plugs, and bypass piping, and make all connections for conducting the above tests. The pumping equipment used shall be centrifugal pump, or other pumping equipment which will not place shock pressures on the pipeline.

40-2022 (02/2022)

Power plunger or positive displacement pumps will not be permitted for use on closed pipe system for any purpose.

8. Inspection of pipe laying shall in no way relieve the CONTRACTOR of the responsibility for passing tests or correcting poor workmanship.

D. Disinfection (Water Mains and Services)

1. Upon completion of the work and cleaning up, and prior to final acceptance, the CONTRACTOR shall disinfect all water lines constructed which are to carry treated water.
2. Prior to starting disinfection, all water mains must be thoroughly flushed to remove mud, rocks, etc. Disinfection will then be accomplished by the adding of a chlorine solution while filling the main to obtain the initial 50 ppm of chlorine. The CONTRACTOR shall supply all equipment, labor, etc., necessary for flushing and disinfecting the mains. The CONTRACTOR shall submit, in writing, to the ENGINEER, the method he proposes to use for adding the chlorine.
3. The calcium hypochlorite granule or tablet method shall not be used. The placement of small amounts of disinfectant material in the main during construction will not be allowed.
4. Disinfection shall be accomplished by filling the new and/or repaired portions of the system with water having a chlorine content of at least 50 parts per million and at the end of a 24 hour contact time a residual of at least 25 parts per million shall remain. At the end of the 24 hour contact period, all the sterilized surfaces and areas shall be thoroughly flushed from the water system. Chlorinated water shall be disposed of in accordance with 401 KAR 5:031 and 8:020, which state that the allowable in stream concentration of chlorine is 10 ug/l, which is equal to 0.01 mg/l. The CONTRACTOR shall submit, in writing to the ENGINEER, the method he proposes for dechlorinating. Recommended chemicals, as given in AWWA C651, are sulfur dioxide, sodium bisulfate, sodium sulfite, and sodium thiosulfate.
5. For tie-ins to an existing system such as tapping valves or direct cut-in, disinfection shall, at the ENGINEER'S discretion, consist of thoroughly cleaning the new part(s) with a solution containing not less than 200 mg/l (ppm) chlorine.
6. After initial disinfection and flushing, the OWNER will collect water samples for bacteriological testing. A core zone, which includes up to the first 2 mile, shall be established. Two samples shall be taken from the core zone. Additionally, 1 sample taken from each mile of new distribution main shall be taken for analysis. A new or routine replacement main shall not be placed in service until negative laboratory results are obtained on the bacteriological analyses. Sample bottles shall be clearly identified as "special" construction tests. If any of the samples

40-2022 (02/2022)

are found to be positive or contain confluent growth, the CONTRACTOR shall repeat the disinfection procedure until the required numbers of negative samples are obtained.

7. The new water main(s) shall not be accepted by the OWNER for operation until the above sterilization procedures have been completed. The cost of sterilization/dechlorination procedures shall be incorporated into the CONTRACTOR'S unit price and/or lump sum bid, as the case may be.

### 3.04 BASIS OF PAYMENT

#### A. Excavation and Backfilling

##### 1. Trenching, Laying, and Backfilling Pipelines

###### a. Unit Price Contracts

- (1) Payment for trenching and backfilling for pressure lines shall be included in the unit price bid for furnishing and installing the pipe, measured by the linear feet installed, including fittings and accessories length.

###### b. Lump Sum Contracts

- (1) The CONTRACTOR'S lump sum bid shall include all costs for trenching, laying and backfilling pipelines.

##### 2. Solid Rock Excavation

###### a. Classified Excavation

- (1) Rock excavation shall be paid for at an extra unit price per cubic yard for extra cost of its excavation over that for excavating earth. Therefore, its quantity will not be subtracted from earth excavation quantities.

###### b. Unclassified Excavation

- (1) Excavation shall be unclassified and the cost of all excavation of whatever nature and state, including solid rock, shall be included in the CONTRACTOR'S unit price bid for each item of construction requiring excavation or included in the lump sum bid for such type contracts.

##### 3. Search and Extra Depth Trench Excavation

- a. "Search" trench excavation shall be the actual measured excavation within limits as acceptable to the ENGINEER.

40-2022 (02/2022)

- b. "Extra Depth" trench excavation shall be the calculated yardage below the lowest point of excavation which would normally have been required for construction.
- c. Trench width limitations for either condition shall be as listed in the following table:

For 6" Pipe 2'-6"	For 16" Pipe 2'-11"	For 36" Pipe 5'-6"
For 8" Pipe 2'-9"	For 18" Pipe 3'-2"	For 42" Pipe 6'-0"
For 10" Pipe 2'-9"	For 20" Pipe 3'-5"	For 48" Pipe 6'-6"
For 12" Pipe 2'-9"	For 24" Pipe 3'-8"	For 54" Pipe 7'-0"
For 14" Pipe 2'-9"	For 30" Pipe 4'-4"	

- d. The work of uncovering and backfilling required for locating existing sewers, water lines and other existing facilities for avoidance in location of proposed pipelines where such uncovering and backfilling is not within trench for improvements, shall be paid for at a price per cubic yard for such excavation actually removed and backfilled under item for "Search or Extra Depth Trench Excavation." Such payment does not include uncovering existing utility lines for their protection during or after trenching operations for the proposed pipeline.
- e. Where pipelines, force mains and sewers are laid in the same trench, the CONTRACTOR shall receive full trenching and backfill unit prices for each pipeline, force main and sewer so laid, the same as if laid in widely separated trenches.

#### 4. Mechanical Tamping

- a. Mechanical tamping is defined as backfill placed and compacted by power driven mechanical equipment to a greater density than can be achieved by natural settlement or hand tamping methods. Mechanical tamping will be required when ordered by the ENGINEER with payment by the cubic yard so compacted. Measurement, but not actual extent of the mechanical tamping, shall be limited by the numerical maximum allowable trench width (for each size pipe) as shown in the table listed under "Search and Extra Depth Trench." Payment for mechanical tamping shall not include the specified bedding, haunching, or initial backfill required above and below the top of pipe.

40-2022 (02/2022)

B. Tunneling, Boring or Jacking

1. Permanent Tunnels

- a. The payment for permanent tunnels shall be the length measured along its centerline from the entrance face on one side to the exit face on the other side of the tunnel. Payment per linear foot for each size tunnel shall include excavation, tunnel liner, pressure grouting, tunnel subgrade, closure plates and backfilling, complete.

2. Temporary Tunnels

- a. Payment for temporary tunnels shall be made per linear foot based on the measured distance along the centerline of tunnel from the inlet face on one side to the outlet face on the other side of the tunnel. Payment shall include all excavation, backfilling and all sheeting and shoring of tunnel, regardless of whether removed.

3. Boring or Jacking

- a. In unit price Contracts, usable holes either bored or jacked shall be paid for per linear foot of hole actually bored or jacked, according to the diameter of the hole required, measured along the centerline from the point of entrance on one side to the point of exit on the other side. When cover pipe is installed inside the bore, boring or jacking and cover pipe shall be paid per linear foot based on the length of the cover pipe installed, according to the diameter of the cover pipe required.

C. Trench and Pipe Stabilization

1. Extra Excavation

- a. Extra excavation required for trench or pipe stabilization shall be paid by the cubic yard so excavated under the item "Search and/or Extra Depth Trench Excavation" based on the limitations for that item.

2. Crushed Stone for Trench Stabilization

- a. Crushed stone ordered by the ENGINEER for trench stabilization shall be as specified in Section 02235 of these Specifications and paid by the ton so placed.

3. Crushed Stone for Pipe Bedding

- a. Additional crushed stone bedding ordered by the ENGINEER for pipe stabilization shall be as specified in Section 02235 of these Specifications and paid by the ton so placed.



40-2022 (02/2022)

4. Plain or Reinforced Concrete Arch
  - a. Plain or reinforced concrete arch called for on the Drawings and/or ordered by the ENGINEER shall be paid for by the linear foot of pipeline upon which it is placed. The Form of Proposal will indicate which method is to be used.
5. Plain or Reinforced Concrete Cradle
  - a. Plain or reinforced concrete cradle called for on the Drawings and/or ordered by the ENGINEER shall be paid for by the linear foot so placed.

D. Water Lines or Sewage Force Mains

1. Unit Price Contracts
  - a. Water Lines or Sewage Force Mains
    - (1) Payment for furnishing, trenching, bedding, laying, and backfilling water lines or force mains shall be included in the unit price bid per linear foot of pipe laid, including length of fittings and valves, unless same are included in lump sum portions or assemblies noted on the Drawings. However, payments will not be made for branch lengths of fittings within 2.5 feet of edge of main trench. The extra cost of trenching in difficult locations, such as stream, railroad, and highway crossings, if not covered in other contract unit prices, shall be included in unit price for furnishing, trenching, bedding, laying, and backfilling the pipe.
    - (2) All blowoff or vent branches will be measured as pipe from center of connecting tee to end of pipe.
    - (3) In the case of unit price contracts, unless otherwise stated in the Special Conditions, ductile iron fittings, laid outside lump sum assemblies, will be paid for by the pound of body castings, without joint accessories, at the weights listed in ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53 in the case of ductile iron compact fittings.
2. Lump Sum Contracts
  - a. All work shall be included in the CONTRACTOR'S lump sum bid.

40-2022 (02/2022)

E. Gas Lines

1. Unit Price Contracts

a. Gas Lines

- (1) Payment for furnishing, trenching, bedding, laying, and backfilling gas lines shall be included in the unit price per linear foot of pipe laid, including length of fittings and valves. However, payments will not be made for branch lengths of fittings within 2.5 feet of edge of main trench. The extra cost of trenching in difficult locations, such as stream, railroad, and highway crossings, if not covered in other contract unit prices, shall be included in unit price for trenching, laying, and backfilling.

2. Lump Sum Contracts

- a. All work shall be included in the CONTRACTOR'S lump sum bid.

F. Excess Materials

1. The unit prices for trench excavation, tunneling and backfill shall include the cost of disposition of excess excavated materials.

G. Valves

1. The unit price bid for the installation of valves shall include valve boxes, the cost of the concrete collar required around the valve boxes and extension stems if required.

H. Testing and Purging

1. The unit price bid for installing pressure lines shall include cleaning, purging, and testing the line.

I. Blocking of Bends and End of Pipe

1. The payment for blocking of bends and ends of pipes shall be included in the price bid for furnishing and laying the pipe.

J. Disinfection and Dechlorination

1. The required disinfection of pipelines followed by disposal of the chlorinated water used in the disinfection process shall be included in the price bid for furnishing and laying the pipe.

40-2022 (02/2022)

**K. Tracing Wire or Tape**

1. The cost of tracing wire or tape installed with nonmetallic pipe shall be included in the price bid for furnishing and installing the pipe.

**END OF SECTION**

\*\*\*

**Water and Sewage Force Main Pipe  
02610-45**

**SECTION 02700**  
**SEWER AND DRAIN PIPE**

**PART 1 GENERAL**

1.01 SUMMARY

- A. All pipe and accessories supplied for use on this project shall be as specified herein.
- B. All pipe supplied for this Project shall be of the pipe material called for on the Drawings.

1.02 REFERENCES

- A. Where referenced specifications (ASTM, AWWA, etc.), are mentioned, these standards are deemed to be the minimum standard of quality of materials or methods to apply to this project.

1.03 SUBMITTALS

- A. Copies of the manufacturer's directions for handling and installing the particular pipe supplied and accepted by the ENGINEER shall be furnished to the ENGINEER at the first delivery of pipe to the project in numbers that will permit the ENGINEER to retain three copies.
- B. The manufacturer's instructions shall be strictly followed unless a conflict exists between the manufacturer's instructions and those contained herein. In such cases, the ENGINEER shall determine which methods are to be followed and no pipe shall be installed until the CONTRACTOR has received written instruction from the ENGINEER as to which procedure to follow.

1.04 QUALITY ASSURANCE

- A. Where pipe enters manholes, the pipe manufacturer shall certify that their pipe is compatible with the watertight, flexible seal to be used at manhole openings as specified in Section 03480 of these Specifications, and that their combined use will produce a flexible watertight installation.

**PART 2 PRODUCTS**

2.01 MANUFACTURERS

- A. All pipe, fittings and jointing materials shall be of one manufacturer unless different types are shown on the Drawings or otherwise accepted by the ENGINEER.

40-2022 (02/2022)

## 2.02 MATERIALS-SEWER AND DRAIN PIPE

### A. Sewer Transition Joints

1. Where sewer pipes of different materials are to be joined, i.e., VC pipe to DI pipe, VC pipe to PVC pipe, or some other combination, an adapter made for this purpose shall be used. The adapter shall be made of polyurethane or polyvinyl chloride with stainless steel clamps and shall be equal to Can-Tex C-T Adapter, Can-Tex Industries, Cannelton, Indiana; or Fernco Adapter by Fernco Joint Sealer Company, Ferndale, Michigan.

### B. PVC (Polyvinyl-Chloride) Sewer Pipe

#### 1. Pipe

- a. PVC pipe 4-inch through 15-inch diameter supplied for use on this project shall be Type PSM Polyvinyl Chloride (PVC) Sewer Pipe as specified per ASTM D 3034. PVC pipe 18-inch through 27-inch diameter shall be as specified in ASTM F 679.
- b. The pipe shall be made of PVC plastic having a cell classification of 12454 as defined in ASTM D 1784. Compounds having different cell classifications due to one or more properties being superior to those of the specified compound are acceptable. Clean rework material, generated from the pipe manufacturer's pipe or fittings production may be used by the same manufacturer provided the reworked products meets the requirements stated herein.
- c. The pipe shall be homogeneous throughout, free of cracks, holes, foreign inclusions or other injurious defects. The pipe shall be uniform in color, wall thickness, density and other physical properties. The maximum laying length for all PVC pipe supplied shall be  $13.0 \pm$  feet. Wall thickness shall be SDR-35 per ASTM D 3034 or ASTM F 679. Marking and identification of pipe shall be per ASTM D 3034 or ASTM F 679 as applicable.
- d. The maximum laying length for all PVC pipe supplied shall be  $13.0 \pm$  feet.
- e. PVC pipe for use on interior piping shall meet the general specification for exterior piping with the socket dimensions conforming to Table 4 of ASTM D 3034.

#### 2. Fittings

- a. PVC fittings supplied for use on this project shall meet all the physical and quality requirements as hereinbefore specified for PVC pipe.
- b. Where 90° bends are used, they shall be the long radius type.

40-2022 (02/2022)

- c. PVC fittings for 4-inch through 15-inch diameter pipe shall meet the dimensional requirements of the tables as shown in ASTM D 3034 except that saddle type wyes or tee branches shall not be allowed for use on new sewer mains. Where 90° bends are used, they shall be the long radius type. PVC fittings for 15-inch through 27-inch diameter pipe shall conform to the requirements of ASTM F 679.

3. Joints - Exterior Piping

- a. Joints for PVC pipe and fittings for sewer mains and exterior plant gravity sewers shall be of the "Push-On Type" composed of an elastomeric ring gasket compressed in the annular space between a bell end or socket and spigot end of the pipe.
- b. All surfaces of the bell, socket or spigot end of the pipe against which the ring gasket may bear shall be smooth, free of cracks or other imperfections that could adversely affect the sealing capacity of the joint.
- c. Lubricant for use in assembling joints shall be supplied with the pipe or be of the specific manufacturer as recommended by the pipe manufacturer for use with the specific pipe supplied. The lubricant shall not cause deterioration of either the elastomeric ring gasket or pipe material.
- d. Where PVC pipe and fittings are connected to piping of other materials, the manufacturer's standard adapters or transition pieces shall be used. Should manufacturer not produce an adapter for a specific pipe of other material, the adapters or transition fittings as specified in this section of these Specifications shall be used.

4. Joints - Interior Piping

- a. Joints for PVC pipe and fittings for interior piping systems shall be the solvent weld type.
- b. The solvent cement for use with PVC pipe and fittings shall be as specified in ASTM D 2564. The cement shall be provided with the pipe by the pipe manufacturer or be of a specific brand as recommended by the manufacturer of the pipe unless otherwise accepted by the ENGINEER.

C. Polyethylene (PE) Sewer Pipe

1. Pipe

- a. Polyethylene pipe shall be manufactured from virgin polyethylene resins conforming to Type III, Class C, Category 5, Grade P34

polyethylene as defined in ASTM D 1248. Minimum cell classifications of the polyethylene material shall be 335433C as referenced in ASTM D 3350.

- b. For determination of minimum wall thickness, the maximum allowable deflection is 5 percent, with the pipe installed in accordance with these Specifications. Calculations shall be based on backfill material of 130 pound per cubic foot, H-20 live load plus 50 percent impact and no internal pressure. The live load and impact may be disregarded for trenches with 8 feet or more cover. Hydrostatic loading shall be considered when the pipe is to be installed below permanent water table. The pipe manufacturer shall furnish calculations to verify the pipe wall thickness for these various conditions for the ENGINEER'S review before the materials are sent to the job site.
- c. No cracks, holes, foreign materials, blisters or other deleterious faults are permitted in the polyethylene pipe. It shall be homogeneous throughout including the heat fused joint. Polyethylene pipe will not be installed containing gouges or cuts that penetrate more than 10 percent of the wall thickness.
- d. Each length of polyethylene pipe shall be marked containing the manufacturer's name, pipe size and other data, as required by ASTM D 3350 to enable an accurate tracing of the raw material source.

## 2. Fittings

- a. Polyethylene fittings for use on this project shall be fabricated from the same materials as specified herein for the pipe. Fittings shall meet the same quality standards as stated herein for the pipe and shall be from the same manufacturer as the pipe unless otherwise accepted by the ENGINEER.
- b. Branch fittings for lateral pipes shall be made using wye or tee branches. Sidewall fused connections using pipe manufacturer's recommended procedures are also acceptable. Saddle type branches for use on new polyethylene sewer lines will not be allowed.

## 3. Joints

- a. Polyethylene pipe shall be joined by the heat fusion process. The pipe and joint (butt or sidewall fusion) shall be leakproof and all fusion must be performed by personnel trained by the pipe supplier or otherwise equally qualified person, as determined by the ENGINEER.

- b. The fusion equipment shall have hydraulic controls and gauges for monitoring the fusion pressures and temperatures. The equipment shall have a motor powered facing unit to trim the irregularities of the pipe ends and an electrically or gas-fired heated and thermostatically controlled heater plate capable of producing fusion temperatures as recommended by the pipe manufacturer for the particular polyethylene extrusion used on the project.
- c. Threaded or solvent weld joints and connections are not permitted. The manufacturer's standard adapters shall be used to connect polyethylene pipe to other types of non-pressure pipe.
- d. Where joints must be made in the ditch, and conditions are such that use of the fusion machine is impossible, a stainless steel coupling may be used, if accepted by the ENGINEER.
- e. Where pipe enters manholes, the pipe manufacturer shall certify that their pipe is compatible with the watertight, flexible seal to be used at manhole openings and that their combined use will produce a flexible watertight installation.

D. Ductile Iron Sewer Pipe

1. Pipe

- a. This specification covers 4 to 64-inch ductile iron gravity sewer pipe designated "DI" on the Drawings. Pipe furnished under this Specification shall comply with all provisions of ANSI/ASTM A 746. Maximum design thickness shall be based on depth of cover, trench loadings and other conditions per ANSI/AWWA C150/A21.50.
- b. Metal Design Strength psi (Minimum)

Tensile Strength	60,000
Yield Strength	42,000
Percent Elongation	10
- c. The net weight, class or nominal thickness, and casting period shall be shown on each pipe. The manufacturer's mark, the year in which the pipe was produced, and the letters "DI" or "DUCTILE" shall be cast or stamped on the pipe.

2. Fittings

- a. Fittings for ductile iron sewer pipe shall be mechanical joint or rubber ring slip joint fittings.
- b. Ductile iron mechanical and rubber ring slip fittings shall conform to ANSI/AWWA C110/A21.10 for gray iron and ductile iron fittings.



40-2022 (02/2022)

Mechanical joints and rubber slip ring joints shall also conform in all respects to ANSI/AWWA C111/A21.11 and ANSI/AWWA C 153.

- c. All fittings shall be manufactured for the size and pressure class of the pipeline in which they are to be used. All fittings shall be furnished complete with all joint accessories.

3. Joints

a. General

- (1) Pipe joints shall be mechanical joint, rubber ring slip joint or restrained joint as shown on the Drawings.
- (2) All items used for jointing pipe shall be furnished with the pipe. The joints shall be made with tools and lubricant in strict conformity with the manufacturer's instructions. Copies of the instructions shall be delivered to the ENGINEER at start of construction in sufficient numbers that will permit the ENGINEER to retain 3 copies.

b. Mechanical Joints

- (1) Mechanical joints are to be furnished according to ANSI/AWWA C111/A21.11-95. All pipe joints must be furnished complete with all accessories. Mechanical joint bolts and nuts shall be of alloy cast iron or alloy steel (Corten type such as U.S. Alloy) or equal. Rubber gaskets shall be made of plain first grade rubber, free of imperfections and porosity. Hardness shall be 70 to 75 durometer.

c. Rubber Ring Slip Joint (Push On)

- (1) Rubber ring slip joint shall be equal to ANSI/AWWA C111/A21.11-95. The joints shall be of the following materials and assembled in the sequence outlined below:
  - (a) Rubber ring gasket compressed in groove in bell of pipe.
  - (b) Beveled spigot end of pipe for initial centering into rubber gasket in bell.

d. Restrained Joints

(1) For Pipe

- (a) Restrained joint for push-on type bell with rubber O-ring shall meet the applicable requirements of ANSI/AWWA C111/A21.11. The bell/spigot configuration for the restrained joint shall be such

that restraint shall be provided for the joint based on a sustained pressure equal to the pressure class of the pipe without separation.

- (b) The restrained joint shall allow the same deflection as standard push-on joint pipe.
- (c) Where field welding is required for restrained field cut pipe, the welder shall be properly instructed in the methods and materials for use on ductile iron pipe by the manufacturer, on site.

(2) For Fittings

- (a) Where restrained joint fittings are called for, the bell configuration for the fitting shall be the same as for the pipe.
- (b) Where fittings with restrained joint bell configurations are not available, restraint materials for use with mechanical joint bell configurations shall be as follows:
  - (i) Connect mechanical joint bell assemblies with stainless steel, all thread rods.
  - (ii) Install restraint glands on each side of the fitting. The restraining glands shall be "Meg-A-Lug," as manufactured by EBAA Iron sales, Inc. of Eastland, Texas; "Grip Ring," as manufactured by Romac Industries, Inc. of Seattle, Washington; or equal.

4. Coating and Linings

- a. All ductile iron pipe and fittings for gravity sewer service shall be bituminous coated outside in accordance with ANSI/AWWA C151/A21.51 for pipe and ANSI/AWWA C110/A21.10 for fittings.
- b. All ductile iron pipe and fittings for gravity sewer service shall be cement-mortar lined with seal coat in accordance with ANSI/AWWA C104/A21.4.

E. Cast Iron Soil Pipe (Sewer)

1. Pipe and Fittings

- a. Wherever soil pipe is called for on the Drawings, it shall be extra heavy soil pipe and fittings plainly marked "XH." Materials, chemical requirements, physical requirements, dimensions,

40-2022 (02/2022)

coating, tests, test methods, certification, inspection and marking shall be as specified in ASTM A 74.

2. Joints - Sewer Laterals

- a. Joint seals for cast iron soil pipe and fittings shall be preformed rubber (neoprene) gaskets meeting the requirements of ASTM C 564. Gaskets shall be manufactured from a vulcanized virgin rubber compound containing no scrap or reclaimed material. Gaskets shall be supplied by the manufacturer of the pipe or of a manufacturer recommended by the manufacturer of the pipe.

3. Joints - Interior Installation

- a. Joint seals shall be preformed rubber (neoprene) gaskets as stated previously for sewer laterals.

F. Reinforced Concrete Drain Pipe

1. Pipe

- a. Reinforced concrete drain pipe shall comply with ASTM Designation C 76. Pipe shall conform to standard strength classification, Classes II, III, IV and V for wall "B" design per ASTM C 76. The coarse aggregate shall be crushed limestone only. The pipe shall be bell and spigot configuration.
- b. The basis for acceptance of the reinforced concrete pipe for use on this Project shall be as stated in ASTM C 76, paragraph 5.1.2.
- c. Pipe dimensions, wall thickness, variations of dimensions, finish, repairs, rejection and marking shall be per paragraphs 11 through 13 and tables 1 through 5 of ASTM C 76.

2. Fittings

- a. Tee branches shall be furnished with the connection or connections of the size or sizes specified, securely and completely fastened in the process of the manufacture to the barrel of the pipes. Tee branches shall have their axis perpendicular to the longitudinal axis of the pipe. All branches shall terminate in sockets and the barrel of the branch shall be of sufficient length to permit making a proper joint where connecting pipe is inserted in the branch socket.

3. Joints

- a. The material used for sealing the joints of reinforced concrete pipe shall be asphalt mastic compound meeting the requirements of Section 807.02.04 of the Kentucky Transportation Cabinet Department of Highways Specifications for Road and Bridge

Construction. The sealing material shall be a smooth, uniform mixture of asphalt cement, solvent and mineral filler. The mineral filler shall consist essentially of cellulose fiber. The compound shall be applied by trowel or caulking gun without pulling or drawing and shall not sag or flow when applied to the surface.

- b. The compound shall be capable of withstanding freezing and shall not exhibit a tendency to separate or deteriorate while in storage. When cured, the compound shall set to a tough, plastic coating without shrinking, cracking or loosening from the surface.
- c. In addition, the material shall comply with the test conditions and requirements of the following table:

TABLE 1.01

	<b>Min.</b>	<b>Max.</b>
Grease Cone Penetration (ASTM D 217, Unworked, 150 gm, 77°F, 5 Sec.) 0.10mm	175	250
Weight per Gallons, Lbs.	9.75	-
Non-Volatile (10 gm, 221°F - 230°F, 24 hrs.), percent	75	-
Ash (by ignition), percent	25	45

- d. The CONTRACTOR shall submit sufficient copies of literature of the sealing material proposed for use for the ENGINEER'S review and acceptance to permit the ENGINEER to retain 3 copies.

**G. Corrugated Steel Drain Pipe**

**1. Pipe**

- a. Galvanized corrugated steel pipe shall be of the gauge and of the sizes shown on the Drawings. Corrugations may be of annular or helical configuration. Helical corrugations may be welded seam or lock seam. Corrugations shall have a pitch of 2-2/3 inches and a depth of 1/2-inch (tolerance for each shall be 1/8-inch).
- b. Corrugated steel circular pipe shall meet the requirements of the American Association of State Highway and Transportation Officials (AASHTO) M-36, Type I. Corrugated steel pipe arch shall meet the requirements of AASHTO M-36, Type II.

40-2022 (02/2022)

2. Fittings

- a. Galvanized corrugated steel fittings for use with corrugated steel pipe shall be of the same gauge as the pipe and of the same manufacturer as the pipe. Fittings shall be fabricated by the pipe manufacturer and be of the type and configuration as accepted by the ENGINEER.

3. Joints

- a. Joints for corrugated steel pipe shall be coupling bands of the same manufacturer as the pipe. Coupling bands shall be galvanized and approximately 5 corrugations in width. Coupling bands shall be connected at the ends by galvanized angles and retained by at least 2 galvanized bolts not less than 1/2-inch in diameter. Coupling bands shall be the same gauge as the pipe.

4. Coating

- a. When shown on the Drawings or called for in these Specifications, corrugated steel pipe, fittings and couplings shall be asphalt coated. Asphalt coating material and methods of application shall meet the criteria as established in AASHTO M-190.

H. Underdrain Pipe

1. Pipe

- a. Underdrain pipe and fittings shall be of the sizes, with and without perforations, as indicated on the Drawings.
- b. Pipe shall be polyvinyl chloride (PVC) pipe, Type S, as follows:
  - (1) Smooth—Conform to ASTM D 1785 for Schedule 40, or ASTM D 2241 for SDR-17.
  - (2) Ribbed—Conform to ASTM F 794 for Series 46.
  - (3) Corrugated—Conform to ASTM F949.
- c. Manufacturer shall certify to ASTM requirements.

2. Fittings and Couplings

- a. Couplings for perforated pipe shall be the flexible plastic type and couplings for unperforated pipe shall be watertight, standard couplings with solid rubber rings. All fittings and couplings shall be as recommended by pipe manufacturer.

2.03 SOURCE QUALITY CONTROL

A. PVC Polyvinyl-Chloride Sewer Pipe

1. Pipe shall be tested and inspected at the factory and inspected at the job site. Testing shall be accomplished in conformance with the following ASTM specifications utilizing the test methods specified therein:

Dimensions	ASTM D 3034 or ASTM F 679 and D 2122
Extrusion Quality	ASTM D 2152
Pipe Stiffness (5%)	ASTM D 2412
Impact Resistance	ASTM D 2444

2. In addition, a typical joint assembly, both gasket type joint and solvent weld joint, shall be tested by a qualified independent laboratory per test requirements of ASTM D 3212. The manufacturer shall submit through the CONTRACTOR sufficient copies of certification and test results for each lot of material represented by shipment to the job site that will permit the ENGINEER to retain 3 copies.

B. Polyethylene (PE) Sewer Pipe

1. All polyethylene pipe and materials shall be tested by the manufacturer of the pipe using the following referenced ASTM methods and procedures:

Density	ASTM D 1505
Flow Rate	ASTM D 1238
Flexural Modules	ASTM D 790
Tensile Strength	ASTM D 638
Stress Crack Resistance	ASTM D 1693
Hydrostatic Design Basis	ASTM D 2837
Thermal Stability	ASTM D 3350
Carbon Black Content	ASTM D 1603

2. Results of tests on the raw materials and the polyethylene pipe shall be furnished along with catalogs and other descriptive literature, in sufficient copies for the ENGINEER'S review before the materials are sent to the job site that will permit the ENGINEER to retain 3 copies.
3. Polyethylene pipe and fittings may be rejected for failure to meet any of the requirements of this specification.

C. Ductile Iron Pipe (Mechanical Joint and Rubber Slip Joint Type)

1. Hydrostatic and physical acceptance tests shall be in accordance with ANSI/AWWA Specification C151/A21.51-81 for ductile iron pipe centrifugally cast in metal molds or sand lined molds for water or other liquids.

40-2022 (02/2022)

2. The ENGINEER shall be provided with sufficient copies of each of the tests for each Contract to permit the ENGINEER to retain 3 copies.
3. All items used for jointing pipe shall be tested before shipment.

### **PART 3 EXECUTION**

#### **3.01 TRENCH EXCAVATION - SEWER AND DRAIN PIPE**

##### **A. General**

1. All excavation shall be open trenches, except where the Drawings call for tunneling, boring or jacking under structures, railroads, sidewalks, roads or highways.

##### **B. Trees and Shrubs**

1. Trenching shall include all clearing and grubbing, including all weeds, briars, trees and stumps encountered in the trenching, regardless of size. The CONTRACTOR shall dispose of any such material by burning, burial or hauling away or as noted on the Drawings, at no extra cost to the OWNER. Ornamental shrubs, hedges and small trees (3 inches in diameter or less) shall be removed, protected and replanted, at no extra cost to the OWNER.
2. Where pipelines run through wooded terrain, cutting of trees within limits of maximum permissible trench widths, as set forth in this article, will be permitted. However, cutting of additional trees on sides of trench to accommodate operating of trenching machine will not be permitted. The CONTRACTOR shall obtain specific permission of the OWNER before cutting any tree larger than 4 inches in diameter.

##### **C. Highways, Streets and Railroads**

1. Trenching also includes such items as railroad, street, road, sidewalk, pipe, small creek crossings, cutting, moving or repairing damage to fences, poles or gates and other surface structures, regardless of whether shown on the Drawings.
2. The CONTRACTOR shall so coordinate his work as to produce a minimum of interference with normal traffic on highways and streets. He may, with the approval of the governing agency, close a street to traffic for such length of time considered necessary, provided persons occupying property abutting the street have an alternate route of access to the property which is suitable for their needs during the time of closure. It shall be the responsibility of the CONTRACTOR to give 24 hours advance notice to fire and police departments and to occupants of a street which will be closed, in a manner approved by the governing body.
3. Where located within city streets and/or roads, the opening of more than 200 feet of trench ahead of pipe laying and more than 100 feet of open

40-2022 (02/2022)

ditch left behind pipe laying, before backfilling, will not be permitted, except upon written consent of the OWNER. Where located outside roadway or parking areas, longer distances for opening and closure may be allowed provided the longer distance does not affect the safety of the general public. No trench shall be left open or work stopped on same for a considerable length of time. In case of objectionable delay trench shall be refilled according to backfill specifications.

4. Construction equipment will not be approved for use where treads are injurious to paving encountered. Curbs, sidewalks, and other structures shall be protected by the CONTRACTOR from damage by his construction equipment.
5. In case of damage to any existing structures, repair and restoration shall be made at once and backfill shall not be replaced until this is done. In all cases, restoration and repair shall be such that the damaged structure will be in as good condition and serve its purpose as completely as before, and such restoration and repair shall be done without extra charge, except as set forth under the applicable provisions of the General Conditions.
6. Where trenching is cut through paving which does not crumble on the edges, trench edge shall be cut to at least 2 inches deep to straight and neat edges, before excavation is started, and care taken to preserve the edge to facilitate neat repaving.
7. The CONTRACTOR shall maintain road crossings in a passable condition for traffic until the final acceptance of the work, being paid only by unit price for crushed rock used, within limitations as hereinafter specified.
8. Railroad company and Department of Highways requirements in regard to trenching, tunneling, boring and jacking shall take precedence over the foregoing general specifications and the following tunneling and boring or jacking specifications, where they are involved. Where work is within railroad right-of-way, Railroad Protective Insurance shall be carried by the CONTRACTOR in the amounts required by the Railroad Company.
9. The insurance policy shall name the railroad as the insured and the original policy shall be delivered to the railroad after submitting same to the OWNER for review. The cost of flagmen required by the railroad and/or highway departments shall be paid by the CONTRACTOR.

#### D. Existing Utilities

1. The CONTRACTOR shall determine, as far as possible in advance, the location of all existing sewer, culvert, drain, water, electric, telephone conduits, gas pipes, and other subsurface structures and avoid disturbing same in opening his trenches. In case of sewer, water and gas services and other facilities easily damaged by machine trenching, same shall be uncovered without damage ahead of trenching machine and left intact or



40-2022 (02/2022)

removed without permanent damage ahead of trenching and restored immediately after machine has passed, without extra cost to the OWNER. The CONTRACTOR shall protect such existing facilities, including power and telephone poles and guy wires, against danger or damage while pipeline is being constructed and backfilled, or from damage due to settlement of his backfill. It shall be the responsibility of the CONTRACTOR to inform the customers of utilities of disruption of any utility service as soon as it is known that it has been or will be cut off.

2. Where there is the possibility of damage to existing utility lines by trenching machine, the CONTRACTOR shall make hand search excavation ahead of machine trenching, to uncover same, at no extra cost to the OWNER. Hand trenching is required, at no extra payment, where undue damage would be caused to existing structures and utilities by machine trenching.
3. The work of uncovering and backfilling required for locating existing sewers, water lines and other existing facilities for connection of improvements or avoidance in location of proposed pipeline, where such uncovering and backfilling is not within trench for improvements, shall be paid for at a price per cubic yard for such excavation actually removed and backfilled under item for "Search or Extra Depth Trench Excavation." Such payment does not include uncovering existing utility lines for their protection during or after trenching operations for the proposed pipeline.

#### E. Pipelines in Same Trench

1. Pipelines, force mains, and sewers laid in same trench shall, in all cases, be bedded on original earth, crushed stone, or other specified bedding materials, regardless of divergence in their elevations, unless otherwise specified. They shall never be laid in unsupported backfill or one above the other. The CONTRACTOR shall receive applicable unit prices for each pipeline, force main, and sewer so laid, the same as if laid in widely separated trenches.

#### F. Location of Proposed Pipelines

1. The location of pipelines and their appurtenances, as shown on the Drawings, are those intended for the final construction. However, conditions may present themselves before construction on any line is started that would indicate desirable changes in location. Also, development of property traversed may require location changes. In such cases, the OWNER reserves the right to make reasonable changes in line and structure locations without extra cost, except as may be determined by the application of the unit prices bid to the quantities actually involved. The OWNER is under no obligation to locate pipelines so they can be excavated by machine.

G. Construction Stake-out

1. The ENGINEER will provide geometric base data for the CONTRACTOR'S use in locating sewers and facilities in the design location. The locations for vertical control (benchmarks) are shown on the Drawings with elevation and description duly noted. Each manhole, pumping station wetwell, or other notable sewage system component shall have the coordinates shown at the individual location or listed with the General Notes of the Drawings. It shall be the CONTRACTOR'S responsibility to locate the new facilities in their intended position using survey grade GPS survey equipment. It should also be the CONTRACTOR'S responsibility to provide offset hubs at each manhole or such reference points as may be required to maintain the location of each new installation.
2. Where the CONTRACTOR elects to use grades (batter) boards for sewer construction, offset line and grade stakes shall be set and cut sheets prepared before trenching work is started. All stake-out work and cut sheet preparation shall be accomplished by the CONTRACTOR, the ENGINEER being responsible for review and checking the finished cut sheets. The CONTRACTOR shall provide all material, equipment, and labor for all stake-out work. Cut sheets, where required, shall be prepared on forms supplied by the ENGINEER (HKB Form RPR-4).
3. The cut sheets shall contain the following minimum information:
  - a. Manhole stations
  - b. Grade between manholes
  - c. Centerline and offset stations
  - d. Amount and direction of offset
  - e. Centerline elevation
  - f. Centerline cut
  - g. Offset elevation
  - h. Offset cut
  - i. Average trench depth
  - j. Utilities information and depths and/or any other pertinent information.
4. Where the CONTRACTOR elects to use grade (batter) boards for sewer construction, offset hubs shall be set perpendicular to each 25 foot centerline station. Where laser beam equipment is to be used, the offset line shall be as required for the specific type of laser equipment used. In either case, the CONTRACTOR shall be required to maintain at least the

40-2022 (02/2022)

offsets at manholes until the sewer main has been constructed. The CONTRACTOR shall also, in either case, be required to obtain the original ground elevation along centerline, at each 25 foot station, for the purpose of calculation of the average trench depth.

5. Grades shown on the Drawings or as revised in the field are invert of pipe and NOT trench subgrade. The centerline cuts on the cut sheets shall have this calculation made, original ground surface to invert of sewer pipe, which is the depth which shall be used for calculation of the average depth of trench and backfill.

#### H. Trench Requirements

1. All trenches must be dug neatly to lines and grades as shown on the Drawings, as established in the field and/or as established on the cut sheets. Trenches shall be of sufficient width to properly assemble or bolt joints.
2. Trenching shall be completed between one grade control point and the next in advance of the laying of pipe, where pipes, culverts, or other structures may be encountered whose grade cannot reasonably be determined ahead of trenching. Should the CONTRACTOR lay pipe closer to the opening of trench ahead, he shall bear cost of any removal and relaying which may be required to avoid location conflict.
3. The extra cost of trenching in difficult locations, such as stream, railroad or highway crossing, if not covered by other Contract unit prices, shall be included in the unit price for furnishing, laying, trenching and backfilling.
4. Where grade (batter) boards are used to establish finish grade, they shall be set by the CONTRACTOR, with at least 3 boards set at all times where installation is in progress. These will be set each 25 feet or less and will be set perpendicular to and spanning the centerline of the trench, such that the grade string is in the vertical plane of the pipe flow line. Grade boards shall be supported by stakes driven firmly on each side of the trench, unless otherwise acceptable to the ENGINEER. Where laser beam equipment is used, the setup shall be per the laser manufacturer's instructions and/or the permission of the ENGINEER.
5. Grades shown on the Drawings and/or profiles, cut sheets and offset stakes are the elevations of the invert of the pipe in all cases and excavation in open trench or tunnel must be made of sufficient depth to take care of required bedding of pipe and bells below these lines.

#### [OPTION I - CONTRACTS WITH CLASSIFIED EXCAVATION]

6. Except for extra for rock excavation, no additional compensation will be allowed for the extra depth of trenching so required below invert.

\* \* \* OR \* \* \*

**[OPTION 2 - CONTRACTS WITH UNCLASSIFIED EXCAVATION]**

1. No additional compensation will be allowed for the extra depth trenching so required below invert.
7. Where bottoms of trench for 6-inch through 16-inch size pipe are in or on solid rock or where concrete cradle or arch is to be used, trenches or tunnels shall be dug to a depth of at least 6 inches below bottom of barrel of pipe. Where in earth, they shall be dug to at least 4 inches below bottoms of pipe barrels and bells.
8. In pipe sizes 18-inch through 72-inch, the trench shall be dug to a depth of 1/4 of the outside diameter of the pipe below the bottom of the pipe barrel in earth or solid rock subgrade, with a maximum of 9 inches, and a minimum of 6 inches. This requirement shall also apply where concrete arch or cradle is used to protect the pipe.
9. When trench or tunnel is dug below required grade, the pipe must be brought to grade by filling with crushed rock for pipe bedding as specified in this Section 02700 of these Specifications, at the CONTRACTOR'S expense. Fill for pipe support shall not be made with material excavated from trench.

I. Solid Rock Excavation

1. Solid rock excavation is defined as materials of 1/3 cubic yard or more in one location (in a native state or concrete) that rings under the hammer, which cannot be removed economically without the use of explosives. Paving removal is excluded; also shale rock.
2. Rock excavation in pipeline trenches will be measured by the cubic yard for such materials actually removed limited in depth to required depths of bedding below outside of pipe barrel and in width to the following dimensions:

TABLE 3.01

---

For 6" Pipe 2'-6"	For 15" Pipe 2'-10"	For 27" Pipe 4'-0"
For 8" Pipe 2'-9"	For 16" Pipe 2'-11"	For 30" Pipe 4'-4"
For 10" Pipe 2'-9"	For 18" Pipe 3'-2"	For 33" Pipe 4'-9"
For 12" Pipe 2'-9"	For 20" Pipe 3'-5"	For 36" Pipe 5'-6"
For 14" Pipe 2'-9"	For 21" Pipe 3'-6"	For 42" Pipe 6'-0"
	For 24" Pipe 3'-8"	For 48" Pipe 6'-6"
		For 54" Pipe 7'-0"

---

3. Rock excavation in tunnels will be measured by the cubic yard for such materials actually removed, limited in pipe sizes 6 inches through 36 inches to twice the trench widths set forth above, and in temporary tunnels to 5 feet in depth.
4. Rock excavation for structures such as manholes will be measured by the cubic yard for such material actually removed, limited by a maximum distance of 12 inches outside of manhole barrel, a maximum distance of 24 inches outside of concrete structural walls, and a maximum depth to planned subgrade of structure or crushed rock pad.
5. Earth seams, crevices and fissures between layers of rock will be measured with the rock, if less than 3 feet in width and/or in depth.

\*\*\* OR \*\*\*

I. Excavation Unclassified

1. Excavation for pipelines shall be unclassified and the cost of all excavation of whatever nature and state, including solid rock, shall be included in the CONTRACTOR'S unit price bid for furnishing, trenching, laying and backfilling the pipe.
2. Excavation for structures such as manholes, pump stations, and vaults is likewise unclassified and the cost of all excavation of whatever nature and state, including solid rock, shall be included in the CONTRACTOR'S lump sum or unit price bid, as the case may be.
3. Solid rock is defined as materials of one-third cubic yard or more in one location (in a native state or concrete) that rings under the hammer which cannot be removed economically without the use of explosives. Paving removal is excluded; also shale rock.

4. In the event the ENGINEER finds it necessary to specifically order mechanical removal of solid rock, it will be measured by the cubic yard for such materials actually removed limited in depth to required depths of bedding below outside of pipe barrel and in width to the following dimensions:

TABLE 3.01

For 6" Pipe 2'-6"	For 15" Pipe 2'-10"	For 27" Pipe 4'-0"
For 8" Pipe 2'-9"	For 16" Pipe 2'-11"	For 30" Pipe 4'-4"
For 10" Pipe 2'-9"	For 18" Pipe 3'-2"	For 33" Pipe 4'-7"
For 12" Pipe 2'-9"	For 20" Pipe 3'-5"	For 36" Pipe 5'-6"
For 14" Pipe 2'-9"	For 21" Pipe 3'-6"	For 42" Pipe 6'-0"
	For 24" Pipe 3'-8"	For 48" Pipe 6'-6"
		For 54" Pipe 7'-0"

5. Mechanical removal of solid rock is defined as solid rock in its native state which is ordered to be fractured and broken up for removal by hand tools and/or hand held power or pneumatic tools to provide protection of utilities, structures, etc. which might otherwise be subject to damage by conventional drilling and shooting or heavy excavating equipment.
6. Payment for mechanical removal will not be authorized for solid rock excavation which is accomplished by drilling and shooting or by crawler or wheel mounted excavators, trenching machine, and similar equipment.

J. Dewatering of Trenches

1. Dewatering of trenches shall be considered a part of trenching, at no extra cost to the OWNER. Dewatering of trenches shall include ground-water and storm or sanitary sewage. Suitable pumping and other dewatering equipment is to be provided by the CONTRACTOR, to insure the installation of the pipeline structure in a dewatered trench and under the proper conditions. Dewatering shall include all practical means available for prevention of surface runoff into trenches and scouring against newly laid pipe.
2. Piles of excavated materials shall be trenched or temporarily piped to prevent, as far as practical, blockage of drainage ditches and gutters, and water carriage of excavated materials over street and highway surfaces.

40-2022 (02/2022)

3. Where subgrade of trench has insufficient stability to support the pipeline and hold it to its original grade, the ENGINEER may order stabilization by various means. Exclusive of dewatering normally required for construction and instability caused by neglect of the CONTRACTOR, it shall be paid for at unit prices set up in the Contract, such as extra excavation, crushed rock for pipe bedding, concrete cradle or piling.

### 3.02 LAYING SEWER PIPE

#### A. General

1. Checking of Pipe
  - a. The selection of pipe strength class shall be based on earth weight of 130 pounds per cubic foot and a safety factory of 1.50.
  - b. All pipe and fittings must be tested for uniform diameter, straightness and defects by the CONTRACTOR before being lowered into trench, and rejected pipe marked in a way not to impair its value. Rejected pipe must be separated from accepted pipe and removed from the project. The ENGINEER will make periodic observations of pipe in storage and/or incorporated into the work. Pipe found defective, not meeting Specifications, or improperly installed shall be rejected and replaced.
2. Alignment and Grade
  - a. All pipe, after being inspected and accepted, shall be laid to correspond with lines and grades staked out by the CONTRACTOR. All sewer lines shall be laid to constant grades between invert elevations shown on the Drawings. Grades shown on the Drawings are invert of pipe and NOT trench subgrade. The pipe lengths shall be fitted together and matched, so that they will form a sewer with a smooth and uniform invert, visible as a full circle from manhole to manhole, except in special cases where curved sewer lines are planned.
3. Unstable Subgrade
  - a. In wet, yielding, and mucky locations where pipe is in danger of sinking below grade or floating out of grade or line, or where backfill materials are of such a fluid nature that such movements of pipe might take place during the placing of the backfill, the pipe must be weighted or secured permanently in place by such means as will prove effective. If crushed rock fill is necessary, it will be paid for per ton of such material used, except in cases where instability is caused by neglect of the CONTRACTOR.

40-2022 (02/2022)

4. Control of Quantities Laid

- a. Laying of pipe may be held up by the ENGINEER until trench has progressed far enough ahead to remove the possibility of having to change grade or alignment on account of other structures, pipelines or conduits.
- b. Unless permitted or directed, not less than 100 feet of pipe shall be laid at one operation except for the following reasons:
  - (1) Street and railroad crossings.
  - (2) Wet caving trenches.
  - (3) Business houses or institutions damaged by prolonged disconnection from street.
  - (4) Less than 100 feet distance between manholes or pipe control sections.

5. Bedding of Pipe

- a. Six-inch through 16-inch pipe shall be laid with bottom quadrant of barrel and bells of pipe bedded in at least 4-inch depth of crushed stone when on earth subgrade and in at least 6-inch depth of crushed stone, below the bottom of the barrel of pipe when on solid rock subgrade. Stone for bedding of 6 inch through 16-inch pipe shall be Kentucky Department of Highways Size 9 crushed rock as specified in Section 02235 of these Specifications, spaded into place. It shall be included in price for furnishing and laying pipe. Payment for the extra stone required for bedding pipe in solid rock for 6-inch through 16-inch pipe shall be included in the price bid for solid rock excavation in the case of classified excavation and in the price bid for trenching and backfilling in the case of unclassified excavation.
- b. In case of pipe sizes 18-inch through 72-inch in both earth and solid rock trench, the subgrade shall be shaped to provide for a crushed stone pad, Kentucky Department of Highways Size 9, for a depth under the pipe barrel at least 1/4 the outside diameter of the pipe, with a minimum of 6-inch depth and a maximum of 9-inch depth. The bedding material shall be thoroughly spaded into place, in order to give a uniform bearing for at least the bottom quadrant of the pipe. Payment for such bedding shall be included in the price paid for trenching and backfilling or laying, even when in or on solid rock.
- c. For PVC or polyethylene pipe, alternate bedding materials will be allowed with permission of the ENGINEER. In order to qualify for use with sewer pipes of these compositions, the bedding material



must be of the type of material delineated as Class IA embedment materials per Table 1 of ASTM D 2321, namely, coral, slag, cinders, crushed stone or crushed shells. The alternate bedding materials must also be of the same gradation of the crushed stone previously specified, namely, Kentucky Department of Highways Size 9. The crushed stone previously specified shall be used for all other piping materials.

- d. No filling of trench with earth to bring pipe to grade will be permitted. If trenches are dug too deep, they must be brought to grade and supported by crushed rock for pipe bedding (No. 9) as specified in Section 02235 of these Specifications at the CONTRACTOR'S expense. No pipe shall be laid in the trench until the subgrade is inspected and found correct.

6. Laying of Pipe (Mains)

- a. Laying crew foreman shall direct subgrade preparation and plumbing and leveling invert of pipe to grade and line, the pipe layer following his directions in placing the pipe. The pipe layer will be responsible for pipe bedding, cleaning joint, proper placement of joint annular ring or gasket, tight jointing and homing pipe, securing pipe against settlement or other movement, and inspecting and swabbing out any jointing material from inside of pipe.
- b. No joints will be accepted that show leakage and, after backfilling and inspection, any joints are found that are allowing groundwater to enter the sewer must be excavated and repaired.
- c. Plugs in branch fittings to future building sewers shall be protected from excavators by the method as shown on the Drawings for protecting the ends of laterals and shall be so constructed and joined in bell of pipe that they will be watertight, yet removable without breaking the bell or coupling when removed.

7. Laying of Branch Pipes and Laterals

- a. Branch pipes shall be laid to serve the abutting property at points to be designated by the ENGINEER. Such pipes shall be connected to sewer main through tees or Y-branches of size of running sewer barrel and 6-inch side opening, with 6-inch 30 degree or 45 degree bends. Branch fittings in sewer and the connected bend, shall be supported from bottom of trench per standard details shown on Drawings.
- b. At locations where the sewer is within street or road rights-of-way, house lateral pipes shall be laid to the property line or right-of-way line.

40-2022 (02/2022)

- c. At locations where the sewer is within easement obtained by the OWNER, house lateral pipes shall be laid to the permanent easement line.
- d. Branch tees or wyes for house laterals will be located during construction, regardless of where shown on the Drawings. House lateral location shall be at the convenience of the property owner or as directed by the OWNER and/or ENGINEER.
- e. The end openings of house laterals shall be plugged with appropriate watertight plugs of permanent materials in the bell of the sewer lateral, removable without breakage of the pipe bell. Dead ends of sewers shall be plugged similarly.
- f. Under normal conditions, where elevations are not critical, branch service sewers to customers shall be laid on not less than .01 foot per foot of length grade. Where elevations are critical, minimum grade shall be .005 foot per foot laid with batter boards or laser, same as specified for street sewers.
- g. In the case of deep sewers, branch pipes may be brought up to a depth of approximately 5 feet below ground level with suitable bends and sewer pipe. These pipes shall be laid on a slant outside sewer trench, so they will be supported on original earth and not dragged down and cracked by backfill settlement.
- h. In case of deep sewers in rock or narrow places, branch pipes shall be of cast iron soil pipe installed vertically per standard details of Drawings, with branch fittings in sewer main encased in Class 2,500 concrete. Payment for such concrete and forms above wye or tee branch shall be at the price bid per encasement.
- i. All lateral sewers and branch pipes installed on this Contract shall have a detectable mylar tape placed in the backfill over and running with the lateral sewer. The tape shall be readily detectable employing the same type metal locators as used for the location of metal pipelines. The tape shall be bright orange in color and have the words, "Caution, Sewer Line Below" printed on it. The tape shall be installed as shown on the standard details of the Drawings.
- j. The tape shall be Type II, Detectable Mylar Marking Tape as manufactured by Line Guard, Inc. or equal. The cost of purchase and placement of the marking tape shall be included in the CONTRACTOR'S unit price bid for the lateral pipe and fittings.

40-2022 (02/2022)

8. Piping Connections at Structures

a. Lines

- (1) Pipes shall be laid free from all structures other than manholes. Any pipe entering structures underground unsupported by original earth shall be supported by Class 2500 concrete, brick and mortar masonry, or Class 4000 concrete beams and columns as shown on detailed Drawings.
- (2) Pipe shall be connected to manholes by fabricated manhole entry seals, specified in Section 03480 of these Specifications.
- (3) Pipe stubbed out of manholes for future connections shall be plugged and tightly sealed with same jointing material used to plug laterals.

b. Plants

- (1) Nonpressure pipes entering structures underground, unsupported by original earth for a distance of more than 3 feet shall be supported by Class 2500 concrete, where depth of such support does not exceed 3 feet. All pipes entering buildings or basins below original ground, which are more than 3 feet above structure subgrade and/or have a 3-foot span between wall and original earth, and have cover of more than 24 inches of earth or under roadway, shall be supported by concrete beams under them as shown on the Drawings with columns each 6 feet between structural wall and edge of excavation for the structure in order to prevent breakage from settlement of backfill about the structure. Concrete and reinforcing steel for such support are to be included in the lump sum portion of the Contract and not as extra concrete. Sewers entering structures shall have flexible joint within 16 inches of exterior of structure.

9. Installing Sewer Pipe in Cover Pipe

- a. The installation of sewer pipe inside steel cover pipe is detailed in Section 02326 of these Specifications.

10. Protection of Pipe in Trench

- a. No walking upon the completed pipelines will be permitted until trench has been backfilled to a depth of at least 6 inches over the top of the pipe. The interior of the pipe shall, as the work progresses, be cleaned of all dirt, jointing materials, and

superfluous materials of every description. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a suitable plug fitted into the pipe bell, so as to exclude earth and other material, precautions being taken to prevent flotation of pipe by runoff into trench.

11. Observation of Pipeline

- a. No backfilling (except for securing pipe in place) over pipe will be allowed until the ENGINEER has had an opportunity to observe the joints, alignment and grade, in the section laid, but such observation shall not relieve the CONTRACTOR of further liability in case of defects occurring during or after placement of backfill.

B. Laying Sewer Pipe

1. PVC Pipe

- a. PVC sewer pipe laying shall comply with the requirements of ASTM D 2321 and the additional requirements of these Specifications and standard details of the Contract Drawings.
- b. Article 3.02.A of this Section 02700 shall apply to the installation of PVC sewer pipe. The pipe shall be bedded true to line and grade with uniform and continuous support from a firm base. The bedding material shall conform to that specified in Article 3.02.A of this Section 02700.
- c. All PVC sewer pipe shall be installed in a manner to limit deflection of the pipe to 5 percent. A deflection test shall be performed on all flexible pipe. The test shall be conducted after the final backfill has been in place at least 30 days. No pipe shall exceed a deflection of 5 percent. If the deflection test is to be conducted using a rigid ball or mandrel, it shall have a diameter equal to 95 percent of the inside diameter of the pipe. The test shall be performed without mechanical pulling devices.
- d. When laser equipment is being used for laying PVC sewer pipe, the CONTRACTOR shall provide adequate ventilation through the pipe to prevent distortion of the beams.

2. Polyethylene (PE) Sewer Pipe

- a. PE sewer pipe laying shall comply with the requirements of these Specifications and standard details of the Contract Drawings.
- b. Article 3.02.A of this Section 02700 shall apply to the installation of PE sewer pipe. The pipe shall be bedded true to line and grade with uniform and continuous support from a firm base. The

40-2022 (02/2022)

bedding material shall conform to that specified in Article 3.02.A of this Section 02700.

- c. All PE sewer pipe shall be installed in a manner to limit deflection of the pipe to 5 percent. A deflection test shall be performed on all flexible pipe. The test shall be conducted after the final backfill has been in place at least 30 days. No pipe shall exceed a deflection of 5 percent. If the deflection test is to be run using a rigid ball or mandrel, it shall have a diameter equal to 95 percent of the inside diameter of the pipe. The test shall be performed without mechanical pulling devices.
- d. When laser equipment is being used for laying PE sewer pipe, the CONTRACTOR shall provide adequate ventilation through the pipe to prevent distortion of the beams.
- e. One additional step in the installation of PE sewer pipe is required as the result of the fusion of the long lengths of pipe on the trench bank which produces a continuous pipeline without an open end where the invert elevation can be confirmed. Thus, it shall be necessary for the CONTRACTOR to carefully check the subgrade for the PE pipe, both for elevation and firmness at 5 foot intervals before installing the pipe in the trench.
- f. Because of the high coefficient of expansion of polyethylene, this pipe shall not be sealed into manholes or walls of other structures until at least 48 hours have elapsed after backfilling the pipe to allow adequate time for the pipe temperature to stabilize.

### 3. Ductile Iron Sewer Pipe

- a. Ductile iron sewers shall be laid in compliance with the requirements of these Specifications and standard details of Contract Drawings. Restrictions on depth of cover shall follow ANSI/AWWA C150/A21.50 requirements in Section 02610 for the various classes of ductile iron pipe. Joints shall be made with mechanical, restrained or rubber ring slip joint, according to the manufacturer's specifications and with tools recommended by them. A copy of the manufacturer's instructions shall be available at the site of work at all times when pipe is being laid. Joints shall be thoroughly cleaned and dry before pipes are laid in place.
- b. Cutting of pipe may be done using methods as the CONTRACTOR may elect, but the CONTRACTOR will be held responsible for breakage or damage caused by careless cutting or handling.
- c. No pipe shall be laid resting on rock, blocking or other unyielding objects, except where laid above ground on piers or in permanent tunnels. Exact lines and grades will be required on exposed

40-2022 (02/2022)

pipelines placed on piers. Attachment of pipe to piers shall be as shown on the Standard Detail Drawings.

- d. In permanent tunnels pipe shall be laid with bells resting on tunnel liner or on blocks just behind bells. After pipe has been adjusted to proper line and grade, a bedding of Class 2500 concrete shall be poured under pipe to support the entire bottom quadrant. Payment for such bedding shall be included in the unit price for tunnel liner.

4. Cast Iron Soil Pipe

a. Sewer Line Contracts

- (1) Cast iron soil pipe shall generally be limited to usage for vertical stacks on sewer laterals when sewer main is located in deep, narrow trench or when trench is excavated into solid rock. Other use of soil pipe shall be per special applications as shown on the Drawings or acceptable to the ENGINEER.
- (2) Soil pipe shall be jointed with rubber gaskets or "boots" as specified with the pipe, this Section 02700 of these Specifications.
- (3) Soil pipe shall be installed such that the pipe is not allowed to rest on the side of trench. When in traffic areas, crushed stone shall be backfilled completely around the pipe for the complete vertical height of same. When outside traffic areas, pipe shall be backfilled with allowable material from trench excavation, hereinafter specified, with material mechanically tamped for complete vertical height.
- (4) Where cutting of pipe is required, it shall be done by wheeled cutters or by hammer and chisel, as the CONTRACTOR may elect. After cutting, all sharp edges shall be filed or ground smooth to prevent damage to gasket during jointing.
- (5) Soil pipe shall be attached to pipe of other materials as shown on standard details of Drawings.

b. Lump Sum Contracts

- (1) Where soil pipe is used for interior or exterior plumbing for water plants, wastewater treatment plants or other building construction, installation shall meet the specific criteria as delineated in the State Plumbing Code.

40-2022 (02/2022)

### 3.03 LAYING DRAIN PIPE

#### A. General

1. All general requirements hereinbefore stated pertaining to the installation of sewer pipe Article 3.02 of this Section 02700 shall also apply to the installation of drain pipe and storm sewers. Exceptions to these general requirements are as follows:
  - a. Article 3.02.A.7, pertaining to branch pipes and laterals.
  - b. Article 3.02.A.8, pertaining to connection of pipe to manholes or structures - the fabricated boot for connection of sewer pipe to manholes will not be required for connection of drain pipe to manholes or other drainage structures.

#### B. Reinforced Concrete Drain Pipe

1. Installation of reinforced concrete drain pipe shall be per the previously stated instructions for installation of large diameter ductile iron or PVC sewer pipe, except that joints shall be sealed with mastic joint compound. Where reinforced concrete drain pipe is to be installed in an embankment area with "negative projection" trench condition, class of pipe, bedding and reinforcement shall be as shown on the Drawings.
2. Prior to applying the mastic joint compound, the complete surfaces of the bell and spigot shall be cleaned and primed with a primer recommended by the manufacturer of the mastic joint compound or with an approved emulsified asphalt. The mastic material shall then be applied to the bottom half of the bell and top half of the spigot ends of the pipes to be joined in such volume that when the joints are pulled tight, the joint compound will be extruded from the joint on both the inside and outside of the pipe. The excess material shall then be wiped or scraped away to provide a smooth, flush joint.

#### C. Corrugated Metal Drain Pipe

1. The requirements of paragraph 3.02.A of this Section 02700 shall be fully adhered to in the installation of corrugated metal drain pipe. When installing corrugated metal pipe, the invert elevation as shown on the Drawings and/or cut sheets shall be measured to the top of the corrugation of the flow line of pipe.
2. The wall thickness or gauge of the pipe shall be as shown on the Drawings. Where corrugated metal pipe is to be laid in an embankment area with a "negative projection" trench condition, the method of bedding and backfill shall be as shown on the Drawings.
3. Connecting bands shall be as specified in this Section 02700 of these Specifications and be of the same manufacturer as the pipe. Band shall be

40-2022 (02/2022)

installed in such manner to completely join pipe to form a smooth invert flush with the ends of the pipe.

4. Where asphalt coated pipe is specified, the CONTRACTOR shall have on hand asphalt coating material of which the pipe was factory coated. Pipe coating damaged during shipping, unloading or on site handling shall be recoated in the field before lowering pipe into the trench. Pipe coating damaged during installation shall be recoated prior to backfilling.

### 3.04 TRENCH BACKFILL - SEWER AND DRAIN PIPE

#### A. General

1. Excavated materials from trenches and tunnels, in excess of quantity required for trench backfill, shall be disposed of by the CONTRACTOR. It shall be the responsibility of the CONTRACTOR to obtain location or permits for its disposal. Unit prices for furnishing and laying pipe, which includes trench excavation, tunneling, and backfill, shall include the cost of disposition of excess excavated materials, as set forth herein, with no additional compensation being allowed for hauling.
2. No extra charge shall be made for backfilling of any kind, except as herein specified. Backfilling shall be included as a part of the price for furnishing, laying, trenching, and backfilling. No extra charge shall be made for supplying outside materials for backfill except where fills above existing ground are necessary and payment is designated on the Drawings or in the Specifications. If backfilling of the trench or surface restoration is not properly completed, a proportionate part of the unit price for furnishing, laying, trenching, and backfilling shall be retained from payment estimates.
3. Railroad company and Department of Highways requirements in regard to backfilling will take precedence over the above general Specifications where they are involved.
4. Mechanical tamping, where required by the ENGINEER in locations other than those specifically designated herein, shall be paid for per unit price bid for mechanical tamping.
5. Before completion of the Contract, all backfills shall be reshaped, holes filled, surplus materials hauled away, all permanent walks, street, driveways, highway paving replaced, and all sodding, seeding, and planting work performed.

#### B. Haunching

1. Upon completion of bedding and laying the sewer or drain pipe, the CONTRACTOR shall place crushed rock, Kentucky Department of Highways Size 9 dependent on size of pipe, or the same material used for pipe bedding on both sides simultaneously to the top of the pipe. This



40-2022 (02/2022)

material shall be hand placed using shovel or other satisfactory tool to work the haunching material completely under the bottom quadrant and around the sides of the pipe to assure the maintenance of alignment of the pipe. No compaction of this material is required other than that obtained by the workmen walking on the material during placement.

2. The haunching material is required for all sewer or drain pipe installed in open trenches except where concrete pipe arch is required, in which case the haunching material is required to the bottom of the arch. Where concrete cradle is required, the haunching material shall be placed from top of cradle to top of pipe.
3. The cost of furnishing and placement of the haunching material shall be included in the CONTRACTOR'S bid for furnishing and laying the pipe.

#### C. Initial Backfill

1. Upon completion of the haunching material to the top of the pipe, initial backfill shall be placed as hereby specified. This material shall serve as protection for the top of pipe reducing the possibility of damage to the pipe during the placement of backfill for the remainder of the trench depth.
2. When sewer or drain pipe is located outside traffic areas, the initial backfill material shall be crushed rock (Kentucky Department of Highways No. 9) placed above the pipe to the level hereinafter stated.
3. When the sewer or drain pipe is located within traffic areas, the initial backfill shall be crushed rock, or the material used for bedding and haunching the pipe, of the same gradation of the pipe bedding material. Other alternate materials may be used only with the specific written permission of the ENGINEER when the work is located inside traffic areas.
4. In the case of steel, cast iron, ductile iron pipe the initial backfill shall be hand placed to a point 6 inches above the barrel of the pipe. In case of plastic pipe, the initial backfill shall be hand placed and evenly spread to a point 12 inches above the pipe barrel for up to 4 feet cover, to a point 18 inches above the barrel for 4 feet to 10 feet cover, and 24 inches for over 10 feet cover.
5. The initial backfill material is required over sewer and drain pipe in all open trenches. The cost of the initial backfill material and placement of same shall be included in the CONTRACTOR'S bid for furnishing, laying, trenching and backfilling.

D. Final Backfill

1. Outside Traffic Areas

- a. After the above specified initial backfill is hand placed, rock may be used in machine placed backfill in pieces no larger than 8 inches in any dimension and to an extent not greater than one-half the volume of the backfill materials required to backfill trench. Larger rock fill will be allowed in wide trenches where side slopes are low enough to prevent rock from dropping over pipe-line. If additional earth is required, it must be obtained and placed by the CONTRACTOR. Filling with rock and earth shall proceed simultaneously, in order that all voids or pockets, created by rock backfill, may be filled with earth. Machine backfilling may be employed with tamping, except as hereinafter restricted, provided caution is used in quantity per dump and in uniformity of level of backfilling. Backfill material must be uniformly ridged over trench, and excess hauled away, with no excavated rock over 1/2-inch diameter or pockets of crushed rock or gravel in top 12 inches of backfill, the top 12 inches reserved for topsoil or material more suited to sustain surface growth. Ridged backfill shall be confined to the width of the trench and not allowed to overlap onto firm original earth, and its height shall not be in excess of that required to provide for settlement of backfill.

2. Inside Traffic Areas

- a. Where sewer and drain pipe is located in street, highway, railroad, sidewalk and driveway crossings or within any roadway paving, or about manholes, valve and meter boxes located in such paving, fill trench to within 6 inches of the surface with Kentucky Department of Highways No. 9 crushed stone, or other gradation acceptable to the ENGINEER. In order to accommodate compacted temporary surfacing it may be necessary to bulkhead or otherwise confine the stone fill at the open end of the trench.

E. Cleanup and Temporary Surfacing

1. General

- a. Immediately following the placement of final backfill, all rock and debris, including crushed rock or gravel from construction operations, shall be removed from yards and fields. Streets, drives and walks shall be broomed to remove all earth and loose rock. The cleaning of streets, drives, and walks shall be of such extent to hold dust to a minimum. Loose earth and rock shall in no case be swept or washed into storm sewers or drains as a method of removal, all such material being loaded and hauled away from the site.

40-2022 (02/2022)

- b. If acceptable cleanup operations are not completed within an acceptable period of time after the completion of final backfilling, a proportionate part of the price bid for trenching and backfilling shall be retained from partial payment estimates until acceptable cleanup is completed.
- 2. Temporary Surface Cover - Unpaved Areas
    - a. Upon completion of acceptable cleanup work, the ground surface shall be prepared for temporary seed, permanent seed or sod per the requirements of Section 02930 of these Specifications.
  - 3. Temporary Surface Replacement - Paved Areas
    - a. Temporary surfacing of street, highway, railroad, sidewalk and driveway crossings, or within any roadway paving, or about manholes, valve and meter boxes located in such paving, shall consist of 6 inches compacted dense graded aggregate as specified under Section 02235 for temporary walkway or road surfacing, placed and compacted in the trench. Compaction shall be accomplished by methods which shall be sufficient to confine stone to the trench under normal traffic. Backfills shall be maintained easily passable to traffic at original paving level until acceptance of project or replacement of paving or sidewalks. The amount of crushed stone placed shall be paid for at the unit price per ton as shown in Section 02700 herein, titled "BASIS OF PAYMENT." No payment will be made for crushed rock surfacing required as a result of unnecessarily wide trenches, omission of sheeting and shoring, or damage by the CONTRACTOR'S equipment, or for maintenance of surface level.
    - b. After the initial placement of the 6-inch depth of temporary surfacing, the CONTRACTOR shall be required to maintain the temporary surfacing to street or road surface level at no additional cost to the OWNER. This requirement shall continue until the replacement of permanent surfacing.

3.05 FIELD QUALITY CONTROL - TESTING SEWERS FOR LEAKS, INFILTRATION, AND DEFLECTION

A. Sewers

1. General

- a. All sewers constructed under this Contract shall be tested for leaks and infiltration using methods as hereinafter specified.
- b. The cost of all testing of sewer lines and manholes shall be included in the unit price bid for pipe and manholes. The CONTRACTOR shall furnish all materials, equipment and labor

required for all types of tests, the ENGINEER being responsible only for directions, recording data and calculating air losses and/or infiltration rates.

2. Sequence

a. Initial Testing

- (1) The first manhole to manhole section of sewer laid under this Contract, for each size of pipe and type of joint, shall be given a smoke test prior to the sewer being backfilled and while the sewer trench is dewatered to bottom of the pipe being tested.
- (2) Should, based on the results of the test of the first section of pipe laid, the materials being used and the CONTRACTOR'S installation procedures prove to be satisfactory, subsequent smoke testing may, at the discretion of the ENGINEER, be waived. Should, however, based on the results of the test of the first section of pipe laid, the material being used and/or the CONTRACTOR'S installation procedures prove to be unsatisfactory, subsequent smoke testing shall, at the discretion of the ENGINEER, be continued until such time that, in the opinion of the ENGINEER, problems with materials and/or installation procedures have been corrected.
- (3) Such subsequent testing shall likewise be done while trenches are dewatered to bottom of pipe to be tested and immediately after completion of either the public sewer lines or laterals, in not more than 2 sections between manholes at a time. All defective work, as so proven by the smoke test, shall be immediately repaired and retested until proven to be satisfactory.
- (4) Observation of pipe laying and smoke testing shall in no way relieve the CONTRACTOR of the responsibility of conducting the required low pressure air test, infiltration tests, or correcting poor workmanship.

b. Subsequent Testing

- (1) As soon as it is practicable after installing and backfilling sewers, and before putting new sewers into service, low pressure air tests shall be made from manhole to manhole, or up to a maximum of 500 feet of sewer main and 500 feet of sewer laterals at a time, as directed by the ENGINEER. The maximum allowance for air loss during testing shall be determined by tables of minimum holding time for a pressure drop of 1.0 psi and are based on an average loss

of 0.0015 cubic feet of air per minute per square foot of internal pipe surface, when tested at an average pressure of 3.0 psi greater than the average back pressure of any groundwater present.

- (2) Upon completion of installation and backfilling of all sewers constructed under this Contract, the low pressure air test is required for all sewers so constructed.

c. Additional Testing

- (1) Upon completion of the required initial (smoke) testing and required subsequent (low pressure air) testing, and prior to placing the sewer into operation, if ground and/or surface water flow is observed in the completed sewer, the ENGINEER may order infiltration tests be accomplished to determine whether the flow is within acceptable and allowable limits. This additional testing may be required even though the results of the initial smoke testing and subsequent low pressure air testing indicate the sewers are substantially watertight. The infiltration tests shall be conducted, on order of the ENGINEER, as hereinafter specified.

3. Equipment

a. Smoke Testing

- (1) The smoke testing blower shall have a capacity of at least 1,200 cfm.
- (2) The smoke bombs shall produce a chemical reaction generated, white to gray smoke, leaving no residue, and be nontoxic and nonexplosive. Each bomb shall be capable of producing 25,000 cubic feet of smoke per 3 minutes.

b. Low Pressure Air Testing

- (1) The air test equipment used shall meet the following minimum requirements:
  - (a) Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be inspected.
  - (b) Pneumatic plugs shall resist internal test pressures without requiring internal bracing or blocking.
  - (c) All air used shall pass through a single control panel.

- (d) Three individual hoses shall be used for the following connections:
  - (i) From control panel to pneumatic plugs for inflation.
  - (ii) From control panel to sealed line for introducing the low pressure air.
  - (iii) From sealed line to control panel for continually monitoring the air pressure rise in the sealed line.

4. Procedures

a. Safety Precautions

- (1) The air test may be dangerous if a line is improperly prepared. It is extremely important that the various plugs be installed and braced in such a way as to prevent blowouts. Inasmuch as a force of 25 lbs is exerted on an 8-inch plug by expulsion of a poorly installed plug or of a plug that is partially deflated before the pipe pressure is released can be dangerous.
- (2) As a safety precaution, pressurizing equipment shall include a regulator set at 10 psi to avoid overpressurizing and damaging an otherwise acceptable line. No one shall be allowed in the manholes during testing.

b. Low Pressure Air Test

- (1) All pneumatic plugs shall be seal tested before being used in the actual test installation. One length of pipe shall be laid on the ground and sealed at both ends with the pneumatic plugs to be checked. Air shall be introduced into the plugs to 25 psig. The sealed pipe shall be pressurized to 5 psig. The plugs shall hold against this pressure without bracing and without movement of the plugs out of the pipe.
- (2) Clean pipe to be tested by propelling snug fitting inflated rubber ball through the pipe with water.
- (3) Plug all pipe outlets with suitable test plugs. Brace each plug securely.
- (4) If the pipe to be tested is submerged in groundwater, insert a pipe probe by boring or jetting into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when the air passes slowly through it. This is the backpressure due to groundwater submergence

over the end of the probe. All gauge pressures in the test shall be increased by this amount.

- (5) Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psig.
- (6) After an internal pressure of 4.0 psig is obtained, allow at least 2 minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.
- (7) When pressure decreases to 3.5 psig, start stopwatch. Determine the time required for the internal air pressure to reach 2.5 psig. Minimum permissible pressure holding times for runs of single pipe diameter and for systems of 4-inch, 6-inch, or 8-inch laterals in combination with trunklines are indicated in the following table based on air loss calculations per ASTM F-1417.

Pipe Diameter, in.	Minimum Time, min:s	Length for Minimum Time, ft	Time for Longer Length, s	Specification Time for Length (L) shown, min:s								
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft	
4	3:46	597	0.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	0.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:40	5:42	7:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:42	10:08	11:24	
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48	
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:36	
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04	
18	17:00	133	7.692 L	17:00	19:13	35:38	32:03	38:27	44:52	51:16	57:41	
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31	
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33	
27	35:30	88	17.306 L	28:51	43:16	57:41	72:07	81:32	100:57	115:22	129:48	
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	134:38	142:26	160:15	
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53	
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46	

c. Infiltration Test

- (1) Before putting new sewer lines into service, weir test shall be made of flow of water in the sewers from manhole to manhole or up to a maximum of 3,000 foot sections at a time, as directed by the ENGINEER. These tests shall be made when, in the ENGINEER'S judgment, groundwater level is equal to the highest groundwater condition in a normal year.
- (2) The maximum allowance for all sewer pipe materials shall be 100 gallons per 24 hours per inch diameter per mile of sewer pipe and manholes.

d. Deflection Test

- (1) A deflection test shall be performed on all flexible sewer pipe. The test shall be conducted after the final backfill has been in place at least 30 days. No pipe shall exceed a deflection of 5 percent. If the deflection test is to be run using a rigid ball or mandrel, it shall have a diameter equal to 95 percent of the inside diameter of the pipe. The test shall be performed without mechanical pulling devices. Pipe deflection shall be measured and recorded by the CONTRACTOR in the presence of the ENGINEER using appropriate methods approved by the pipe manufacturer and acceptable to the ENGINEER.

5. Repairs and Acceptance

- a. If the sewer fails to meet the requirements of the leakage and/or infiltration tests, the CONTRACTOR shall, at his own expense, determine the source of leakage and/or infiltration and make the necessary repairs or replacements.
- b. If any sewer fails to meet the requirements of the deflection test, the CONTRACTOR shall, at his own expense, replace all failed pipe as necessary to comply with the deflection requirements. All replacement pipe shall also be tested for deflection.
- c. On completion of sewer lines, all sewers and manholes will be inspected for foreign matter, including sand brought in by infiltration, and any such matter shall be removed before final acceptance of the lines. Any visible leakage at manholes or into lines shall be corrected regardless of the results of the required tests.

B. Drains and Storm Sewers

1. It is not the intent herein that drains and storm sewers shall be constructed watertight. If, however, groundwater flows are observed in the pipeline in fairly large quantities, the ENGINEER may require infiltration tests, as herein specified, to be completed in order to determine the amount of groundwater entering the completed pipeline. Should leakage result in a volume flow exceeding 500 gallons per inch diameter per mile of pipe per 24 hours, the CONTRACTOR shall be required to locate and repair leaks occurring in the system.
2. Culverts and cross drains shall be inspected visually for groundwater leakage.



40-2022 (02/2022)

### 3.06 BASIS OF PAYMENT

#### A. Excavation and Backfilling

##### 1. Trenching and Backfilling

###### a. Unit Price Contracts

- (1) On unit price Contracts, payment for trenching and backfilling shall be included in the price bid for furnishing, laying, trenching and backfilling sewer and/or drain pipe.
- (2) Where sewer lines and/or drain pipes are installed in bores or tunnels, no payment will be made for separate trench and backfill unit price items for the length of pipe installed in the tunnel or bore.
- (3) Where pipe is installed on piers no payment will be made for separate trench and backfill unit price items for the length of pipe exposed and supported by piers.

###### b. Lump Sum Contracts

- (1) The CONTRACTOR'S lump sum bid shall include all costs for trenching and backfilling.

##### 2. Solid Rock Excavation

###### a. Classified Excavation

- (1) Rock excavation shall be paid for at an extra unit price per cubic yard for extra cost of its excavation over that for excavating earth. Therefore, its quantity will not be subtracted from earth excavation quantities.

###### b. Unclassified Excavation

- (1) Excavation shall be unclassified and the cost of all excavation of whatever nature and state, including solid rock, shall be included in the CONTRACTOR'S unit price bid for each item of construction requiring excavation.

##### 3. Search and Extra Depth Trench Excavation

a. "Search" trench excavation shall be the actual measured excavation within limits as acceptable to the ENGINEER.

b. "Extra Depth" trench excavation shall be the calculated yardage below the lowest point of excavation which would normally have been required for construction.

- c. Trench width limitations for either condition shall be as listed in the following table:

For 6" Pipe 2'-6"	For 15" Pipe 2'-10"	For 27" Pipe 4'-0"
For 8" Pipe 2'-9"	For 16" Pipe 2'-11"	For 30" Pipe 4'-4"
For 10" Pipe 2'-9"	For 18" Pipe 3'-2"	For 33" Pipe 4'-9"
For 12" Pipe 2'-9"	For 20" Pipe 3'-5"	For 36" Pipe 5'-6"
For 14" Pipe 2'-9"	For 21" Pipe 3'-6"	For 42" Pipe 6'-0"
	For 24" Pipe 3'-8"	For 48" Pipe 6'-6"
		For 54" Pipe 7'-0"

- d. Payment shall be by the cubic yard removed, including backfilling.

4. Mechanical Tamping

- a. Mechanical tamping is defined as backfill placed and compacted by power driven mechanical equipment to a greater density than can be achieved by natural settlement or hand tamping methods. Mechanical tamping will be required when ordered by the ENGINEER with payment by the cubic yard so compacted. Measurement, but not actual extent of the mechanical tamping, shall be limited by the numerical maximum allowable trench width (for each size pipe) as shown in the table listed under "Search and Extra Depth Trench." Payment for mechanical tamping shall not include the specified haunching or initial backfill required above and below the top of pipe.

5. Crushed Rock Trench Backfill

- a. When crushed rock trench backfill is listed as a pay item on the Form of Proposal, payment for the crushed stone or accepted granular material will be made by the ton so placed limited to the following calculation:

- (1) Maximum trench widths (W) as shown in the following table:

40-2022 (02/2022)

For 6" Pipe 2'-6"	For 15" Pipe 2'-10"	For 27" Pipe 4'-0"
For 8" Pipe 2'-9"	For 16" Pipe 2'-11"	For 30" Pipe 4'-4"
For 10" Pipe 2'-9"	For 18" Pipe 3'-2"	For 33" Pipe 4'-9"
For 12" Pipe 2'-9"	For 20" Pipe 3'-5"	For 36" Pipe 5'-6"
For 14" Pipe 2'-9"	For 21" Pipe 3'-6"	For 42" Pipe 6'-0"
	For 24" Pipe 3'-8"	For 48" Pipe 6'-6"
		For 54" Pipe 7'-0"

- b. Quantity for payment shall be calculated by determining the ton(s) removed, including backfilling, with the following restrictions:
- (1) Depth (D) of cover less the previously specified initial backfill and less the top 6 inches of trench.
  - (2) Weight (Lb/cu ft) of crushed stone or approved granular material not to exceed 100 lbs/cu ft.
  - (3) Length (L) limited to 1 foot beyond edge of traffic area, or as directed by the ENGINEER.
  - (4)  $Q(\text{Tons}) = (W \times D \times L \times \text{lb/cu ft}) / (2000 \text{ lb/Ton})$   
Ex:  $(2.5' \times 3.0' \times 12.0' \times 100 \text{ lb/cu ft}) / (2000 \text{ lb/Ton}) = 4.5 \text{ Tons}$
- c. When crushed rock trench backfill is NOT listed as a pay item on the Form of Proposal, the cost of same shall be incorporated in the CONTRACTOR'S bid for trenching and backfilling.

## B. Tunneling, Boring or Jacking

### 1. Permanent Tunnels

- a. The payment for permanent tunnels shall be the length measured along its centerline from the entrance face on one side to the exit face on the other side. Payment per linear foot for each size tunnel shall include excavation, tunnel liner, pressure grouting, tunnel subgrade, closure plates and backfilling, complete.

### 2. Temporary Tunnels

- a. Payment for temporary tunnels shall be made per linear foot based on the measured distance along the centerline of tunnel from the entrance face on one side to the exit face on the other. Payment

40-2022 (02/2022)

shall include all excavation, backfilling and all sheeting and shoring of tunnel, regardless of whether removed.

3. Boring or Jacking

- a. In unit price Contracts, usable holes either bored or jacked shall be paid for per linear foot of hole actually bored or jacked, according to the diameter of the hole required, measured along the centerline from the point of entrance on one side to the point of exit on the other side. When cover pipe is installed inside the bore, boring or jacking and cover pipe shall be paid per linear foot based on the length of the cover pipe installed, according to the diameter of the cover pipe required.

C. Trench and Pipe Stabilization

1. Extra Excavation

- a. Extra excavation required for trench or pipe stabilization shall be paid by the cubic yard so excavated under the item "Search and/or Extra Depth Trench Excavation" based on the limitations for that item.

2. Crushed Stone for Trench Stabilization

- a. Crushed stone ordered by the ENGINEER for trench stabilization shall be paid by the ton so placed.

3. Crushed Stone for Pipe Bedding

- a. Additional crushed stone bedding ordered by the ENGINEER for pipe stabilization shall be paid by the ton so placed.

4. Plain or Reinforced Concrete Arch

- a. Plain or reinforced concrete arch called for on the Drawings and/or ordered by the ENGINEER shall be paid for by the linear foot of pipeline upon which it is placed. The Form of Proposal will indicate which method is to be used.

5. Plain or Reinforced Concrete Cradle

- a. Plain or reinforced concrete cradle called for on the Drawings and/or ordered by the ENGINEER shall be paid for by the linear foot so placed.

D. Sewer and Drain Pipe and Accessories

1. Unit Price Contracts

a. Sewer and Drain Pipe

- (1) Except where otherwise specified hereinafter, sewer and drain pipe laid shall include furnishing, laying, trenching and backfilling (all depths), and shall be paid for by the linear foot of sewer or drain line measured from center to center of manholes, transition in type of pipe, or junction fittings to ends of pipe. In case of transition of type of pipe at manhole, transition in pay will be at center of manhole.
- (2) Where sewer lines and/or drain pipes are installed in bores or tunnels, pipe shall be paid for by the linear foot of sewer and/or drain pipe furnished and installed, in permanent tunnel, tunnel liner, temporary tunnel, boring or jacking, and/or cover pipe.
- (3) Sewer lines and/or drain pipes installed on piers shall be paid for by the linear foot of sewer and drain pipe furnished and installed on piers.
- (4) In case of drainage structures other than manholes, measurement of pipe will end at the inside wall of the structure.

b. Sewer Laterals

- (1) Payment for sewer laterals, including furnishing, laying, trenching, and backfilling (all depths), shall be per linear foot measured from the branch fitting to end of pipe and shall include the cost of furnishing, laying, and plugging the end of the lateral and the required detectable mylar tape.
- (2) Laterals consisting of fittings only and in the case of connecting to existing sewers with not more than 6 feet of pipe, no furnishing, laying, trenching, and backfilling payment for sewer pipe will be included.

c. Sewer Branch Fittings

- (1) Wye or tee branches for sewer laterals will be paid per each unit installed.

d. Concrete Encasement of Wye or Tee Branches

- (1) At locations where a vertical stack is to be installed on the sewer lateral, the wye or tee branch shall be encased in concrete with payment for same made for each branch encased.

40-2022 (02/2022)

2. Lump Sum Contracts

- a. All work shall be included in the CONTRACTOR'S lump sum bid.

E. Temporary Surface Replacement

1. The amount of crushed stone placed shall be paid for at the unit price per ton up to the maximum limits of 225 pounds per linear foot of trench over which it is placed for pipe sizes through 16 inches, 300 pounds per linear foot for pipe sizes 18 through 24 inches and 400 pounds per linear foot for sizes 27 inches through 48 inches. The ENGINEER shall have control of thickness and width to be placed and paid for, and may order changes in depth and width as conditions dictate. No payment will be made for crushed rock surfacing required as a result of unnecessarily wide trenches, omission of sheeting and shoring, or damage by the CONTRACTOR'S equipment, or for maintenance of surface level.

**END OF SECTION**

\*\*\*

**SECTION 02830**

**FENCING**

**PART 1 GENERAL**

**1.01 SCOPE OF WORK**

- A. Provide all labor, materials, equipment and services required to install fencing as shown on the Contract Drawings and as specified herein.

**1.02 RELATED WORK**

- A. Special sequence or schedule requirements (if any) are specified in Section 01010 - Summary of Work.
- B. Concrete is specified in Division 3.

**1.03 QUALIFICATIONS**

- A. The fencing shall be furnished and installed by a manufacturer and supplier who are reputable and qualified in the design, fabrication, and installation of fencing in accordance with best practices and methods.

**1.04 SUBMITTALS**

- A. Shop drawings and other items needed to establish compliance with the Drawings and these Specifications shall be submitted to the ENGINEER in accordance with Section 00700.

**1.05 SYSTEM WARRANTY**

- A. Refer to Division 0 and 1 for warranty requirements.

**PART 2 PRODUCTS**

**2.01 SECURITY FENCING**

**A. General**

- 1. Fencing shall be woven wire, chain link type, and shall be 8 feet high overall. Fabric shall be 7 feet high with 1 foot of height of 3-strand barbed wire overhanging outside at a 45 degree angle.

**B. Fittings**

- 1. All fittings necessary to make a complete installation shall be malleable iron, pressed steel, aluminum or forgings. All ferrous materials shall be thoroughly galvanized by the hot dip method as specified in ASTM A 525-81.

**TABLE 1**  
**CHAIN LINK FRAMEWORK TABLE**  
**(Schedule 40)**

Size Pipe	Weights Lbs. Per Ft.	Depth	Concrete Diameter
1 5/8" O.D.	2.27 lbs.		
2" O.D.	2.72 lbs.		
2 1/2" O.D.	3.65 lbs.	30"	10 Inches
3" O.D.	5.79 lbs.	3 Ft.	12 Inches
4" O.D.	9.11 lbs.	3 Ft.	12 Inches
6 5/8" O.D.	8.97 lbs.	4 Ft.	14 Inches
8 5/8" O.D.	5.00 lbs.	4 Ft.	16 Inches

**C. Corner, Terminal and Pull Posts**

1. Corner, terminal and pull posts shall be hot galvanized inside and outside at a rate of 2.0 oz per square foot of actual surface area. The 3-inch outside diameter seamless steel pipe shall weigh 5.79 pounds per foot and extend 3 feet below ground level. The posts shall extend high enough to allow attachment of barbed wire by 3 tension bands equally spaced to give a uniform appearance. All posts shall be capped with a heavy malleable iron top, of bullet type construction, to exclude moisture.
2. SS-40 pipe, as manufactured by Allied Tube and Conduit Corp. or equal, may be substituted for Schedule 40 pipe. The SS-40 pipe sizes may be less than the Schedule 40 sizes but shall have greater strength.

**D. Line Posts**

1. Line posts shall be 2-1/2 inch diameter high carbon seamless steel pipe, hot galvanized inside and outside at a rate of 2.0 oz per square foot of actual surface area. The 2-1/2 inch pipe shall weigh 3.65 lbs per foot and extend 30 inches below ground level. Line posts shall be capped with a barbed wire extension arm as specified herein.
2. SS-40 pipe, as manufactured by Allied Tube and Conduit Corp. or equal, may be substituted for Schedule 40 pipe. The SS-40 pipe sizes may be less than the Schedule 40 sizes but shall have greater strength.

**E. Gate Posts**

1. The posts shall be in conformance with the "Gate Post Schedule" and shall be capped with a heavy malleable iron top, of bullet type construction to exclude moisture. Gate posts shall be coated inside and outside with hot galvanized at a rate of 2.0 oz per square foot of surface area. Posts will extend high enough to allow attachment of barbed wire by 3 tension bands equally spaced to give a uniform appearance.



2. Gate Post Schedule

<u>Single Gates</u>	<u>Double Gates</u>	<u>Schedule 40</u>
Up thru 5'	Up thru 10'	3" O.D.
Over 5' thru 8'	Over 10' thru 16'	4" O.D.
Over 8' thru 12'	Over 16' thru 24'	6 5/8" O.D.
Over 12' thru 18'	Over 24' thru 36'	8 5/8" O.D.

3. SS-40 pipe, as manufactured by Allied Tube and Conduit Corp. or equal, may be substituted for Schedule 40 pipe. The SS-40 pipe sizes may be less than the Schedule 40 sizes but shall have greater strength.

F. Rails

1. Top rails and brace rails shall be 1-5/8 inch outside diameter seamless steel tubing, weighing 2.27 pounds per foot, hot galvanized at a rate of 2.0 oz. per square foot of actual surface area. Rails shall be not less than 20 feet in length jointed with extra long pressed steel sleeves as specified herein.
2. SS-40 pipe, as manufactured by Allied Tube and Conduit Corp. or equal, may be substituted for Schedule 40 pipe. The SS-40 pipe sizes may be less than the Schedule 40 sizes but shall have greater strength.

G. Fabric

1. The fabric shall be aluminum coated steel to meet ASTM A 491-80 composed of individual wire pickets, helically wound and interwoven from No. 9 gauge steel wire to form a continuous chain link fabric having a 2-inch mesh. Both the top and bottom edges shall be twist construction. Basic steel wire shall conform to the following:

Carbon	.18 - .31
Manganese	.60 - .90
Phosphorous	.040 Max.
Sulphur	.050 Max.

2. The aluminum coating weight shall be a minimum of 0.40 ozs per square foot of wire surface. The breaking strength of the aluminum coated wire shall be a minimum of 1,290 ft-lbs

H. Gates

1. Swing frames shall be 2 inches outside diameter galvanized seamless steel pipe weighing 2.72 lbs per foot, corners fitted with rigid watertight heavy malleable iron castings or electrically welded joints. Internal bracing shall be of 1-5/8 inch outside diameter galvanized seamless steel pipe weighing 2.27 lbs per foot.

40-2022 (02/2022)

2. SS-40 pipe, as manufactured by Allied Tube and Conduit Corp. or equal, may be substituted for Schedule 40 pipe. The SS-40 pipe sizes may be less than the Schedule 40 sizes but shall have greater strength.
  3. Fabric - See 2.01.G this Section.
  4. Gate hinges shall be double clamping offset type allowing gates to swing back parallel with line of fence. They shall be of malleable iron and forged steel heavily galvanized.
  5. Gate latches shall be of the eccentric double locking type which engage the strikes securely bolted to either gate frame or gate post at both the top and bottom. In the case of double gates, latches shall also engage a heavy malleable iron non-freezing gate stop anchored in concrete footing. Latches shall be equipped for locking with padlock.
  6. Gate keepers shall be furnished with each gate frame to automatically engage gate frame when swung to open position.
  7. Barbed wire shall be 3 strands each of two No. 12-1/2 gauge twisted copper bearing steel line wires, hot dipped aluminum per ASTM A 585-81 for Class II coating. The weight of the coating shall be 0.30 oz per square foot of surface area. The barbs shall be No. 14 gauge aluminum 4-point barbs, spaced not more than 4 inches apart.
  8. Gate Posts - See 2.01.E this Section.
- I. Chain Link Special Appurtenances (Per ASTM F 626-79)
1. Each line post shall be capped with a hot dipped galvanized barbed wire extension arm capable of passing top rail. The arm shall be of pressed steel riveted to a malleable iron base at a 45 degree angle for carrying three strands of barbed wire.
  2. Brace and tension bands shall be beveled edge type fabricated from pressed steel or aluminum. Steel bands shall be hot dipped galvanized with a minimum of 1.2 oz of zinc coating per square foot of surface area. Brace bands shall be a minimum of 12 gauge in thickness and a minimum width of 3/4-inch or 19.05 mm. Tension bands shall be a minimum of 14 gauge with a minimum of 3/4-inch or 19.05 mm in width.
  3. All post caps and rail ends shall be designed to fit snugly over post and prevent moisture from entering the inside of the tube. Post caps shall be fabricated from malleable iron, pressed steel or aluminum. Line post caps shall be designed to allow top rail to pass through. All ferrous materials shall be thoroughly galvanized by the hot dip method with a minimum of 1.2 oz of zinc coating per square foot of surface area.
  4. Top rail sleeve shall be fabricated from pressed steel or round steel tubing. Sleeve shall be hot dip galvanized with a minimum of 1.2 oz. of zinc coating per square foot of surface area. The design of the sleeve

40-2022 (02/2022)

shall be such that no movement along the rail can take place upon installation.

5. Tension bars for attaching fabric to terminal post shall be a minimum of 3/16-inch thickness by 3/4-inch in width. The length shall be a minimum of 2 inches less than the full height of the chain link fabric.
6. Truss rods shall be a minimum of 5/16 inch in diameter fabricated from merchant quality steel rod and hot dip galvanized with a minimum of 1.2 oz of zinc coating per square foot of surface area. All rods shall be designed and equipped with a truss tightener.
7. Aluminum ties shall be used for attaching fabric to top rail, brace rails and line post. The aluminum ties shall be 9 gauge round wire of Alloy 1100-H 14 or equal.
8. Carriage bolts shall be hot dip galvanized or aluminum, 5/16-inch x 1-1/4 inch, with nut and shall be used in conjunction with brace and tension bands. Galvanized bolts and nuts shall be coated in accordance with ASTM A 153-80. Larger bolts as required at gates or latches shall be galvanized coated in accordance with ASTM A 153-80.

## 2.02 FARM WIRE FENCING

### A. General

1. Fencing shall be farm type fabric with 2 strands of galvanized barbed wire stretched between 9-inch diameter treated pine corner and/or pull posts set in concrete. Intermediate or line posts shall be 5-1/2 inch diameter treated pine post or standard painted steel tee section post spaced on 8-foot centers. Every third post shall be a 5-1/2 inch diameter treated pine post. The corner posts shall be braced from the center of corner posts to the center of a 6-inch diameter treated pine brace post located 8 feet from the corner post. Bracing shall be provided with a 4-inch diameter treated pine post keyed and doweled in place. Cross bracing shall be accomplished with 3 strands of No. 9 gauge galvanized brace wire wrapped from top of brace post to bottom of corner post. The tensioning adjustment shall be made with an extra heavy galvanized turnbuckle attached to a 3/4-inch eye bolt through the 9-inch corner post. The brace wire shall be tightened to a taut position and locked in place by a method acceptable to the ENGINEER.
2. Layouts of fencing and gate are as shown on the Drawings. Copies of shop drawings and descriptive literature of fencing materials shall be submitted to the ENGINEER for review and acceptance prior to the use of materials.

40-2022 (02/2022)

B. Material

1. Fence fabric shall be farm type 1047-6-9, 10 wires horizontal, 47 inches high, 6-inch stays with No. 9 gauge wire throughout with Class 2 (0.60 oz/ft) galvanized coating per ASTM A 116-81.
2. Barbed wire shall be 2 strands each of two No. 12-1/2 gauge twisted copper bearing steel wires, hot galvanized after weaving, with No. 14 gauge aluminum 4 point barbs spaced not more than 4 inches apart. The zinc coated (galvanized) steel barbed wire shall be produced and tested in accordance with ASTM A 121-81 for Class 2 coating (0.50 oz per ft).
3. Wood line posts shall be 5-1/2 inches diameter x 7 feet-6 inches long pressure treated pine in accordance with the American Wood Preserver's Association Standard C5-81.
4. Steel line post shall be the standard painted steel tee section, 7 feet-6 inches long, with hooks to clasp wire.
5. Corner posts shall be 9 inch diameter x 9 feet long pressure treated pine in accordance with the American Wood Preserver's Association Standard C5-81.
6. Farm gate shall be made of tubular construction from 1-1/2 inch O.D. pregalvanized pipe, 50 inches in height with 7 bars horizontally with spacing being closer toward the bottom.

2.03 FARM PLANK FENCING

A. General

1. Fencing shall be farm type, 4 board treated rough oak planks, treated wood posts (40 penetration) set on 7.81-foot (7-foot-10-inch) centers with a treated wood batten at each post. The fence shall be 54 inches in height with a 7-inch gap between each board. The layout of the fence line and gates shall be as shown on the Drawings.

B. Material

1. All posts shall be 5-1/2 inch diameter, 7 feet-6 inches long pressure treated to 0.40 penetration (min.) in accordance with the American Wood Preserver's Association Standard C5-81. All posts shall be uniform without bows or crooks. The ENGINEER reserves the right to reject any post not meeting the above stated requirements.
2. Planks shall be rough cut oak with the minimum dimensions of 6 inches wide, 1 inch thick and running 16 feet in length, pressure treated to 0.40 penetration per requirements established by the American Wood Preserver's Association C5-81.

40-2022 (02/2022)

3. Post bats shall be used at each post to cover joints. The bat shall be flush with the top of top plank and extend 2 inches below bottom plank of fence. Bats shall meet the same quality requirements for wood and preservatives as specified for planks.

### **PART 3 EXECUTION**

#### **3.01 DELIVERY, STORAGE AND HANDLING**

- A. Special provisions for material and equipment are given in Section 01600.

#### **3.02 SITE PREPARATION**

- A. The location of fence lines, gates and terminal posts shall be as shown on the Drawings. Prior to construction the CONTRACTOR shall locate and flag all underground utilities in or about the fence construction. Adequate clearing and grading shall be done prior to fence construction.

#### **3.03 SECURITY FENCE INSTALLATION**

##### **A. Posts**

1. All posts shall be set 10 feet or less on centers equally spaced between pull posts in a hole filled with concrete as required per Table 1. All concrete shall be left 2 inches below grade to allow for cover with sod, blacktop or other cover material. Posts shall be accurately lined and plumbed. Intermediate pull posts with bracing shall be equally spaced when a straight run becomes greater than 300 feet in length. If solid rock is encountered, excavation shall be at no extra cost to the OWNER.

##### **B. Terminal, Gate, Pull and Corner Post Bracing**

1. A center rail is required with horizontal braces and truss rod to adjacent line post, securely fastened with adequate adjustment.

##### **C. Top Rail**

1. The top rail shall run through the openings in the line post tops on a continuous grade uniformly parallel with the ground surface. Connection to the corner, gate, terminal and pull posts shall be with brace bands and rail ends. Offsets at corners will not be permitted.

##### **D. Fabric Stretching**

1. Two stretcher bars shall be threaded through the fabric from top to bottom at a location in the center of the fence section to be stretched. The bars shall be adequately spaced such that when stretched the installer has room to thread a loose picket link down through the meshing links of the 2 ends to make a perfect jointing. The stretching shall be done with 2 blocks and when released the fabric shall be taut along any point of the fence line. The top selvage shall be dressed above the top

40-2022 (02/2022)

rail and the fabric secured with tie wires spaced not more than 24 inches apart and uniformly tied. The fabric shall be fastened to the line posts with specified tie wires spaced not more than 14 inches on center uniformly tied.

E. Barb Wire Stretching

1. Block and tackles and come along shall be used to string barbed wire. Wire shall be placed in the openings provided in the barb arms, and locked in place by sliding the locking wire down inside the V-channel and over the barbed wire.

F. Repair of Galvanized Surfaces

1. Galvanized surfaces damaged by welding or other reasons shall be repaired according to Federal Specification MIL-P-21035 (Galvanizing Repair Spec.) as follows:
  - a. Remove foreign matter from both damaged and contiguous undamaged area by wire brushing and cleaning with metal conditioner recommended by cold galvanizing coating manufacturer.
  - b. Apply 2 coats of cold galvanizing coating to damaged area, ensuring an overlap of the surrounding undamaged galvanizing for continuity of galvanic protection. Cold galvanizing coating shall be Z.R.C. Chemical Products Co., "Z.R.C. Cold Galvanizing" or Galvicon Corp., "Cold Galvanizing," or equal.

3.04 FARM WIRE FENCING INSTALLATION

A. Corner Posts

1. Corner posts shall be placed, true to line and plumb at least 36 inches in the ground in concrete according to the concrete requirements shown in Table 2 in this group of the Specifications. All corner posts shall be braced to the first line post or brace post. This post shall be a standard specified 6-inch diameter wood post set in concrete in accordance with Table 2 of this group of the Specifications. Bracing shall be with a 4-inch diameter post keyed and doweled from center of corner post to the center of brace post. Wire cross bracing shall be with 3 strands of No. 9 gauge galvanized brace wire wrapped from bottom of corner post to top of brace post. Adjustment on the brace wire shall be with an extra heavy galvanized turnbuckle attached to a 3/4-inch eye bolt through the 9-inch corner post. The brace wire shall be tightened to a taut position and locked in place.

B. Line Posts

1. All line posts shall be placed on 8 foot centers at least 30 inches in the ground true to line and plumb. Wood line posts shall be either driven into

place or set in an augered hole. If augered, the hole shall be backfilled with dense graded aggregate (DGA), and hand tamped until post is tight. Mechanically tamped earth backfill will also be acceptable. Steel line posts shall be driven into place by an acceptable method which prevents damage to post.

C. Gate Posts

1. Gate posts shall be placed true to line and plumb at least 36 inches in the ground and set in concrete in accordance with concrete requirements per Table 2 of this group of the Specifications. All gate posts shall be braced back to first line post or brace post. This post shall be a 6-inch diameter treated wood post set in concrete. Bracing shall be with a 4-inch diameter post keyed and doweled from bottom of gate post to top of brace post. Wire bracing shall be with 3 strands of No. 9 gauge galvanized wire wrapped from bottom of corner post to top of brace post. Adjustment on the brace wire shall be with an extra heavy galvanized turnbuckle attached to a 3/4-inch eye bolt which shall be bolted through the 9-inch corner post. The brace wire shall be tightened to a taut position and locked in place.

D. TABLE 2: Concrete Requirements for Corner, Brace and Gate Posts

<u>Description</u>	<u>Depth</u>	<u>Concrete Dia.</u>
9" Corner Post	3 Ft.	16 Inches
6" Brace Post	3 Ft.	12 Inches
9" Gate Post	3 Ft.	16 Inches
9" Pull Post	3 Ft.	16 Inches

E. Fabric

1. Fence fabric shall be stretched taut between corner posts, intermediate pull posts and/or gate posts. No splicing will be permitted. Fabric shall connect to corner posts, pull posts or gate posts by wrapping the horizontal wire strands twice around post before connecting to line fabric. Fabric shall be fastened to wood line post with 1-1/4 inch staples at a rate of 1 per horizontal strand. Wire hooks or ties shall be used to secure fabric to steel line posts.

F. Hanging Gates

1. Gates shall be swung plumb and level and high enough to prevent dragging. Latches shall be properly fitted and firmly secured to posts. Means shall be provided for latching as well as retaining gate in the open position.

40-2022 (02/2022)

G. Barbed Wire Stretching

1. The 2 strands of barbed wire shall be stretched to accepted tension with stretchers specifically manufactured for that purpose. All strands shall be double stapled to each wood line post and tied at each steel line post. OWNER may require at no extra cost, for strands of barbed wire to be alternated on each side of posts.

3.05 FARM PLANK FENCING INSTALLATION

A. Posts

1. All posts shall be placed at least 30 inches in the ground true to line and plumb on 7.81-foot (7-foot-10-inch) centers. Posts shall be either driven in place or set in augered hole. If augered, each hole shall be backfilled with dense graded aggregate (DGA) hand tamped until post is tight. Mechanically tamped earth backfill will also be acceptable.

B. Planks

1. Plank ends shall be trimmed where cracking exists. Top plank or top rail shall be installed first by temporarily tacking in order to check alignment. Adjustment shall be made if a smooth flowing fence is not attained. Once the top rail has been installed to the ENGINEER'S satisfaction the CONTRACTOR shall install the remaining 3 planks. Each board shall be nailed with three #10 screw type nails per post.
2. The battens shall be placed at each post to cover post and plank joints. They shall be flush with top rail and be nailed with #10 screw type nails, 2 at the top, 2 at the bottom and 2 in the middle.

3.06 CLEANUP

- A. CONTRACTOR is responsible for removal of all excess material, earth, etc. due to fence construction.
- B. Earth shall be slightly mounded around each post to enhance drainage.

3.07 METHOD OF PAYMENT

- A. Payment for all fencing work under this Contract shall be included in the CONTRACTOR's lump sum price, unless otherwise specified on the bid form and in the Contract Agreement.

**END OF SECTION**

\*\*\*

Fencing  
02830-10



**SECTION 03301**  
**CAST-IN-PLACE CONCRETE**  
**(MINOR STRUCTURES)**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This specification delineates the requirements for cast-in place concrete for minor structures including concrete kickers for pipe blocking, sidewalks, collars, manholes, manhole bottoms, pipe cradles, piers and other areas where small quantities of concrete are required. It shall not be used for major structures such as floor slabs, structure or basin walls, roof slabs, or other structural components.

**1.02 SCOPE OF WORK**

- A. Provide all labor, material, equipment and services to complete all cast-in-place concrete work required by the Project as shown on the Drawings or specified herein.

**1.03 REFERENCES**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 185	Specification for Steel, Welded Wire, Fabric, Plain, for Concrete Reinforcement
ASTM A 497	Specification for Welded Deformed Steel Wire Fabric for Concrete Reinforcement
ASTM A 615/A615M	Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 616/A616M	Specification for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 617/A617M	Specification for Axle-Steel Deformed and Plain End Bars for Concrete Reinforcement
ASTM A 706/A706M	Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement
ASTM C 33	Specification for Concrete Aggregates
ASTM C 150	Specification for Portland Cement

40-2022 (02/2022)

ASTM C 260 Specification for Air-Entraining Admixtures for Concrete

ASTM C 494 Specification for Chemical Admixtures for Concrete

#### 1.04 SUBMITTALS

- A. Copies of all materials required to establish compliance with these Specifications shall be submitted in accordance with the provisions of the General Conditions.

#### 1.05 QUALITY ASSURANCE

- A. All work shall be performed to secure for the entire job homogeneous concrete having required strength, durability and weathering resistance, without planes of weakness and other structural defects and free of pronounced honeycombs, air pockets, voids, projections, offsets of plane and other defacements on exposed surfaces.

#### 1.06 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver ready-mixed concrete to job site until ready for placement.
- B. All materials used for on-site mixed concrete shall be kept clean and free from all foreign matter during transportation and handling and kept separate until measured and placed in the mixer.
- C. Store concrete aggregates to prevent contamination or segregation. Store reinforcement of different sizes and shapes in separate piles or racks raised above the ground to avoid excessive rusting.
- D. Protect from contaminants such as grease, oil and dirt. Provide for accurate identification after bundles have been broken and tags removed.

#### 1.07 PROJECT/SITE CONDITIONS

##### A. Cold Weather

- 1. Provide and maintain 50 degrees Fahrenheit minimum concrete temperature. Do not place concrete when ambient temperature is below 40 degrees Fahrenheit. Cover concrete and provide with a source of heat sufficient to maintain 50 degrees Fahrenheit minimum while curing.

##### B. Hot Weather

- 1. Concrete temperature from initial mixing through final cure shall not exceed 90 degrees Fahrenheit. Cool ingredients before mixing, or substitute chip ice for part of required mixing water or use other suitable means to control concrete temperature to prevent rapid drying of newly placed concrete. Shade the fresh concrete and start curing as soon as the surface is sufficiently hard to permit curing without damage.

40-2022 (02/2022)

## PART 2 PRODUCTS

### 2.01 CONCRETE

#### A. Mix Design

1. The concrete mix shall conform to the requirements of the following table according to the class of concrete required. The number in the "Class" column refers to the 28-day compressive strength of the concrete in pounds per square inch (psi).

Class	Minimum Cement Content (Lbs./Cu. Yd.)	*Maximum Slump (Inches)
3000	470	3 to 4
3500	520	3 to 4
4000	550	3 to 4

\* Maximum slump unless high range water reducing admixture is used.

#### B. Area of Application

1. Unless otherwise noted on the Drawings, concrete mixes shall be used as follows:

Class 3000 - kickers for pipe, fittings

Class 3500 - non-reinforced portions of manholes, pipe cradles

Class 4000 - reinforced portions of manholes, sidewalks, piers

### 2.02 MATERIALS

#### A. Cement

1. Portland cement for concrete and mortar shall conform to ASTM C 150, Type I or II.

#### B. Water

1. Water shall be potable.

#### C. Aggregates

1. Aggregates shall conform to ASTM C 33. Obtain aggregates from one source. Aggregates shall not contain any substance which may be deleteriously reactive with the alkalis in the cement.

#### D. Admixtures

1. Admixtures for air-entrained concrete shall conform to ASTM C 260, for water reducing (Type A, D or E) accelerating (Type C) and retarding (Type B or D) ASTM C 494. Calcium chloride shall not be used as an admixture.

40-2022 (02/2022)

Admixtures shall not be used without prior written approval of the ENGINEER.

**E. Reinforcement**

**1. Reinforcing Bars**

- a. Reinforcing bars shall conform to ASTM A 615/A615M Grade 60, ASTM A 616/A616M Grade 60, ASTM A 617/A617M Grade 60 or ASTM A 706/A706M Grade 60 as applicable.

**2. Welded Wire Fabric**

- a. Welded wire fabric shall conform to ASTM A 497 or ASTM A 185.

**PART 3 EXECUTION**

**3.01 FORMS**

- A. Forms shall be used to confine concrete and shape it to the required dimensions. Set forms true to line and grade and make mortar tight. Chamfer above grade exposed joints, edges and external corners 3/4-inch, unless otherwise indicated. Earth cuts may be used as forms for footing vertical surfaces, if sides are sharp and true, and not exposed in finished structure.

**3.02 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS**

- A. Provide bars, wire fabric and other reinforcing materials, including wire ties, supports and other devices necessary to install and secure the reinforcement.

**3.03 CONTROL AND CONSTRUCTION JOINTS**

- A. For sidewalks, provide control joints spaced at an interval equal to the width of the sidewalk, the minimum spacing of 5 feet. Cut joints 1 inch deep with a jointing tool after the surface has been finished. Provide 0.5-inch thick transverse expansion joints at changes in direction, where sidewalk abuts curb, steps, rigid pavement or other similar structures; space joints not more than 40 feet apart. Limit variation in cross section to 1/4-inch in 5 feet.

**3.04 CURING AND PROTECTION**

- A. Protect concrete from injurious action by sun, wind, rain, flowing water or mechanical injury. Do not allow concrete to dry out from time of placement until the expiration of the curing period. Forms may be removed 48 hours after concrete placement.

**END OF SECTION**

\*\*\*

**SECTION 05520**  
**METAL FABRICATIONS**

**PART 1 GENERAL**

**1.01 SCOPE OF WORK**

- A. Provide all labor, materials, and equipment required to construct and install metal fabrications as shown on the Drawings and specified herein. Included in this section are handrails, grating, nuts, bolts, anchors, hatches, ladders, and stairs.

**1.02 RELATED WORK NOT INCLUDED**

- A. Concrete work is included in Division 3.
- B. Castings are included in Division 5, Section 05540.

**1.03 QUALITY ASSURANCE**

- A. All fabricated materials shall be of the highest quality, free of structural, handling, and workmanship defects.
- B. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

**1.04 SUBMITTALS**

**A. Shop Drawings**

- 1. The CONTRACTOR shall submit to the ENGINEER in accordance with Division 1, Section 00700 detailed shop drawings of all materials to be fabricated, and shall receive the ENGINEER's certification of review before fabrication. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor bolt installation by others. Include any requirements for surface preparation, paint products, or grout.
- 2. Where materials or fabrications are indicated to comply with certain requirements for design loadings, include structural computations, material properties and other information needed for structural analysis. This shall not relieve the CONTRACTOR of responsibility for all errors, omissions, and deviations of his shop drawings from the Drawings and Specifications and from requirements of final results called for in the Drawings and Specifications.

40-2022 (02/2022)

B. Samples

1. The CONTRACTOR shall submit 2 sets of representative samples of materials and finished products as may be requested by the ENGINEER, or as specified herein.

**PART 2 PRODUCTS**

2.01 MATERIALS

A. Steel

1. Steel fabrication shall be done in conformity with the "AISC Load and Resistance Factor Design Specification for Structural Steel Buildings," Second Edition dated December 1, 1993, latest revision.
2. Prime and paint in accordance with Division 9, unless otherwise required or permitted.
3. Unless otherwise noted on the Drawings or in the Specifications, galvanizing shall be by hotdip process in accordance with ASTM A 525-93, Coating Designation G90 (previous Coating Class Commercial 1.25 oz per sq ft).
4. Damaged zinc coating shall be repaired according to Federal Specification DOD-21035A (Galvanizing Repair Spec.) and ASTM A 780-93a as follows:
  - a. Remove foreign matter from both damaged and contiguous undamaged area by wire brushing and cleaning with metal conditioner recommended by cold galvanizing coating manufacturer.
  - b. Apply 2 coats of cold galvanizing coating to damaged area, ensuring an overlap of the surrounding undamaged galvanizing for continuity of galvanic protection. Cold galvanizing coating shall be Z.R.C. Chemical Products Co., "Z.R.C. Cold Galvanizing" or Galvicon Corp., "Cold Galvanizing," or equal.

B. Aluminum

1. Aluminum shall have a high resistance to corrosion and shall be Alloys 6061-T6, 6062-T6, 6063-T5, 6063-T6, or 6105-T5 for wrought products such as rods, bars, standard structural shapes, extrusions, and forgings; and Alloy 214 for castings, or equal.
2. Aluminum fabrication shall be in accordance with ASCE the Aluminum Association "Specifications for Aluminum Structures," latest revision. Welding shall be done by the argon-shielded tungsten-arc method or the automatic or semi-automatic argon-shielded consumable-electrode method, or equal. Welding rods and electrodes shall be in strict accordance with above specifications.

40-2022 (02/2022)

3. Where anodic coating is required and type is not specified or shown on the Drawings, coating shall be Class II Clear (204-R1). Anodic coatings shall conform to the following requirements:
  - a. Clear Anodic Coatings
    - (1) Class II Clear (204-R1) (0.4 Mil Coating)
      - (a) The exposed surfaces of aluminum shall be cleaned of all fabricating oils and foreign matter, given a medium caustic etch pretreatment.
    - (2) Class I Clear (215-R1) (0.7 Mil Coating)
  - b. Color Anodic Coatings
    - (1) All aluminum parts (both extrusion and sheet stock) shall be of a controlled aluminum alloy and temper suitable for receiving an electrochemically produced hard anodic oxide coating. All aluminum parts (both extrusion and sheet stock) shall receive a caustic etch pretreatment to remove all surface foreign matter followed by an electrochemically produced anodic oxide coating having a minimum coating thickness of 0.7 mil. Color shall be specified by the OWNER and range samples shall be submitted to establish the upper and lower limits of color variations.

## 2.02 HANDRAILS AND TOEBOARDS

### A. General

1. All handrail components and systems shall meet the requirements of Kentucky OSHA Standards for General Industry, ADAAG, and the Kentucky Building Code.
2. Handrail shall be the product of a company normally engaged in the manufacture of pipe railing.
3. Toeboards shall be provided on handrails as required by OSHA and as shown on the Drawings. (Examples of required locations are walkways, platforms, runways, and wherever tools, machine parts or materials are likely to be stored or fall to the next lower level.)
4. Openings in the railing shall be guarded by a self-closing handrail gate.
5. Handrail and toeboard finish shall be Aluminum Association M10-C22-A41 (215-R1). The pipe shall be plastic wrapped. The plastic wrap is to be removed after erection.

40-2022 (02/2022)

6. Aluminum surfaces in contact with concrete, grout or dissimilar metals shall be protected with a coat of bituminous paint or zinc chromate paint, mylar isolators, or other approved material.
7. The ENGINEER may request a vertical post sample. The sample shall include top and intermediate rail connections and base flange connection.
8. Shop drawing submittals shall include verification that all components, including base flanges, side mounting assemblies and anchor bolts, will meet required strength capacities. Anchorages shall be identical to those shown on the Drawings.
9. Acceptable manufacturers:
  - a. Thompson Fabricating Company - Tuf Rail
  - b. Hollaender Manufacturing Company - Interna-Rail
  - c. A manufacturer providing an acceptable equivalent product.

**B. Standard Aluminum Handrail**

1. Handrail posts spacing shall be a maximum of 6 feet 0 inches. Posts and railings shall be 1-1/2 inch diameter Schedule 40 aluminum pipe alloy 6061-T6, 6063-T6, or 6105-T5. The manufacturer shall show that their posts are of adequate strength to meet the loading requirements. If the manufacturer's posts are not of adequate strength, the manufacturer may reduce the post spacing or add reinforcing dowels or may do both in order to meet loading requirements.
2. Handrails and stair rails shall be designed to withstand a 200 lb concentrated load applied in any direction at any point on the top rail. Handrails and stair rails shall also be designed to withstand a load of 50 lb/ft applied horizontally to the top rail. The 200 lb load will not be applied simultaneously with the 50 lb/ft load. In addition, the handrails shall be designed to withstand a load of 100 lb/ft applied vertically downward to the top rail and simultaneously with the 50 lb/ft horizontal load. The 100 lb/ft vertical load does not apply to stair rails.
3. The manufacturer shall submit calculations to the ENGINEER for review. Testing of base castings or base extrusions by an independent laboratory or manufacturer's laboratory (if manufacturer's laboratory meets the requirements of the Aluminum Association) will be an acceptable substitute for calculations. Calculations will be required for approval of all other design aspects.
4. The handrail shall be made of pipes joined together with component fittings. All components must be mechanically fastened with stainless steel hardware. Components that are pop-riveted or glued at the joints will not be acceptable.



40-2022 (02/2022)

5. Posts shall not interrupt the continuation of the top rail at any point along the railing, including corners and end terminations. The top surface of the top railing shall be smooth and shall not be interrupted by projecting fittings.
6. Standard fasteners into concrete shall be 1/2-inch x 6-3/8 inch minimum embedment, AISI 304 stainless steel adhesive anchors. Anchor bolts shall be furnished by the handrail manufacturer.
7. Toeboard shall conform to OSHA standards. Toeboard shall be 4 inches high and shall be an extrusion that attaches to the posts with clamps which will allow for expansion and contraction between posts. Toeboard shall be set 1/4-inch above the walking surface.

#### C. Aluminum Fence Handrail

1. Handrail post and components shall meet the same requirements as for Standard Aluminum Handrail, Section 2.02 A and Section 2.02 B of these specifications.
2. Chain link fence fabric shall be made of aluminum alloy wire 6061-T6 ASTM B-221. The minimum tensile strength of the wire after weaving shall be 50,000 psi. The chain link fabric shall be made from 9 gauge wire helically wound and interwoven in such a manner as to provide a continuous 2 inch mesh without knots or ties except in the form of knuckling.
3. Tension rods or tension bars to attach fabric to end posts and top rail and to stiffen bottom of fabric shall be aluminum alloy 6061-T6. All bars and bands shall have beveled edges.
4. Tie wires for securing chain link fabric to rail and line posts shall be 9 gauge (9/64-inch) aluminum alloy 6061-T6.

#### D. Performance

1. Handrail system design, construction and installation shall meet or exceed all applicable federal and state regulations. Handrail anchors, posts, rail and fabric shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail, with a minimum of deflection.
2. The manufacturer shall submit to the ENGINEER certified test data verifying the strength of his handrail system.

### 2.03 STEEL FRAMED STAIRS

- A. General: Construct stairs to conform to sizes and arrangements indicated; join pieces together by welding unless otherwise indicated. Provide complete stair assemblies including metal framing, hangers, columns, railings, newels, balusters, struts, clips, brackets, bearing plates and other components neces-

40-2022 (02/2022)

sary for the support of stairs and platforms and as required to anchor and contain the stairs on the supporting structure.

- B. Stair Framing: Fabricate stringers of structural steel channels, or plates, or a combination thereof, as indicated. Provide closures for exposed ends of stringers. Construct platforms of structural steel channel headers and miscellaneous framing members as indicated. Bolt or weld headers to strings, newels and framing members to strings and headers; fabricate and join so that bolts, if used, do not appear on finish surfaces. Where masonry walls support steel stairs, provide temporary supporting struts designed for erection of steel stair components before installation of masonry.
- C. Steel Floor Plate Treads and Platforms: Provide raised pattern steel floor plate complying with FS QQ-F-461, Class I. Provide pattern indicated or, if not indicated, as selected from manufacturer's standard patterns. Provide plate manufacturer's standard abrasive granules, rolled into surface of steel plate, complying with ASTM A-283/A-283M-93, Grade A.
  - 1. Form treads of 1/4-inch thick steel floor plate with integral nosing and back edge stiffener. Weld steel supporting brackets to strings and treads to brackets.
  - 2. Fabricate platforms of steel floor plate of thickness indicated. Provide nosing matching that on treads at all landings. Secure to platform framing members with welds.
- D. Galvanize all steel stair components.

#### 2.04 STEEL PIPE RAILINGS AND HANDRAILS

- A. Fabricate steel pipe railings and handrails to design, dimensions, and details indicated. Provide railing and handrail members formed of pipe of sizes and wall thickness indicated, but not less than that required to support design loading.
- B. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
  - 1. At tee and cross intersections provide coped joints.
  - 2. Form bends by use of prefabricated elbow fittings and radius bends or by bending pipe, at fabricator's option.
  - 3. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-connection of pipe throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.
  - 4. Provide wall returns at ends of wall-mounted handrails, except where otherwise indicated.

40-2022 (02/2022)

5. Close exposed ends of pipe by welding 3/16-inch thick steel plate in place or by use of prefabricated fittings.
  6. Toe Boards: Where required, provide toe boards at railings around openings and at the edge of open-sided floors and platforms. Fabricate to dimensions and details indicated, or if not indicated, use a 4-inch high x 1/4-inch plate secured to each railing post and intermediate brackets, as required, with stainless steel fasteners. Provide for thermal expansion and contraction, as necessary, through elongated fastener holes, or equal.
- C. Brackets, Flanges, Fittings and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.
1. For railing posts set in concrete, provide sleeves of galvanized steel pipe not less than 6 inches long and with an inside diameter not less than 1/2-inch greater than the outside diameter of pipe. Provide steel plate closure welded to bottom of sleeve and of width and length not less than 1 inch greater than outside diameter of sleeve.
  2. Provide friction fit, removable covers designed to keep sleeves clean and hold top edge of sleeve 1/2-inch below finished-surface of concrete.
- D. Galvanize steel railings, including pipe, fittings, brackets, fasteners and other ferrous metal components.

## 2.05 GRATINGS

- A. Gratings shall be the dimensions required on the Drawings and as required to meet deflection specs below and of aluminum Alloy 6063-T5, 6063-T6, or 6061-T6, or equal. Gratings shall be designed for an allowable uniformly distributed load of 200 lbs/sq ft and a concentrated load of 400 lbs/ft of width with less than 0.25-inch deflection.
- B. Gratings shall be IKG Industries "IBar," Reliance "ILok," or equal.

## 2.06 NUTS AND BOLTS

- A. Unless otherwise shown on the Drawings or required in other parts of these Specifications, all nuts and bolts shall be in accordance with ASTM A 307-93a, Grade A and shall be electrogalvanized according to ASTM B 633-85 (1994).
- B. All nuts, bolts, washers and accessories in contact with water, in any moist atmosphere or damp area such as occurs above water, or embedded in concrete exposed to the weather, shall be Type 302 or 304 stainless steel. Stainless steel nuts, bolts, and washers shall be used to fasten aluminum to all materials including aluminum.

40-2022 (02/2022)

## 2.07 CONCRETE ANCHORS

- A. Sizes and spacings or numbers of anchors shall be shown on the Drawings and materials shall comply with exposure requirements listed under Nuts and Bolts above. All anchors used for securing moving or vibrating equipment (pumps, motors, gears, sluice gates, conveyors, etc.), shall be of the cast-in-place type.
- B. The size and number of anchors shall be approved by the equipment manufacturer.
- C. Unless specifically noted otherwise on the Drawings or Specifications, concrete anchors for other applications shall be chemical grout-type anchors equal to Hilti "HVA Adhesive Anchor," or Ramset "Chemset Chemical Anchors." Installation shall be in strict accordance with the manufacturer's recommendations which shall be available on the job site.

## 2.08 ALUMINUM LADDERS

- A. Aluminum ladders shall be fabricated as detailed on the Drawings.

## 2.09 HATCHES

- A. Metal hatches shall be fabricated as detailed on the Drawings.

## 2.10 GUARD POST

- A. Concrete filled, steel posts shall be as shown on Drawings.

## PART 3 EXECUTION

### 3.01 GENERAL

- A. The CONTRACTOR shall be responsible for all errors, omissions, and deviations of the shop drawings from the Drawings and Specifications. Any errors or omissions shall be brought to the attention of the ENGINEER whose interpretation and instructions shall be received before proceeding with the fabrication of that portion of the work.
- B. Manufacturers' printed installation instructions shall be strictly followed and any conflicts with the shop drawings and/or Contract Drawings shall be directed to the ENGINEER for resolution before proceeding with installation.
- C. All base plates, inserts and anchorages shown embedded in concrete shall be accurately located and secured before placing concrete as per a manufacturer supplied template. All structural members and components shall be accurately leveled, plumbed and secured at locations shown on the Drawings.
- D. Painting
  - 1. Cleaning and painting of all fabricated materials shall be in strict accordance with Division 9, Section 09900, of these Specifications.

40-2022 (02/2022)

E. Steel

1. All fabrication and erection shall be done in conformity with the "AISC Load and Resistance Factor Design Specification for Structural Steel Buildings," Second Edition dated December 1, 1993, latest revision.
2. Refer to Article 2.01.A of this Specification Section for repair of galvanized surfaces.

F. Aluminum

1. The contact surfaces of aluminum with steel, dissimilar materials, concrete and/or masonry shall be protected from corrosion by a coating of coal tar, Kop-Coat Bitumastic Super Service Black, or equal.
2. Aluminum surfaces embedded in concrete shall be protected from corrosion by a tightly adherent coating of 2 applications of zinc chromate primer.

3.02 HANDRAILS

A. General

1. Shop drawings and handrail manufacturer's printed instructions shall be closely followed during handrail installation. Posts shall be installed plumb and rails parallel.
2. Required anchorages shall be strictly followed.

B. Workmanship

1. All rail and post cuts shall be square and accurate for minimum joint gap, clean and straight, and free of burrs and nicks.
2. In exterior and high humidity interior fabricated fitting installations, provision shall be made to drain entrapped water from inside the railing system to prevent electrolysis and/or damage from freezing. Manufacturer's printed instructions shall be strictly followed.
3. Welds and damaged areas shall be finished and coated according to Article 2.02, this Section.
4. Where required, holes shall be drilled and countersunk the correct size for proper fit of all components.
5. In aluminum handrail systems where protection is applied for prevention of electrolysis from dissimilar materials, visibility of protective material shall be minimized.

40-2022 (02/2022)

6. Handrail system surfaces shall be protected from physical damage and discoloration during storage, assembly and installation. Manufacturer's coverings to protect anodized finishes shall be left intact until damage from construction operations no longer exists.

C. Rigidity

1. Posts shall be continuous from mounting surface to top rail.
2. Top and bottom rails shall be unspliced lengths between posts except as covered under expansion joints.
3. Railing manufacturer's instructions shall be strictly followed regarding torquing and tightening of fittings, and type and materials of fasteners.
4. Only stainless steel fasteners shall be used in aluminum installations, unless otherwise noted.

D. Expansion Joints

1. To prevent excessive stresses and misalignment in standard aluminum handrail systems, expansion joints and gaps shall be provided in top and bottom rails. Joints shall be located within 8 inches of posts and supports and the top and bottom rail joints shall be in vertical alignment. In fence-type handrail systems, top rail couplings shall be furnished with galvanized expansion compression spring as required in PART 2, this Section.
2. Where sleeve-type expansion joints are used, fasten only one side of sleeve to rail and allow other side of sleeve to slide on adjacent rail in standard aluminum handrail systems.
3. Gaps shall be provided according to the table below which is based on coefficients of expansion of 0.000013 inch/degrees Fahrenheit for aluminum and 0.0000065 inch/degrees Fahrenheit for steel; a temperature difference of 120 degrees Fahrenheit less the minimum listed temperature; and an expansion joints spacing of 24 feet 0 inches on centers for aluminum and 40 feet 0 inches on centers for steel. Where it is known that other temperature differentials and/or expansion joint spacings will be experienced, gap dimensions can be determined by: gap in inches = (coefficient of expansion) x (temperature difference from maximum to minimum) x (distance in inches between expansion joints).

**EXPANSION JOINTS GAP TABLE**

Temperature (°F) at Time of Installation	<u>Gap Dimension Required at Each Expansion Joint</u>	
	Aluminum Railing with Expansion Joints on 24'-0" Centers	Steel Railing with Expansion Joints on 40'-0" Centers
-20 to 0	1/2"	7/16"
0 to 20	7/16"	3/8"
20 to 35	3/8"	5/16"
35 to 50	5/16"	1/4"
50 to 70	1/4"	1/4"
70 to 90	3/16"	3/16"
90 to 120	1/8"	1/8"

**3.03 GRATINGS**

- A. Grating frames shall be installed flush with the floor surface. Adequate blocking shall be provided to hold corners square during placing concrete and exposed aluminum surfaces shall be protected to prevent pitting from the concrete. Surfaces embedded in concrete shall be protected as covered under Article 3.01, this Section.

**3.04 NUTS AND BOLTS**

- A. Bolts embedded in concrete shall be secured with templates at the time of pouring concrete. Bolts shall be suitably protected from damage throughout the construction period.
- B. Damaged galvanized surfaces on nuts and bolts shall be repaired according to Article 2.04, this Section.

**3.05 CONCRETE ANCHORS**

- A. Concrete anchors shall be installed strictly in accordance with manufacturer's printed instructions which shall be available on the job site.
- B. Refer to Division 15 for supporting small pipe.

**3.06 LADDERS**

- A. Install ladders as herein specified and as detailed on the Drawings.

**3.07 HATCHES**

- A. Install hatches as herein specified and as detailed on the Drawings.

40-2022 (02/2022)

3.08 GUARD POSTS

- A. Set in concrete as indicated. Fill cores solidly with air-entrained concrete having a 28-day minimum compressive strength at 3,000 psi.

**END OF SECTION**

\*\*\*

Metal Fabrications  
05520-12



**SECTION 05540**

**CASTINGS**

**PART 1 GENERAL**

**1.01 SCOPE OF WORK**

- A. Provide all labor, materials, and equipment required to install castings as shown on the Drawings and specified herein. Included in this section are manhole covers, steps, valve boxes, hatch covers, and commemorative plaques.

**1.02 RELATED WORK NOT INCLUDED**

- A. Concrete work is included in Division 3.

**1.03 SUBMITTALS**

- A. The CONTRACTOR shall submit to the ENGINEER, in accordance with Division 1, Section 00700, copies of construction details of castings proposed for use.

**PART 2 MATERIALS**

**2.01 GENERAL**

- A. All castings shall be gray iron, conforming to the requirements of the ASTM Standards, Designation A 48-83, Class 35-B for manhole casting and class 20 for valve boxes.

**2.02 MANHOLE CASTINGS**

**A. Frames and Covers**

- 1. Manhole castings shall consist of cast iron frames and 22-3/4-inch diameter covers. All manhole castings shall be designed for H-20 traffic loading. The frame shall be at least 7 inches high overall. Manhole covers must set neatly in the frame, with contact surfaces machined smooth for even bearing. The top of the cover shall be flush with the frame edge. The top of the cover shall have sufficient corrugations to prevent slipperiness and be marked in large letters "SANITARY SEWER" or "STORM SEWER" as applies. Covers shall have one or 2 pick holes only, about 1-1/2 inches wide and 1/2-inch deep with 3/8-inch square undercut at rear and 3/4-inch square undercut on sides. Covers on sanitary sewer manholes must not be perforated.

**B. Steps**

- 1. Polypropylene plastic encapsulated steel manhole steps shall be of patterns shown on the detail Drawings, and have corrugated treads. In case of need for nonprotruding steps, shop drawings of special inset cast

40-2022 (02/2022)

iron steps shall be reviewed by and be acceptable to the ENGINEER prior to use.

2. It is intended that the polypropylene plastic encapsulated steel step be M.A. Industries PS-1, PS-1PF or equal.

## 2.03 VALVE BOXES

### A. Slide Type for Iron Body Gate Valves

1. Valve boxes for sizes through 12-inch valves shall be the cast iron slide type, without screw, of sufficient length to allow for 30 inches of cover over the top of the pipe. The inner section shall have a minimum inside diameter of 5-1/4 inches with a hood type base that will cover the packing gland on valves through 12 inches in size (minimum of 8 inches inside diameter). The base of the top section shall be flanged at least 1-1/4 inches. The caps shall be circular with a corrugated surface and have pick holes in the periphery and be marked "Water," "Gas," "Sewer," or "Air" according to use. The valve boxes shall be Tyler Pipe/Utilities Division, 6855 Series, or equal.
2. For vertical valves larger than 12-inch size, provide Tyler Pipe/Utilities Division Series 6865 with No. 8 base, or equal.
3. Valve boxes for valves in the horizontal position shall be cast iron Tyler Pipe/Series 6855 or equal, with a base that is sized to allow covering of the bevel gear case and centering of the operating nut in the valve box.

## PART 3 EXECUTION

### 3.01 INSTALLATION OF CASTINGS

#### A. Installation In or On Structures

1. The installation of castings is generally covered under specifications for pipe work and manholes. Castings shall be leveled, plumbed and secured before pouring concrete or attaching to masonry with solid, watertight, cement mortar joints.

#### B. Installation on Buried Valves

1. Valve box construction shall consist of the approved manufactured box and accessories. Line pipe shall not be accepted for use as valve boxes.
2. Mechanically tamp backfill, or backfill with crushed rock (per requirements of location - see Section 02610 of these Specifications) to the bottom of the packing gland of the operating nut. Install valve box base centered over operating nut.

40-2022 (02/2022)

3. Install valve box shafts, of the required height, and top section to proposed top elevation. Mechanically tamp backfill around box or backfill with crushed rock.
4. Place reinforced concrete collar around top section when shown on the Drawings.
5. Furnishing and installation of the valve box and accessories, including the concrete valve box collar, shall be included in the price bid for furnishing and installation of the valve.

**END OF SECTION**

\*\*\*

Castings  
05540-3

**SECTION 11312**

**SUBMERSIBLE SEWAGE PUMPS AND ACCESSORIES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Provide all labor, materials, equipment and services required to furnish and install the submersible sewage pumps as shown on the Drawings and specified herein.

**1.02 RELATED WORK**

- A. Special requirements for materials and equipment are given in Section 01600.
- B. Painting is shown on Drawings.
- C. Motors and electrical work are specified in Division 16.

**1.03 REFERENCES**

- A. Where referenced specifications (ASTM, ACI, PCI, etc.), are mentioned, these standards are deemed to be the minimum standard of quality of materials or methods to apply to this project.

**1.04 SUBMITTALS**

- A. Shop drawings, control drawings, and operation and maintenance instructions shall be submitted in accordance with Section 00700. Refer to Section 01600 for additional requirements.

**1.05 QUALITY ASSURANCE**

- A. The pump manufacturer shall have a minimum number of not less than 50 units of the type specified and required installed and in operation handling sewage for no less than 2 years in North America.

**PART 2 PRODUCTS**

**2.01 PUMPS AND MOTORS**

- A. The pumps shall be capable of handling raw, unscreened sewage. The design of the connection between the pumps and the discharge piping shall be such that the pumps will be automatically connected to the discharge piping when lowered into place. The pumps shall be easily removable for servicing or inspection, requiring no bolts, nuts or other fasteners to be removed for this purpose, or need for personnel to enter the wet well. The pumps shall be fitted with a stainless steel chain for each pump, of adequate strength and length to permit raising the pump for inspection and removal.

B. Casing and Impeller

1. The stator casing, oil casing and impeller shall be of grey iron construction, with all parts coming in contact with sewage being protected by a coat of rubber-asphalt paint. All external bolts and nuts shall be of stainless steel. The wear ring between impeller and pump housing shall be of stainless steel or bronze with vitrile rubber O-ring or neoprene O-ring at the inlet of the pump. The impeller shall be of nonclog design, capable of passing solids, fibrous material, and heavy sludge, and constructed with long throughway with no acute turns.

C. Shaft Seal

1. Each pump shall be provided with a tandem double mechanical seal running in an oil reservoir, composed of two separate lapped face seals, each consisting of one stationary and one rotating ring with each pair held in contact by a separate spring. The lower seal shall be tungsten-carbide on tungsten-carbide or silicon carbide on silicon carbide. The upper seal shall be either tungsten-carbide, silicon carbide or tool steel on carbon. The compression spring shall be protected against exposure to the pumped liquid. All elastomeric components of the seal shall be fabricated using Viton.
2. The pumped liquid shall be sealed from the oil reservoir by one face seal and the oil reservoir from the motor chamber by the other. The seals shall require neither maintenance nor adjustment, and shall be easily replaced.
3. Seal failure detection shall be provided and wired to an indicator light in the control panel.

D. Pump Mounting and Removal Facilities

1. A sliding guide bracket shall be an integral part of the pumping unit. The pump casing shall have a machined connection with yoke to connect with the cast iron discharge connection, which shall be bolted to the floor of the sump and so designed as to receive the pump connection without the need of any bolts or nuts.
2. Sealing of the pumping unit to the discharge connection shall be accomplished by a simple linear downward motion of the pump with the entire weight of the pumping unit guided to and wedging tightly against the discharge connection.
3. Guide rails and all accessories shall be non-sparking.

E. Motors

1. Pump motor shall be housed in an oil or air-filled watertight casing and shall have Class F insulated windings which shall be moisture resistant. All 3 phase motors shall be dual voltage. Pump motors shall have cooling

40-2022 (02/2022)

characteristics suitable to permit continuous operation in a totally, partially or nonsubmerged condition.

2. Motors shall not be overloaded under any condition of operation. Motor service factor shall not be used to prevent overloading. See Division 16-Electrical for detailed motor specifications.
3. Motors shall be furnished with extra hard usage flexible power cables, length as required. The cable entry into the motor housing shall be equipped with integral strain relief or an external strain relief device installed to prevent cable pullout.
4. Each submersible pump shall be equipped with a power cable of sufficient length to reach to the disconnect switch or control panel without splicing.
5. The pump/motor assembly shall be suitable for use in hazardous locations. The assembly shall be rated or certified for use in NEC Class 1, Group D, Division 1 hazardous locations.

F. Pump Warranty

1. The pump manufacturer shall warrant the pumps being supplied to the OWNER against defects in workmanship and materials for a period of 5 years under normal use, operation and service. In addition, the manufacturer shall replace certain parts which become defective through normal use and wear on a progressive schedule of cost for a period of 5 years. Parts included are the mechanical seal, impeller, pump housing, wear ring, and ball bearings. The warranty shall be in published form and apply to all similar units.

2.02 PUMP AND MOTOR CHARACTERISTICS

- A. The service conditions, size and characteristics of the pumps and motors shall be as shown in Table 1.

40-2022 (02/2022)

1. Table 1—Leestown Road Industrial Pump Station

Item	Unit	Quantity
Number of Units Required	--	2
Minimum Static Head	Feet	18
Average Static Head	Feet	19
Maximum Static Head	Feet	21
System Head @ 300 gpm & Avg. Static Head	Feet	42
System Head @ 400 gpm & Avg. Static Head	Feet	59
Capacity Requirement	gpm	350
Total Head @ Capacity Required and Maximum Static Head	Feet	50
Pump Efficiency @ Capacity Required	Percent	68
Minimum Shutoff Head	Feet	78
Minimum Suction Size, Diameter	Inches	2
Minimum Discharge Size, Diameter	Inches	6
Diameter of Solids Passed	Inches	3.0
Maximum Motor Size	Hp	10
Maximum Allowable Pump and Motor Speed	rpm	1750
Motor Phase	--	3
Motor Voltage	V,	230/460

2. The Leestown Road Industrial Pump Station replacement pumps shall be Pentair Myers—4VHA or equal.

2.03 ACCESS FRAME AND GUIDES

- A. A complete access frame and guides for each pump shall be furnished complete with hinged and hasp-equipped cover(s), stainless steel upper guide holder and level sensor cable holder. Frame shall be securely mounted above the pumps.

40-2022 (02/2022)

Each door shall have safety locking handle in open position. Doors shall be of checkered aluminum plate, aluminum frame and all stainless steel hardware.

- B. Lower guide holders shall be an integral part of the discharge connection. Guide bars shall be of Schedule 80 galvanized steel pipe of the size indicated on Drawings or required by the pump manufacturer.
- C. Dual safety grates shall be furnished at each wet well hatch opening as a fall prevention system and shall consist of 2 aluminum grates attached on opposite sides of the wet well hatch frame under the cover. Both grates shall smoothly pivot on hinges 90 degrees upward and lock in place by hold open rods. The grate shall be designed to withstand a minimum pedestrian load of 300 pounds per square foot. The aluminum grates shall have an OSHA safety yellow (or orange) finish. Hardware components shall be made of 316 stainless steel to withstand corrosive wastewater environments. The system shall be a Dual Safety Grate as manufactured by U.S.F. Fabrication, Inc., Hialeah, FL, or equal.

#### 2.04 CONTROLS

- A. The pumps shall be furnished with a control panel as specified in Division 16. The pumps shall operate by liquid level sensors (Flygt Model ENH-10 or equal), which shall be furnished with the pumps. Four sensors are required, 3 normally open for stop, start lead, and start backup, and one normally closed for the alarm level. See the control circuit on the drawings and sequence of operation in Division 16 of these specifications for complete control requirements. The controls for the pumps shall be provided by the pump manufacturer.
- B. Each submersible pump shall be furnished with seal leak detection. Extra hard usage power cable shall also be furnished with each pump, and a power cable support/mounting bracket. All cables shall be of adequate length to remove pumps and set wet well pump control elevations as necessary.
- C. The pump control panel shall be NEMA 4X enclosed, with necessary intrinsic safety barriers, sealing fittings, etc. to interface correctly with the Class 1, Division 1, Group D classified wetwell atmosphere.

### PART 3 EXECUTION

#### 3.01 DELIVERY, STORAGE AND HANDLING

- A. Store indoors.
- B. Pumps and motors shall not be stored on vibrating bases or floors. Any motor so stored should be disassembled and inspected for bearing damage, prior to service. If bearing damage is evident, replace bearing.
- C. Check the rust preventative coating on external machined surfaces (including shaft extension) for damage. If necessary, recoat the surfaces with Rust Veto No. 342 (Manufactured by E.F. Houghton Co.) or equivalent. The condition of the rust preventative coating shall be checked periodically and surfaces should be recoated as recommended by the coating manufacturer.



40-2022 (02/2022)

- D. Oil lubricated bearings-drain oil from bearing housing and refill, to maximum level, with a circulating type oil. Oil should be changed every 12 months while motor is in storage.
- E. Grease lubricated bearings-once a month, inject a small quantity of grease into the grease fill such that grease is purged from the drain. Inspect purged greases for water condensation or oxidation. If water condensation or oxidation is evident, the motor shall be disassembled and contaminated grease removed, and replaced with new grease.
- F. Take precautions as necessary to prevent rodents, snakes or other small animals from nesting inside pump.
- G. Prevent moisture or condensation from accumulating by energizing motor space heaters if provided, or applying reduced voltage to one phase of motor windings (trickle-voltage-heating). Request percent of rated voltage and transformer capacity to be used from manufacturer. The winding should be maintained 5° degrees Celsius minimum above ambient temperature (some locations require a higher temperature above ambient) to prevent condensation.
- H. If pump and motor are covered by plastic or similar material, additional precautions such as heated or circulating air and silica gel may be necessary, to protect against moisture or condensation.
- I. Rotate pump and motor shaft several revolutions by hand once every 2 weeks while in storage to insure a protective oil film on bearing surfaces.
- J. Start-up preparation after storage:
  - 1. Thoroughly clean and inspect motor.
  - 2. Change oil or grease in bearing housing.
  - 3. Secure all plugs, fittings, etc., to prevent leakage.
  - 4. Check insulation resistance.

### 3.02 INSTALLATION

- A. Submersible pumps shall be shipped to the job completely assembled with the power cable attached. The unit must be properly stored and special care given to the protection of the power cable to protect it from mechanical damage and protect the cut end of the cable from the intrusion of moisture. The cable will act like a wick if the cut is allowed to lay in a pool of water. Should this condition be allowed to occur, the unit shall be shipped back to the manufacturer for complete drying out and testing. A test report from the manufacturer shall be required before any payment for unit is made.
- B. It is important that the discharge connection is attached to the bottom slab level and at the exact location required relative to the access cover. Suggested procedure:

40-2022 (02/2022)

1. Install access cover.
  2. Attach upper guide bracket(s).
  3. Put discharge connection(s) on bottom slab.
  4. Cut to length and install guide bars between upper guide bracket(s) and discharge connection(s).
  5. Put check with level (shim, if necessary) and anchor discharge connection(s) exactly where position will result in guide bars being parallel and vertical.
- C. Use proper gaskets, tighten bolts gradually and evenly. In deep stations install discharge pipe brackets to relieve discharge connections from overload and intermediate guide bar brackets to prevent guide bars from bending when pumps are pulled.
- D. Lower pump units into place along guide bars. Check visually metal-to-metal contact between volute flange and discharge connection. If necessary, recheck and re-align discharge connection(s) and guide bars with pumps in place.
- E. After proper alignment of all components, including metal-to-metal connection of pump flange is established, grout access cover, discharge connection(s) and pipe thrulets. Build up and shape slopes at pump bottom in accordance with Drawings.
- F. As a part of the final inspection each pump shall be pulled to verify trueness of alignment of guide rails, in the presence of the OWNER and the ENGINEER.
- G. All motors and controls shall be connected and the motor operated while disconnected from the pump to determine proper rotation and to observe for vibration or motor defects. Disconnecting of the pump and motor on certain factory assembled units may be waived by the ENGINEER.

### 3.03 TESTING OF PUMPS

- A. All pumps shall be tested to verify performance data submitted. When possible, pumps shall be tested by pumping down a basin or by filling a basin. All pumps shall be tested for capacity at a minimum of 3 points on the pump curve. The motor full load amperage and voltage shall be checked and must fall within the rated values of the motor tested. Failure to perform can result in having the unit removed and replaced.
- B. All tests shall be performed by the CONTRACTOR in the presence of the ENGINEER. All equipment needed for the pump tests, rulers, stopwatch, gauges, volt meter and ammeter shall be provided by the CONTRACTOR.
- C. All motors shall be megged with the winding resistance recorded. Motor voltage and amperage shall also be measured and recorded.

40-2022 (02/2022)

D. All test data shall be reported to the ENGINEER in writing.

### 3.04 SPARE PARTS

A. Spare parts shall be furnished for all pumping equipment. All spare parts shall be boxed and tagged with positive identification, including part number, description and the particular pump to which it applies.

B. The required spare parts shall include the following items as a minimum for each different size or model pumping unit:

One complete set of mechanical seals  
One set of impeller adjustment washers  
One set of O-rings  
Wear ring  
Impeller screw

### 3.05 PAYMENT

A. Payment for the complete system shall be included in the lump sum bid for the project and shall include the furnishing of materials, equipment and parts and installation of all components to provide a completely functional and operational system.

**END OF SECTION**

\*\*\*

**SECTION 11900**

**OPEN-CHANNEL GRINDERS, GRINDING, AND SHREDDING EQUIPMENT**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes Open-channel grinder, installation frame and controller.

**1.02 REFERENCE STANDARDS**

- A. Equipment shall, as applicable, meet the requirements of the following industry standards.

1. ASTM International (ASTM)
  - a. ASTM A36 - Carbon Steel Plate.
  - b. ASTM A536 - Ductile Iron Castings.
  - c. ASTM A48 - Gray Iron Castings.
  - d. ASTM A564 Grade 630 condition H1150 (17-4) stainless steel
2. American Iron and Steel Institute (AISI)
  - a. AISI Type 1020 Steel
  - b. AISI Type 1045 Steel
  - c. AISI Type 4130 Heat Treated Alloy Steel
  - d. AISI Type 4140 Heat Treated Alloy Steel
  - e. AISI Type 18-8 Stainless Steel
  - f. AISI Type 303 Stainless Steel
  - g. AISI Type 304 and 304L Stainless Steel
  - h. AISI Type 316 and 316L Stainless Steel
3. Society of Automotive ENGINEERs (SAE)
  - a. SAE Type 660 Bearing Bronze.
4. National Electrical Manufacturer's Association (NEMA) Standards
5. National Electrical Code (NEC)
6. Underwriters Laboratory (UL and cUL)
7. International Electrotechnical Commission (IEC)

**1.03 QUALITY ASSURANCE**

**A. Qualifications**

1. Manufacturer is documented as being engaged in the sale of similar products for over 40-years.

40-2022 (02/2022)

2. Manufacturer is single supplier for equipment listed in this section.
3. Manufacturer's service center is located domestically for repairs and upgrades.
4. Manufacturer supports Renew Program, providing new factory-built replacements of selected products for install without requirement to return existing equipment.
5. Manufacturer supports Preventative Maintenance Program, providing inspection and service of equipment by manufacturer's factory technicians.
6. Manufacturer stocks all non-custom spare Parts.

B. Regulatory Requirements

1. Manufacturer is UL listed for the construction of controller.

C. Certifications

1. Manufacturer's management system is ISO9001 certified.

1.04 SUBMITTALS

A. Submittal documentation is provided for approval in ".pdf" format.

1. Product Data
  - a. Product description text
  - b. Performance curves or capacity tables
  - c. Catalog data
2. Shop Drawings
  - a. General arrangement of installation
  - b. Product configuration
  - c. Assembly
3. Operation and Maintenance Manuals
  - a. Submit one copy of a suitable operation and maintenance manual with shipment of product. An electronic version shall be supplied to create additional copies.
  - b. The manuals shall include but not be limited to the following: Equipment descriptions, operating instructions, drawings, troubleshooting techniques, recommended maintenance schedule, recommended lubricants, and recommended replacement parts list.

40-2022 (02/2022)

#### 1.05 DELIVERY, STORAGE, AND HANDLING

##### A. Packaging, Shipping, Handling, and Unloading

1. Packaged in containers or on skids suitable for normal shipping, handling, and storage.
2. Protected from rain, snow, impact, and abrasion while in the possession of the carrier.

##### B. Acceptance at Site

1. CONTRACTOR shall review the contents of the shipment at time of delivery and promptly notify the carrier and supplier of any discrepancies.

##### C. Storage and Protection

1. Equipment to remain in the packaging provided by the supplier until it is installed.
2. Equipment to be stored in a dry environment between 40 and 100 degrees Fahrenheit.

##### D. Waste Management and Disposal

1. CONTRACTOR shall be responsible for discarding all packaging materials in an environmentally friendly manner and in accordance with local regulations.

#### 1.06 WARRANTY

##### A. 12-Month Limited+5-Year Special Warranty (Monster Metal®)

1. Manufacturer submits a document clearly identifying the scope, term and exclusions of coverage for a standard 12-month limited warranty plus 5-year warranty on the wet end of the grinder including coverage for failure from excessive wear of the cutters, spacers, seals, bearings and shafts.

#### 1.07 SERVICE

##### A. Supplier supports product with multiple programs options available.

1. Service center located domestically for repairs and upgrades.
2. Renew Program: Provides new factory-built replacements of selected products for install without requirement to return existing products.
3. Preventative Maintenance Program: Inspection and service of equipment by factory technicians.
4. Spare parts

40-2022 (02/2022)

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

A. JWC Environmental Inc, 2850 S. Red Hill Ave. Suite 125, Santa Ana, California 92705; Tel: 800-331-2277; www.jwce.com

1. Substitution requests will be considered in accordance with provisions in appropriate sections in Division 01 and the following conditions.

### **2.02 OPEN-CHANNEL GRINDER**

A. Reduces solids conveyed in a wastewater stream to a size that is non-detrimental to downstream equipment. Grinder uses side rail with flow channel and specially designed fingers with a shape to create a pressure gradient increasing flow capacity and maximize capture of solids. Grinder uses low speed and high torque drive with 2 counter-rotating shafts stacked with intermeshed individual cutters and spacers supported on both ends of each shaft with mechanical seal and bearing cartridges, driven by an electric motor and speed reducer.

#### **B. Basis of Design**

1. Muffin Monster model# 30005-0012-DI as manufactured and supplied by JWC Environmental Inc
  - a. Maximum Design Flow Capacity: 620 gpm (0.89 mgd)
  - b. Cutter Stack Height: 12-inches

#### **C. Cutter Assembly-Multi-Zone**

1. Zone 1-Grit Zone Cutters and Spacers.
  - a. Material Zone 1: Alloy Steel.
    - (1) Cutters: Through hardened to 45-52 HRC
    - (2) Spacers: Through hardened to 34-52 HRC.
  - b. Configuration Zone 1: Double stacked.
  - c. Cutters-Zone 1
    - (1) 7-tooth Cam style, .876-inch thick, 4.710-inch diameter. Designed specifically for waste streams containing heavy volumes of solids.
    - (2) Precision ground individual cutter elements with a thickness tolerance of +.000/ -.001.
    - (3) Keyed to shaft with hexagon opening.

40-2022 (02/2022)

- (4) Spacers-Zone 1
  - (5) Smooth O.D. .892-inch thick, Alloy Steel.
  - (6) Precision ground individual spacer elements with a thickness tolerance of  $+.001/-0.000$ .
  - (7) Keyed to shaft with hexagon opening.
2. Zone 2-Working Zone Cutters and Spacers.
- a. Material Zone 2: Alloy Steel.
    - (1) Cutters: Through hardened to 45-52 HRC
    - (2) Spacers: Through hardened to 34-52 HRC.
  - b. Configuration Zone 2: Single Stacked.
    - (1) Cutters-Zone 2
      - (a) 17-tooth serrated cam style, .438-inch thick, 4.730-inch diameter. Designed specifically for waste streams requiring focused reduction of disposable and non-disposable cloth products or wipes.
      - (b) Multiple serrations located on outside diameter edge of cutter teeth create punctures or perforations in the cloth or paper materials creating a confetti type cut that inhibits reweaving of the material with hair and other solids.
      - (c) Precision ground individual cutter elements with thickness tolerance of  $+.000/-0.001$
      - (d) Keyed to shaft with hexagon inner profile.
    - (2) Spacers-Zone 2
      - (a) Knurled O.D. .446-inch thick.
      - (b) Knurled diamond pattern on outside diameters surface.
      - (c) Precision ground individual spacer elements with a thickness tolerance of  $+.001/-.000$ .
      - (d) Keyed to shaft with hexagon opening.



40-2022 (02/2022)

- (3) Cutters-Zone 2
  - (a) 7-tooth cam style, .438-inch thick, 4.710-inch diameter. Designed specifically for waste streams containing heavy volumes of solids.
  - (b) Precision ground individual cutter elements with a thickness tolerance of  $+.000/-0.001$ .
  - (c) Keyed to shaft with hexagon opening.
- (4) Spacers-Zone 2
  - (a) Smooth O.D. .446-inch thick.
  - (b) Precision ground individual spacer elements with a thickness tolerance of  $+.001/-0.000$ .
  - (c) Keyed to shaft with hexagon opening.
- (5) Cutters-Zone 2
  - (a) 11-tooth cam style, .310-inch thick, 4.710-inch diameter. Designed specifically for waste streams containing municipal waste and moderate volumes of solids.
  - (b) Precision ground individual cutter elements with a thickness tolerance of  $+.000/-0.001$ .
  - (c) Keyed to shaft with hexagon opening.
- (6) Spacers-Zone 2
  - (a) Smooth O.D. .319-inch thick.
  - (b) Precision ground individual spacer elements with a thickness tolerance of  $+.001/-0.000$ .
  - (c) Keyed to shaft with hexagon opening.

#### D. Mechanical Seal and Bearing Cartridges-Standard

- 1. Seals and bearing incorporated into a cartridge style design requiring no external seal flush or lubricants to operate wet or dry.
- 2. Rated for maximum operating depth: 208 feet (90 psi).
- 3. Dynamic and Static seal faces to be Tungsten carbide with 6% nickel binder.
- 4. Cartridge bushing and housing are AISI 304 stainless steel.

40-2022 (02/2022)

5. O-rings to be Buna-N (Nitrile).

E. Shafts

1. 2-inch hexagon heat treated AISI 4140 alloy steel.
2. Minimum tensile strength of 170,000 psi.
3. Supported on either end by Mechanical Seal and Bearing Cartridges.
4. Cantilevered designs are not acceptable.

F. End Housings, Side Rails, Top Cover, Bottom Cover, and Gaskets

1. End Housings

- a. Cast integral bushing deflector directs solids away from Mechanical Seal and Bearing Cartridge bushings.
- b. Directional flow arrows on side of housings indicate correct installation orientation for solids discharge.
- c. Cast ASTM A536-84 65-45-12 ductile iron.

2. Side Rails

- a. Evenly-spaced horizontal fingers and flow channels. Flow channels create additional open area through grinder increasing flow capacity. Horizontal fingers direct solids toward cutters by creating a pressure differential towards the cutters.
- b. Shape of flow fingers creates a pressure gradient to force solids to cutters and minimize water head loss.
- c. Fingers and flow channel are positioned on the upstream side of the grinder terminating even with the center of the cutter providing free discharge.
- d. Side rails with flow channel running the entire length of the side rail are not allowed.
- e. Cast ASTM A536-84 65-45-12 ductile iron.

3. Top Cover

- a. Manufacturing identification plate mounting.
- b. Cast ASTM A536-84 65-45-12 ductile iron.

4. Bottom Cover

- a. ASTM A36 Steel.

40-2022 (02/2022)

5. Gaskets
  - a. Cork and neoprene rubber.

G. Transfer Gears with Integral Interlocking Lobes

1. Heat treated and hardened AISI 4140 alloy steel.
2. Number of teeth on gears creates ratio of cutter tip speed on low speed shaft to cutter tip speed of highspeed shaft greater than 0.90 and less than 1.00 to promote cleanout of processed material in cutting stack.

H. Couplings

1. Low Speed Coupling
  - a. Two-piece 3-jaw interlocking design.
  - b. Hardened AISI 4140 alloy steel
2. High Speed Coupling
  - a. Type L 3-jaw with elastomer
  - b. Buna-N spider.

I. Lifting Eyes

1. Drop forged Steel
2. Rated for 1300 lb
3. Designed for lift of grinder.

J. Speed Reducer

1. Grease lubricated cycloidal design Cyclo Series 6000 with 29:1 reduction ratio.
2. Manufacturer: Sumitomo Machinery Corporation of America.

K. Motor

1. XPNV Immersible Explosion Proof Motor: Baldor Electric Company.
  - a. Installed Horsepower: 5 Hp
  - b. Motor Service Factor: 1.15
  - c. Minimum Motor Efficiency (at Full Load): 91 percent
  - d. Minimum Motor Power Factor (at Full Load): 76
2. Performance
  - a. Grinder Peak Torque with Reducer: 1,665 lb-ft
  - b. Grinder Peak Force at Cutter Tip: 8,493 lbf

40-2022 (02/2022)

- c. UL rated NEMA 6P, Class I, Division 1 Groups C and D, Class II Division 2, Groups F and G, Class III Division 1
- d. Manufacturer rating of 40 consecutive days of submergence at a maximum depth of 40 feet.
- e. Capable of operating in air 100 percent of time with no external cooling required.
- f. No fan cooling during operation.
- g. Utilize ceramic shaft seal requiring no oil lubrication.

L. Identification

- 1. Corrosion resistant nameplate affixed to top cover of Grinder.
- 2. Nameplate Information: Manufacturer's name and address, Model No., Serial No., Capacity, Maximum psi, Weight, Manufacture Date.

M. Finishes

- 1. Paint Coatings for Ferrous Materials: Prepared to SSPC-SP6 (Commercial Blast Cleaning) and coated with minimum 6 to 8 mils TDFT (total dry film thickness) of an aliphatic acrylic polyurethane paint in the color Hunter Green.
- 2. Paint Coatings for Previously Coated Components (Motors, Speed Reducers, etc.): Prepared to SSPC-SP1 (Solvent Cleaning) and SSPC-SP2 (Hand Tool Cleaning) and coated with minimum 6-8 mils TDFT (total dry film thickness) of an aliphatic acrylic polyurethane paint in the color Hunter Green.

2.03 INSTALLATION FRAME

A. Installation frame provides structure for mounting and positioning of the grinder in an open channel or wet well. Installation frame secures the grinder in position and provides structure and baffling to properly support and prevent unwanted bypass of material.

B. Frame

- 1. Mounts to channel walls supporting weight of grinder with suitable anchors supplied by contractor for installation.
- 2. Frame design uses pocket or guide plate to allow grinder to be lifted or lowered in and out of frame with no removal of fasteners.
- 3. Where possible frame uses adjustable side flanges to mount to channel walls adjusting to taper or irregularities in the wall.

C. Guide Rail

- 1. Provides guidance of grinder into frame for deep channel or well installations.

40-2022 (02/2022)

2. Mounts to channel walls or well with suitable anchors supplied by contractor for installation.
3. Uses guide plate mounted to grinder to interface with guide slots in rail to guide grinder into installation frame.
4. Fabricated of AISI 304L stainless steel.
5. Finish: No special requirements

## 2.04 MOTOR CONTROLLER

### A. Design

1. NEMA enclosure with programmable logic controller (PLC), operation and fail indicators, and selector switches.

### B. Basis of Design

1. Model# PC2200 as manufactured and supplied by JWC Environmental Inc.
2. Motor Controller Power Supply: 240 V/ 3 PH/ 60 Hz.

### C. Enclosure, Selector Switches, Pushbuttons and Pilot Lights

1. Enclosure NEMA 4X
  - a. Fiberglass reinforced plastic with hinged door and mounting flanges.
  - b. Selector Switches: 22 mm, 3-position, rated equal or better than the enclosure and indicate On-Off/Reset-Remote.
  - c. Pilot Lights: 22 mm, LED (pilot lamp), rated equal or better than the enclosure and indicate POWER ON, grinder RUN, grinder JAMMED and MOTOR FAULT.

### D. Programmable Logic Controller

1. Basis of Design: Panasonic FP-X series.
  - a. 16K program capacity.
  - b. Eight 24 Vdc inputs, 6 relay outputs.

### E. Motor Starters, Overload Relays and Control Power Transformer

1. Starters
  - a. IEC, full voltage, and reversing.
  - b. Maximum short circuit protective fault current 100 kA.

40-2022 (02/2022)

2. Overload Relays
  - a. Adjustable and sized to full load amperes (FLA) of the motor.
3. Control Power Transformer
  - a. Produce 120-volt AC power from the supply power. Sized and fused in accordance with code to accommodate the control power requirements.

F. Current Transducers

1. Discrete output type with an adjustable set point from 1-135A with 200ms or faster response time.

G. Operation

1. Grinder Control: In accordance with ON-OFF/RESET-REMOTE Selector Switch.
  - a. OFF/RESET Position (OFF): De-energizes grinder.
  - b. OFF/RESET Position (RESET): Clears all fault conditions.
  - c. ON Position: Energizes grinder
  - d. REMOTE Position: Grinder operates as controlled by a remote start/stop dry contact.
2. Grinder JAM Condition: In accordance with setting of current transducer.
  - a. Controller will stop and reverse the grinder motor 3 times and activate the grinder FAIL indicator and relay.
  - b. Grinder will stop operation.
3. Grinder MOTOR OVERLOAD Condition: In accordance with setting of Motor Overload Relay.
  - a. The MOTOR FAULT indicator lamp will be illuminated, and the FAIL contact will be closed.
  - b. Grinder will stop operation.
4. Grinder MOTOR OVERTEMP Condition: In accordance with setting of Motor Thermostat. (Only with applicable motors).
  - a. The MOTOR FAULT indicator lamp will be illuminated, and the FAIL contact will be closed.
  - b. Grinder will stop operation.

40-2022 (02/2022)

5. Power Failure:
  - a. While System is Operating: System shall not return to normal operation until power is restored and START pushbutton is pressed.
  - b. While System is in a Fail Condition: System shall return to a fail state when power is restored. The fail state shall not be cleared until reset.
6. Reset of Grinder: Accomplished from the controller only.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. Coordinate installation of the equipment in accordance with the manufacturer's installation instructions, approved submittals, and in accordance with OSHA, local, state, and federal codes and regulations.

#### **3.02 FIELD QUALITY CONTROL**

##### **A. Inspection**

1. The manufacturer is required to provide the services of a factory or manufacturer's representative for a minimum of one day to inspect the equipment for proper installation, apply power for the first time and check for proper motor rotation, oversee the initial introduction of material into the system and confirm the equipment operates as intended.

##### **B. Training**

1. Field training for operations, maintenance, and supervisory staff members is to be provided by a manufacturer or manufacturer's representative. Field instruction shall cover key components of the equipment, operating and maintenance requirements and troubleshooting techniques.

**END OF SECTION**

\*\*\*

**SECTION 16020**

**PUMPING STATION ELECTRICAL**

**PART 1 GENERAL**

**1.01 SCOPE OF WORK**

- A. Provide all labor, material, tools, approvals, utility connection fees, excavation, backfill, and other services and equipment necessary to install the electrical system as shown on the Contract Drawings and as specified herein.
- B. Each contractor bidding on the work included in these Specifications shall view the building site and carefully examine the Contract Drawings and Specifications, so that he/she may fully understand what is to be done, and to document existing conditions.
- C. Install the SCADA telemetry cabinet, antenna, and antenna cable to be furnished by the OWNER. Provide termination of all cabling and conductors. Provide the services of an electrician for SCADA system commissioning to test each signal with OWNER's personnel. See the SCADA I-O table on the Drawings for the required signals.

**1.02 RELATED WORK SPECIFIED ELSEWHERE**

- A. Contractors bidding work under this Contract shall read and understand Division Zero and Division 1-General Requirements. If any discrepancies are discovered between this Division and the General Requirements, the above-mentioned documents shall overrule this section.
- B. Section 16900–Control Panels

**1.03 SUBMITTALS**

- A. Provide shop drawings including descriptive literature and/or installation, operation and maintenance instructions. Shop drawings shall be submitted for all equipment proposed to be furnished under this Division.
- B. Electrical submittals shall be submitted after the pumping/process equipment has been approved. Otherwise, the CONTRACTOR is responsible for any changes and costs incurred as a result of changes necessary to the electrical equipment.
- C. Shop Drawings shall be clearly marked and or highlighted as to which product, type, option, etc. is being submitted.
- D. Where wiring diagrams are not shown on the Contract Drawings, they are to be provided by the supplier of the equipment served.
- E. O&M manuals are required and shall consist of approved shop drawings, manufacturer O&M instructions, and test reports.



40-2022 (02/2022)

#### 1.04 SYMBOLS AND ABBREVIATIONS

- A. The symbols and abbreviations generally follow standard electrical practice, however, exceptions to this shall be as shown on the Contract Drawings.

#### 1.05 COORDINATION WITH OTHER TRADES

- A. The CONTRACTOR shall coordinate the electrical work with that of other trades to ensure proper final location of all electrical equipment and/or connections.

#### 1.06 CODES

- A. Comply with the latest revision of the following codes:

1.	Kentucky Building Code	KBC
2.	National Electrical Code	NEC
3.	National Electrical Safety Code	NESC
4.	Underwriters Laboratories, Inc.	UL
5.	National Fire Protection Association	NFPA
6.	National Electrical Manufacturers Association	NEMA
7.	Occupational Safety and Health Administration	OSHA
8.	Insulated Cable Engineers Association	ICEA
9.	Instrument Society of America	ISA
10.	American National Standards Institute, Inc.	ANSI
11.	Anti-Friction Bearing Manufacturers Association, Inc.	AFBMA
12.	Federal Communications Commission	FCC

- B. Comply with any other applicable federal, state, or local laws and ordinances.
- C. Where the ENGINEER's design requires a higher standard than the applicable code, the ENGINEER's design shall be followed.

#### 1.07 INSPECTIONS AND PERMITS

- A. Inspection of the electrical system on all construction projects is required. If the local government has appointed a state licensed inspector, the CONTRACTOR shall be required to use that person to perform the inspections. If a locally mandated inspector does not exist, the CONTRACTOR shall select and hire a state licensed inspector, who has jurisdiction before any work is concealed.

40-2022 (02/2022)

- B. At the time of completion of the project, there shall be furnished to the OWNER and ENGINEER a certificate of compliance, from the agency having jurisdiction pursuant to all electrical work performed.
- C. All permits necessary for the complete electrical system shall be obtained by the CONTRACTOR from the authorities governing such work.

#### 1.08 STORAGE

- A. All work, equipment, and materials shall be protected against dirt, water, or other injury during the period of construction. Complete replacement with new equipment is required for any damaged materials.
- B. Sensitive electrical equipment such as motor starters, controls, transmitters, etc., delivered to the jobsite, shall be protected against injury or corrosion due to atmospheric conditions or physical damage by other means. Protection is interpreted to mean that equipment shall be stored under roof, in a structure properly heated in cold weather and ventilated in hot weather. Provision shall be made to control the humidity in the storage area at 50 percent relative. The stored equipment shall be inspected periodically, and if it is found that the protection is inadequate, further protective measures shall be employed.

#### 1.09 MATERIALS

- A. All materials used shall be new and at least meeting the minimum standards as established by the NEC and/or National Electrical Manufacturers Association. All materials shall be UL listed for the application where a listing exists. All equipment shall meet applicable FCC requirements and restrictions.
- B. The material and equipment described herein has been specified according to a particular trade name or make to set quality standards. However, each CONTRACTOR has the right to substitute other material and equipment in lieu of that specified, other than those specifically mentioned at matching or for standardization, providing such material and equipment meets all of the requirements of those specified and is accepted, in writing by the ENGINEER.
- C. The reuse of salvaged electrical equipment and/or wiring will not be permitted unless specified herein or indicated on the Contract Drawings.
- D. All salvaged or abandoned electrical materials shall become the property of the CONTRACTOR and shall be removed from the job site upon completion of the project, unless otherwise noted on the Contract Drawings or specified herein.

#### 1.10 ERRORS, CORRECTIONS, AND/OR OMISSIONS

- A. Should a piece of utilization equipment be supplied of a different size or horsepower than shown on the Contract Drawings, the CONTRACTOR shall be responsible for installing the proper size wiring, conduit, starters, circuit breakers, etc., for proper operation of that unit and the complete electrical system at no extra cost to the OWNER.

40-2022 (02/2022)

- B. It is the intent of these Specifications to provide for an electrical system installation complete in every respect, to operate in the manner and under conditions as shown in these Specifications and on the Contract Drawings. The CONTRACTOR shall notify the ENGINEER, in writing, of any omission or error at least 10 days prior to opening of bids. In the event of the CONTRACTORs failure to give such notice, he/she may be required to correct work and/or furnish items omitted without additional cost.
- C. Necessary changes or revisions in electrical work to meet any code or power company requirement shall be made by the CONTRACTOR without additional charge.

#### 1.11 GUARANTEES AND WARRANTIES

- A. The CONTRACTOR shall guarantee all work including equipment, materials, and workmanship. This guarantee shall be against all defects of any of the above and shall run for a period of 1 year from the date of acceptance of the work, concurrent with the one-year guarantee period designated for the general construction contract under which electrical work is performed.
- B. Repair and maintenance for the guarantee period is the responsibility of the CONTRACTOR and shall include all repairs and maintenance other than that which is considered as routine. (That is oiling, greasing, etc.) The ENGINEER shall be the judge of what shall be considered as routine maintenance.

#### 1.12 TESTING

- A. After the wiring system is complete, and at such time as the ENGINEER may direct, the CONTRACTOR shall conduct an operating test for acceptance. The equipment shall be demonstrated to operate in accordance with the requirements of these Specifications and the Contract Drawings. The test shall be performed in the presence of the ENGINEER or his authorized representative. The CONTRACTOR shall furnish all instruments and personnel required for the tests, as well as the necessary electrical power.
- B. Before energizing the system, the CONTRACTOR shall check all connections and set all relays and instruments for proper operation. He shall obtain all necessary clearances, approvals, and instructions from the serving utility company prior to placing power on the equipment.

#### 1.13 CLEANUP

- A. Cleanup shall be performed as soon as possible after the electrical installation is complete. All control panels, switches, etc., shall be free from tags, stickers, etc. All painted enclosures shall be free from scratches or splattered paint. The interior of all enclosures shall be clean from dust, wire strippings, etc. Surplus material, rubbish, and equipment shall be removed from the jobsite upon completion of the work.
- B. During construction, cover all OWNER equipment subject to damage.

40-2022 (02/2022)

#### 1.14 EXCAVATION AND BACKFILL

- A. Excavation for conduits shall be of sufficient width to allow for proper jointing and alignment of the type conduit used. Conduit shall be bedded on original ground unless indicated otherwise on the Drawings. Where conduit is in solid rock, a 6-inch earth cushion must be provided. Conduit shall be laid in straight lines between pull boxes and/or structures unless otherwise notes on the Contract Drawings. The cost of solid rock excavation shall be included in the lump sum bid.
- B. Backfill shall be hand placed, loose granular earth for a height of 6 inches above the top of the largest conduit. This material shall be free of rocks over ½ inches in diameter. Above this, rocks up to 3-inch diameter may be included but must be mixed with sufficient earth to fill all voids.

#### 1.15 POWER COMPANY COORDINATION

- A. The CONTRACTOR is responsible for coordinating all activities onsite by the power company.
- B. The CONTRACTOR is required to meet all requirements and special provisions of the power company. The CONTRACTOR shall coordinate with the utility prior to bidding the project. No extras will be allowed for provisions required by the power company.

#### 1.16 TEMPORARY ELECTRICAL POWER

- A. The CONTRACTOR shall be responsible for providing temporary electrical power as required during the course of construction and shall remove the temporary service equipment when no longer required.

#### 1.17 OVERCURRENT PROTECTION

- A. Circuit breakers or fused switches shall be the size and type as written herein and shown on the Contract Drawings. Any additional overcurrent protection required to maintain an equipment listing by an authority having jurisdiction shall be installed by the CONTRACTOR at no extra cost to the OWNER.

#### 1.18 TRAINING

- A. No training will be required for the electrical equipment on this project.

#### 1.19 RECORD DRAWINGS

- A. The CONTRACTOR shall maintain 1 set of the Contract Drawings on the job in good condition for examination at all times. The CONTRACTOR's qualified representative shall enter upon these Drawings, from day to day, the actual "as-built" record of construction and/or alteration progress. Entries and notes shall be made in a neat and legible manner and these Drawings delivered to the ENGINEER after completion of the construction, for use in preparation of Record Drawings. Underground lines must be dimensioned to permanent structures.

40-2022 (02/2022)

1.20 MAINTAINING CONTINUOUS ELECTRICAL SYSTEM AND SERVICE

- A. Existing pump system continuity shall be maintained at all times. Provide all equipment necessary (including bypass pumps, temporary switchgear, controls, and rental power generation/pumping equipment if necessary) to ensure that sewage pumping remains operational until the new system is fully functional.

1.21 GROUNDING AND BONDING

- A. All metallic conduit, cabinets, equipment, and service shall be grounded in accordance with NEC requirements. All supporting framework in contact with electrical conduit, cable, and/or enclosures, shall be properly grounded.

1.22 SERVICE ENTRANCE

- A. Conductors and terminations for service entrances shall be furnished and installed by the CONTRACTOR. Voltage, phase, and number of wires shall be as shown on the Drawings. Clearances for overhead entrance wires shall be per power company, NEC, and NESC requirements.

1.23 CONTRACTOR LICENSING

- A. The CONTRACTOR performing the electrical work on this project shall be a licensed electrical contractor in the State of Kentucky.

1.24 ELECTRICAL COMPONENT MOUNTING HEIGHTS

- A. Mounting heights shall be as shown on the Contract Drawings. Operators and control devices shall not be mounted higher than 6'6" above finished floor or grade.

1.25 EQUIPMENT IDENTIFICATION

- A. All starters, feeder units, disconnects, instruments, etc., shall be marked to indicate the motors, circuit, they control or monitor. Marking is to be done with engraved laminated nameplates. Nameplates shall be fastened to equipment with stainless steel screws, one each side. In no way shall the installation of the mounting screws void the NEMA enclosure rating of the equipment in which they are installed. If there are more than one number, the equipment shall be numbered consecutively and labeled as such. Nameplate background color shall be white, with black engraved letters.
- B. Disconnect switches, control panels, transfer switches, panelboards etc. shall be labeled with orange OSHA-compliant vinyl self-adhesive signs that list the maximum voltage contained inside the cabinet or panel.

1.26 EQUIPMENT CONFIGURATION/PROGRAMMING

- A. Comminutor program is required to be furnished/installed/commissioned by the manufacturer's authorized representative. Submit a startup report to ENGINEER.

40-2022 (02/2022)

## **PART 2 PRODUCTS**

### **2.01 ACCEPTABLE MANUFACTURERS**

#### **A. Raceways**

1. Rigid Aluminum Conduit-"Allied," "Wheatland," "Indalex," or equal.
2. PVC Conduit-"Allied," "Carlson," "Cantex," or equal.
3. Liquidtight Flexible Metal Conduit-"Allied," "Anaconda," or equal.

#### **B. Wires and Cables**

1. Building Wire (Types THWN and THW)-"General Cable," "Southwire," "AWC" or equal.
2. Instrumentation Cables-"General Cable," "Belden," "Okonite," or equal.

#### **C. Boxes-"Appleton," "Crouse-Hinds," "Hoffman," "Rittal," or equal.**

#### **D. Wire Connections and Connecting Devices**

1. Termination and Splice Connectors-"3M Scotchlok," "Anderson," "T&B," "Burndy," or equal.
2. Connectors, Lugs, etc.-"T&B," "Anderson," "Burndy," or equal.

#### **E. Grounding Equipment-"Cadweld," "ITT Blackburn," "Copperweld Bimetallics Group," "Cathodic Engineering Equipment Co.," or equal.**

#### **F. Motor Control Equipment-"Schneider," "Allen Bradley," "Eaton," "G.E.," or equal.**

### **2.02 MATERIALS**

#### **A. Conduit and Fittings**

##### **1. Aluminum Conduit**

- a. Aluminum conduit shall be extruded from alloy 6063 and shall be the rigid type, non-toxic, corrosion resistant, and non-staining. It shall be manufactured per UL standards as well as listed/labeled by same.
- b. Fittings, boxes, and accessories used in conjunction with aluminum conduit shall be die cast, copper free type. They shall be resistant to both chemical and galvanic corrosion. All covers shall have neoprene gaskets. Aluminum fittings containing more than 0.4 percent copper are prohibited.
- c. Aluminum conduit proposed for concrete slab or underground applications shall be UL listed for the purpose and factory pre-coated. Corrosion-resistant taping is allowed for stubouts out of the ground.

##### **2. Polyvinylchloride (PVC) Conduit-PVC conduit and fittings shall be Schedule 80 heavy wall and UL listed. Expansion joints shall be used as**

40-2022 (02/2022)

recommended by the manufacturer in published literature. PVC systems shall be 90 degrees Celsius minimum UL rated, have a tensile strength of 7,000 psi @ 73.4 degrees Fahrenheit, flexural strength of 11,000 psi and compressive strength of 8,000 psi.

3. Liquidtight Flexible Conduit-Flexible conduit shall be the metallic liquidtight type UA constructed from flexibly or spirally wound electro-galvanized steel with light gray PVC coating. Connections shall be by means of copper-free aluminum fittings.
4. Myer-style aluminum hubs shall be used rather than locknuts for all NEMA 4X and exterior penetrations.
5. Bushings shall be metallic insulating type, consisting of an insulating insert molded or locked into the metallic body of the fitting. Bushings made entirely of metal or nonmetallic material are not permitted.
6. Corrosion-Protection Tape: The corrosion protection tape shall be Scotchrap 51 or equal with 20mil thickness PVC tape and high-tack adhesive. Degreasing and priming of the conduit is required prior to applying the corrosion-protection tape.

B. Conductors (600 Volts and Below)

1. All conductors shall be insulated so that they are rated at 600 volts.
2. Insulated conductors shall be minimum #12 AWG for power or #14 AWG for control and shall be stranded.
3. All conductors brought to the job site shall be new and unused and where no special factory cut lengths are involved, shall be delivered to the job site in standard coils. CONTRACTOR shall provide verification to the ENGINEER of wire condition before wire is installed.
4. All conductors shall be soft drawn, 98% conductivity copper conforming to the latest ASTM Specifications and the requirements of the National Electrical Code.
5. Conductors shall be insulated with type THWN insulation and all conduits shown on the Drawings are sized accordingly.

- C. Submersible pump power cables shall be of the extra hard usage type suitable for submerged duty and able to withstand common corrosive agents found in water and wastewater. They shall be provided with high grade non-magnetic stainless steel strain relief cable grips installed at the pump end and high grade non-magnetic stainless steel support cable grips anchored to the wet well structure where they enter the wetwell. The support grips shall be the heavy-duty type stainless 302, 304, or 316 as manufactured by Hubbell/Bryant or equal.

D. Boxes and Enclosures

1. All boxes shall be stainless NEMA 4X unless noted otherwise, with at least 5-½ full threads for each conduit opening, and shall be suitable for surface mounting as required with drilled external, cast mounting extensions. Box covers shall be hinged or cap screw retained as required, of the same material as the box and provided with stainless steel hardware.

E. Wire Connections and Connecting Devices

1. Terminals and splice connectors from #22 to #4 AWG shall be compression type with barrels to provide maximum conductor contact and tensile strength. Performance, construction, and materials shall be in conformance with UL standards for wire connectors and rated for 600 Volts and 105 degrees Celsius.
2. Lugs and splice connectors from #6 AWG to 1000 kcmil shall be compression types with barrels to provide maximum conductor contact and tensile strength. They shall be manufactured from high conductivity copper and entirely tin plated. They shall be crimped with standard industry tooling. The lugs and connectors must have a current carrying capacity equal to the conductors for which they are rated and must also meet all UL requirements. All lugs above #4/0 shall be 2 hole lugs with NEMA spacing. The lugs shall be rated for operation through 35 KV. The lugs shall be of closed end construction to exclude moisture migration into the cable conductor.

F. Wiring Devices

1. Ground fault interrupting receptacles shall be required where shown on the Contract Drawings. They shall be rated 20 amps (125 volts) and shall be of the duplex, feed through type, capable of protecting all downstream receptacles on the same circuit. They shall be UL listed and shall comply with UL 943 and interrupt the current between 4-6 milliamps of ground fault leakage. Appropriate plates shall be furnished and installed. The 20 ampere rating shall apply not only to device internals but to the faceplate as well. Receptacle shall be Hubbell GFI 5352, or equal.
2. Weatherproof covers shall be Hubbell WP series, Thomas and Betts 2CKG, or equal. They shall be weatherproof-in-use with cast aluminum construction. Mounting screws shall be stainless. Protection shall be NEMA 3R.

G. Motors

1. Ratings and Electrical Characteristics
  - a. Time: All motors shall be rated for continuous duty.



40-2022 (02/2022)

- b. Temperature: Maximum ambient temperature of 40 degrees Celsius and an altitude of 3,300 feet or less, according to service factor and insulation class employed.
  - c. Voltage: All single phase motors shall be rated 115/208/230 volts and all polyphase motor 230/460 volts. All motors shall be capable of normal operation at balanced voltages in the range of + 10 percent from rated winding voltage.
  - d. Frequency: All AC motors shall be rated for 60 hz. operation. All motors shall be capable of normal operation at frequencies 5 percent above or below the normal rating of 60 hz.
  - e. Locked Rotor Current: Locked rotor current shall be in accordance with NEMA standards.
  - f. Speed: Slip shall not exceed 4 percent at full load.
  - g. Service Factor: The service factor shall be 1.15 or higher.
  - h. Insulation Class: Insulation shall be NEMA Class F or Class H.
  - i. Design Level: Motors shall be NEMA design B, except as otherwise noted.
  - j. Enclosure: Submersible motors shall be air or oil filled and of watertight construction. Motors shall be listed Class 1 Division 1 Group D.
  - k. Winding Overtemperature Sensors: The devices shall be hermetically sealed, snap-acting thermal switches, actuated by a thermally responsive bi-metallic disk. A minimum of 1 per phase is required, with switches wired into the control circuit of the starter to provide de-energization should overheating threaten. All submersible motors shall be equipped with motor winding thermostats.
  - l. All submersible motors shall be equipped to detect seal failure.
2. Tests, Nameplates, and Shop Drawings:
- a. Test
    - (1) Tests shall be required on integral horsepower motors only. A factory certified test report of "electrically duplicate motors previously tested" shall be supplied on all motors under 200 horsepower. The test shall be certified by the factory and shall contain a statement to the effect that complete tests affirm the guaranteed characteristics published in the manufacturer's catalogs or descriptive

literature. Tests shall be in accordance with IEEE test procedures.

b. Nameplates

- (1) Each motor shall have a permanently affixed nameplate of brass, stainless steel, or other metal of durability and corrosion resistance. The data contained on the nameplate shall be in accordance with NEMA standards. Provide a spare nameplate with each motor and mount the nameplate in the starter cabinet. A Brady label with equivalent nameplate information will be accepted in lieu of an actual spare nameplate.

H. Safety Switches

1. All safety switches shall be heavy-duty load break type with a quick-make, quick-break, switch mechanism. The switches shall be fused or unfused as indicated on the Drawings. The handle position shall give visual indication of open and closed switch position. Padlocking capability shall be provided for locking the switch in the "OFF" (open) position. Switches are required to be UL98 listed and shall comply with NEMA KS-1 latest version.
2. The switch jaws shall be multi-spring type for positive grip of the switch blades and shall be provided with arc suppressors. The fuse clips shall be spring reinforced, positive pressure type of electrolytic copper. Fuse clips shall be rejection type.
3. The switch shall be provided with cover-blade interlock so that the cover cannot be opened when the switch blades are closed, nor can the switch blades be closed with the cover open. Interlock bypassing devices shall be included for use by authorized personnel. Note: where indicated, safety switches shall have integral electrical interlocks. Contacts shall be open when the switch is in the off position.
4. Enclosures shall 4X stainless steel except for the service switch which will be allowed to be NEMA 3R.
5. Each safety switch shall be provided with ground lugs as required to accept grounding conductors as shown on the Drawings. The grounding lugs shall be factory installed and shall have direct metal-to-metal contact with the switch enclosure.
6. The service switch shall be the double throw type fused safety switch with service entrance rating, Eaton DT series or equal. It shall be lockable in any position. The switch shall include E1016 female Camlok connectors with the following colors: Black, Red, Blue, White, and Green. The Camlok connectors must be verified by CONTRACTOR prior to procurement to ensure compatibility with OWNER's generator cables and to determine the

40-2022 (02/2022)

exact model/catalog number. Incompatible Camlok connectors will not be accepted. The Camlok connections shall be arranged on an interior dead-front panel with a hinged bottom panel that allows portable cable entry into the enclosure.

I. Motor Control–See Section 16900 for requirements.

J. Lighting

1. All fixtures shall be delivered complete with suspension and mounting accessories, diffusers, reflectors, etc., all wired and assembled. All accessory wiring shall be furnished and installed as shown on the Contract Drawings.

2. All supports required for luminaires shall be furnished and installed by the CONTRACTOR.

K. Supporting Devices–All strut, channel, conduit clamps/straps, and other supporting devices shall be either stainless steel or aluminum. All hardware such as nuts, bolts, anchors, washers, etc. shall be stainless steel.

L. Grounding Equipment–Ground rods shall be 10' x ¾" size, minimum.

M. Float (Level) Switches

1. The float switches shall be oval-shaped, direct-acting, with a single pole mercury switch which activates when the liquid level is slightly above horizontal and de-actuates when the liquid level falls below horizontal. Electrical rating shall be 4.5A minimum at 120V; 2.25A minimum at 230V (resistive). The float body shall have polypropylene casing that is impact and chemical resistant. It shall be a suspended-style unit with built-in counterweight.

2. The switch shall have a cable which is oil-resistant, 18-gauge, 2 conductor, extra hard usage STOOW-type and is rated for 600V. The cable shall be furnished of a length sufficient to terminate as shown on the Contract drawings. The switch and cable assembly shall be UL listed.

3. The float switch shall be Roto-Float Signal-Duty Internally Weighted Float Switch, or equal.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION/APPLICATION/ERECTION**

A. Conduit

1. PVC conduit shall be utilized below grade, and aluminum conduit shall be used above grade. The transition from PVC to aluminum shall occur below grade prior to the elbow. The aluminum conduit shall be taped

40-2022 (02/2022)

with corrosion-prevention tape from the transition point to 6 inches above finished grade.

2. During construction, all new conduits shall be kept dry and free of moisture and debris. Before the wire is pulled in, all conduits shall be swabbed to clear all moisture and debris which may have unavoidably accumulated.
3. Rigid conduits, where they enter cabinets, pull boxes or outlet boxes, shall be secured in place by Myers hubs. The use of locknuts is not acceptable.
4. All field bends shall be made with standard tools and bending equipment manufactured especially for this purpose. Bends in metallic conduit shall be made while cold and in no case shall the conduits be heated. Conduits shall not be bent through more than 90 degrees.
5. Size of conduits shall not be less than that indicated on the Contract Drawings. If the conduit size is not indicated, provide the minimum size required by the National Electrical Code.
6. In general, flexible conduit is prohibited. Where absolutely necessary, it shall be liquidtight, with maximum lengths of 3 feet.
7. All conduit joints shall be made up tight and no running threads shall be permitted on threaded connections. No kinked, clogged or deformed conduits shall be permitted on the job.
8. During construction, all installed conduits shall be temporarily capped or corked.
9. All moisture proofing or other material for thread protection shall be removed from conduit threads prior to installation. No material of insulating quality shall be used on the conduit threads or other places which will reduce the overall conductivity of the conduit system.
10. Raceways shall be securely and rigidly fastened in place with conduit clamps or approved conduit hangers. Bolts, screws, etc. used in securing the work shall be stainless steel and of ample size for the service. Assembly bolts, nuts, washers, etc., shall be stainless steel. Raceways shall not be welded to steel structures.
11. Conduit runs shall be supported by one-hole straps with clamp backs or by mini-clamps/hangers. An air-gap is required between the conduit and the supporting structure. All mounting screws/bolts/hardware shall be stainless steel.
12. The use of perforated iron straps or wire for supporting conduits will not be permitted.

40-2022 (02/2022)

13. Conduits shall not be installed horizontally inside concrete slabs. The conduit must be installed underneath of the slab.
14. All conduit shall have an insulated ground wire pulled to all equipment.
15. All conduits penetrating enclosures shall have duct seal applied to seal the conduit and prevent moisture from entering the enclosure.

B. Wire and Cable (600 Volts and Below):

1. All wiring shall be installed in conduit. Wire shall not be installed until all work of any nature that may cause injury to the wire is completed.
2. Mechanical means shall not be used in pulling in wires No. 8 or smaller.
3. Approved wire pulling lubricant shall be used as required to prevent insulation damage and over stressing of the wire while pulling through conduit. In no case shall conductors be greased or coated with any substance injurious to the conductor insulation or sheath.
4. All wiring in control equipment, cabinets, etc., shall be neatly wrapped, taped, or laced into groups to provide a neat and orderly appearance in the equipment.
5. Where the wire is shown larger than that required for the load, it is done so for voltage drop or other purposes and must be installed as shown. Where the wire is stranded, the removal of strands in order to install the wire into a lug provided on any equipment will not be permitted. A larger lug shall be installed which will accept the wire size indicated.
6. For the wiring of circuits consisting of AWG No. 10 or smaller wire, self-insulated pressure connectors (wirenuts) shall be utilized for all splices or joints.
7. Where indicated on the Drawings, cables entering enclosures shall be sealed using strain relief connectors suitable for Class I, Division 1, Group D hazardous locations. The purpose of the connector is to provide a seal between the hazardous and non-hazardous location without the use of sealing fittings.
8. Each wire shall be labeled at both termination points. Individual conductor or circuit identification shall be carried throughout, with circuit numbers or other identification clearly stamped on terminal strips and shown in wiring diagrams.
9. In all junction boxes, cabinets, control compartments and terminal boxes where no terminal board is provided, each wire, including all power wires, shall be properly identified by plastic coated, self-adhesive, wire marker.
10. In cases similar to the above where the terminal boards are provided for the control, indicating, and metering wires, all wires including motor

leads and other power wires shall be identified by wire markers as specified above.

11. Equipment ground wire insulation shall be colored green or green with 2 or more yellow stripes. Isolated grounding conductors shall be green with striping that identifies the conductor as "isolated ground" and different from the equipment (bonded) ground.
12. In general and unless otherwise shown on the drawings, no two wires of the same color shall be run in the same conduit except such as control wiring, switch legs, neutral, and ground. Where a conduit run is shown on the drawings to have two or more wires connected to the same phase and, therefore, are the same color, pressure sensitive, plastic marked wire marker identification tape shall be used wherever the wire is accessible (junction boxes, panels, device boxes, etc). The numbers shall in each case, correspond to the circuit number and panelboard from which the circuit emanates. Control wiring inside any compartment which may be energized from a source outside the compartment shall have insulation. Where yellow insulated wires are used inside any cabinet, compartment, etc., a machine engraved, laminated plastic identification marker shall be installed on the outside of the compartment.
13. Insulation on ungrounded conductors larger than AWG #10 and on grounded (neutral) and grounding (equipment ground) conductors larger than AWG #6 may be black with color coding accomplished with the use of colored plastic tape. Tape shall be installed on the conductors wherever they are visible and shall be wrapped at least three (3) turns around the conductor.
14. All wiring on this project, except control wiring, shall reflect the phase relationship as follows:  

120/240 volt, 3-phase 4-wire, delta system:	black, red for ungrounded conductors, orange for ungrounded conductor connected to "high leg", white for neutral.
--	---

#### C. Grounding

1. Ground rods shall be driven vertically into the earth to at least one foot below finished grade. Where a counterpoise or grounding grid is indicated and where rock is encountered at a depth of less than 4 feet, rods shall be buried in a trench at not less than 2 feet below finished grade, and at equal angles from any 2 adjacent sides on the outside of the counterpoise or grid. In these cases, at the CONTRACTOR's option, equal lengths of bare conductor of the same size as the counterpoise or grid may be used in place of ground rods.
2. Conductors connecting the main ground bars in switchgear to the earth shall be continuous without joints or splices. Connections to the

grounding system at the switchgear shall be made with pressure connectors such as defined in Article 100, "Connector, Pressure (Solderless)", of the National Electrical Code.

3. Connections to ground rods and all other ground connections below grade shall have a minimum mechanical contact surface area between the conductor and the ground rod of not less than 3 square inches.
4. All connections made below finished grade shall be exothermic.
5. Installation of grounding conductors shall be such that they are not exposed to physical damage. All connections shall be firm and tight. Conductors and connectors shall be so arranged and provided so that there is no strain upon the connection. Buried equipment grounding conductors shall be buried at least 24 inches below finished grade and shall not be buried below concrete pads, paving, etc. except where running a tap to the grid or where shown on the contract drawings. Where buried below concrete or paving, grounding conductors shall be in rigid conduit unless shown on the drawings as a part of a grid.
6. Resistance measurements shall be made between the main grounding bar in the switchgear and a good earth ground. If this resistance is not equal to or less than 5 Ohms, an additional grounding electrode system in the form of ground rods installed and connected together in a 10-foot by 10-foot grid shall be added. The rods shall be connected together and this grid connected to the system with AWG #3/0 bare tinned copper. The number of rods shall be as required to register the resistance value mentioned above. Measurements shall be made in normally dry conditions and, in no case, less than 48 hours after rainfall. Submit a ground test report to the ENGINEER using the "Fall of Potential" method and appropriate ground testing instrumentation.
7. Where a bare conductor is the only conductor installed in conduit or other raceway, and this conductor is serving as a grounding conductor, it shall be bonded to the raceway that contains it at each end of the raceway. The bond shall be made using a grounding type bushing and bonding jumper. The size of the jumper shall be the maximum size that the grounding bushing lug will accept and it shall be connected to the bushing with the lug and to the grounding conductor with a split bolt connector.
8. All metal electrical equipment cabinets (wireways, panels, switchgear, device boxes, junction and pull boxes, motor control panels, etc.) shall be securely bonded to a grounding conductor running through any conduit terminating at the cabinet or enclosure by use of a grounding lug bushing and jumper wire to the enclosure wall. Switchgear, panelboards and motor control equipment shall be provided with an equipment ground bus (including lugs or screw terminals) securely bonded to the enclosure. Junction boxes and other enclosures shall utilize an equipment ground bus or lug as required to securely bond the equipment grounding conductor to the enclosure. The grounding conductor shall be connected

with pressure connectors at the main switchgear to the main grounding system. Where screw terminals or set screw lugs are used, sufficient lugs shall be provided such that not more than one conductor is installed into each lug or terminal.

9. No raceway (including rigid steel conduit, EMT, etc.) shall serve as a grounding conductor.
10. All main feeder circuits and all branch circuits shall contain a grounding conductor sized according to Table 250-95, Article 250 of the National Electrical Code or as shown on the Drawings. This grounding conductor shall be connected to the main grounding conductor in the switchgear from which the circuit emanates. Individual components of the system served by the main feeder circuit shall have their enclosures connected to the main feeder grounding conductor with pressure connectors.
11. The grounding conductor serving motor circuitry shall be connected inside the entrance compartment to the motor frame with a bolted solderless pressure connector. Bolts, nuts, washers and other assorted hardware shall be bronze, cadmium plated steel, or other corrosion resistant material. The motor ground connection shall be to the motor frame and independent of the mounting bolts or sliding base.
12. Grounded and Grounding Conductor: Connections to the grounding conductor and/or the neutral (grounded) conductor shall be made in such a manner that removal of any device or equipment will not interrupt the continuity of these conductors to any device downstream from the device removed.

#### D. Lighting

1. The CONTRACTOR shall furnish all light fixtures, lighting equipment, components, hangers, etc., as shown on the Contract Drawings and shall install them at the locations shown on the Contract Drawings. Clean lighting fixtures of dirt and debris upon completion of installation. Protect installed fixtures from damage during remainder of construction period.

#### E. Light Poles

1. A concrete foundation shall be provided for each pole as detailed on the Contract Drawing. The poles shall be mounted utilizing anchor bolts set in the concrete. The anchor bolts shall have galvanized or plated threads and shall be furnished with the pole by the manufacturer. Bases shall have 1 inch chamfer all around and rubbed and buffed smooth to below grade.
2. When anchor bolts are positioned prior to pouring concrete, spacing and projection must be verified with pole manufacturer's recommendations. A plastic or plywood template should be fabricated from the manufacturer's



40-2022 (02/2022)

instructions to use when setting the anchor bolts. Anchor bolts that are not installed plumb and in the correct locations shall be removed and replaced. The CONTRACTOR shall not be allowed to bend the anchor bolts back to plumb after concrete is set.

3. Leveling nuts shall be utilized for the mounting of poles to foundations. A nut should be screwed down on each bolt until it meets the concrete, then the nuts must be adjusted until they are level.
4. The pole shall be carefully lowered onto the anchor bolts and allowed to rest on the leveling nuts. Flat washers followed by lockwashers should be placed on the anchor bolts and the top nut installed. Minor adjustments on the leveling nuts may be necessary to plumb the pole before the top nuts are tightened down. Special care shall be taken to tighten the top nuts to the torque level recommended by the pole manufacturer. All nuts and washers shall be galvanized or plated.
5. Concrete grout of the nonshrink type must be installed between the base of the pole and the concrete foundation. The grout should be puddled around the edge of the pole base and firmly packed in the space between the pole and foundation. A short piece of small diameter pipe must be installed to make a drain hole through the grout to the pole interior.
6. Aluminum poles must have the bottom of the base painted with Koppers bitumastic No. 50 or equal substitute product before grouting so that the aluminum does not come in contact with the concrete.
7. Poles shall not be modified or drilled on the job site.
8. Under no circumstances should a ground wire be wrapped around an anchor bolt underneath an anchor bolt nut.
9. Manufacturer's installation instructions should be followed as well as those instructions contained herein. Should a discrepancy exist, promptly contact the ENGINEER for clarification.
10. Anchor bolt covers shall be furnished and installed.

**END OF SECTION**

\*\*\*

**SECTION 16900  
CONTROL PANELS**

**PART 1 GENERAL**

**1.01 SCOPE OF WORK**

- A. Control panels shall be as specified herein and as shown on the Contract Drawings.

**1.02 RELATED WORK**

- A. Drawings and General and Supplementary Conditions of the Contract and Division 1 Specifications sections apply to this Section.

**1.03 SUBMITTALS**

- A. Panel and enclosure plan and elevation drawings depicting all components and wiring duct.
- B. Complete wiring diagrams.
- C. Catalog cut-sheets on all components, with options clearly indicated and non-applicable items clearly excluded.
- D. Shop Drawings shall be clearly marked and or highlighted as to which product, type, option, etc. is being submitted. Product literature with one or more styles/configurations for a single product shall have a written description of use for each of the styles/configurations represented on the literature.
- E. O&M manuals shall be submitted in accordance with Section 16020. They shall include all field modifications made such that the wiring diagrams exactly match the field-installed equipment and control panels. They shall also include complete cut-sheets, product data, operation, and maintenance information.

**1.04 REFERENCES**

- A. NFPA 79–All control panels shall comply with NFPA 79.
- B. NEC–All control panels shall comply with NEC article 409.
- C. UL698–All control panels shall be listed to UL698 and shall bear the UL label.

**1.05 GENERAL REQUIREMENTS**

- A. All control panels furnished under this Contract shall be manufactured in accordance with industry standards and as herein specified. The CONTRACTOR shall coordinate all subcontractors and vendors to ensure that the control panels are furnished and meet the requirements specified herein.

40-2022 (02/2022)

- B. Control panels shall be as manufactured by ControlWorks, Inc., Quality Controls, ADGO, or other UL or ETL qualified panel vendor. Panel construction shall comply with OSHA requirements and shall be either UL or ETL listed.
- C. Control panels to be furnished on this project shall be wired to function according to schematics shown on the Contract Drawings. The pump control panel shall be manufactured using "relay logic" as shown on schematics (control circuits) located in the Contract Drawings. In addition to the requirements shown on the Contract Drawings, the panels shall adhere to additional requirements as written herein, and in the utilization equipment specifications.
- D. All components shall be mounted with threaded screws to a subpanel inside the enclosure such that they are replaceable without removing the subpanel. All wiring must be stranded and protected by a circuit breaker. Supplementary circuit breakers may be utilized for circuits that require wiring smaller than 14 gauge. Wiring ducts for cable/conductor management are required to be utilized for routing of conductors and cables. Ducts are also required to be provided for field-wiring at the top and bottom of the panels. All field wires should terminate at a terminal strip upon entering the control panel enclosure.
- E. Elementary control schematics and connection diagrams showing the spatial relationship of components and wiring shall be submitted for review. Also, a bill of materials, drawing of device arrangement on front, and enclosure fabrication drawings shall be submitted. Further, descriptive literature is required on all components. A copy of the as-built wiring diagrams and BOM shall be stored in a pocket inside the control panel enclosure.
- F. Labels shall be installed on all wires, keynoted back to the elementary schematic or the connection diagram, and all terminals identified.
- G. Short circuit ampacity: The minimum short circuit ampacity of the control panel shall be 5kA.
- H. Controlled equipment shall restart automatically after a power outage is restored, unless specifically exempted by ENGINEER due to safety concerns.

## **PART 2 PRODUCTS**

### **2.01 ENCLOSURES**

- A. Control panel enclosure shall be wall-mount type where sized at 30-inch width x 42-inch height or less. Otherwise, it shall be floor-mount type. Enclosures shall be single or double-door as required. Enclosure shall include a NEMA flange-mounted lockable disconnect for 3-phase power supply, or an IEC style rotary lockable disconnect for single phase power supply. Enclosures shall be manufactured by Hoffman, or equal.
- B. Enclosure NEMA rating shall be NEMA 4X stainless steel 304 or 316.
- C. Enclosure door shall have a 3-point latch. Screw clamps are not acceptable. The latch handle shall have a padlock hasp.

40-2022 (02/2022)

- D. Enclosures shall have an interior dead-front swing out panel for panel-mounting of all pilot devices and displays. Operator devices shall not be mounted on the exterior of the enclosure. The enclosure shall also have an interior pocket for holding wiring diagrams, and an interior sub-panel for mounting control equipment.

## 2.02 WIRING REQUIREMENTS

- A. Wire and cable shall comply with Section 16020 except Type MTW conductors shall be used inside the control panel for control circuits. Control circuit wiring shall be 18 gauge or larger.
- B. Power wiring shall utilize compression lugs. All wiring shall extend to terminal blocks for connection to external equipment.

## 2.03 TEMPERATURE CONTROL DEVICES

### A. Electric Heater for Control Panels

1. Provide an electric heater for exterior control panels
2. Heater shall be sized as indicated on the Contract Drawings, or shall be sized and submitted in the Enclosure Heat Gain calculation
3. The heater shall include an integral thermostat, adjustable from 0°F to 100°F, and a fan
4. Heater housing shall be anodized aluminum
5. Fan shall have ball bearings and shall be designed for continuous operation
6. Terminal strip shall accept both solid and stranded wire
7. The heater shall be UL Recognized and CSA listed
8. The heater shall be Hoffman's thermostatically controlled fan-driven heater, or equal.

## 2.04 MOTOR CONTROLS

### A. Starters

1. All magnetic starters and contactors shall be steel mounted, front wired with all terminals accessible for wiring directly from the front. Movable contact blocks shall depend on gravity only and not the use of springs for operation to the open position.

40-2022 (02/2022)

2. Starters shall be NEMA type and sized appropriately for the motor to be controlled, but in no case shall any starter or contactor be smaller than NEMA size 1 or smaller than as indicated on the Drawings. IEC starters are not acceptable.
3. All contactors shall be double break, solid silver cadmium oxide alloy, or equal. Bare copper or silver flashed copper contacts which require periodic filing or cleaning maintenance will not be permitted.
4. Operating coils shall be pressure molded and so designed that, if accidentally connected to excessive voltage they will not expand, bubble or melt. When a coil fails under and condition, the starter shall open and shall not "freeze" in the closed (on) position. Coils shall be replaceable from the front of the starter without having to remove the starter from the panel or enclosure.
5. Combination starters shall be of the molded case circuit breaker type. Trip elements of multi-pole breakers shall be effectively insulated from one another. Multi-pole breakers shall be designed such that an overload on one pole opens all poles simultaneously. Breakers shall be quick-make, quick-break and shall be entirely trip free to prevent the contacts being held in a closed position against a short circuit. Breakers for full voltage starters shall be the magnetic only type. All others shall be thermal magnetic.
6. Each starter leg shall have a thermal overload device in each ungrounded leg. The overload shall be bimetal, ambient compensated, thermal element type.

## 2.05 POWER SUPPLIES

### A. DC Power Supplies

1. DC power supplies shall be switched mode and Din-rail mountable.
2. Input power range shall be from 85-264 VAC.
3. Output voltage range shall be as needed with a tolerance of 1 percent. Output voltage shall be adjustable up and down at least 10 percent from the nominal value.
4. The power supply shall include an internal input fuse.
5. Power supply shall have a "DC Ok" signaling LED.
6. Operating temperature rating shall be -25 degrees Celsius to +70 degrees Celsius and up to 95 percent relative humidity.
7. Output power shall be buffered for full output power ridethrough for 20 milliseconds in the event of a power outage.

40-2022 (02/2022)

8. The power supply shall be able to supply 150 percent of its continuous capacity for short periods of time.
9. The power supply shall have internal short circuit protection with automatic recovery.
10. The power supply shall be Phoenix Contact, Sola, Allen-Bradley, or equal.

## 2.06 OVERCURRENT PROTECTION

- A. Main 3-Phase Breakers–Shall be thermal-magnetic, molded-case, Type FA or KA as needed, Square D or equal. Provide service entrance rating where indicated on the Drawings as being used in a service entrance application. See short circuit rating requirements above. Provide cable assembly to connect to flange-mounted disconnect.
- B. Main Single-Phase Breakers–Shall be Din-rail mountable with clear “on,” “off,” and “tripped” positions, Square D QOU or equal. Where a substantial number of breakers are used, provide a panelboard mounting base.
- C. Combination Starters–Circuit breakers for use with combination starters shall be magnetic-only, Square D MagGuard, or equal, with adjustable trip settings.
- D. Supplementary Protectors–Shall be Din-rail mountable UL489 listed. Trip rating shall match load served.
- E. Power Fuses–Fuse blocks must have protective cover. Fuses may only be used where indicated on the Drawings. Otherwise, use circuit breakers.

## 2.07 MISCELLANEOUS PANEL COMPONENTS

- A. Terminal Blocks, #10 conductor size and smaller.
  1. Terminal blocks shall be Din-rail mountable IEC style with minimum width of 6.2 mm. They shall be rated for conductors from #10 to #24 AWG. Current rating shall be 30A, minimum. Terminal blocks shall be finger-safe. Double level terminal blocks may be utilized where necessary to conserve space.
  2. Screw clamp terminal blocks are required. Terminal blocks that rely upon spring pressure only for conductor termination are not acceptable.
  3. Provide cross connection bridges, partition plates, end anchors, zack strip labels, and all other components necessary for a complete installation. Each block shall be labeled with a machine-printed label. No more than 2 conductors may be landed under on single terminal block terminal screw.
  4. Utilize the following terminal block colors:
    - a. 120V Power–Black

40-2022 (02/2022)

- b. 120V Control-Red
  - c. 120V Neutral-White
  - d. Equipment Grounding-Green or Green/Yellow
  - e. DC Positive-Blue
  - f. DC Negative/Grounded-Gray
  - g. Conductor energized from remote source: Yellow
5. Terminal blocks shall be manufactured by Phoenix Contact, Allen-Bradley, or equal.
- B. Fuse blocks (control circuits)-Fuse blocks shall be finger safe and shall have LED indication when the fuse is blown. Fuses may be used only where indicated on the Drawings; otherwise use circuit breakers.
- C. Conductor Labels-Shall be the heat-shrink type, machine printed. Brady, or equal.
- D. Component nameplates-Shall be engraved, rigid, laminated plastic with adhesive back and letter height of 3/16-inch minimum. Nameplates shall be white with black letters.
- E. Intrinsic Safety Barriers-Provide UL listed intrinsic safety barriers for circuit extensions into hazardous areas. The barriers shall be Phoenix Contact, or equal.
- F. Control transformers shall be machine tool type transformers with epoxy encapsulated coils or resin impregnated coils, high quality silicon steel laminations, copper magnet wire, molded-in terminals, and 55°C rise insulation system.
- G. Voltage/Phase Monitor-Shall continually measure the voltage of all phases of incoming power and provide protection for any motors or other equipment that could be damaged. The phase monitor shall sense under and overvoltage, voltage unbalance, phase loss, and phase reversal. It shall have a relay output.
- H. Pilot Devices
1. Selector switches shall be NEMA 4X, 30mm, oil-tight construction, and of the quick-make, quick-break type.
  2. Pushbuttons shall be NEMA 4X oil-tight, 30mm.
  3. Pilot lights shall be 30mm, oil-tight, push-to-test, NEMA 4X LED type. Green pilot lights shall be used for indicating "pump running," and yellow shall be used for "seal leak."
  4. Elapsed time meters shall be non-resettable.
  5. Timing relays shall have an adjustable time range suitable for the application, with the time delay occurring after energization.

I. Control Relays

1. Control relays shall be magnetic, general purpose, "ice cube" type with 3-pole (minimum), double throw contacts rated at 5 amperes (minimum), 120 volts (minimum). Coils shall be rated to operate at the indicated control voltage.
2. Provide proper bases, mounting track, etc. for a complete installation. All relays shall have a retainer clip, manual operator, and pilot light. Coils connected to solid-state digital outputs shall have transient surge protection.

J. Surge Protection Devices (SPD)

1. Control Panel SPD

- a. The SPD shall be suitable for application in category C3 environments as described in ANSI/IEEE C62.41. The SPD shall be of parallel design and provide protection, line to ground, neutral to ground, and line to neutral for wye or delta distribution systems. The SPD shall be compatible with the indicated electrical system, voltage, current and distribution configuration.
- b. SPD shall comply with ANSI/IEEE C62.1, C62.41, and C62.45. The TVSS shall be capable of surviving 1,000 sequential category C3 surges without failure following IEEE test procedures established in C62.45.
- c. The SPD shall have LED indicators that provide indication of suppression failure. It shall also have a surge counter. It shall also have a relay contact that provides remote indication of surge protection failure.
- d. The SPD maximum continuous operating voltage (MCOV) shall be capable of sustaining 110 percent of the nominal RMS voltage continuously without degradation.
- e. SPD shall have surge current capacity of 80,000 amps minimum per mode with a response time no greater than 5 nanoseconds, for any of the individual protection modes, under laboratory conditions with optimum lead lengths.
- f. The SPD UL 1449 surge suppression rating for any suppression mode shall not exceed:

Electrical System Voltage	Phases	UL 1449 Surge Suppression Ratings
120/240	1	330V
120/240	3	330V
120/208	3	330V



40-2022 (02/2022)

208	3	700V
277/480	3	700V
480	3	1500V

### **PART 3 EXECUTION**

#### **3.01 LABELING**

- A. Provide labels for all conductors and components.
- B. Legends for starter nameplates shall be taken from the one line diagram in the Contract Drawings. Wire and miscellaneous component labels shall match the O&M manual wiring diagrams.

#### **3.02 GROUNDING**

- A. Enclosures shall be grounded in accordance with the NEC.

#### **3.03 PROTECTION**

- A. All electrical and electronic components of the Control Panel shall be protected against damage due to electrical transients induced in interconnecting lines from lightning discharges and surges in nearby electrical systems. Provide a surge protection device (SPD).
- B. The pump control panel shall be equipped with a voltage/phase monitor.

#### **3.04 INSTALLATION/ERECTION**

- A. Equipment furnished under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with the Drawings, Specifications, manufacturer Shop Drawings, and manufacturer installation instructions.

**END OF SECTION**

\*\*\*