R-647-2019
Contract # 288-2019

CONTRACT DOCUMENTS AND SPECIFICATIONS

FOR

Shandon Park Trunks, Winburn Trunk and Thoroughbred Acres Trunk Sewers, Phase 2

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

Remedial Measures Plan ID No.'s CR-5, CR-6 and CR-7

LFUCG Bid No. 91-2019

Date: September 24, 2019

PREPARED BY:

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Edition: Conform Documents

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SECTION 00100 - ADVERTISEMENT FOR BIDS

1.01 INVITATION

Sealed proposals for the following work will be received by the Lexington-Fayette Urban County Government (LFUCG) until 2:00 p.m., local time, October 15, 2019 for furnishing all labor and/or materials and performing all work as set forth in the Contract Documents prepared by and for Lexington-Fayette Urban County Government, Division of Water Quality (OWNER). Immediately following the scheduled closing time for reception of Bids, all proposals which have been submitted in accordance with the above will be publicly opened and read aloud.

1.02 DESCRIPTION OF WORK

The project includes providing all construction supervision, labor, materials, tools, test equipment necessary for the Shandon Park Trunks, Winburn Trunk and Thoroughbred Acres Trunks, Phase 2. The project will include the decommissioning of four existing pump stations and connection to adjacent trunk sewers

1.03 OBTAINING PLANS, SPECIFICATIONS, AND BID DOCUMENTS

Plans, Specifications, and Contract Documents may be obtained from Lynn Imaging, 328 Old Vine Street, Lexington, KY 40507, (859) 255-1021 or (www.lynnimaging.com) and click on planroom for a non-refundable price of reproduction for each full set of plans and documents. Contract Documents may be examined at the following places:

LFUCG
Division of Central Purchasing
200 East Main Street
Third Floor, Room 338
Lexington, KY 40507
(859) 258-3320

McGraw-Hill Co./F.W. Dodge
2321 Fortune Drive
Suite 112-A
Lexington, KY 40509

LFUCG
Division of Water Quality
125 Lisle Industrial Avenue
Lexington, KY 40511
(859) 425-2400

Builders Exchange
1035 Strader Drive
Suite 100
Lexington, KY 40505
(859) 288-0011

1.04 METHOD OF RECEIVING BIDS

Bids will be received from Prime contracting firms on a unit price basis. Bids shall be submitted in the manner and subject to the conditions as set forth and described in the Information Available to Bidders and Bid Form. Sealed Bids shall be clearly marked on the outside of the envelope as follows: Company Name and Address, Bid Invitation Number, and the Project Name. Bids are to remain sealed until official Bid closure time.

1.05 METHOD OF AWARD

Determination of the successful Bid will be based on the lowest responsive and responsible Bidder whose qualifications indicate the award will be in the best interest of the OWNER and whose Bid/proposal complies with all the prescribed requirements. No Notice of Award will be given until the OWNER has concluded such investigation as deemed necessary to establish the responsibility, qualifications and financial ability of Bidders to do the work in accordance with the Contract Documents to the satisfaction of the OWNER within the time prescribed. The OWNER

reserves the right to reject the Bid of any Bidder who does not pass such investigation to the OWNER's satisfaction. In analyzing Bids, the OWNER may take into consideration alternate and unit prices, if requested by the Bid forms.

1.06 BID WITHDRAWAL

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

1.07 BID SECURITY

All Bids shall be accompanied by a Bid Bond of not less than five percent (5%) of the amount of the Bid executed by a Surety Company authorized to do business in the Commonwealth of Kentucky and countersigned by a licensed Kentucky Resident Agent, representing the Surety Company. Certified Check or Bid Bond shall be payable to Lexington-Fayette Urban County Government.

1.08 SUBMISSION OF BIDS

Contractors shall submit their Bids to the Lexington-Fayette Urban County Government, Division of Purchasing, Third Floor, 200 East Main Street, Lexington, Kentucky 40507. Bids shall be submitted in a sealed envelope not later than 2:00 p.m. (local time) October 15, 2019. Sealed proposals shall be marked clearly on the outside of the container "**Sealed Proposal for: Shandon Park, Winburn and Thoroughbred Acres Trunk Sewers Phase 2** to be opened at 2:00 **p.m. Local Time, October 15, 2019**. Bids received after the scheduled closing time for receipt of Bids will not be considered and will be returned unopened.

1.09 RIGHT TO REJECT

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.

1.10 NOTICE CONCERNING MWDBE GOAL

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

LFUCG has set a goal that not less than ten percent (10%) of the total value of this Contract be subcontracted to MWDBEs. 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 goal for the utilization of MWDBEs as well as Veteran subcontractors is a recommended goal. 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 goal will be a consideration in the procurement process. Depending on the funding source, other MWDBE goals may apply.

For assistance in locating MWDBE Subcontractors contact:

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

1.11 PRE-BID MEETING

A mandatory pre-Bid meeting will be held at 3:00p.m. **local time, October 2, 2019** at the Division of Water Quality, 125 Lisle Industrial Avenue, Lexington, Kentucky 40511, 2nd floor conference room.

1.12 CONSENT DECREE REQUIREMENTS

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

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

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

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

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

END OF SECTION

SECTION 00300 – INFORMATION AVAILABLE TO BIDDERS

1.01 RECEIPT AND OPENING OF BIDS

The Lexington-Fayette Urban County Government (herein called the Owner) invites Bids from firms on the project described in the Advertisement for Bids. The Owner will receive Bids at the Division of Purchasing, at the time and in the manner set forth in the Advertisement for Bids, and the Bids will then be publicly opened and read aloud. The Owner may consider informal any Bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all Bids. Any Bid may be withdrawn prior to the scheduled time for the opening of Bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be considered. No Bidder may withdraw a Bid within ninety (90) days after the actual time and date of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid Security prior to that date.

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

1.02 PREPARATION OF BID

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

1.03 SUBCONTRACTS

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

1.04 QUALIFICATIONS OF BIDDER

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

In evaluating Bids, Owner shall consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and alternatives and unit or lump sum prices, as requested. Owner may consider maintenance requirements, performance data, and disruption or damage to private property. The contract, if awarded, will be awarded to the lowest, qualified, responsible Bidder based upon Owner's evaluation which indicates that the award will be in the best interest of Owner and the general public.

In the event there is any question as to the Bidder's qualifications and ability to complete the work, a final determination will be made in accordance with a fair evaluation by the Lexington-Fayette Urban County Government of the above listed elements.

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.

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

1.05 BID SECURITY

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

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

1.06 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.

1.07 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 Documents. Bidder must agree also to pay liquidated damages for each consecutive calendar day thereafter as specified in the Contract Documents.

1.08 EXAMINATION OF CONTRACT DOCUMENTS AND SITE

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

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

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

1.09 ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the Contract Documents will be made to any Bidder orally. Every request for such interpretation should be in writing addressed to the Director of Central Purchasing, who in turn will have an addendum issued for the Lexington-Fayette Urban County Government, and to be given consideration must be received prior to the date fixed for the opening of Bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications. Acknowledgement of the receipt of addenda must be included with all submitted Bids. Failure of any Bidder to receive any such addendum or interpretation shall not relieve such Bidder from any obligation under his Bid as submitted. All addenda so issued shall become part of the Contract Documents.

1.10 SECURITY FOR FAITHFUL PERFORMANCE

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

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

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

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

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

1.11 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.

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

1.13 LAWS AND REGULATIONS

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

1.14 EROSION AND SEDIMENT CONTROL AND PERMITS

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

1.15 PREVAILING WAGE LAW AND MINIMUM HOURLY RATES

The project shall not be subject to the Davis Bacon Act or prevailing wage rates.

1.16 AFFIRMATIVE ACTION PLAN

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

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

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

All submissions should be directed to:

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

1.17 CONTRACT TIME

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

1.18 SUBSTITUTE OR "OR-EQUAL" ITEMS

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

1.19 ALTERNATE BIDS

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

Any Bidder who submits a Bid incorporating an alternate proposal when alternate Bids/proposals have not been requested in the Advertisement 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 Advertisement for Bids), or which imposes conditions for acceptance other than those established in the Advertisement for Bids, shall have their Bid rejected as non-responsive.

1.20 SIGNING OF AGREEMENT (CONTRACT)

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

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

A. Outreach for MWDBE(s)

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

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

Sherita Miller, Division of Central Purchasing
Lexington-Fayette Urban County Government
200 East Main Street, Room 338
Lexington, Kentucky 40507
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, Division of Central Purchasing
Lexington-Fayette Urban County Government
200 East Main Street, Room 338
Lexington, Kentucky 40507

smiller@lexingtonky.gov

D. MWDBE and Veteran Subcontractors

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

For a list of eligible subcontractors, please contact:

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

1.22 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) and Disadvantaged (DBE) Business Enterprises 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. The LFUCG has also established a 3% of total procurement costs as a Goal for participation of Veteran-Owned Small Businesses (VOSB).

4. **It is therefore a request of each Bidder to include in its bid, the same goal (10%) for MWDBE participation, the same goal (3%) for Veteran 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, section 00410 – Bid Form)

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 MWDBE Substitution Form, section 00410 – Bid 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 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 and operated 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 and operated by one or more Non-Minority Females.

3. A Disadvantaged Business (DBE) is defined as a business which is certified as being at least 51% owned and operated 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 and operated 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 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. Section 00410 – Bid Form 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.**

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 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 (see section 00410 – Bid Form).

1.23 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
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 167-91—Disadvantaged Business Enterprise (DBE) 10% Goal Plan in July of 1991. The resolution states in part (a full copy is available in Central Purchasing):

> *"A Resolution supporting adoption of the administrative plan for a ten percent (10%) Minimum goal for disadvantaged business enterprise participation in Lexington-Fayette Urban County Government construction and professional services contracts; Providing that as part of their bids on LFUCG construction contracts, general Contractors shall make a good faith effort to award at least ten percent (10%) of All subcontracts to disadvantaged business enterprises; providing that divisions of LFUCG shall make a good faith effort to award at least ten percent of their Professional services and other contracts to disadvantaged business enterprises…"*

A Disadvantaged Business Enterprise is defined as a business that has been certified as being at least 51% owned, operated and managed by a U.S. Citizen of the following groups:

- African-American
- Hispanic-American
- Asian/Pacific Islander
- Native American/Native Alaskan
- Non-Minority Female
- Economically and Socially Disadvantaged

In addition, to that end the city council also adopted and implemented resolution 167-91—Veteran-owned Businesses, 3% Goal Plan in July of 2015. The resolution states in part (a full copy is available in Central Purchasing):

> *"A resolution adopting a three percent (3%) minimum goal for certified veteran-owned small businesses and service disabled veteran-owned businesses for certain of those Lexington-Fayette Urban County contracts related to construction for professional services, and authorizing the Division of Purchasing to adopt and implement guidelines and/or policies consistent with the provisions and intent of this resolution by no later than July 1, 2015."*

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

Business	Contact	Email Address	Phone
LFUCG	Sherita Miller	smiller@lexingtonky.gov	859-258-3323
Commerce Lexington – Minority Business Development	Tyrone Tyra	ttyra@commercelexington.com	859-226-1625
Tri-State Minority Supplier Diversity Council	Susan Marston	smarston@tsmsdc.com	502-365-9762
Small Business Development Council	Shirie Hawkins, UK SBDC	smack@uky.edu	859-257-7666
Community Ventures Corporation	Phyllis Alcorn	palcorn@cvky.org	859-231-0054
KY Transportation Cabinet (KYTC)	Melvin Bynes	Melvin.bynes2@ky.gov	502-564-3601
KYTC Pre-Qualification	Shella Eagle	Shella.Eagle@ky.gov	502-782-4815
Ohio River Valley Women's Business Council (WBENC)	Sheila Mixon	smixon@orvwbc.org	513-487-6537
Kentucky MWBE Certification Program	Yvette Smith, Kentucky Finance Cabinet	Yvette.Smith@ky.gov	502-564-8099
National Women Business Owner's Council (NWBOC)	Janet Harris-Lange	janet@nwboc.org	800-675-5066
Small Business Administration	Robert Coffey	robertcoffey@sba.gov	502-582-5971
LaVoz de Kentucky	Andres Cruz	lavozdeky@yahoo.com	859-621-2106
The Key News Journal	Patrice Muhammad	paatricem@keynewsjournal.com	859-373-9428

1.25 OWNER PERMITS

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

1.26 GEOTECHNICAL DATA

Bidder shall refer to Section 00320 regarding available geotechnical data for this Contract.

END OF SECTION

1.21 BID BOND

BID BOND

Bond Number: Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we BASHAM CONSTRUCTION & RENTAL COMPANY, INC.

as principal (the "Principal") and Nationwide Mutual Insurance Company

hereinto called Surety, are held and firmly bound unto

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

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

WHEREAS, the Principal has submitted a bid for Shandon Park Trunks, Winburn Trunks and Thoroughbred Acres Trunk Sewers, Phase 2

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

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

DATED as of this 15th day of October, 2019.

WITNESS / ATTEST:

Brenton R. Basham
Principal (Secretary)
Brenton R Basham, Secretary

BASHAM CONSTRUCTION & RENTAL COMPANY, INC.
Principal

By: _____ (seal)
Name: Chris Day
Title: Estimator

Surety (Secretary)

Nationwide Mutual Insurance Company
Surety

By: _____ (seal)
Name: Deborah L. Burton
Title: Attorney-in-Fact

Power of Attorney

KNOW ALL MEN BY THESE PRESENTS THAT:

Nationwide Mutual Insurance Company, an Ohio corporation
Allied Property and Casualty Insurance Company, an Iowa corporation
AMCO Insurance Company, an Iowa corporation

hereinafter referred to severally as the "Company" and collectively as "the Companies" does hereby make, constitute and appoint:

Deborah L. Burton

each in their individual capacity, its true and lawful attorney-in-fact, with full power and authority to sign, seal, and execute on its behalf any and all bonds and undertakings, and other obligatory instruments of similar nature, in penalties not exceeding the sum of : **Unlimited**

Surety Bond Number **Bid Bond**
Principal **BASHAM CONSTRUCTION & RENTAL COMPANY, INC.**
Obligee **Lexington-Fayette Urban County Government**

and to bind the Company thereby, as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Company; and all acts of said Attorney pursuant to the authority given are hereby ratified and confirmed.

This power of attorney is made and executed pursuant to and by authority of the following resolution duly adopted by the board of directors of the Company:

"RESOLVED, that the president, or any vice president be, and each hereby is, authorized and empowered to appoint attorneys-in-fact of the Company, and to authorize them to execute and deliver on behalf of the Company any and all bonds, forms, applications, memorandums, undertakings, recognizances, transfers, contracts of indemnity, policies, contracts guaranteeing the fidelity of persons holding positions of public or private trust, and other writings obligatory in nature that the business of the Company may require; and to modify or revoke, with or without cause, any such appointment or authority; provided, however, that the authority granted hereby shall in no way limit the authority of other duly authorized agents to sign and countersign any of said documents on behalf of the Company."

"RESOLVED FURTHER, that such attorneys-in-fact shall have full power and authority to execute and deliver any and all such documents and to bind the Company subject to the terms and limitations of the power of attorney issued to them, and to affix the seal of the Company thereto; provided, however, that said seal shall not be necessary for the validity of any such documents."

This power of attorney is signed and sealed under and by the following bylaws duly adopted by the board of directors of the Company.

Execution of Instruments. Any vice president, any assistant secretary or any assistant treasurer shall have the power and authority to sign or attest all approved documents, instruments, contracts, or other papers in connection with the operation of the business of the company in addition to the chairman of the board, the chief executive officer, president, treasurer or secretary; provided, however, the signature of any of them may be printed, engraved, or stamped on any approved document, contract, instrument, or other papers of the Company.

IN WITNESS WHEREOF, the Company has caused this instrument to be sealed and duly attested by the signature of its officer the 27th day of February, 2019.

Antonio C. Albanese, **Vice President** of Nationwide Mutual Insurance Company, AMCO Insurance Company, Allied Property and Casualty Insurance Company

ACKNOWLEDGMENT

STATE OF NEW YORK, COUNTY OF NEW YORK: ss
On this 27th day of February, 2019, before me came the above-named officer for the Company aforesaid, to me personally known to be the officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, deposes and says, that he is the officer of the Company aforesaid, that the seal affixed hereto is the corporate seal of said Company, and the said corporate seal and his signature were duly affixed and subscribed to said instrument by the authority and direction of said Company.

Suzanne C. Delio
Notary Public, State of New York
No. 02DE6126649
Qualified in Westchester County
Commission Expires September 16, 2021

Notary Public
My Commission Expires
September 16, 2021

CERTIFICATE

I, Laura B. Guy, Assistant Secretary of the Company, do hereby certify that the foregoing is a full, true and correct copy of the original power of attorney issued by the Company; that the resolution included therein is a true and correct transcript from the minutes of the meetings of the boards of directors and the same has not been revoked or amended in any manner; that said Antonio C. Albanese was on the date of the execution of the foregoing power of attorney the duly elected officer of the Company, and the corporate seal and his signature as officer were duly affixed and subscribed to the said instrument by the authority of said board of directors; and the foregoing power of attorney is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of said Company this 15th day of October 2019

Assistant Secretary

BDJ 1(02-19)00

MAYOR LINDA GORTON

LEXINGTON

CHARLES MARTIN
DIRECTOR
WATER QUALITY

ADDENDUM #1

Bid Number: #91-2019

Date: September 26, 2019

Subject: Shandon Park Trunks, Winburn Trunk, Thoroughbred Acres Trunks Phase II

Address inquiries to:
Brian Marcum
brianm@lexingtonky.gov
(859) 258-3325

TO ALL PROSPECTIVE SUBMITTERS:

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

1. **CLARIFICATIONS**

   A. The Umbrella Insurance Policy shall be $5 million rather than $3 million

   B. The following work is removed from the Contract
      1. All work shown on Sheet 3
      2. All work shown on Sheet 7

   C. A revised Bid Schedule is attached.

Todd Slatin

Todd Slatin, Director
Division of Central Purchasing

All other terms and conditions of the Bid and specifications are unchanged.
This letter should be signed, attached to and become a part of your Bid.

COMPANY NAME: Basham Construction & Rudd Co, Inc

ADDRESS: 1102 South Park Rd. Fairdale, KY 40118

SIGNATURE OF BIDDER:

MAYOR LINDA GORTON

LEXINGTON

CHARLES MARTIN
DIRECTOR
WATER QUALITY

ADDENDUM No. 2 October 08, 2019 Bid Number: **#91-2019**

1. **CLARIFICATIONS**

   - The pump station decommissioning shown on Sheet 3 (Shandon Park PS #1) is still to be included in the project. This pump station decommissioning has been added to the bid tab.
   - Updated DBE forms have been added for use.

2. **DRAWINGS**

3. **SPECIFICATIONS**

Todd Slatin

Todd Slatin, Director
Division of Central Purchasing

All other terms and conditions of the Bid and specifications are unchanged.
This letter should be signed, attached to and become a part of your Bid.

COMPANY NAME: Basham Construction & Rental Co, Inc.

ADDRESS: 1102 South Park Rd Fairdale, KY 40118

SIGNATURE OF BIDDER: , Chris Pile

MAYOR LINDA GORTON

LEXINGTON

CHARLES MARTIN
DIRECTOR
WATER QUALITY

ADDENDUM No. 3

October 09, 2019

Bid Number: **#91-2019**

Subject: Shandon, Winburn, Thoroughbred Acres Trunks Phase 2

Address inquiries to:
Brian Marcum
brianm@lexingtonky.gov
(859) 258-3325

TO ALL PROSPECTIVE SUBMITTERS:

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

	Questions	Answers
1.	Is there data available on sanitary sewer flow in the lines?	No. The design flow for dry weather bypass pumping shall be 0.4 MGD. The wet weather bypass pumping design flow shall be 2.0 MGD.

Todd Slatin

Todd Slatin, Director
Division of Central Purchasing

All other terms and conditions of the Bid and specifications are unchanged.
This letter should be signed, attached to and become a part of your Bid.

COMPANY NAME: Becker Contracting & Rail Co, Inc

ADDRESS: 1102 South Pearl Rd. Fairdale, Ky 40118

SIGNATURE OF BIDDER:

SECTION 00410 – BID FORM

Shandon Park Trunks, Winburn Trunk and Thoroughbred Acres Trunk, Phase 2

Division of Water Quality
Lexington-Fayette Urban County Government

LFUCG Bid No. 91-2019

1.01 GENERAL

Place: Lexington, Kentucky Date: October 14, 2019

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

This Bid Form Submitted by Bashan Construction & Rental Co, Inc.
1102 South Park RD, Fincastle, KY 40118
(Name and Address of Bidder)

(Hereinafter called "Bidder"), organized and existing under the laws of the State of Kentucky, doing business as a Corporation
"a corporation," "a partnership", or an "individual" as applicable

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

The Bidder, in compliance with your Advertisement for Bids for the **Shandon Park Trunks, Winburn Trunk and Thoroughbred Acres Trunk, Phase 2:** Lexington, Kentucky, having examined the Contract Documents including the Plans and Specifications with related documents, having examined the site for proposed Work, and being familiar with all of the conditions and any and all addendums surrounding the construction of the proposed Project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the Project in accordance with the Contract Documents, within the time set forth therein, and at the unit prices stated hereinafter. These prices are to cover all expenses incurred in performing the Work required under the Contract Documents, of which this Bid is a part.

The Bidder hereby agrees to commence Work under this Contract on a date to be specified in a written "Notice to Proceed" of the Owner and to substantially complete the Project within 180 consecutive calendar days. Bidder further agrees to pay liquidated damages, the sum of $1,000 Dollars and 0 cents ($1,000) for each consecutive day thereafter.

The Bidder hereby acknowledges receipt of the following addenda:

Addendum No. 1 Date 9.26;	Addendum No. ____ Date _____
Addendum No. 2 Date 10-8;	Addendum No. ____ Date _____
Addendum No. 3 Date 10-9;	Addendum No. ____ Date _____
Addendum No. ____ Date _____;	Addendum No. ____ Date _____

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

1.03 BIDDERS AFFIDAVIT

Comes the Affiant, Chris P. L., and after being first duly sworn, states under penalty of perjury as follows:

A. His/her name is Estimator and he/she is the individual submitting the Bid or is the authorized representative of Beshear Construction & Rental Co, Inc., the entity submitting the Bid (hereinafter referred to as "Bidder").

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

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

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

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

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

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

Further, Affiant sayeth naught.

CRO

Affiant Signature

STATE OF Kentucky

COUNTY OF Bullitt

The foregoing instrument was subscribed, sworn to and acknowledged before me by Chris P. L. on this the 14th day of October, 2019.

My Commission expires: August 13, 2022

Delores E. Jones

NOTARY PUBLIC, STATE AT LARGE ID# 605985

1.04 BID SCHEDULE

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

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

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

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

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

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

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

BID SCHEDULE

BID ITEM NO.	UNIT DESCRIPTION	UNIT	Approximate Quantity	UNIT PRICE	TOTAL AMOUNT BID
1	Mobilization	LS	1	20,500	20,500
2	Bonds and Insurance	LS	1	12,408	12,408
3	General Requirements	LS	1	19,900	19,900
4	Demobilization	LS	1	3,000	3,000
5	Erosion and Sediment Control and Conformance with SWPPP	LS	1	10,000	10,000

6	8-inch Gravity Sewer Pipe, PVC (SDR 35), 6.1'-10' depth	LF	205	175	35,875
7	8-inch Gravity Sewer Pipe, PVC (SDR 26), 10.1'-14' depth	LF	27	240	6480
8	12-inch PVC Gravity Sewer Pipe 6.1'-10' depth	LF	208	390	81,120
9	12-inch PVC Gravity Sewer Pipe 10.1'-14' depth	LF	152	400	60,800
10	24-inch PVC Gravity Sewer Pipe 6.1'-10' depth	LF	30	250	7500
11	24-inch PVC Gravity Sewer Pipe 10.1'-14' depth	LF	57	260	14,820
12	Manhole Abadonment	EA	1	2,000	2000
13	Standard Manhole, 4-foot diameter (depth 5.1 to 6.0 ft)	EA	11	7500	82,500
14	Manhole Barrel Extensions, 4 ft. diameter	VF	40	325	13,000
15	Connect to existing 6-inch sewer	EA	1	750	750
16	Connect to existing 8-inch sewer	EA	5	750	3750
17	Connect to existing 10-inch sewer	EA	1	850	850
18	Connect to existing 12-inch sewer	EA	1	850	850

19	Connect to Existing Manhole	EA	13	1200	15,600
20	Pipe Abandonment, Safeload, 10"	LF	100	30	3000
21	Pipe Abandonment, Plug, 8"	EA	2	300	600
22	Pipe Abandonment, Plug, 10"	EA	9	500	4500
23	Pipe Abandonment, Plug, 12"	EA	4	700	2800
24	Remove Existing 10" Force Main	LF	390	16	6240
25	Video inspection of new sewer pipe	LF	679	3	2037
26	Bituminous Concrete: Full Width Paving, Street	SY	2,360	22	51,920
27	Site Restoration Method B	SY	1,500	5	7500
28	Concrete Curb Removal and Replacement	LF	40	60	2400
29	Concrete Sidewalk - 4.5 - inch thick	SY	110	55	6,050
30	Storm Sewer Removal and Replacement (15")	LF	45	50	2250
31	Bypass Pumping Setup and Setup	LS	1	6,000	6,000

32	Maintenance of Traffic	LS	1	7500	7500
33	Combination Vacuum/Hydraulic Jet/Hydro Excavator, extra as directed by Engineer	HR	10	300	3000
34	Backhoe/Extend-a-hoe, extra as directed by Engineer	HR	150	60	9,000
35	Hoe Ram, extra as directed by Engineer	HR	10	115	1150
36	Dump Truck, Single Axle, extra as directed by Engineer	HR	10	80	800
37	Dump Truck, Tandem or Tri-Axle, extra as directed by Engineer	HR	10	90	900
38	Large Track Hoe, CAT 311 or Equivalent, extra as directed by Engineer	HR	10	115	1150
39	Small Track Hoe, CAT 301.6C or Equivalent, extra as directed by Engineer	HR	10	75	750
40	Skid-Steer Loader, extra as directed by Engineer	HR	10	75	750
41	Roller/Compactor, extra as directed by Engineer	HR	10	50	500
42	Traffic Maintenance - Type 1 (Flagger), extra as directed by Engineer	HR	10	50	500

43	Brundige Memorandum of Understanding Conditions 761 Kingston Road	LS	1	9,000	9,000
44	Decommission of the Shandon park Pump Station No 1	LS	1	12,000	12,000
45	Decommission of the Shandon park Pump Station No 2	LS	1	15,000	15,000
46	Decommission of the Thoroughbred Acres Pump Station	LS	1	12,000	12,000
47	Decommission of the Winburn Pump Station	LS	1	12,000	12,000
48	Miscellaneous Site Improvements	LS	1	$70,000	$70,000
			Total Bid (Items 1 through 48)		$643,000.00

TOTAL BID AMOUNT:

Six Hundred Fourty Three Thousand Dollars Even

_____ **Dollars ($** 643,000 **)**

ADDRESS: 1102 South Park Rd.

CITY/STATE/ZIP: Fairdale, KY 40118

DATE: October 14, 2019

BY: [signature]
(must be original signature)

TITLE: Estimator

PHONE: (502) 961-9001 FAX: (502) 961-0998
(area code, number & extension)

EMAIL ADDRESS: dashemconstr@yahoo.com

OFFICIAL ADDRESS AND PHONE:

1102 South Park Rd.
Fairdale, KY 40118
(502) 961-9001 (Seal if Bid is by Corporation)

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

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

NAME	POSITION DESCRIPTION	NO. OF YEARS WITH BIDDER
Chris Pilo	Estimator / Project Manager	19
Mike Clark	Superintendent	19
Jason Lynch	Foreman	10

J. MWDBE Participation on current bonded projects under contract:

SUBCONTRACTORS (LIST)	PROJECT (SPECIFIC TYPE)	MWDBE	% of WORK
Sag Corporation	Sewer / Drainage	M	15%
D.D. Mid-Continent	Drainage / Water	M/W	6%
Effective Erosion Control	Drainage / Water	W	2%
Stom Precast	Sewer / Water	W	2%

(USE ADDITIONAL SHEETS IF NECESSARY)

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

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

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

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

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

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

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

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

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

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

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

Bashom Construction & Rental Co., Inc. Oct. 14, 2013 Chair Pres

Company Date Representative

1.09 EQUAL OPPORTUNITY AGREEMENT

The Law

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

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

* Section 503 of the Rehabilitation Act of 1973 States:

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

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

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

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

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

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

Bidders

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

Signature

Bashen Construction & Rental Co, Inc
Name of Business

LEXINGTON

LFUCG MWDBE PARTICIPATION FORM
Bid/RFP/Quote Reference # LFUCG Bid No. 91-2019

The MWDBE and/or veteran subcontractors listed have agreed to participate on this Bid/RFP/Quote. If any substitution is made or the total value of the work is changed prior to or after the job is in progress, it is understood that those substitutions must be submitted to Central Purchasing for approval immediately. **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. D.D. Mills Contr 1408 South Pearl Rd Florence KY 41018 (502) 333-0927 Delores Donnell	W	Remove Ex. F.M. P.S. Decommissioning	$46,680.00	7.259%
2. Sam Corp 4574 Milton Trace Louisville KY (502) 368-0315 Charlie Sam	M	Clearing	$18,000.00	2.799%
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.

Bashen Contracting & Rental Co, Inc
Company

Chris Pile
Company Representative

October 14, 2019
Date

Estimator
Title

LEXINGTON

MWDBE QUOTE SUMMARY FORM
Bid/RFP/Quote Reference # 91-2019

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.

Company Name	Contact Person
Beshear Construction & Rental Co, Inc	Chris P.
Address/Phone/Email 1102 South Park Rd Fairdale, KY 40118	**Bid Package / Bid Date** 91-2019

MWDBE Company Addres	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
N/A		*See Attached Call Logs						

(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.

Beshear Construction & Rental Co, Inc
Company

Chris P.
Company Representative

October 14, 2019
Date

Estimator
Title

LFUCG STATEMENT OF GOOD FAITH EFFORTS
Bid/RFP/Quote # 91-2019

By the signature below of an authorized company representative, we certify that we have utilized the following Good Faith Efforts to obtain the maximum participation by 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 bidders good faith efforts package

_____ Attended LFUCG Central Purchasing Economic Inclusion Outreach event

\ Attended pre-bid meetings that were scheduled by LFUCG to inform MWDBEs 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 MWBDE firms and Veteran-Owned businesses to work on this project. Those contacted and their responses should be a part of the bidder's good faith efforts documentation.

_____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 MWBDE 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 reasonable good faith efforts to include MWDBE **and Veteran participation.**

NOTE: Failure to submit any of the documentation requested in this section may be cause for rejection of bid. Bidders may include any other documentation deemed relevant to this requirement which is subject to approval by the MBE Liaison. Documentation of Good Faith Efforts must be submitted with the Bid, if the participation Goal is not met.

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

Bashaw Construction & Rental Co Inc
Company

October 14, 2019
Date

Chris Pile
Company Representative

Estimator
Title

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 quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy MWDBE goals.

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

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

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

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.

Burton Contracting Road Co, Inc
Company

Chris Pile
Company Representative

October 14, 2019
Date

Project Manager
Title

Name of Organization: Baker Construction & Rental Co, Inc.

Categories	Total	White (not Hispanic or Latino)		Hispanic or Latino		Black or African-American (not Hispanic or Latino)		Native Hawaiian and other Pacific Islander (not Hispanic or Latino)		Asian (not Hispanic or Latino)		American Indian or Alaskan Native (not Hispanic or Latino)		Two or more races (not Hispanic or Latino)		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Administrators			2								1						3
Professionals		3														3	
Superintendents		3														3	
Supervisors		3														3	
Foremen		4														4	
Technicians																	
Protective Service																	
Para-Professionals																	
Office/Clerical		4														4	
Skilled Craft		20														20	
Service/Maintenance		4														4	
Total		41	2								1					41	3

Prepared By: [signature]

Date 10/14/19

1.18 DEBARRED FIRMS

PROJECT NAME: Shandon Park Trunks, Winburn Trunk and Thoroughbred Acres Trunk, Phase 2

LFUCG BID NO.: 91-2019

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
LEXINGTON, KY

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

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

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

Bucher Construction & Rental Co, Inc.
Name of Firm Submitting Bid

CRC
Signature of Authorized Official

Estimator
Title

October 14, 2019
Date

DD Midori Construction, LLC
(MBE Certified/WBE Certified)
1408 South Park Road
Fairdale, Kentucky 40118
Phone (502) 333-0927 Fax (502) 384-2390
Email: ddmidori@yahoo.com

OCTOBER 14, 2019

TO BASHAM CONSTRUCTION & RENTAL COMPANY

REF: LEXINGTON FAYETTE URBAN COUNTY GOVERNMENT – SHANDON PARK TRUNKS, WINBURN TRUNK AND THOROUGHBRED ACRES TRUNK SEWERS, PHASE 2 – BID NO. 91-2019

DD MIDORI CONSTRUCTION OFFERS THE FOLLOWING ITEMS OF WORK FOR THE ABOVE REFERENCED PROJECT

SCOPE OF WORK:

Remove existing 10" force main 390 LF @ $12.00 LB	$ 4,680.00 ✓
Assist with De-commissioning Shandon Park Pump Station #1, 1 lump sum @ $10,000.00	$10,000.00 ✓
Assist with De-commissioning Shandon Park Pump Station #2, 1 lump sum @ $12,000.00	$12,000.00 ✓
Assist with De-commissioning Thoroughbred Acres Pump Station 1 lump sum @ $10,000.00	$10,000.00 ✓
Assist with De-commissioning Winburn Pump Station 1 lump sum @ $10,000.00	$10,000.00 ✓
Total	**$46,680.00** ✓

Accepted CR 10.14.19

Thank you.

Delores Dowell

Delores Dowell, Owner

THIS CERTIFIES THAT

DD Midori Construction, LLC

NMSDC
National Minority Supplier Development Council

* Nationally certified by the: **TRISTATE MINORITY SUPPLIER DEVELOPMENT COUNCIL**

*NAICS Code(s): 237110; 237990; 238910

* Description of their product/services as defined by the North American Industry Classification System (NAICS)

05/30/2019		TN02296
Issued Date		**Certificate Number**
	Adrienne Trimble	
05/30/2020		
Expiration Date		**Cheri K. Henderson, President/CEO**

By using your password (NMSDC Issued only), authorized users may log into NMSDC Central to view the entire profile: http://nmsdc.org

Certify, Develop, Connect, Advocate.

* MBEs certified by an Affiliate of the National Minority Supplier Development Council, Inc.®

WBENC
WOMEN'S BUSINESS ENTERPRISE NATIONAL COUNCIL
JOIN FORCES. SUCCEED TOGETHER.

hereby grants

National Women's Business Enterprise Certification

to

D D MIDORI CONSTRUCTION, LLC

who has successfully met WBENC's standards as a Women's Business Enterprise (WBE).
This certification affirms the business is woman-owned, operated and controlled; and is valid through the date herein.

Certification Granted: June 19, 2017
Expiration Date: June 30, 2020
WBENC National Certification Number: WBE1701129

WBENC National WBE Certification was processed and validated by Women's Business Enterprise Council Ohio River Valley, a WBENC Regional Partner Organization.

WBECORV
WOMEN'S BUSINESS ENTERPRISE COUNCIL OHIO RIVER VALLEY

Authorized by Shella Mixon, Executive Director
Women's Business Enterprise Council Ohio River Valley

NAICS: 237110, 237310, 237990
UNSPSC: 72103004, 72103300, 72103305, 72141102, 72141105, 72141106, 72141120, 72141121, 72141123, 72141124, 72141125, 72141126, 72152700, 72152704, 72152705, 72152706, 72152707, 72152711

WBECPACIFIC WBECEAST WBECSOUTH

Louisville and Jefferson County Metro Human Relations Commission

Certifies that

DD Midori Construction, LLC.

Has met all the *TriState Minority Supplier Development Council* certification program requirements and is hereby deemed a *Reciprocally Certified*

Minority Business Enterprise (MBE) and Woman Business Enterprise (WBE)

Kendall Boyd
Executive Director

Issued: 05/31/2019
Expires: 05/31/2020

Sang Corporation
(MBE Certified)
4574 Melton Ave.
Louisville, KY 40213
Ph # 502-368-0315 Fax # 502-367-0256
Email: dsilva_sangcorp@yahoo.com

October 14, 2019

TO ALL BIDDING CONTRACTORS:

RE: Shandon Park Trunks, Winburn Trunks, and Thoroughbred Acres Trunk Sewers Phase 2

THE SANG CORPORATION OFFERS THE FOLLOWING ITEMS OF WORK FOR THE ABOVE REFERENCED PROJECT TO BE PERFORMED BY THE COMPANY IN ITS ENTIRETY INCLUDING ALL LABOR AND MATERIALS TO PERFORM SUCH.

Tree and Brush Removal	1 LS @ $15,000	=$15,000.00
EPSC Installation	1 LS @ $ 3,000	=$ 3,000.00

Contractor is to supply all EPSC material

Total **=$18,000.00**

10-14-19

THANK YOU,

Charles Sang

THIS CERTIFIES THAT

Sang Corporation

NMSDC
National Minority Supplier Development Council

* Nationally certified by the: **TRISTATE MINORITY SUPPLIER DEVELOPMENT COUNCIL**

*NAICS Code(s): 238910; 561730; 484220; 562991; 238990; 237110; 221310

* Description of their product/services as defined by the North American Industry Classification System (NAICS)

06/15/2019	TN01207
Issued Date	**Certificate Number**

Adrienne Trimble

06/15/2020	Cheri K. Henderson
Expiration Date	**Cheri K. Henderson, President/CEO**

By using your password (NMSDC Issued only), authorized users may log into NMSDC Central to view the entire profile: http://nmsdc.org

Certify. Develop. Connect. Advocate.

* MBEs certified by an Affiliate of the National Minority Supplier Development Council, Inc.®

Oct 15 19 07:20a

Louisville and Jefferson County Metro
Human Relations Commission

Certifies that

Sang Corporation

Has met all the *National Minority Supplier Development Council (NMSDC)* certification program requirements and is hereby deemed a *Reciprocally Certified*

Minority Business Enterprise (MBE)

Kendall Boyd
Executive Director

Issued: 06/15/2019
Expires: 06/15/2020

Oct 15 19 07:20a

2:29 ONBE Call Logs

All Missed Edit

Recents

(937) 476-2200 Dayton, OH	2:28 PM
(931) 476-2200 Baxter, TN	2:27 PM
(859) 792-2000 (2) Lancaster, KY	2:27 PM
(314) 961-8484 Ladue, MO	2:25 PM
(859) 252-8339 Lexington, KY	2:24 PM
(859) 523-8913 Lexington, KY	2:24 PM
868-2240 unknown	2:22 PM
(606) 295-7262 Jackson, KY	2:21 PM
Trampus (2) work	2:06 PM
(859) 559-2595 Lexington, KY	1:56 PM

Favorites Recents Contacts Keypad Voicemail

VBE Call Logs

2:30

All Missed Edit

Lexington, KY 2:24 PM

868-2240
unknown 2:22 PM

(606) 295-7262
Jackson, KY 2:21 PM

Trampus (2)
work 2:06 PM

(859) 559-2595
Lexington, KY 1:56 PM

(859) 361-5955
Lexington, KY 1:55 PM

(270) 765-7570
Elizabethtown, KY 1:53 PM

(859) 231-0069
Lexington, KY 1:52 PM

767-6878
unknown 1:51 PM

(859) 230-2663
Lexington, KY 1:49 PM

315-9161
unknown 1:47 PM

Favorites Recents Contacts Keypad Voicemail

SECTION 00510 – NOTICE OF AWARD

CONTRACTOR: Basham Construction and Rental Company, Inc
1102 South Park Road
Fairdale, Kentucky 40118

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

PROJECT: Shandon Park Trunk Sewers, Winburn Trunk and Thoroughbred Acres Trunk, Phase 2
Lexington-Fayette Urban County Government

LFUCG Bid No. 91-2019

You are hereby notified that the Owner has considered the Bid submitted by you for the above-described project in response to its Advertisement for Bids dated October 14, 2019.

It appears that it is to the best interest of said Owner to accept your Bid in the amount of Six Hundred and Forty Three Thousand dollars ($643,000.00), and you are hereby notified that your Bid has been accepted for

Shandon Park Trunk Sewers, Winburn Trunk and Thoroughbred Acres Trunk, Phase 2

LFUCG Bid No. 91-2019

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

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

Dated this 16th day of December, 2019.

Lexington-Fayette Urban County Government

By: _____

Title: Remedial Measures Project Manager

NOTICE OF ACCEPTANCE

Receipt of the above Notice of Award is hereby acknowledged this 17th day of Dec, 2019.

By: _____, Chris Pile

Title: Estimator

END OF SECTION

SECTION 00520 – AGREEMENT (CONTRACT)

THIS AGREEMENT, made on the 13th day of January, 2020 by and between Lexington Fayette Urban County Government, acting herein called "OWNER" and Basham Construction and Rental Company, Inc. doing business as a corporation located in the City of Fairdale, KY, County of Jefferson , State of Kentucky, hereinafter called "CONTRACTOR".

WITNESSETH: That the CONTRACTOR and the OWNER in consideration of six hundred and forty three thousand dollars quoted in the BID by the CONTRACTOR, dated October 14, 2019, hereby agree to commence and complete the construction described as follows:

1.01 SCOPE OF WORK

The CONTRACTOR shall furnish all the materials, supplies, machinery, equipment, tools, supervision, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the BID, the Contract Documents, and the Specifications prepared by the Engineer for the
Shandon Park Trunk Sewers, Winburn Trunk and Thoroughbred Acres Trunk, Phase 2
LFUCG Bid No. 91-2019.

1.02 TIME OF COMPLETION

The time period estimated and authorized by the OWNER for Substantial Completion of the Work by the Agreement, in full, is hereby fixed as 180 consecutive calendar days. The time shall begin ten (10) calendars days after the CONTACTOR is issued Notice to Proceed. However, the following project milestone is required to be completed 120 consecutive calendar days after the CONTACTOR is issued Notice to Proceed: All flow will be off the existing pump stations, and all gravity sewer shall be installed and receiving flow. Failure to meet this milestone shall result in the penalties outlined in Section 00520 1.08 Liquidated Damages.

1.03 ISSUANCE OF NOTICE TO PROCEED

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

1.04 AGREEMENT (CONTRACT) AMOUNT

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

1.05 PROGRESS PAYMENTS

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

1.06 ACCEPTANCE AND FINAL PAYMENT

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

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

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

1.07 EXTRA WORK

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

1.08 LIQUIDATED DAMAGES

If the CONTRACTOR shall fail or refuse to complete the Work within the AGREEMENT (CONTRACT) Time, or extension of time granted by the OWNER, then the CONTRACTOR agrees as a partial consideration for the awarding of this AGREEMENT (CONTRACT) that the OWNER may retain the compensation otherwise to be paid to the CONTRACTOR the amount of one thousand dollars ($1,000.00) per consecutive calendar day that the CONTRACTOR shall be in default after the Final Completion time stipulated in the Contract Documents. The said amount is fixed and agreed upon by and between the CONTRACTOR and the OWNER because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the OWNER would in such event sustain.

1.09 CONSENT DECREE REQUIREMENTS

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

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

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

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

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

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

F. DISPUTES

Except as otherwise provided in this AGREEMENT (CONTRACT), any dispute hereunder may be resolved by agreement of the OWNER's Agent (Charles H. Martin, P.E., Director of Water Quality) and the CONTRACTOR. In the absence of such an agreement, the dispute shall be submitted to the OWNER's Commissioner, Department of Public Works and Environmental Quality, whose decision shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, capricious, arbitrary, or so grossly erroneous as necessarily to imply bad faith. Pending a final decision of a dispute hereunder the CONTRACTOR shall proceed diligently with the performance of the AGREEMENT (CONTRACT) in accordance with the direction of the OWNER.

1.10 RIGHT TO REVIEW, AUDIT, AND INSPECT

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

1.11 CONTRACT DOCUMENTS

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

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

Specifications: Per Table of Contents

Drawings (Plans): Per Table of Contents

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

(Seal)

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

ATTEST:

Mackenzie Sommers
Clerk of Urban County Council

By: Linda Gorton
(Signature of Mayor)

Linda Gorton, Mayor
(Name/Title)

(Seal)

Basham Construction and Rental Company, Inc.
(Contractor)

Brenton N. Basham
(Secretary)*

By:
(Contractor's Signature)

Dee Jones
(Witness)

Chris Pile / Vice President
(Name/Title)

1102 South Park Road, Fairdale, Kentucky 40118
(Address)

*IMPORTANT: Strike out any non-applicable terms:

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

END OF SECTION

SECTION 00550 – NOTICE TO PROCEED

CONTRACTOR: Basham Construction and Rental Company, Inc.

1102 South Park Road

Fairdale, Kentucky 40118

OWNER: Lexington-Fayette Urban County Government
Lexington, Kentucky

PROJECT: Shandon Park Trunk Sewers, Winburn Trunk and Thoroughbred Acres Trunk, Phase 2
Lexington-Fayette Urban County Government
Lexington, Kentucky

LFUCG Bid No.91-2019

Agreement (Contract) Amount:
Six Hundred and Forty Three Thousand dollars ($643,000.00)

You are hereby notified to commence Work on the referenced project on or before _____, 2020 and to substantially complete Work within 180 CONSECUTIVE CALENDAR DAYS thereafter. However, the following project milestone is required to be completed 120 consecutive calendar days after the CONTACTOR is issued Notice to Proceed: All flow will be off the existing pump stations, and all gravity sewer shall be installed and receiving flow. Your Agreement (Contract) completion date is therefore_____, 2020. The Project Milestone completion date is _____ _____, 2020.

The Agreement (Contract) provides for assessment of the sum of one thousand dollars ($1,000.00) as liquidated damages for each consecutive calendar day after the above established Agreement (Contract) completion date that the Work remains incomplete.

Lexington-Fayette Urban County Government

By:_____

Title:_____

Date:_____

END OF SECTION

1.01 PERFORMANCE BOND Bond #7901020796

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that

BASHAM CONSTRUCTION & RENTAL COMPANY, INC.
(Name of CONTRACTOR)

1102 South Park Rd. - Fairdale, KY 40118-9784
(Address of CONTRACTOR)

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

called Principal, and Nationwide Mutual Insurance Company
(Name of Surety)

1100 Locust St., Dept. 2006 - Des Moines, IA 50391-2006
(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:

Six Hundred Forty Three Thousand and 00/100 dollars ($ 643,000.00),
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 **Shandon Park Trunk Sewers, Winburn Trunk and Thoroughbred Acres Trunk Sewer, Phase 2** LFUCG Bid No. 91-2019 in accordance with Contract Documents prepared by **EA Partners, PLC** and dated **September 24, 2019**, 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 (number) counterparts, each one of

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

ATTEST:

BASHAM CONSTRUCTION & RENTAL COMPANY, INC.
Principal

Brenton R. Basham
(Principal) Secretary
Brenton R. Basham, Secretary

By: Chris Pike, V.P. (s)

1102 South Park Rd.
Address

Fairdale, KY 40118-9784

Witness as to Principal

1102 South Park Rd.
Address

Fairdale, KY 40118-9784

Nationwide Mutual Insurance Company
Surety

ATTEST:

By: Deborah L. Burton
Attorney-in-Fact Deborah L. Burton

(Surety) ~~Secretary~~ XXXXXXX

1100 Locust St., Dept. 2006
Address

Des Moines, IA 50391-2006

(SEAL)

Witness to Surety

Title: _____
Surety

950 Breckenridge Lane, Suite 50
Address

By: _____

Louisville, KY 40207

Title: Account Manager

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

Bond #7901020796

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that

BASHAM CONSTRUCTION & RENTAL COMPANY, INC.
(Name of CONTRACTOR)

1102 South Park Rd. - Fairdale, KY 40118-9784
(Address of CONTRACTOR)

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

called Principal, and Nationwide Mutual Insurance Company
(Name of Surety)

1100 Locust St., Dept. 2006 - Des Moines, IA 50391-2006
(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:

Six Hundred Forty Three Thousand and 00/100 dollars ($ 643,000.00),
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 **Shandon Park Trunk Sewers, Winburn Trunk and Thoroughbred Acres Trunk Sewer, Phase 2**, LFUCG Bid No. 91-2019 in accordance with Contract Documents prepared by **EA Partners, PLC** and dated **September 24, 2019**, 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 (number) counterparts, each one of

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

ATTEST:

BASHAM CONSTRUCTION & RENTAL COMPANY, INC.
Principal

Brenda R. Basham
(Principal) Secretary
Brenda R. Basham

By: _____ (s)
Chris Pdl, V.P.

1102 South Park Rd.
Address

Fairdale, KY 40118-9784

_____
Witness as to Principal

1102 South Park Rd.
Address

Fairdale, KY 40118-9784

Nationwide Mutual Insurance Company
Surety

ATTEST:

By: _____
Attorney-in-Fact Deborah L. Burton

_____
(Surety) Secretary

1100 Locust St., Dept. 2006
Address

Des Moines, IA 50391-2006

(SEAL)

_____
Witness to Surety

Title: _____
Surety

950 Breckenridge Lane, Suite 50
Address

By: _____

Louisville, KY 40207

Title: Account Manager

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 #7901020796

EROSION AND SEDIMENT CONTROL PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that

.BASHAM CONSTRUCTION & RENTAL COMPANY, INC.
(Name of CONTRACTOR)

1102 South Park Rd. - Fairdale, KY 40118-9784
(Address of CONTRACTOR)

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

called Principal, and Nationwide Mutual Insurance Company
(Name of Surety)

1100 Locust St., Dept. 2006 - Des Moines, IA 50391-2006
(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:
Six Thousand Four Hundred Thirty and 00/100
[1% of Total Bid Price] dollars ($ 6,430.00), 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 **Shandon Park Trunk Sewers, Winburn Trunk and Thoroughbred Acres Trunk Sewer Phase 2,** LFUCG Bid No. 91-2019 in accordance with Contract Documents prepared by EA Partners, PLC and dated **September 24, 2019** 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 in accordance with the Agreement (Contract), the LFUCG Land Disturbance Permit, Chapter 16 Article X Division 5 of the LFUCG Code of Ordinances, and the KPDES General Permit for Stormwater Discharges Associated with Construction Activities (KYR 10).

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 (number) counterparts, each one of

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

ATTEST:

BASHAM CONSTRUCTION & RENTAL COMPANY, INC.
Principal

Brenton R. Basham
(Principal) Secretary
Brenton R. Basham, Secretary

By: Chris Pugh, V.P. (s)

1102 South Park Rd.
Address

Fairdale, KY 40118-9784

Witness as to Principal

1102 South Park Rd.
Address

Fairdale, KY 40118-9764

Nationwide Mutual Insurance Company
Surety

ATTEST:

By: Deborah L. Burton
Attorney-in-Fact Deborah L. Burton

(Surety) ~~Secretary~~

1100 Locust St., Dept. 2006
Address

Des Moines, IA 50391-2006

(SEAL)

Witness to Surety

Title: _____
Surety

950 Breckenridge Lane, Suite 50
Address

By: _____

Louisville, KY 40207

Title: Account Manager

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

Power of Attorney

KNOW ALL MEN BY THESE PRESENTS THAT:

Nationwide Mutual Insurance Company, an Ohio corporation

hereinafter referred to severally as the "Company" and collectively as "the Companies" does hereby make, constitute and appoint:

Deborah L. Burton

each in their individual capacity, its true and lawful attorney-in-fact, with full power and authority to sign, seal, and execute on its behalf any and all bonds and undertakings, and other obligatory instruments of similar nature, in penalties not exceeding the sum of: Unlimited

Surety Bond Number 7901020796
Principal BASHAM CONSTRUCTION & RENTAL COMPANY, INC.
Obligee Lexington-Fayette Urban County Government

and to bind the Company thereby, as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Company; and all acts of said Attorney pursuant to the authority given are hereby ratified and confirmed.

This power of attorney is made and executed pursuant to and by authority of the following resolution duly adopted by the board of directors of the Company:

"RESOLVED, that the president, or any vice president be, and each hereby is, authorized and empowered to appoint attorneys-in-fact of the Company, and to authorize them to execute and deliver on behalf of the Company any and all bonds, forms, applications, memorandums, undertakings, recognizances, transfers, contracts of indemnity, policies, contracts guaranteeing the fidelity of persons holding positions of public or private trust, and other writings obligatory in nature that the business of the Company may require; and to modify or revoke, with or without cause, any such appointment or authority; provided, however, that the authority granted hereby shall in no way limit the authority of other duly authorized agents to sign and countersign any of said documents on behalf of the Company."

"RESOLVED FURTHER, that such attorneys-in-fact shall have full power and authority to execute and deliver any and all such documents and to bind the Company subject to the terms and limitations of the power of attorney issued to them, and to affix the seal of the Company thereto; provided, however, that said seal shall not be necessary for the validity of any such documents."

This power of attorney is signed and sealed under and by the following bylaws duly adopted by the board of directors of the Company.

Execution of Instruments. Any vice president, any assistant secretary or any assistant treasurer shall have the power and authority to sign or attest all approved documents, instruments, contracts, or other papers in connection with the operation of the business of the company in addition to the chairman of the board, the chief executive officer, president, treasurer or secretary; provided, however, the signature of any of them may be printed, engraved, or stamped on any approved document, contract, instrument, or other papers of the Company.

IN WITNESS WHEREOF, the Company has caused this instrument to be sealed and duly attested by the signature of its officer the 27th day of February, 2019.

Antonio C. Albanese, Vice President of Nationwide Mutual Insurance Company

NATIONWIDE MUTUAL INSURANCE COMPANY SEAL SURETY USE ONLY COLUMBUS, OH

ACKNOWLEDGMENT

STATE OF NEW YORK, COUNTY OF NEW YORK: ss
On this 27th day of February, 2019, before me came the above-named officer for the Company aforesaid, to me personally known to be the officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, deposes and says, that he is the officer of the Company aforesaid, that the seal affixed hereto is the corporate seal of said Company, and the said corporate seal and his signature were duly affixed and subscribed to said instrument by the authority and direction of said Company.

Suzanne C. Dello
Notary Public, State of New York
No. 02DE6128649
Qualified in Westchester County
Commission Expires September 16, 2021

Notary Public
My Commission Expires
September 16, 2021

CERTIFICATE

I, Laura B. Guy, Assistant Secretary of the Company, do hereby certify that the foregoing is a full, true and correct copy of the original power of attorney issued by the Company; that the resolution included therein is a true and correct transcript from the minutes of the meetings of the boards of directors and the same has not been revoked or amended in any manner; that said Antonio C. Albanese was on the date of the execution of the foregoing power of attorney the duly elected officer of the Company, and the corporate seal and his signature as officer were duly affixed and subscribed to the said instrument by the authority of said board of directors; and the foregoing power of attorney is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of said Company this _____ day of _____, _____.

Laura B. Guy
Assistant Secretary

BDJ 1(02-19)00

Client#: 1116486 BASHACON

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 12/30/2019

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

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

PRODUCER	CONTACT NAME: USI Insurance Services	
USI Insurance Services LLC-CL 950 Breckenridge Lane Suite 50 Louisville, KY 40207	PHONE (A/C, No, Ext): 502.815.5200	FAX (A/C, No): 855.209.1246
	E-MAIL ADDRESS:	

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Phoenix Insurance Company	25623
INSURER B : Travelers Property Cas. Co. of America	25674
INSURER C : KY Associated General Contractors	A55002
INSURER D : Travelers Property Casualty Co. of Amer	25674
INSURER E :	
INSURER F :	

INSURED
Basham Construction & Rental Company In
1102 South Park Road
Fairdale, KY 40118-9784

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

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

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR X PD Ded: $2,500 GEN'L AGGREGATE LIMIT APPLIES PER: POLICY X PRO-JECT LOC OTHER:			CO9L150668	01/01/2020	01/01/2021	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$1,000,000 $300,000 $5,000 $1,000,000 $2,000,000 $2,000,000
B	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY HIRED AUTOS ONLY SCHEDULED AUTOS NON-OWNED AUTOS ONLY X Comp Ded X Coll Ded			8109L14953A	01/01/2020	01/01/2021	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) $1000/$1000	$1,000,000 $ $ $ $
B	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION $10000			CUP9L20018A	01/01/2020	01/01/2021	EACH OCCURRENCE AGGREGATE	$10,000,000 $10,000,000 $
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		006981	01/01/2020	01/01/2021	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$4,000,000 $4,000,000 $4,000,000
D	Installtion Fltr			QT6600N243386	01/01/2020	01/01/2021	$1.2M Limit/$2,500 Ded	
D	Contractors Equip			QT6608F926464	01/01/2020	01/01/2021	As Scheduled/$2,500 Ded	

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

RE: Shandon, Winburn & Thoroughbred Acres Sewer Connector, #91-2019
The General Liability policy includes an automatic Additional Insured endorsement that provides Additional Insured status to the Certificate Holder only when there is a written contract that requires such status and only with regard to work performed on behalf of the named insured.

CERTIFICATE HOLDER

LFUCG
200 East Main Street
Room 338
Lexington, KY 40507

CANCELLATION

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

AUTHORIZED REPRESENTATIVE

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The ACORD name and logo are registered marks of ACORD

S9KZP

Client#: 1116486 BASHACON

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 11/04/2019

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

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

PRODUCER USI Insurance Services LLC-CL 950 Breckenridge Lane Suite 50 Louisville, KY 40207	CONTACT NAME: USI Insurance Services PHONE (A/C, No, Ext): 502-815-5200 FAX (A/C, No): 855-209-1246 E-MAIL ADDRESS:
INSURED Basham Construction & Rental Company In 1102 South Park Road Fairdale, KY 40118-9784	INSURER(S) AFFORDING COVERAGE / NAIC # INSURER A : Phoenix Insurance Company 25623 INSURER B : Travelers Property Cas. Co. of America 25674 INSURER C : KY Associated General Contractors A55002 INSURER D : Travelers Property Casualty Ins. Co 36161 INSURER E : INSURER F :

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

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

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR X PD Ded:2,500 GEN'L AGGREGATE LIMIT APPLIES PER: POLICY PRO-JECT LOC OTHER:			CO9L150668	01/01/2019	01/01/2020	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG $	$1,000,000 $300,000 $5,000 $1,000,000 $2,000,000 $2,000,000 $
B	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY SCHEDULED AUTOS X HIRED AUTOS ONLY X NON-OWNED AUTOS ONLY X Drive Oth Car			8109L14953A	01/01/2019	01/01/2020	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) $	$1,000,000 $ $ $ $
B	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION $10000			CUP9L20018A	01/01/2019	01/01/2020	EACH OCCURRENCE AGGREGATE $	$10,000,000 $10,000,000 $
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		006981	01/01/2019	01/01/2020	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$4,000,000 $4,000,000 $4,000,000
D	Installation Fltr			QT6600N243386	01/01/2019	01/01/2020	$1.2M Limit/$2500 Ded	
D	Contractors Equip			QT6608F926464	04/01/2019	04/01/2020	As Scheduled/$2500 Ded	

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

RE: Shandon, Winburn & Thoroughbred Acres Sewer Connector, #91-2019

The General Liability policy includes an automatic Additional Insured endorsement that provides Additional Insured status to the Certificate Holder only when there is a written contract that requires such status and only with regard to work performed on behalf of the named insured.

CERTIFICATE HOLDER

LFUCG
200 East Main Street
Room 338
Lexington, KY 40507

CANCELLATION

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

AUTHORIZED REPRESENTATIVE

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

30. *PCBs*—Polychlorinated biphenyls.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.02 *Terminology*

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

B. *Intent of Certain Terms or Adjectives:*

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

C. *Day:*

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

D. *Defective:*

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

a. does not conform to the Contract Documents; or

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

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

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

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

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

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the

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Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete

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and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of

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the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work*: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work*: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation , (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

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B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

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ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

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4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and

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contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all such information and data;

b. locating all Underground Facilities shown or indicated in the Contract Documents;

c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the

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consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

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C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

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H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also

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meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.

E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

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a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

6. include completed operations coverage:

a. Such insurance shall remain in effect for two years after final payment.

b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

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5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;

2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors,

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members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:

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1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's

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interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

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B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

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2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and

3) it has a proven record of performance and availability of responsive service.

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,

b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

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c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services; and

4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be

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required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

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

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner,

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Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

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6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought

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by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

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B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are

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required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

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d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any

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disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the

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extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

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D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

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1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.

C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and

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tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

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9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

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9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

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D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

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

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B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

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B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part;

2. approve the Claim; or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing

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in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

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

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

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

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

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

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances:*

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

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

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11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

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

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

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3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

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12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and

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testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

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B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract

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Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's

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recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

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14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

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3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

   a. to supervise, direct, or control the Work, or

   b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

   c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

   d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

   e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

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

   b. the Contract Price has been reduced by Change Orders;

   c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

   d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

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C. *Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

   a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

   b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

   c. there are other items entitling Owner to a set-off against the amount recommended; or

   d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

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B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

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3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;

   b. consent of the surety, if any, to final payment;

   c. a list of all Claims against Owner that Contractor believes are unsettled; and

   d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid

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or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees

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specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's repeated disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and

3. complete the Work as Owner may deem expedient.

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C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

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

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

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B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or

2. agrees with the other party to submit the Claim to another dispute resolution process; or

3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

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ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SECTION 00800 – SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC C-700) (2007 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

1.01.A.12 Replace in its entirety with the following:

"12. Contract Documents – The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), Contractor's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and Engineer's written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or Hardcopies of the items listed in this paragraph are Contract Documents. Files in electronic format of text, data, graphics, and the like that may be furnished by Owner to Contractor are not Contract Documents".

1.01.A.44 First sentence, change: "in the opinion of the Engineer", to "in the opinion of Engineer and Owner".

1.02 Terminology

Delete 1.02.E and replace with the following:

1.02.E The words "furnish", "furnish and install", "install", and "provide" or words with similar meaning shall be interpreted, unless otherwise specifically stated, to mean "furnish and install complete in place and ready for service".

Add the following:

1.02.G The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract (EJCDC C-700, (2007 Edition) have the meanings assigned to them in the General Conditions.

ARTICLE 2 – PRELIMINARY MATTERS

Add the following:

2.00 Execution of Agreement

2.00.A At least six (6) counterparts of the Agreement will be executed and delivered by the Contractor to the OWNER within fifteen (15) days of the Notice of Award and receipt of the Contract Documents by the Contractor for execution; and OWNER will execute and deliver one counterpart to Contractor within ten (10) days of receipt of the executed Agreement from Contractor.

2.01 Delivery of Bonds and Evidence of Insurance

2.01.B Replace "Before any Work at the Site is started, Contractor and Owner shall each deliver to the other" with "When Contractor delivers the executed counterparts of the Agreement to the Owner, Contractor shall deliver to the Owner", and replace "and Owner respectively are" with "is".

2.02 Copies of Documents

2.02A Revise as follows:

Owner shall furnish to Contractor up to ~~ten~~ three printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed:

2.03.A Delete in its entirety and substitute the following:

2.03.A The Contract Time will commence to run on the day indicated in the Notice to Proceed; but in no event will the Contract Time commence to run later than the ninetieth day after the day of Bid opening or the thirtieth day after the effective date of the Agreement. By mutual consent of the parties to the Contract, these time limits may be changed.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING AND REUSE

3.01 Intent

Add the following:

3.01.D It is the intent of the Specification and Contract Documents to obtain an operable Project. Equipment, components, systems, etc., therein shall be made operable by the Contractor.

3.01.E The Contract Drawings may be supplemented from time to time with additional Drawings by the Engineer as may be required to illustrate the work or, as the work progresses, with additional Drawings, by the Contractor, subject to the approval of the Engineer. Supplementary Drawings, when issued by the Engineer or by the Contractor, after approval by the Engineer, shall be furnished in sufficient quantity to all those who, in the opinion of the Engineer, are affected by such Drawings.

3.03 Reporting and Resolving Discrepancies

Add the following:

3.03.B.2 In resolving such conflicts, errors and discrepancies, the Contract Documents shall be given precedence in the following order:

a. Agreement
b. Field and Change Orders
c. Addenda
d. Special Conditions
e. Instruction to Bidders
f. General Conditions
g. Project Specifications and Drawings
h. LFUCG standard specifications and standard details

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

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS.

4.02 Subsurface and Physical Conditions

4.02.A Delete: "the Supplementary Conditions", and substitute "Section 00320 – Geotechnical Data".

4.02.B Second sentence, delete: "Supplementary Conditions" and substitute "Specifications and Contract Drawings".

4.04 Underground Facilities

Add the following:

4.04.B.3 The Owner, Engineer, and Engineer's Consultants shall not be liable to Contractor for any claims, costs, losses or damages incurred or sustained by Contractor on or in connection with any other project or anticipated project.

4.06 Hazardous Environmental Condition at Site

4.06.A First sentence, delete "Supplementary Conditions" and substitute "Section 00300 – Information Available To Bidders."

4.06.B Second sentence, delete "Supplementary Conditions: and substitute "Specifications and Contract Drawings."

4.06.G First sentence, insert "Kentucky" between "by" and "Laws".

Add the following at the end of this section: "The parties understand and acknowledge that no Kentucky case, statute, or Constitutional provision authorizes a local government to indemnify a contractor and that this contract provision may be unenforceable.

ARTICLE 5 – BONDS AND INSURANCE

Delete Article 5 in its entirety and substitute the following:

5.01 Performance and Payment Bonds

5.01A Concurrent with execution of the Agreement and within fifteen (15) days of the Notice of Award, the successful Contractor shall procure, execute and deliver to the OWNER and maintain, at his own cost and expense, the following bonds in the forms attached, of a surety company approved by the State of Kentucky as a Surety:

5.01.B Performance Bond – in an amount not less than 100% of the total amount payable to the Contractor by the terms of the Contract as security for the faithful performance of the work. Bond must be valid until one (1) year after the date of issuance of the Certificate of Substantial Completion.

5.01.C Payment Bond – in an amount not less than 100% of the total amount payable to the Contractor by the terms of the Contract as security for the payment of all persons performing labor and furnishing material in connection with the work. Bond must be valid until one (1) year after date of issuance of the Certificate of Substantial Completion.

5.01.D All Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

5.01.E If the Surety on any Bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business in the State of Kentucky is revoked, the Contractor shall within five (5) days thereafter substitute another Bond or Surety, both of which shall be acceptable to the OWNER.

5.02 Insurance Requirements

See Section 00600 – Bonds and Certificates for Insurance Requirements.

5.03 Contractor's Liability Insurance

See Section 00600 – Bonds and Certificates for Insurance Requirements.

5.04 Indemnification Agreement

See Section 00600 – Bonds and Certificates for Indemnification.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.06 Concerning Subcontractors, Suppliers and Others

6.06.B First sentence, delete: "If the Supplementary Conditions", and substitute "The Bid Form". The seventh line, delete "Supplementary Conditions", and substitute "Bid Form".

6.06.G Delete in its entirety and substitute the following:

6.06.G All work performed for Contractor by a Subcontractor shall be pursuant to an appropriate agreement between the Contractor and Subcontractor. The Subcontractor shall not commence work until Contractor has obtained all insurance as required by Paragraphs 5.02 through 5.03 inclusive.

6.07 Patent Fees and Royalties

6.07 Delete 6.07.A, 6.07.B, and 6.07.C in their entirety and substitute the following:

6.07.A Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work of any invention, design, process, products or device which is the subject of patent rights or copyrights held by others. Contractor shall indemnify and hold harmless OWNER and Engineer and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses, including attorney's fees, arising out of any infringement of patent rights or copyrights incident to the use in the performance of the Work or furnished by him in fulfillment of the requirements of this Contract. In the event of any claim or action by law on account of such patents or fees, it is agreed that the OWNER may retain out of the monies which are or which may become due the Contractor under this Contract, a sum of money sufficient to protect itself against loss, and to retain the same until said claims are paid or are satisfactorily adjusted.

6.08 Permits

6.08.A Third sentence of paragraph delete, "or if there are no Bids…..to the Work.", and substitute "and the Contractor shall pay all charges of utility owners for connections to the Work."

6.09 Laws and Regulations

6.09.B Delete 6.09B in its entirety and substitute the following:

6.09.B If Contractor observes that the Specifications or Drawings are at variance with any Laws or Regulations, he shall give Engineer prompt written notice thereof. If Contractor performs any Work knowing it to be contrary to such Laws or Regulations, and without such notice to Engineer, he shall bear all costs arising therefrom. The Contractor shall, at all times, observe and comply with and shall cause all his agents and employees and all his Subcontractors to observe and comply with all such existing Laws or Regulations, and shall protect and indemnify the OWNER and the Engineer and the municipalities in which work is being performed, and their officers and agents against any claim, civil penalty, fine or liability arising from or based on the violation of any such Law or Regulation, whether by himself or his employees or any of his Subcontractors.

6.13 Safety and Protection

6.13.B First sentence, after "CONTRACTOR" add the following:

", subject to provisions 6.09.B,"

6.19 Contractor's General Warranty and Guarantee

6.19.A After the first sentence of Section 6.19.A add the following:

"All materials or equipment delivered to the site shall be accompanied by certificates, signed by an authorized officer of the supplier, and notarized guaranteeing that the materials or equipment conform to specification requirements, Such certificates shall be immediately turned over to the Engineer. Materials or equipment delivered to the site without such certificates will be subject to rejection. The warranty and guarantee period shall be for a period of one (1) year, or such longer period of time as may be prescribed by Law, from the date of Substantial Completion."

6.20 Indemnification

6.20.A First sentence, after "...claims, costs" add the following:

", civil penalties, fines,"

6.20.C Add the following:

6.30.C.3 Nothing in the Contract Documents shall create or give to third parties any claim or right of action against the Contractor, the OWNER or the Engineer beyond such as may legally exist irrespective of the Contract.

ARTICLE 7 – OTHER WORK AT THE SITE

7.02 Coordination

Delete in its entirety.

7.03 Legal Relationships

7.03.B Delete "Owner and".

7.03.C Delete "Owner and".

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.02 Replacement of Engineer

8.02.A Delete in its entirety.

8.06 Insurance

8.06.A Delete in its entirety.

8.11 Evidence of Financial Arrangements

8.11.A Delete in its entirety.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 OWNER'S Representative

9.01.A Delete in its entirety and substitute the following:

9.01.A Engineer will be the OWNER'S representative during the construction period, and his instructions shall be carried into effect promptly and efficiently.

9.03 Project Representative

Add the following:

9.03.B The Resident Project Representative will serve as the Engineer's liaison with the Contractor, working principally through the Contractor's resident superintendent to assist him in understanding the intent of the Contract Documents.

9.03.C The Resident Project Representative shall conduct on-site observations of the work in progress to confirm that the work is proceeding in accordance with the Contract Documents. He will verify that tests, equipment and systems start-ups and operating maintenance instructions are conducted as required by the Contract Documents. He will have the authority to disapprove or reject defective work in accordance with Article 13.

9.09 Limitations on Engineer's Authority and Responsibilities

Add the following:

9.09.F Except upon written instructions of the Engineer, the Resident Project Representative:

1. Shall not authorize any deviation from the Contract Documents or approve any substitute materials or equipment.

2. Shall not exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Shall not undertake any of the responsibilities of Contractor, Subcontractors, or Contractor's superintendent, or expedite the Work.

4. Shall not advise on or issue directions relative to any aspect of the means, methods, techniques, sequences or procedures of construction unless such is specifically called for in the Contract.

5. Shall not advise on or issue directions as to safety precautions and programs in connection with the Work.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES, UNIT PRICE WORK

11.01 Cost of the Work

11.01.A Last sentence, following "...in Paragraph 11.01.B," insert the following:

"or claims for extra cost shall be considered based on an escalation of labor costs throughout the period of the Contract,"

11.01.A.2 Add the following at the end of the paragraph:

"No claims for extra cost shall be considered based on an escalation of material costs throughout the period of the Contract."

11.01.A.3 Delete second sentence "If required...be acceptable."

11.01.A.4 Delete in its entirety.

11.01.A.5.a Delete in its entirety.

11.01.A.5.c Add the following before last sentence of paragraph:

"These rates shall include all fuel, lubricants, insurance, etc. Equipment rental charges shall not exceed the prorated monthly rental rates listed in the current edition of the 'Compilation of Rental Rates for Construction Equipment' as published by the Associated Equipment Distributors. Charges per hour shall be determined by dividing the monthly rates by 176."

11.01.A.5.f Delete in its entirety.

11.01.A.5.g Delete in its entirety.

11.01.A.5.h Delete in its entirety.

11.03 Unit Price of Work:

11.03.D.1 Delete "materially and significantly", and insert "by more than plus or minus twenty percent (20%)".

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 Change of Contract Price

12.01.A Add the following after the last sentence:

Section 01025 shall be given precedence over section 00700 in regards to changes in contract price.

12.03 Delays

12.03.B Delete in its entirety and substitute the following:

12.03.B Delays beyond the control of the Contractor, as provided in paragraph 12.03.A, shall not entitle the Contractor to obtain additional project overhead costs unless such delays extend the Project as described below:

1. beyond the original Contract Times,

2. beyond the Contract Times for which the overhead costs have been previously approved, or

3. beyond Contract Times that are extended as a result of delays described in 12.03.C.

For the purpose of this paragraph, overhead costs shall be the supplemental costs defined in 11.01.A.5, paragraphs a, b, c, g, h and i. The Contractor's bid shall include all overhead costs as necessary to be on the Project for the original Contract Times.

12.03.C Add the following after the last sentence:

If the Contractor and the Owner cannot agree upon an equitable adjustment in the Contract Times, delays described in this Paragraph 12.03.C shall be determined as follows:

1. Contractor shall obtain weather history for the most recent five (5) years (minimum) preceding the Bid date. Weather history shall be obtained from the National Oceanic & Atmospheric Administration (NOAA) or other source approved by the Engineer. Historical weather shall be based on data from the weather reporting station closest to the project site.

2. For delays to be considered that are associated with an abnormal amount of rain, the Contractor shall use the weather history to calculate an average number of days that rainfall exceeded 0.1-inches for the period (month, quarter, year, etc.) in question. The average value calculated shall be rounded up to the next full day. A time extension may be considered equal to the number of days, above the calculated average, that the period in question experienced rainfall in excess of 0.1-inches. A Contract Time extension will not be considered for rain amounts less than 0.1-inches.

3. For daily rain amounts in excess of 1-inch, a time extension of one day beyond the number of days calculated as described above may be considered.

4. For delays associated with other abnormal weather events, the weather history shall be used to calculate an average number of days for the type of weather considered to be the cause of a delay. (Calculation of the average number of days shall be as described above.) Where the Contractor can demonstrate that the abnormal weather event has impaired his ability to perform work, beyond the day of the abnormal event, to perform site maintenance as necessary to restore the site to a workable condition may be considered.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.03 Tests and Inspections

13.03.B Delete in its entirety and substitute the following:

13.03.B Contractor shall employ and pay for inspections and testing services specifically noted as such in the Contract.

13.03.C Delete in its entirety and substitute the following:

13.03.C If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to be specifically inspected, tested, or approved by some public body, Contractor shall assume full responsibility therefore, pay all

costs in connection therewith and furnish Engineer the required certificates of inspection, testing or approval.

Add the following:

13.03.G The OWNER reserves the right to independently perform at its own expense, laboratory tests on random samples of material or performance tests on equipment delivered to the site. These tests if made will be conducted in accordance with the appropriate referenced standards or Specification requirements. The entire shipment represented by a given sample, samples or piece of equipment may be rejected on the basis of the failure of samples or pieces of equipment to meet specified test requirements. All rejected materials or equipment shall be removed from the site, whether stored or installed in the Work, and the required replacement shall be made, all at no additional cost to the OWNER.

13.05 OWNER May Stop the Work:

13.05A First sentence, after "...conform to the Contract Documents", insert "or if the Work interferes with the operation of the existing facility".

13.06 Correction or Removal of Defective Work

Add the following:

13.06.C At any time during the progress of the Work and up to the date of final acceptance, the Engineer shall have the right to reject any work which does not conform to the requirements of the Contract Documents, even though such work has been previously inspected and paid for. Any omissions or failure on the part of the Engineer to disapprove or reject any Work or materials at the time of inspection shall not be construed as an acceptance of any defective work or materials.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 Schedule of Values

Add the following:

14.01.B The Contractor shall submit for the Engineer's approval, a complete breakdown of all Lump Sum Items in the Proposal. This breakdown, modified as directed by the Engineer, will be used as a basis for preparing estimates and establishing progress payments.

14.02 Progress Payments

14.02.A.3 Delete in its entirety and replace with the following:

14.02.A.3 Progress payment request shall include the percentage of the total amount of the Contract which has been completed from initiation of construction of the Project to and including the last day of the preceding month, or other mutually agreed upon day of the month accompanied by such data and supporting evidence as OWNER or Engineer may require.

Add the following:

14.02.A.4 Forms to be used shall be prepared by the Contractor and submitted to the Engineer for approval.

14.02.A.5 At the option of the OWNER, partial payment up to the estimated value, less retainage, may be allowed for any materials and equipment not incorporated in the Work, pursuant to the following conditions:

a. Equipment or materials stored on the site shall be property stored, protected and maintained.

b. For any partial payment the Contractor shall submit, with his monthly progress payment from each material or equipment manufacturer, bills or invoices indicating actual material cost.

c. Contractor shall submit evidence that he has paid for materials or equipment stored and for which the Engineer has authorized partial payment and previous progress payments, prior to submission to the next monthly payment request. (See example letter at the end of this Section 00800).

14.02.A.6 The OWNER will retain ten percent (10%) of the amount of each such estimate until Work covered by the Contract is fifty percent (50%) complete. After fifty percent (50%) of the Work of the original Contract has been completed as evidenced by approved Partial Payment Requests exclusive of stored materials and in the opinion of the OWNER, satisfactory progress is being made, the OWNER may adjust future partial payment so that five percent (5%) of the original Contract Price is retained.

14.02.A.7 If the OWNER determines it is appropriate to reduce retainage, the method used for such adjustment shall be to fix retainage at five percent (5%) of the original Contract amount (when the work is 50% complete) and to pay all subsequent Partial Payment Requests to the full approved amount. The intent of such an adjustment is to gradually reduce retainage to five percent (5%) of the original Contract amount when the work is one hundred percent (100%) complete.

14.02.A.8 The OWNER may reinstate up to ten percent (10%) retainage if it is determined that the Contractor is not making satisfactory progress or there is other specific cause for retainage.

14.02.B.1 Review of Applications:

First sentence, delete "10 days", insert "30 days".

14.02.C.1 Payment Becomes Due:

First sentence, delete "Ten days" and insert "Thirty Days".

14.02.D.3 Delete in its entirety.

14.04 Substantial Completion

14.04 Delete paragraphs A, B, C, and D in their entirety and substitute the following:

14.04.A Contractor may, in writing to OWNER and Engineer, certify that the entire project is substantially complete and request that Engineer issue a certificate of Substantial Completion. Within a reasonable time thereafter, OWNER, Contractor and Engineer shall make an inspection of the Project to determine the status of completion. If Engineer and OWNER do not consider the Project substantially complete, Engineer will notify Contractor in writing giving his reasons therefore. If Engineer and OWNER consider the Project substantially complete, Engineer will prepare and deliver to OWNER a tentative certificate of Substantial Completion and the responsibilities between OWNER and Contractor for maintenance, heat and utilities. There shall be attached to the certificate a tentative list of items to be completed or corrected before Substantial Completion, and the certificate shall fix the time within which such items shall be completed or corrected, said time to be within Contract Time.

14.04.B In accordance with KRS 371.410, Substantial Completion is the point at which, as certified in writing by the contracting entity, a project is at the level of completion, in strict compliance with the contract, where:

1. Necessary approval by public regulatory authorities has been given;
2. The Owner has received all required warranties and documentation; and
3. The Owner may enjoy beneficial use or occupancy and may use, operate, and maintain the project in all respects, for its intended purpose.

14.05 Partial Utilization

14.05.A Delete in its entirety and substitute the following:

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

14.05.B Equipment Warranty will not begin until after successful start-up, training, and acceptance by Owner for Partial Utilization. Any manufacturer's request to initiate warranty period earlier than Owner's acceptance will not be valid.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 Owner May Suspend Work

Add the following:

15.01.B Should the OWNER suspend Work due to repeated unsafe Work conducted by the Contractor which is confirmed by subsequent inspection by OSHA, the Contractor shall not be allowed any adjustment in Contract Price or extension of Contract Time attributed to the delay.

15.02 Owner May Terminate for Cause

15.02.A.2 Add the following to the end of first sentence after "jurisdiction":

"(including those governing employee safety)"

15.02D Delete in its entirety.

Add the following:

15.05 Assignment of Contract

15.05 Contractor shall not assign, transfer, convey or otherwise dispose of the Contract, or of his legal right, title, or interest in or to the same or to any part thereof, without the prior written consent of the OWNER. Contractor shall not assign by power of attorney or otherwise any monies due him and payable under this Contract without the prior written consent of the OWNER. Such consent, if given, will in no way relieve the Contractor from any of the obligations of this Contract. OWNER shall not be bound to abide by or observe the requirements of any such assignment.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 Methods and Procedures

16.01.A, B and C Replace the first sentence with the following:

"Dispute Resolution shall be in accordance with Paragraph 1.09(F) of the Agreement (Contract), Specification Section 00520."

ARTICLE 17 – MISCELLANEOUS

17.01 Giving Notice

Add the following:

17.01.B No oral statement of any person whomsoever shall in any manner or degree modify or otherwise affect the terms of this Contract. Any notice to the Contractor, form OWNER and Engineer, relative to any part of this Contract shall be in writing.

Add the following:

17.07 Claims for Injury or Damage

17.07.A Should OWNER or Contractor suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 17.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

17.08 Non-Discrimination in Employment

17.08.A The Contractor shall comply with the following requirements prohibiting discrimination:

17.08.A.1 That no person (as defined in KRS 344.010) shall Bid on Lexington-Fayette Urban County Government Construction projects, or bid to furnish materials or supplies to the Lexington-Fayette Urban County Government, if, within six months prior to the time of opening of Bids, said person shall have been found, by declamatory judgment action in Fayette Circuit Court, to be presently engaging in an unlawful practice, as hereinafter defined. Such declamatory judgment action may be brought by an aggrieved individual or upon an allegation that an effort at conciliation pursuant to KRS 344.200 has been attempted and failed, by the Lexington-Fayette County Human Rights Commission.

17.08.A.2 That it is an unlawful practice for any employer:

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

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

17.08.A.3 That it is unlawful practice for an employer, labor organization, or joint-labor management committee controlling apprenticeship or other training or retraining, including on-the-job training programs to discriminate against an individual because of his race, color, religion, sex, age, or national origin in admission to, or employment in, any program established to provide apprenticeship or other training.

17.08.A.4 That a copy of the LFUCG Ordinance shall be available for viewing at the Lexington-Fayette Urban County Government offices.

17.09 Temporary Street Closing or Blockage

17.09.A The Contractor will notify the Engineer, Owner, and LFUCG Division of Traffic Engineering at least 72 hours prior to making any temporary street closing or blockage. This will permit orderly notification to all concerned public agencies.

17.10 Percentage of Work Performed by Prime Contractor

17.10.A The Contractor shall perform on site, and with its own organization, Work equivalent to at least fifty percent (50%) of the total amount of Work to be performed under the Contract. This percentage may be reduced by a supplemental agreement to this Contract if, during performing the Work, the Contractor requests a reduction and the Engineer determines that the reduction would be to the advantage of the OWNER.

17.11 Clean-Up

17.11.A Clean-up shall progress, to the greatest degree practicable, throughout the course of the Work. The Work will not be considered as completed, and final payment will not be made, until the right-of-way and all ground occupied or affected by the Contractor in connection with the Work has been cleared of all rubbish, equipment, excess materials, temporary structures, and weeds. Rubbish and all waste materials of whatever nature shall be disposed of, off of the project site, in an acceptable manner. All property, both public and private, which has been damaged in the prosecution of the Work, shall be restored in an acceptable manner. All areas shall be draining, and all drainage-ways shall be left unobstructed, and in such a condition that drift will not collect or scour be induced.

17.12 General

17.12.A The duties and obligations imposed by the Contract Documents and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon Contractor, and all of the rights and remedies available to OWNER and Engineer, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply. All representations, warranties and guarantees made in the Contract Documents will survive final payment and termination or completion of the Agreement.

17.13 Debris Disposal

17.13.A For all LFUCG projects any fill, trash, construction demolition debris, yard waste, dirt or debris of any kind that is removed from the project site must be disposed of in accordance with local, state, and federal regulations. The disposal site or facility must be approved in advance by the LFUCG and disposal documentation is required. The Contractor will be responsible for payment of any fines associated with improper disposal of material removed from the project site.

17.14 Maintenance of Traffic

17.14.A Traffic shall be maintained on state and LFUCG highways and streets at all times during construction. For all work that impacts traffic, the Contractor shall obtain a traffic permit at least two (2) working days in advance from the Division of Traffic Engineering (859) 258-3489.

17.14.B It shall be the Contractor's responsibility to notify LFUCG Police Department's Safety Officer (859) 258-3600 prior to performing any construction work, which might interfere with traffic or compromise the public safety.

Add the following:

ARTICLE 18 – LIQUIDATED DAMAGES FOR FAILURE TO COMPLETE WORK ON TIME

18.01 Liquidated Damages

18.01.A If the Contractor shall fail to complete the Work within the Contract Time, or extension of time granted by the OWNER in accordance with Article 12, then the Contractor will pay to the OWNER the amount for liquidated damages as specified in the Contract for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.

(Reference Section 00800, Article 14.02.A.5.c)

*****PUT ON CONTRACTOR'S LETTERHEAD*****

DATE: _____

TO: OWNER:_____

ADDRESS:_____

_____

_____

RE: Project Title: _____
Lexington Fayette Urban County Government
Lexington, Kentucky
LFUCG Bid No.: _____

We hereby certify that the labor and materials listed on this request for payment have been used in the construction of this work, or that all materials included in this request for payment and not yet incorporated into the construction are now on the site or stored at an approved location with proper insurance to protect these stored materials; and that all lawful charges for labor, materials etc., covered by previous Certificates of Payment have been paid and that all other lawful charges on which this request for payment is based have been paid for in full or will be paid for in full from the funds received in payment of this request within ten (10) calendar days from receipt of this partial payment from the OWNER.

CONTRACTOR: _____

BY: _____

TIME: _____

State of: _____

County of: _____

Sworn to and subscribed before me this _____day of _____, 20____.

_____
Notary Public (Seal)

My Commission Expires:_____

END OF SECTION

SECTION 00820 – WAGE DETERMINATION SCHEDULE

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

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

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

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

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

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

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

1.02 PREVAILING WAGE REQUIREMENTS

A. Prevailing wage rates and/or Davis Bacon Wage Rates shall not apply to this project.

END OF SECTION

SECTION 00890 – PERMITS

END OF SECTION

SECTION 00910 - ADDENDA

(Insert Addenda as they are issued.)

END OF SECTION

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. The Work to be done under this Contract and in accordance with these Specifications consists of furnishing all equipment, supervision, labor, skill, material and all other items necessary for the construction of the **Shandon Park Trunk Sewers, Winburn Trunk and Thoroughbred Acres Trunk Sewers, Phase 2**

B. The Contractor shall perform all work required for such construction in accordance with the Contract Documents and subject to the terms and conditions of the Contract, complete and ready for use.

C. The principal features of the Work to be performed under this Contract includes, but is not limited to:

1. Installation of gravity sanitary sewers, reinforced concrete manholes, and appurtenances.

2. Connections to existing sanitary sewers and service laterals, as necessary.

3. Decommissioning and abandonment of four existing pump stations.

4. Maintenance of existing sanitary sewer flows during construction

D. The foregoing description(s) shall not be construed as a complete description of all work required.

1.02 CONTRACT DOCUMENTS

A. Work to be done is shown on the set of Drawings entitled: **Shandon Park Trunk Sewers, Winburn Trunk and Thoroughbred Acres Trunk Sewers, Phase 2**. The numbers and titles of all Drawings appear on the index sheet of the Drawings. All drawings so enumerated shall be considered an integral part of the Contract Documents as defined herein.

1.03 GENERAL ARRANGEMENT

A. Drawings indicate the extent and general arrangement of the work. If any departures from the Drawings are deemed necessary by the Contractor to accommodate the materials and equipment he proposes to furnish, details of such departures and reasons therefore shall be submitted as soon as practicable to the Engineer for approval. No such departures shall be made without the prior written approval of the Engineer. Approved changes shall be made without additional cost to the Owner for this work or related work under other Contracts of the Project.

1.04 CONSTRUCTION PERMITS, EASEMENTS AND ENCROACHMENTS

A. The Owner shall obtain or cause to be obtained all permanent and temporary construction easements as shown on the Drawings or required for completion of the Work. The Contractor shall verify that these easements have been obtained and shall comply with the conditions set forth in each easement.

B. The Contractor shall obtain, keep current and pay all fees for any necessary construction permits from those authorities, agencies, or municipalities having jurisdiction over land areas,

utilities, or structures which are located within the Contract limits and which will be occupied, encountered, used, or temporarily interrupted by the Contractor's operations unless otherwise stated. Record copies of all permits shall be furnished to the Engineer.

C. When construction permits are accompanied by regulations or requirements issued by a particular authority, agency or municipality, it shall be the Contractor's responsibility to familiarize himself and comply with such regulations or requirements as they apply to his operations on this Project.

1.05 ADDITIONAL ENGINEERING SERVICES

A. In the event that the Engineer is required to provide additional engineering services as a result of substitution of materials or equipment by the Contractor which are not "or equal", or changes by the Contractor in dimension, weight, power requirements, etc., of the equipment and accessories furnished, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor for the convenience of the Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the Owner.

B. In the event that the Engineer is required to provide additional engineering services as a result of Contractor's errors, omissions, or failure to conform to the requirements of the Contract Documents, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the Owner.

1.06 ADDITIONAL OWNER'S EXPENSES

A. In the event the Work of this Contract is not completed within the time set forth in the Contract or within the time to which such completion may have been extended in accordance with the Contract Documents, the additional engineering or inspection charges incurred by the Owner may be charged to the Contractor and deducted from the monies due him. Extra work or supplemental Contract work added to the original Contract, as well as extenuating circumstances beyond the control of the Contractor, will be given due consideration by the Owner before assessing engineering and inspection charges against the Contractor.

B. Unless otherwise specifically permitted, the normal time of work under this Contract is limited to 40 hours per week, Monday through Friday. Work beyond these hours will result in additional expense to the Owner. Any expenses and/or damages, including the cost of the Engineer's on site personnel, arising from the Contractor's operations beyond the hours and days specified above shall be borne by the Contractor.

C. Charges assessed to the Contractor for additional engineering and inspection costs will be determined based on actual hours charged to the job by the Engineer. Daily rates will depend on the number and classifications of employees involved, but in no case shall such charges exceed $500 per day for field personnel based on an eight hour workday. Additional charges will apply if multiple personnel are needed or if engineering time is required as part of the work outside the contract times.

D. Charges for additional Owner's expenses shall be in addition to any liquidated damages assessed in accordance with the Contract.

1.07 TIME OF WORK

A. The normal time of work for this Contract is limited to 40 hours per week and shall generally be between the hours of **7:00 a.m. and 6:00 p.m., Monday through Friday**. The Contractor may work beyond these hours or on weekends with written approval from the Owner provided

that all costs incurred by the Owner for any additional engineering shall be borne by the Contractor. The Owner shall deduct the cost of additional engineering from monies due the Contractor.

B. If it shall become imperative to perform work outside of the normal working hours the Owner and Engineer shall be informed a reasonable time in advance of the beginning of such work. Temporary lighting and all other necessary facilities for performing and inspecting the work shall be provided and maintained by the Contractor.

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

1.08 SURVEYS AND LAYOUT

A. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings or as directed by the Engineer. Elevations of existing ground and appurtenances are believed to be reasonably correct but are not guaranteed to be absolute and therefore are presented only as an approximation. Any error or apparent discrepancy in the data shown or omissions of data required for accurately accomplishing the stake out survey shall be referred immediately to the Engineer for interpretation or correction.

B. All survey work for construction control purposes shall be made by the Contractor at his expense. The Contractor shall provide a Licensed Surveyor as Chief of Party, competently qualified survey party, all necessary instruments, stakes, and other material to perform the work.

C. Contractor shall establish all baselines for the location of the principal component parts of the work together with a suitable number of bench marks adjacent to the work. Based upon the information provided by the Contract Drawings, the Contractor shall develop and make all detail surveys necessary for construction, including stakes for all working points, lines and elevations.

D. Contractor shall have the responsibility to carefully preserve the bench marks, reference points and stakes, and in the case of destruction thereof by the Contractor or resulting from his negligence, the Contractor shall be charged with the expense and damage resulting therefrom and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points and stakes.

E. Existing or new control points, property markers and monuments that will be or are destroyed during the normal causes of construction shall be reestablished by the Contractor and all reference ties recorded therefore shall be furnished to the Engineer. All computations necessary to establish the exact position of the work shall be made and preserved by the Contractor.

F. The Engineer may check all or any portion of the work and the Contractor shall afford all necessary assistance to the Engineer in carrying out such checks. Any necessary corrections to the work shall be immediately made by the Contractor. Such checking by the Engineer shall not relieve the Contractor of any responsibilities for the accuracy or completeness of his work.

G. At completion of the work, the Contractor shall furnish Record Drawings indicating the final layout of all constructed piping and manholes and finished grades constructed or changed as part of this work.

1.09 FIRE PROTECTION

A. Contractor shall take all necessary precautions to prevent fires at or adjacent to the work and shall provide adequate facilities for extinguishing fires which do occur. Burning shall not be permitted on site.

B. When fire or explosion hazards are created in the vicinity of the work as a result of the locations of fuel tanks or similar hazardous utilities or devices, the Contractor shall immediately alert the local Fire Marshal, the Engineer, and the Owner of such tank or device. The Contractor shall exercise all safety precautions and shall comply with all instructions issued by the Fire Marshal and shall cooperate with the Owner of the tank or device to prevent the occurrence of fire or explosion.

1.10 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, or reactant of other classification, must show approval of either the EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with all applicable rules and regulations.

1.11 FIRST AID FACILITIES AND ACCIDENTS

A. First Aid Facilities

1. The Contractor shall provide at the site such equipment and facilities as are necessary to supply first aid to any of his personnel who may be injured in connection with the work.

B. Accidents

1. The Contractor shall promptly report, in writing, to the Engineer and Owner all accidents whatsoever out of, or in connection with, the performance of the work, whether on or adjacent to the site, which cause death, personal injury or property damage, giving full details and statements of witnesses.

2. If death, serious injuries, or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Owner and the Engineer.

3. If any claim is made by anyone against the Contractor or a Subcontractor on account of any accidents, the Contractor shall promptly report the facts, in writing, to the Engineer and Owner, giving full details of the claim.

1.12 ULTIMATE DISPOSITION OF CLAIMS BY ONE CONTRACTOR ARISING FROM ALLEGED DAMAGE BY ANOTHER CONTRACTOR

A. During the progress of the Work, other Contractors may be engaged in performing other work or may be awarded other Contracts for additional work on this project. In that event, the Contractor shall coordinate the work to be done hereunder with the work of such other Contractors and the Contractor shall fully cooperate with such other Contractors and carefully fit its own work to that provided under other Contracts as may be directed by the Engineer. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other Contractor.

B. If the Engineer shall determine that the Contractor is failing to coordinate his work with the work of the other Contractors as the Engineer directed, then the Owner shall have the right to withhold any payments otherwise due hereunder until the Contractor completely complies with the Engineer's directions.

C. If the Contractor notifies the Engineer in writing that another Contractor is failing to coordinate his work with the work of this Contract as directed, the Engineer will promptly investigate the charge. If the Engineer finds it to be true, he will promptly issue such directions to the other Contractor with respect thereto as the situation may require. The Owner, the Engineer, nor any of their agents shall not, however, be liable for any damages suffered by the Contractor by reason of the other Contractor's failure to promptly comply with the directions so issued by the Engineer, or by reason of another Contractor's default in performance, it being understood that the Owner does not guarantee the responsibility or continued efficiency of any Contractor.

D. The Contractor shall indemnify and hold the Owner and the Engineer harmless from any and all claims of judgments for damages and from costs and expenses to which the Owner may be subjected or which it may suffer or incur by reason of the Contractor's failure to promptly comply with the Engineer's directions.

E. Should the Contractor sustain any damage through any act or omission of any other Contractor having a Contract with the Owner for the performance of work upon the site or of work which may be necessary to be performed for the proper execution of the work to be performed hereunder, or through any act or omission of a Subcontractor of such Contract, the Contractor shall have no claim against the Owner or the Engineer for such damage, but shall have a right to recover such damage from the other Contractor under the provision similar to the following provisions which have been or will be inserted in the Contracts with such other Contractors.

F. Should any other Contractor having or who shall hereafter have a Contract with the Owner for the performance of work upon the site sustain any damage through any act or omission of the Contractor hereunder or through any act or omission of any Subcontractor of the Contractor, the Contractor agrees to reimburse such other Contractor for all such damages and to defend at his own expense any suit based upon such claim and if any judgment or claims against the Owner shall be allowed, the Contractor shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith and shall indemnify and hold the Owner harmless from all such claims.

G. The Owner's right to indemnification hereunder shall in no way be diminished, waived or discharged, by its recourse to assessment of liquidated damages as provided in the Contract, or by the exercise of any other remedy provided for by Contract Documents or by law.

1.13 BLASTING AND EXPLOSIVES

A. Refer to section 02225 of these specifications for blasting requirements.

1.14 LIMITS OF WORK AREA

A. The Contractor shall confine his construction operations within the Contract limits shown on the Drawings and/or property lines and/or fence lines. Storage of equipment and materials, or erection and use of sheds outside of the Contract limits, if such areas are the property of the Owner, shall be used only with the Owner's approval. Such storage or temporary structures, even within the Contract's limits, shall not be placed on properties designated as easements or rights-of-way unless specifically permitted elsewhere in the Contract Documents.

B. The Contractor shall secure, insure, maintain, rent/lease, and restore staging area.

C. The Contractor shall provide Engineer and Owner copy of agreement with landowner of staging areas.

1.15 WEATHER CONDITIONS

A. No work shall be done when the weather is unsuitable. The Contractor shall take necessary precautions (in the event of impending storms) to protect all work, materials, or equipment from damage or deterioration due to floods, driving rain, or wind, and snow storms. The Owner reserves the right, through the opinion of the Engineer, to order that additional protection measures over and beyond those proposed by the Contractor, be taken to safeguard all components of the Project. The Contractor shall not claim any compensation for such precautionary measures so ordered, nor claim any compensation from the Owner for damage to the work from weather elements.

1.16 PERIODIC CLEANUP: BASIC SITE RESTORATION

A. During construction, the Contractor shall regularly remove from the site of the work all accumulated debris and surplus materials of any kind which result from his operations. Unused equipment and tools shall be stored at the Contractor's staging area for the Project.

B. As the work involves installation of sewers, drains, manholes, underground structures, or other disturbance of existing features in or across streets, rights-of-way, easements, or private property, the Contractor shall (as the work progresses) promptly backfill, compact, grade, and otherwise restore the disturbed area to the basic condition which will permit resumption of pedestrian or vehicular traffic and any other critical activity or functions consistent with the original use of the land. The requirements for temporary paving of streets, walks, and driveways are specified elsewhere. Unsightly mounds of earth, large stones, boulders, and debris shall be removed so that the site presents a neat appearance.

C. The Contractor shall perform the cleanup work on a regular basis and as frequently as ordered by the Engineer. Basic site restoration in a particular area shall be accomplished immediately following the installation or completion of the required facilities in that area. Furthermore, such work shall also be accomplished, when ordered by the Engineer, if partially completed facilities must remain incomplete for some time period due to unforeseen circumstances.

D. Upon failure of the Contractor to perform periodic cleanup and basic restoration of the site to the Engineer's satisfaction, the Owner may, upon five (5) days prior written notice to the Contractor, without prejudice to any other rights or remedies of the Owner, cause such work for which the Contractor is responsible to be accomplished to the extent deemed necessary by the Engineer, and all costs resulting therefrom shall be charged to the Contractor and deducted from the amounts of money that may be due him.

1.17 USE OF FACILITIES BEFORE COMPLETION

A. The Owner reserves the right to enter the site and use any portion of the constructed facilities before final completion of the whole work to be done under this Contract. However, only those portions of the facilities which have been completed to the Engineer's satisfaction, as evidenced by his issuing a Certificate of Substantial Completion covering that part of the work, shall be placed in service.

B. It shall be the Owner's responsibility to prevent premature connections to or use of any portion of the installed facilities by private or public parties, persons or groups of persons, before the Engineer issues his Certificate of Substantial Completion covering that portion of the work to be placed in service.

C. Consistent with the approved progress schedule, the Contractor shall cooperate with the Owner, his agents, and the Engineer to accelerate completion of those facilities, or portions thereof, which have been designated for early use by the Owner.

1.18 CONSTRUCTION VIDEO

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

PART 2 – PRODUCT (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01025 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all necessary labor, machinery, tools, apparatus, equipment, materials, equipment, service, other necessary supplies and perform all work including all excavation and backfilling (without additional compensation, except where specifically set out in these specifications) at the contract unit prices bid for the work described in Part 2 of this Section.

1.02 PROGRESS AND PAYMENTS SCHEDULES

A. Within fifteen (15) days after the date of formal execution of the Agreement (Contract), the Contractor shall prepare and submit to the Engineer, for approval, a construction schedule of the Critical Path Method (CPM) type which depicts the Contractor's plan for completing the contract requirements and show work placement in dollars versus contract time. The Contractor's construction schedule must be approved by the Engineer before any payments shall be made on this contract.

B. Within fifteen (15) days after the date of formal execution of the Agreement (Contract), the Contractor shall prepare and submit to the Engineer, for approval, a periodic estimate which depicts the Contractor's cost for completing the contract requirements and show by major unit of the project work, the Contractor's dollar value for the material and the labor (two separate amounts) to be used as a basis for the periodic payments. The Contractor's periodic estimate must be approved by the Engineer before any payments shall be made on this contract.

C. The Engineer's decision as to sufficiency and completeness of the Contractor's construction schedule and periodic estimate shall be final.

D. The Contractor must make current, to the satisfaction of the Engineer, the construction schedule and periodic estimate each time the Contractor requests a payment on this contract.

E. The Contractor's construction schedule and periodic estimate must be maintained at the construction site available for inspection and shall be revised to incorporate approved change orders as they occur.

F. When the Contractor requests a payment on this contract, it must be on the approved periodic estimate and be current. Further, the current periodic estimate and construction schedule (both updated and revised) shall be submitted for review and approval by the Engineer before monthly payments shall be made by the Owner. The Contractor shall submit as stored materials for pay purposes.

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

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

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

1.04 CLAIMS FOR EXTRA WORK

A. If the Contractor claims that any instructions by Drawings or otherwise involve extra cost, the Contractor shall give the Engineer written notice of said claim within seven (7) days after the receipt of such instructions, and in any event before proceeding to execute the work, stating clearly and in detail the basis of its claim or claims. No such claim shall be valid unless so made.

B. Claims for additional compensation for extra work, due to alleged errors in spot elevations, contour lines, or bench marks, shall not be recognized unless accompanied by certified survey data, made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted, or would result, in handling more material, or performing more work than would reasonably be estimated from the Drawings and topographical maps issued.

C. Any discrepancies which may be discovered between actual conditions and those represented by the topographical maps and Drawings shall at once be reported to the Engineer, and work shall not proceed, except at the Contractor's risk, until written instructions have been received by the Contractor from the Engineer.

D. If, on the basis of the available evidence, the Engineer determines that an adjustment of the Contract Price or time is justifiable, the procedure shall then be as provided herein for "Changes in the Work".

E. By execution of this Contract, the Contractor warrants that it has visited the site of the proposed work and fully acquainted himself with the conditions there existing relating to construction and labor, and that it fully understands the facilities, difficulties, and restrictions attending the execution of the work under this Contract. The Contractor further warrants that it has thoroughly examined and is familiar with the Drawings, Specifications and all other documents comprising the Contract. The Contractor further warrants that by execution of this Contract its failure when it was bidding on this Contract to receive or examine any form, instrument or document, or to visit the site and acquaint himself with conditions there existing, in no way relieves the Contractor from any obligation under the Contract, and the Contractor agrees that the Owner shall be justified in rejecting any claim based on facts regarding which it should have been on notice as a result thereof.

1.05 DETERMINATION OF THE VALUE OF EXTRA (ADDITIONAL) OR OMITTED WORK

A. The value of extra (additional) or omitted work shall be determined in one or more of the following ways:

1. On the basis of the actual cost of all the items of labor (including on-the-job supervision), materials, and use of equipment, plus a maximum 15 percent for added work or a minimum 15 percent for deleted work which shall cover the Contractor's general supervision, overhead and profit.

    a. Labor may include on-site supervision, on-site project management, in addition to field personal associated with the work.

    b. In case of subcontracts, the 15 percent (maximum for added work and minimum for deleted work) is interpreted to mean the subcontractor's supervision, overhead and profit, and an additional 5 percent (maximum for added work and minimum for deleted work) may then be added to such costs to cover the General Contractor's supervision, overhead and profit.

    c. The cost of labor shall include required insurance, taxes and fringe benefits.

    d. Equipment costs shall be based on current rental rates in Lexington, KY.

2. By estimate and acceptance in a lump sum.

3. By unit prices named in the Contract or subsequently agreed upon.

B. Provided, however, that the cost or estimated cost of all extra (additional) work shall be determined in advance of authorization by the Engineer and approved by the Owner.

C. All extra (additional) work shall be executed under the conditions of the original Contract. Any claim for extension of time shall be adjusted according to the proportionate increase or decrease in the final total cost of the work unless negotiated on another basis.

D. Except for over-runs in contract unit price items, no extra (additional) work shall be done except upon a written Change Order from the Engineer, and no claim on the part of the Contractor for pay for extra (additional) work shall be recognized unless so ordered in writing by the Engineer.

PART 2 - PRODUCTS

2.01 MOBILIZATION

Payment for the Contractor's mobilization shall be made at the Contract lump sum price and shall include all costs incurred for moving equipment onto the project area, staging, security fencing, and any pertinent costs related thereto, for the duration of the contract term. Mobilization unit price shall not exceed two percent (2%) of the total Bid Amount.

2.02 BONDS AND INSURANCE

Payment for bonds and insurance shall be made at the Contract lump sum price, and shall include the costs of all bonds provided under the Contract, and the premiums for insurance required under the Contract, for the duration of the contract term. Unit price shall be based on actual invoices and payment shall be made upon receipt of invoices attached to a monthly progress payment request.

2.03 GENERAL REQUIREMENTS

Payment for general requirements shall be made at the Contract lump sum price and shall include field supervision and support staff, office supervision and support staff, costs associated with maintaining the field operation, and other items required by the general requirements and conditions of the Contract. Payment for General Requirements shall be made on an equal distribution across the Contract term on a monthly basis.

2.04 DEMOBILIZATION

Payment for the Contractor's demobilization upon completion of the project shall be made at the Contract lump sum price and shall include all costs incurred for removing equipment and materials from the project area and any pertinent costs related thereto, for the duration of the Contract term. Demobilization unit price shall not exceed one percent (1%) of the total Bid Amount.

2.05 EROSION AND SEDIMENT CONTROL AND CONFORMANCE WITH SWPPP

Payment is for furnishing, installing, maintaining and removing erosion and sediment control devices. This is to be paid at the contract lump sum price, complete in place, which shall include compensation for materials, placing, cleaning, and maintaining the sediment and erosion control devices throughout the construction period and removal of the of the sediment and erosion control devices once vegetation is established. Payment shall be distributed as follows: 25% when all ESC measures are in place and operating correctly; 50% equally distributed across the Contract term; and 25% for the removal of the ESC measures and final stabilization/restoration.

2.06 PVC (SDR 35) GRAVITY SEWER LATERAL

Payment is for furnishing and installing gravity sewer laterals at the contract unit price per linear foot, based on the line size as indicated on the Bid Schedule. This is to be paid at the contract unit price, complete in place, which shall include compensation for pipe, reducers, spool pieces, fittings (excluding items included in cleanout pay item), materials, hauling, excavation (including rock excavation), shoring, sheeting, removal of existing lateral, bedding, backfilling, cleanup, restoration, testing, and all other items necessary for a complete installation.

2.07 GRAVITY SEWER PIPE

Payment is for furnishing and installing Gravity Sewer Pipe at the contract unit price per linear foot, based on the line size and burial depth as indicated on the Bid Schedule. Depth of burial is measured from existing ground surface to invert of sewer pipe and paid for accordingly. The quantity of sewer to be paid for shall be the actual length of installed in trench and into boot of manhole. Fittings and tees are paid for separately under a different pay item and not included in the length of pipe. Gravity sewer pipe is to be paid at the contract unit price, complete in place, which shall include compensation for pipe, materials, hauling, clearing and grubbing, excavation (including rock excavation), shoring, sheeting, removal of existing pipe, bedding, backfilling, cleanup, restoration (excluding permanent seeding), testing, and all other items necessary for a complete installation.

2.08 DUCTILE IRON TEE FITTINGS FOR GRAVITY SEWER LATERAL CONNECTION

Payment is for furnishing and installing Ductile Iron Tee Fittings for Gravity Sewers at the contract unit price per pound, as indicated on the Bid Schedule. This is to be paid at the contract unit price, complete in place, which shall include compensation for materials, hauling, excavation (including rock excavation), shoring, sheeting, bedding, backfilling, cleanup, testing, and all other items necessary for a complete installation.

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

Payment is for furnishing and installing Tee Fittings for Gravity Sewers (non-ductile iron) at the contract unit price per each, based on the line size as indicated on the Bid Schedule. This is to be paid at the contract unit price, complete in place, which shall include compensation for materials, hauling, excavation (including rock excavation), shoring, sheeting, bedding, backfilling, cleanup, testing, and all other items necessary for a complete installation.

2.10 CONNECTION TO EXISTING SEWER

For pipes 12" and larger, payment shall be made for furnishing and installing a Connection to Existing Sewer. This is to be paid at the contract unit price, based on the line size as indicated on the Bid Schedule, complete in place, which shall include compensation for coupling, one full length of pipe, materials, hauling, tapping, excavation (including rock excavation), shoring, sheeting, bedding, forming and placing (constructing) concrete cradle, backfilling, cleanup, testing, and all other items necessary for a complete installation.

2.11 MANHOLE ABANDONMENT

Payment is for Manhole Abandonment at the contract unit price each. This is to be paid at the contract unit price, complete in place, which shall include compensation for excavation (including rock excavation), demolition, disposal, concrete, crushed stone fill, backfilling, cleanup, restoration, and all other items necessary for a complete installation.

2.12 MANHOLE

Payment is for furnishing and installing a Manhole, based on the size and depth as indicated on the Bid Schedule. This is to be paid at the contract unit price each, complete in place, which shall include compensation for the manhole casting, Xypex or Conshieid admixture, boots, gaskets,

crushed stone, SS frame anchors, frame and cover, grout, materials, removal of existing manhole, hauling, excavation (including rock excavation), bedding, backfilling, testing, cleanup, and all other items necessary for a complete installation on new or existing sewer lines.

2.13 MANHOLE BARREL EXTENSION

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

2.14 MANHOLE DROP CONNECTION

Payment is for furnishing and installing a Manhole Drop Connection, based on the size as indicated on the Bid Schedule. This is to be paid at the contract unit price each, complete in place, which shall include compensation for concrete casting, piping/ fittings cast into manhole concrete, Xypex or Conshield admixture, materials, assembly, installation, testing, and all other items necessary for a complete installation on new or existing sewer lines.

2.15 MANHOLE ACCESSORIES FOR LOCATION WITHIN 100-YEAR FLOODPLAIN

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

2.16 RECONNECT EXISTING GRAVITY SEWER OR SERVICE LATERAL TO NEW MANHOLE

Payment is for furnishing and installing a new manhole connection to an existing gravity sewer or service lateral. This is to be paid at the contract unit price each, complete in place, which shall include compensation for gasket, Fernco Strongback coupling, full length of pipe, grout, materials, furnishing, excavation (including rock excavation), bedding, backfilling, cleanup, coring, and all other items necessary for a complete installation.

2.17 CUT AND CAP EXISTING SEWER

Payment is for cutting and capping existing sewer, based on the size as indicated on the Bid Schedule. This is to be paid at the contract unit price each, complete in place, which shall include compensation for concrete, cutting pipe, materials, equipment, excavation (including rock excavation), backfilling, cleanup, restoration, and all other items necessary for a complete capping.

2.18 PIPE ABANDONMENT, SAFELOAD

Payment is for abandoning an existing sewer by safeloading, at the contract unit price per linear foot based on the size as indicated on the Bid Schedule. This is to be paid at the contract unit price, complete in place, which shall include compensation for concrete, cutting pipe, materials, equipment, excavation (including rock excavation), backfilling, cleanup, restoration, and all other items necessary for a complete installation.

2.19 PIPE ABANODONMENT, PLUG

Payment is for abandoning an existing sewer using a plug, based on the size as indicated on the Bid Schedule. This is to be paid at the contract unit price each, complete in place, which shall include compensation for concrete, cutting pipe, materials, equipment, excavation (including rock

excavation), backfilling, cleanup, restoration, and all other items necessary for a complete installation.

2.20 PLUG MANHOLE INLET

Payment is for installing plug on spool section of pipe entering manhole, based on the size as indicated on the Bid Schedule. This is to be paid at the contract unit price each, complete in place, which shall include compensation for concrete, grout, cutting pipe, materials, equipment, excavation (including rock excavation), backfilling, cleanup, restoration, and all other items necessary for a complete capping.

2.21 VIDEO INSPECTION OF NEW SEWER PIPE

Payment for video inspection shall be made at the contract price per linear foot, including dewatering of pipe, bypass pumping, maintenance of traffic, hydraulic jet cleaning, disposal of debris, furnishing all labor, materials, tools, equipment, and incidentals, and doing all the work involved to perform sewer video inspections, including delivery of DVDs and written logs of the sewer videos to the Owner.

2.22 BITUMINOUS CONCRETE: TRENCH CONSTRUCTION, STREET

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

2.23 BITUMINOUS CONCRETE: FULL WIDTH PAVING, STREET

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

2.24 BITUMINOUS CONCRETE: PRIVATE PARKING LOTS/DRIVEWAYS

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

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

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

2.26 ASPHALT PAVEMENT PATCH

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

2.27 ROADWAY STRIPING

Payment for roadway striping shall be paid for at the Contract unit price per linear foot of striping placed, which shall include materials, placement of striping, all maintenance of traffic, including flaggers, arrow board, message board, etc., and all appurtenances and manpower necessary for a complete installation.

2.28 MISCELLANEOUS ROADWAY MARKINGS

Payment for miscellaneous roadway markings shall be paid for at the Contract lump sum, which shall include materials, placement of stop bars, lettering, etc, all maintenance of traffic, including flaggers, arrow board, message board, etc., and all appurtenances and manpower necessary for a complete installation.

2.29 STORM SEWER REMOVAL AND REPLACEMENT

Payment is for removal and replacement (furnishing and installing) storm sewers at the contract unit price per linear foot, based on the line size as indicated on the Bid Schedule. This is to be paid at the contract unit price, complete in place, which shall include compensation for pipe, materials, connections, hauling, excavation (including rock excavation), bedding, backfilling, cleanup, maintenance of traffic, removal of existing storm sewer, and all other items necessary for a complete installation.

2.30 SEEDING, TEMPORARY, EXTRA AS DIRECTED BY ENGINEER

Payment for temporary seeding shall be paid for at the Contract unit price per square yard, which shall include seed, fertilizer, lime, mulch/straw/netting, placement, watering and maintenance throughout the duration of the contract, and all appurtenances necessary for a complete installation.

2.31 SITE RESTORATION, METHOD A

Payment for site restoration method A (as defined in the General Notes), shall be paid for at the Contract unit price per square yard, which shall include sod, fertilizer, lime, placement, watering and maintenance throughout the duration of the contract, and all appurtenances necessary for a complete installation.

2.32 SITE RESTORATION, METHOD B

Payment for site restoration, method B (as defined in the General Notes), shall be paid for at the Contract unit price per square yard, which shall include seed, fertilizer, lime, placement, watering and maintenance throughout the duration of the contract, and all appurtenances necessary for a complete installation.

2.33 SITE RESTORATION, METHOD C

Payment for site restoration, method C (as defined in the General Notes), shall be paid for at the Contract unit price per square yard, which shall include seed, fertilizer, lime, mulch/straw/netting, placement, watering and maintenance throughout the duration of the contract, and all appurtenances necessary for a complete installation.

2.34 SOD

Payment for sod shall be paid for at the Contract unit price per linear foot, which shall include sod, fertilizer, lime, placement, watering and maintenance throughout the duration of the contract, and all appurtenances necessary for a complete installation.

2.35 MONOLITHIC CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT

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

2.36 CONCRETE CURB REMOVAL AND REPLACEMENT

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

2.37 BITUMINOUS CURB REMOVAL AND REPLACEMENT

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

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

Payment for dense graded aggregate shall be paid for at the Contract unit price per ton, which shall include placement of aggregate, compaction and all appurtenances necessary for a complete installation.

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

Payment for No. 9 crushed stone shall be paid for at the Contract unit price per ton, which shall include placement of aggregate, compaction and all appurtenances necessary for a complete installation.

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

Payment for No. 57 crushed stone shall be paid for at the Contract unit price per ton, which shall include placement of aggregate, compaction and all appurtenances necessary for a complete installation.

2.41 NO. 2 CRUSHED STONE, EXTRA AS DIRECTED BY ENGINEER

Payment for No. 2 crushed stone shall be paid for at the Contract unit price per ton, which shall include placement of aggregate, compaction and all appurtenances necessary for a complete installation.

2.42 FLOWABLE (CONTROLLED DENSITY) FILL

Payment for flowable fill shall be paid for at the Contract unit price per cubic yard measured in-place, which shall include placement of flowable fill, maintenance of traffic, and all appurtenances necessary for a complete installation.

2.43 CONCRETE SIDEWALK

Payment for concrete sidewalk removal and replacement shall be paid for at the Contract unit price per square yard, which shall include excavation, crushed stone, formwork, compaction, placement of concrete sidewalk, expansion joints, curing compound, and all appurtenances necessary for a complete installation.

2.44 SIDEWALK RAMPS, INCLUDING DETECTABLE WARNINGS

Payment for concrete sidewalk ramps removal and replacement shall be paid for at the Contract unit price per each, which shall include excavation, crushed stone, formwork, compaction, placement of concrete sidewalk, detectable warning tile, expansion joints, curing compound, and all appurtenances necessary for a complete installation.

2.45 CHAIN LINK FENCE

Payment for chain link fence removal and replacement shall be paid for at the Contract unit price per linear foot, which shall include posts, anchoring, concrete, fencing, gates, and all appurtenances necessary for a complete installation. Chain link fence shall be replaced from post to post unless specifically noted otherwise on the plans.

2.46 PRIVACY FENCE (WOODEN)

Payment for privacy fence removal and replacement shall be paid for at the Contract unit price per linear foot, which shall include posts, anchoring, concrete, fencing, gates, and all appurtenances necessary for a complete installation.

2.47 SAFETY FENCE

Payment for safety fence shall be paid for at the Contract unit price per linear foot as shown on the Drawings, which shall include materials, labor, equipment, removal once work is complete, and all appurtenances necessary for a complete installation. Safety fence used on daily basis is not included in this pay item and is an incidental cost to the Work.

2.48 BYPASS PUMPING AND SETUP

Payment is for operation and setup of bypass pumping required for installation of all items shown in Contract Documents. This is to be paid for at the Contract lump sum as indicated on the Bid Schedule. Work shall be complete in place, which shall include compensation for all mobilizations, set ups, testings (per section 01520), takedowns, relocations, and demobilization for the pumps, hoses, line plugs, generator, rental fees, fuel, monitoring, piping, duty and backup pumps, check valve, adapters, hose, labor, maintenance, and all appurtenances necessary for the continued setup and operation of the bypass pumping system throughout the project. Provision of redundant pumping capability per Section 01520 is incidental to the cost of bypass pumping and shall be included in this pay item.

2.49 ROAD RAMPS (AS DIRECTED BY ENGINEER)

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

2.50 MAINTENANCE OF TRAFFIC

Payment is maintenance of traffic. This is to be paid at the contract lump sum price, complete in place, which shall include compensation for flaggers, arrow board, message board, etc., removal of equipment after work is completed, and all appurtenances and manpower necessary.

2.51 MISCELLANEOUS SITE IMPROVEMENTS

An allocation has been established for Miscellaneous Site Improvements or other work not included in the Contract Documents but deemed necessary for the project during construction. Miscellaneous Site Improvements will be as directed by the Engineer in a Field Order which will document costs associated with the directed Miscellaneous Site Improvement(s). Costs shall include all labor, equipment, materials, and other incidental costs required to perform the directed

work. Funds from the Miscellaneous Site Improvements allocation not encumbered by a Field Order will be credited to the final contract amount in a Final Adjusting Change Order.

2.52 FOUR PLANK FENCING

Payment for privacy fence removal and replacement shall be paid for at the Contract unit price per linear foot, which shall include posts, anchoring, concrete, fencing, gates and all appurtenances necessary for a complete installation.

2.53 2321 SHANDON DRIVE – MEMORANDUM OF UNDERSTADNING CONDITIONS

Payment shall be paid at the Contract Lump Sum price to include all of the Memorandum of Understanding Conditions as follows:

- Remove large maple tree at the front left corner of the property near SPT-I-2 and replace with a 2" caliper black gum at the owners direction.

2.54 761 KINGSTON ROAD – MEMORANDUM OF UNDERSTANDING CONDITIONS

Payment shall be paid at the Contract Lump Sum price to include all of the Memorandum of Understanding Conditions as follows

- Remove and dispose of existing chain link dog kennel located in North West corner of the property.
- Remove and replace 130 LF of existing 6 foot chain link fence.
- Remove and replace damaged sidewalk along the front of the property on Kingston Road.

2.55 DECOMMISSION OF EXISTING PUMP STATION

Payment is for decommission of existing pump station at the Contract Lump Sum Price. The work is to include.

- Termination of electric and gas service to the pump station including coordination with Kentucky Utilities, Columbia Gas and the LFUCG Division of Pump Station Maintenance.
- Removal of all equipment and piping from within the pump station and valve vault.
- Cutting off of the pump station can three feet below the existing ground.
- Filling pump station with crushed stone to the top of the cut off can.
- Removal of the top slab and top phases of the wet wells.
- Fill wet well with concrete above influent lines.
- Fill wet well with crushed stone to the top of the remaining phase.
- Cover all crushed stone with geotextile fabric.
- Backfill disturbed area with topsoil to finished grade.
- Seed and straw disturbed area.
- Where a valve vault exists, remove to slab, fill with crushed stone, cover with geotextile fabric, and backfill with topsoil.

PART 3 - EXECUTION

3.01 PAY ITEMS

A. The pay items listed hereinbefore refer to the items listed in the Bid Schedule and are the only pay items for this contract.

B. Any and all other items of work listed in the specifications or shown on the Contract Drawings for this contract shall be considered incidental to and included in the associated pay items.

END OF SECTION

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.01 THE REQUIREMENT

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

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

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

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

1.02 COORDINATION OF CRAFTS, TRADES, AND SUBCONTRACTORS

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

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

1.01 PRECONSTRUCTION MEETING

A. A preconstruction meeting will be held after Award of Contract, but prior to starting work at the site. Contractor's Project Manager and Site Superintendent are required to attend, as are representatives of all major subcontractors. Progress schedule update shall be submitted in advance of each meeting.

1.02 PROGRESS MEETINGS

A. Progress meetings will be held monthly at the Division of Water Quality offices during the performance of the Work. Additional progress meetings may be called as progress of work dictates. Prior to each progress meeting, Contractor shall submit a progress report summarizing the work completed over the past month and providing a look ahead at the work to be done over the next month.

B. Minimum Agenda for meeting shall include:

1. Review and approve minutes of previous meetings.
2. Review progress of Work since last meeting.
3. Review proposed 30 day construction schedule.
4. Note and identify problems which impede planned progress.
5. Develop corrective measures and procedures to regain planned schedule.
6. Revise construction schedule as indicated and plan progress during next work period.
7. Maintaining of quality and work standards.
8. Complete other current business.
9. Schedule next progress meeting.

1.03 SPECIAL MEETINGS

A. Owner or Engineer may schedule special meetings at the site or at Division of Water Quality offices to resolve construction issues. Contractor and when appropriate, subcontractors, shall attend upon request. No additional compensation shall be paid for meeting attendance.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

(NOT USED)

END OF SECTION

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. Progress Schedule

1. Within thirty (30) days after execution of the Agreement, but at least 20 days prior to submitting the first application for a progress payment, the Contractor shall prepare and submit three (3) copies of his proposed progress schedule to the Engineer for review and approval.

2. If so required, the schedule shall be revised until it is approved by the Engineer.

3. The schedule shall be updated monthly, depicting progress to the last day of the month and three (3) copies submitted to the Engineer not later than the fifth day of the month with the application for progress payment.

4. The schedule shall be prepared in the form of a horizontal bar chart showing in detail the proposed sequence of the work and identifying construction activities for each structure and for each portion of work.

5. The schedule shall be time scaled, identifying the first day of each week. The Schedule shall be provided with estimated dates for Early Start, Early Finish, Late Start and Late Finish as applicable. The work shall be scheduled to complete the Project within the Contract time. The Late Finish date shall equal the Contract Completion Date.

6. The schedule shall show duration (number of days) and float for each activity. Float shall be defined as the measure of leeway in starting or completing a scheduled activity without adversely affecting the project completion date established by the Contract Documents.

7. The updated schedule shall show all changes since the previous submittal.

8. All revisions to the schedule must have the prior approval of the Engineer.

B. Equipment and Material Orders Schedule

1. Contractor shall prepare and submit three (3) copies of his schedule of principal items of equipment and materials to be purchased to the Engineer for review and approval.

2. If so required, the schedule shall be revised until it is approved by the Engineer.

3. The schedule shall be updated monthly and three (3) copies submitted to the Engineer not later than the fifth day of every month with the application for progress payment.

4. The updated schedule shall be based on the Progress Schedule developed under the requirements of Paragraph 1.01(A) of this Section.

5. The schedule shall be in tabular form with appropriate spaces to insert the following information for principal items of equipment and materials:

   a. Dates on which Shop Drawings are requested and received from the manufacturer.

   b. Dates on which certification is received from the manufacturer and transmitted to the Engineer.

c. Dates on which Shop Drawings are submitted to the Engineer and returned by the Engineer for revision.

d. Dates on which Shop Drawings are revised by manufacturer and resubmitted to the Engineer.

e. Date on which Shop Drawings are returned by Engineer annotated either "Furnish as Submitted" or "Furnish as Corrected".

f. Date on which accepted Shop Drawings are transmitted to manufacturer.

g. Date of manufacturer's scheduled delivery.

h. Date on which delivery is actually made.

C. Working Drawings

1. Within thirty (30) days after the Notice to Proceed, each prime Contractor shall prepare and submit three (3) copies of his preliminary schedule of Working Drawing submittals to the Engineer for review and approval. If so required, the schedule shall be revised until it is approved by the Engineer.

2. Working Drawings include, but are not limited to, Shop Drawings, layout drawings in plan and elevation, installation drawings, etc. Contractor shall be responsible for securing all of the information, details, dimensions, Drawings, etc., necessary to prepare the Working Drawings required and necessary under this Contract and to fulfill all other requirements of his Contract. Contractor shall secure such information, details, Drawings, etc., from all possible sources including the Drawings, Working Drawings prepared by subcontractors, Engineers, suppliers, etc.

3. In the event that the Engineer is required to provide additional engineering services as a result of a substitution of materials or equipment by the Contractor, the additional services will be provided in accordance with Section 01010 - Summary of Work, and will be covered in supplementary or revised Drawings which will be issued to the Contractor. All changes indicated that are necessary to accommodate the equipment and appurtenances shall be incorporated into the Working Drawings submitted to the Engineer.

4. Shop Drawings

a. Contractor shall submit for review by the Engineer Shop Drawings for all fabricated work and for all manufactured items required to be furnished by the Contract Documents.

b. Structural and all other layout Drawings prepared specifically for the Project shall have a plan scale of not less than 1/4-inch = 1 foot.

c. The submitted documents shall provide information indicating that the materials are in conformance with the Technical Specifications and Contract Documents.

d. Where manufacturer's publications in the form of catalogs, brochures, illustrations or other data sheets are submitted in lieu of prepared Shop Drawings, such submittals shall specifically indicate the item for which approval is requested. Identification of items shall be made in ink, and submittals showing only general information are not acceptable.

5. Contractor Responsibilities

a. All submittals from subcontractors, manufacturers or suppliers shall be sent directly to the Contractor for checking. Contractor shall thoroughly check all Drawings for accuracy and conformance to the intent of the Contract Documents. Drawings found

to be inaccurate or otherwise in error shall be returned to the subcontractors, manufacturers, or suppliers by the Contractor for correction before submitting them to the Engineer.

b. All submittals shall be bound, dated, properly labeled and consecutively numbered. Information on the label shall indicate Specification Section, Drawing number, subcontractors', manufacturer's or supplier's name and the name or type of item the submittal covers. Each part of a submittal shall be marked and tabulated.

c. Working Drawings shall be submitted as a single complete package including all associated drawings relating to a complete assembly of the various parts necessary for a complete unit or system.

d. Shop Drawings shall be submitted as a single complete package for any operating system and shall include all items of equipment and any mechanical units involved or necessary for the functioning of such system.

e. ALL SUBMITTALS SHALL BE THOROUGHLY CHECKED BY THE CONTRACTOR FOR ACCURACY AND CONFORMANCE TO THE INTENT OF THE CONTRACT DOCUMENTS BEFORE BEING SUBMITTED TO THE ENGINEER AND SHALL BEAR THE CONTRACTOR'S STAMP OF APPROVAL CERTIFYING THAT THEY HAVE BEEN SO CHECKED. SUBMITTALS WITHOUT THE CONTRACTOR'S STAMP OF APPROVAL WILL NOT BE REVIEWED BY THE ENGINEER AND WILL BE RETURNED TO THE CONTRACTOR. Any comments added to the drawings by the Contractor shall be done in green ink so as to denote any Contractor notes.

f. If the submittals contain any departures from the Contract Documents, specific mention thereof shall be made in the Contractor's letter of transmittal. Otherwise, the review of such submittals shall not constitute approval of the departure.

g. No materials shall be ordered, fabricated or shipped or any work performed until the Engineer returns to the Contractor the submittals, herein required, annotated either "Furnish as Submitted" or "Furnish as Corrected".

h. Where errors, deviations, and/or omissions are discovered at a later date in any of the submittals, the Engineer's prior review of the submittals does not relieve the Contractor of the responsibility for correcting all errors, deviations, and/or omissions.

6. Procedure for Review

a. Submittals shall be transmitted in sufficient time to allow the Engineer at least thirty (30) working days for review and processing.

b. Contractor shall transmit two (2) prints of each submittal to the Engineer for review for all Drawings greater than 11-inches by 17-inches in size, as well as six (6) copies of all other material. If electronic submittals are used, the Contractor shall transmit two (2) hardcopies of each submittal to the Engineer once the submittal has been reviewed.

c. Submittal shall be accompanied by a letter of transmittal, in duplicate, containing date, project title, Contractor's name, number and titles of submittals, notification of departures and any other pertinent data to facilitate review.

d. Submittals will be annotated by the Engineer in one of the following ways:

"Furnish as Submitted" - no exceptions are taken.

"Furnish as Corrected" - minor corrections are noted and shall be made.

"Revise and Resubmit" - major corrections are noted and a re
required.

"Rejected" - Based on the information submitted, the submissio
conformance with the Contract Documents. The deviations fro
Documents are too numerous to list and a completely revised su
proposed equipment or a submission of other equipment is requir

e. If a submittal is satisfactory to the Engineer, the Engineer will annotate
"Furnish as Submitted" or "Furnish as Corrected", retain four (4) copies
remaining copies to the Contractor.

f. If a resubmittal is required, the Engineer will annotate the submittal "Revi
Resubmit" and transmit five (5) copies to the Contractor for appropriate a

g. Contractor shall revise and resubmit submittals as required by the Enginee
submittals are acceptable to the Engineer. It is understood by the Contract
Owner may charge the Contractor the Engineer's charges for review in the
submittal is not approved (either "Furnish as Submitted" or "Furnish as Corr
the third submittal for a system or piece of equipment. These charges shall
costs associated with engineering review, meetings with the Contractor or
manufacturer, etc., commencing with the fourth submittal of a system or type
equipment submitted for a particular Specification Section.

h. Acceptance of a Working Drawing by the Engineer will constitute acceptance of
subject matter for which the Drawing was submitted and not for any other structu
material, equipment or appurtenances indicated or shown.

7. Engineer's Review

a. Engineer's review of the Contractor's submittals shall in no way relieve the Contractor of any of his responsibilities under the Contract. An acceptance of a submittal shall be interpreted to mean that the Engineer has no specific objections to the submitted material, subject to conformance with the Contract Drawings and Specifications. The Engineer will denote any notes in red ink so as to record his comments.

b. Engineer's review will be confined to general arrangement and compliance with the Contract Drawings and Specifications only, and will not be for the purpose of checking dimensions, weights, clearances, fittings, tolerances, interferences, coordination of trades, etc.

8. Record Working Drawings

a. Prior to final payment, the Contractor shall furnish the Engineer one complete set of all accepted Working Drawings, including Shop Drawings, for equipment, piping, electrical work, heating system, ventilating system, air conditioning system, instrumentation system, plumbing system, structural, interconnection wiring diagrams, etc.

b. Manufacturer's publications, submitted in lieu of prepared Shop Drawings, will not be required in reproducible form. However, three (3) sets of such material shall be furnished by the Contractor to the Engineer.

c. Working Drawings furnished shall be corrected to include any departures from previously accepted Drawings.

D. Construction Photographs

1. The General Contractor shall take photographs at the locations and at such stages of the construction as directed by the Engineer. Digital format shall be used. Provide all pictures for a given period on a CD or DVD.

2. Provide the equivalent of 36 different exposures per month for the duration of the Contract time. When directed by the Engineer, frequency of photographs may be increased to weekly sessions provided that the equivalent number of exposures is not exceeded. Engineer may waive requirements for photographs during inactive construction periods in favor of increased photographs during active construction sequences.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01320 - PROGRESS SCHEDULES

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. Scheduling Responsibilities:

1. In order to provide a definitive basis for determining job progress, a construction schedule of a type approved by the Owner will be used to monitor the project.

2. Each week the Contractor shall be responsible for preparing the schedule and updating it based on a tentative two week basis. It shall at all times remain the Contractor's responsibility to schedule and direct his forces in a manner that will allow for the completion of the work within the contractual period.

B. Construction Hours: see Section 01010 – Summary of Work – for construction working hours requirements.

C. Progress of the Work:

1. The work shall be started within ten (10) days following the Notice to Proceed and shall be executed with such progress as may be required to prevent delay to other Contractors or to the general completion of the project. The work shall be executed at such times and in or on such parts of the project, and with such forces, material and equipment, to assure completion of the work in the time established by the Contract.

2. The Contractor agrees that whenever it becomes apparent from the current monthly schedule update that delays have resulted and, hence, that the Contract completion date will not be met or when so directed by the Owner, he will take some or all of the following actions at no additional cost to the Owner:

a. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of work.

b. Increase the number of working hours per shift, shifts per working day or days per week, the amount of construction equipment, or any combination of the foregoing to substantially eliminate the backlog of work.

c. Reschedule activities to achieve maximum practical concurrency of accomplishment of activities, and comply with the revised schedule.

d. The Contractor shall submit to the Owner or the Owner's representative for review a written statement of the steps he intends to take to remove or arrest the delay to the critical path in the accepted schedule.

1.02 CONSTRUCTION SCHEDULE

A. Within ten (10) calendar days of the Notice to Proceed, the Contractor shall submit to the Engineer five (5) copies of his proposed schedule. The schedule will be the subject of a schedule review meeting with the Contractor, the Engineer and the Owner or the Owner's representative within one (1) week of its submission. The Contractor will revise and resubmit the schedule until it is acceptable and accepted by the Owner or the Owner's representative.

1.03 CONTRACT COMPLETION TIME

A. Causes for Extensions:

The Contract completion time will be adjusted only for causes specified in this Contract. In the event the Contractor requests an extension of any Contract completion date, he shall furnish such justification and supporting evidence as the Owner or the Owner's representative may deem necessary for a determination as to whether the Contractor is entitled to an extension of time under the provisions of this Contract. The Owner, with the assistance of the Engineer, will, after receipt of such justification and supporting evidence, make findings of fact and will advise the Contractor in writing thereof.

B. Requests for Time Extension:

Each request for change in any Contract completion date shall be initially submitted to the Owner within the time frame stated in the General Conditions. All information known to the Contractor at that time concerning the nature and extent of the delay shall be transmitted to the Owner at that time. Within the time frame stated in the General Conditions but before the date of final payment under this Contract, all information as required above concerning the delay must be submitted to the Owner. No time extension will be granted for requests which are not submitted within the foregoing time limits.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. Testing Laboratory Services

1. Laboratory testing and checking required by the Specifications, including the cost of transporting all samples and test specimens, shall be provided and paid for by the Owner unless otherwise indicated in the Specifications.

2. Materials to be tested include, but are not necessarily limited to the following: cement, concrete aggregate, concrete, and reinforcing steel.

3. Tests required by the Owner shall not relieve the Contractor from the responsibility of supplying test results and certificates from manufacturers or suppliers to demonstrate conformance with the Specifications.

4. In place testing of compacted materials will be conducted as specified or recommended by Engineer.

5. Procedure

   a. The Contractor shall plan and conduct his operations to permit taking of field samples and test specimens, as required, and to allow adequate time for laboratory tests.

   b. The collection, field preparation and storage of field samples and test specimens shall be as directed by the Engineer with the cooperation of the Contractor.

6. Significance of Tests

   a. Test results shall be binding on both the Contractor and the Owner, and shall be considered irrefutable evidence of compliance or noncompliance with the Specification requirements, unless supplementary testing shall prove, to the satisfaction of the Owner, that the initial samples were not representative of actual conditions.

7. Supplementary and Other Testing

   a. Nothing shall restrict the Contractor from conducting tests he may require. Should the Contractor at any time request the Owner to consider such test results, the test reports shall be certified by an independent testing laboratory acceptable to the Owner. Testing of this nature shall be conducted at the Contractor's expense.

1.02 IMPERFECT WORK OR MATERIALS

A. Any defective or imperfect work or materials furnished by the Contractor which is discovered before the final acceptance of the work, as established by the Certificate of Substantial Completion, or during the subsequent guarantee period, shall be removed immediately even though it may have been overlooked by the Engineer and estimated for payment. Any materials condemned or rejected by the Engineer shall be tagged as such and shall be immediately removed from the site. Satisfactory work or materials shall be substituted for that rejected.

B. The Engineer may order tests of imperfect or damaged work or materials to determine the required functional capability for possible acceptance, if there is no other reason for rejection. The cost of such tests shall be borne by the Contractor; and the nature, tester, extent and supervision of the tests will be as determined by the Engineer. If the results of the tests indicate that the required functional capability of the work or material was not impaired, consistent with the final general appearance of same, the work or materials may be deemed acceptable. If the results of such tests reveal that the required functional capability of the questionable work or materials has been impaired, then such work or materials shall be deemed imperfect and shall be replaced. The Contractor may elect to replace the imperfect work or material in lieu of performing the tests.

1.03 INSPECTION AND TESTS

A. The Contractor shall allow the Engineer ample time and opportunity for testing materials to be used in the work. He shall advise the Engineer promptly upon placing orders for material so that arrangements may be made, if desired, for inspection before shipment from the place of manufacture. The Contractor shall at all times furnish the Engineer and his representatives, facilities including labor, and allow proper time for inspecting and testing materials and workmanship. The Contractor must anticipate possible delays that may be caused in the execution of his work due to the necessity of materials being inspected and accepted for use. The Contractor shall furnish, at his own expense, all samples of materials required by the Engineer for testing, and shall make his own arrangements for providing water, electric power, or fuel for the various inspections and tests of structures and material.

B. Where other tests or analyses are specifically required in other Sections of these Specifications, the cost thereof shall be borne by the party (Owner or Contractor) so designated in such Sections. The Owner will bear the cost of all tests, inspections, or investigations undertaken by the order of the Engineer for the purpose of determining conformance with the Contract Documents if such tests, inspection, or investigations are not specifically required by the Contract Documents, and if conformance is ascertained thereby. Whenever nonconformance is determined by the Engineer as a result of such tests, inspections, or investigations, the Contractor shall bear the full cost thereof or shall reimburse the Owner for said cost. In this connection, the cost of any additional tests and investigations, which are ordered by the Engineer to ascertain subsequent conformance with the Contract Documents, shall be borne by the Contractor.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01510 - TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. The General Contractor shall provide temporary sanitary facilities for the construction operations of this Contract. The temporary services shall be provided for use throughout the construction period.

B. Temporary Sanitary Service

Sanitary conveniences, in sufficient numbers, for the use of all persons employed on the work and properly screened from public observation, shall be provided and maintained at suitable locations by the General Contractor, all as prescribed by State Labor Regulations and local ordinances. The contents of same shall be removed and disposed of in a manner consistent with local and state regulations, as the occasion requires. Sanitary facilities shall be removed from the site when no longer required.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01520 - MAINTENANCE OF UTILITY OPERATIONS DURING CONSTRUCTION

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. The sanitary sewer system shall be maintained in continuous operation during the entire construction period of all Contracts as hereinafter specified. The intent of this section is to outline the minimum requirements necessary to provide continuous transference of wastewater throughout the construction period.

B. Work under each Contract shall be scheduled and conducted by each Contractor so as to not reduce the quality of near-by water streams or cause odor or other nuisance except as explicitly permitted hereinafter. In performing the work shown and specified, the Contractor shall plan and schedule his/her work to meet the plant and collection system operating requirements, and the constraints and construction requirements as outlined in this Section. No discharge of raw or inadequately treated wastewater shall be allowed. The Contractor shall pay all civil penalties, costs, and assessments associated with any discharge of raw or inadequately treated wastewater associated with the Contractor's work.

C. The General Contractor shall be responsible for coordinating the general construction and for ensuring that permanent or temporary power is available for all existing, proposed, and temporary facilities that are required to be on line at any given time.

D. The Contractor has the option of providing additional temporary facilities that can eliminate a constraint, provided it is done without cost to the Owner and provided that all requirements of these Specifications are fulfilled and approved by the Engineer.

1.02 TEMPORARY BYPASS PUMPING

A. Requirements for this section shall apply to all pumping required for Contractor to perform tie-ins, shutdowns, etc. for construction of the work. Temporary bypass pumping shall be performed in accordance with this section unless noted otherwise herein. Temporary pumping system design calculations and equipment information shall be submitted for review by Engineer per Section 01300. Calculations shall be stamped by a professional engineer registered in the Commonwealth of Kentucky.

B. Contractor shall furnish, install, maintain, and operate temporary bypass pumping facilities as required to complete the Work. Contractor shall be responsible for all construction necessary to accommodate pumps and piping including but not limited to structure modifications, pump base construction, pipe supports, etc.

C. The Contractor shall perform a test run of the bypass pumping set-up before being allowed to continue with the full-scale bypass pumping.

D. Contractor shall design the temporary bypass pumping facilities to convey flows from the upstream manholes where existing manhole or sewer tie-ins, replacement, or modifications will be conducted in a manner that will prevent backup of the existing system.

E. All tie-ins, replacement, or modifications shall be performed during low flow conditions.

F. All tie-ins, replacement, or modifications Work shall be accomplished as quickly as possible. If Work required extends beyond eight (8) hours or weather causes higher flows in the existing system during the Work, the new Work shall be stopped and the existing system shall be placed back into service. The new Work shall be properly protected from damage. Any damage to the new Work or damage to surrounding areas caused by the new Work shall be repaired or replaced at the Owner's decision by the Contractor at the Contractor's sole expense.

G. Contractor shall provide all power, fuel, maintenance materials, parts, and other expendables in order to maintain temporary pumping through the duration of the Work.

H. Contractor shall provide one primary pump capable of conveying all dry weather flows as provided in plans. Contractor shall provide one standby pump, which, when run in conjunction with primary pump, is capable of conveying the 2-year/24-hour storm flows as provided in plans. Temporary control system shall start standby pump on high level and dial-out to local contact who will respond and be on-site within an hour to check and address problem. High-high level shall also alarm and dial-out indicating that standby pump is not maintaining level. Temporary pumping system shall be provided by company that has spare pumps ready to be delivered and installed locally if problems occur.

I. Contractor shall provide standby power or 48-hour on-site fuel storage capacity for diesel engine type pumps to ensure continuous operation at all times.

J. Contractor shall provide sound attenuation for temporary pumping facilities to limit noise levels to no more than 85 dBA at a distance of 21 feet from the noise source.

K. Temporary pumping system shall remain fully operational until all modifications are complete and approved by Owner or Engineer.

L. Following successful completion of the new Work, Contractor shall remove all temporary pumps, piping and appurtenances and restore area and/or structures to original condition prior to start of work.

M. Contractor shall prepare Temporary Bypass Plan and submit to Owner and Engineer at pre-construction conference for review and approval.

N. Contractor shall reconnect to existing gravity sewer at the end of each day, weather delay, or completion of Work so that bypass pumping does not occur when not on jobsite. Overnight bypass pumping will only be allowed when directed by Engineer and Owner.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01530 - PROTECTION OF EXISTING FACILITIES

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. Contractor shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of his operations under this Contract. Any damage or injury occurring on account of any act, omission or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.

B. Contractor shall comply promptly with such safety regulations as may be prescribed by the Owner or the local authorities having jurisdiction and shall, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of, his employees. In the event of the Contractor's failure to comply, the Owner may take the necessary measures to correct the conditions or practices complained of, and all costs thereof will be deducted from any monies due the Contractor. Failure of the Engineer to direct the correction of unsafe conditions or practices shall not relieve the Contractor of his responsibility hereunder.

C. In the event of any claims for damage or alleged damage to property as a result of work under this Contract, the Contractor shall be responsible for all costs in connection with the settlement of or defense against such claims. Prior to commencement of work in the vicinity of property adjacent to the work site, the Contractor, at his own expense, shall take such surveys as may be necessary to establish the existing condition of the property. Before final payment can be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained.

1.02 PROTECTION OF WORK AND MATERIAL

A. During the progress of the work and up to the date of final payment, the Contractor shall be solely responsible for the care and protection of all work and materials covered by the Contract.

B. All work and materials shall be protected against damage, injury or loss from any cause whatsoever, and the Contractor shall make good any such damage or loss at his own expense. Protection measures shall be subject to the approval of the Engineer.

1.03 BARRICADES, WARNING SIGNS AND LIGHTS

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

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

1.04 EXISTING UTILITIES AND STRUCTURES

A. The term existing utilities shall be deemed to refer to both publicly-owned and privately-owned utilities such as electric power and lighting, telephone, water, gas, storm drains, sanitary sewers and all appurtenant structures.

B. Where existing utilities and structures are indicated on the Drawings, it shall be understood that all of the existing utilities and structures affecting the work may not be shown and that the locations of those shown are approximate only. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.

C. Prior to beginning any excavation work, the Contractor shall, through field investigations, determine any conflicts or interferences between existing utilities and new utilities to be constructed under this project. This determination shall be based on the actual locations, elevations, slopes, etc., of existing utilities as determined in the field investigations, and locations, elevation, slope, or other information of new utilities as shown on the Drawings. If an interference exists, the Contractor shall bring it to the attention of the Engineer as soon as possible. If the Engineer agrees that an interference exists, he shall develop a plan to address the interference as required, and obtain the Owner's approval. Additional costs to the Contractor for this change shall be processed through a Change Order as detailed elsewhere in these Contract Documents. In the event the Contractor fails to bring a potential conflict or interference to the attention of the Engineer prior to beginning excavation work, any actual conflict or interference which does arise during the Project shall be corrected by the Contractor, as directed by the Engineer, at no additional expense to the Owner.

D. The work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Temporary connections shall be provided, as required, to insure uninterruption of existing services. Any damage resulting from the work of this Contract shall be promptly repaired by the Contractor at his own expense in a manner approved by the Engineer and further subject to the requirements of any authority having jurisdiction. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the Contractor shall be responsible for all costs thereof.

E. Where excavations by the Contractor require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction work, such support and protection shall be provided by the Contractor. All such work shall be performed in a manner satisfactory to the Engineer and the respective authority having jurisdiction over such work. In the event the Contractor fails to provide proper support or protection to any existing utility, the Engineer may, at his discretion, have the respective authority to provide such support or protection as may be necessary to insure the safety of such utility, and the costs of such measures shall be paid by the Contractor. This is not a pay item.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01540 - DEMOLITION AND REMOVAL OF EXISTING STRUCTURES AND EQUIPMENT

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. This Section covers the demolition, removal, and disposal of structures, pavement, curbs, sidewalk, and any existing equipment. The Contractor shall furnish all labor, materials and equipment to demolish and remove structures and equipment designated to be removed on Drawings.

1.02 TITLE TO EQUIPMENT AND MATERIALS

A. Contractor shall have no right or title to any of the equipment, materials or other items to be removed from the existing structures unless authorized by Owner.

1.03 CONDITION OF STRUCTURES AND EQUIPMENT

A. The Owner does not assume responsibility for the actual condition of structures and equipment to be demolished and removed.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 DEMOLITION AND REMOVALS

A. The removal of all equipment and piping, and all materials from the demolition of structures shall, when released by the Owner and Engineer, be done by the Contractor and become the Contractor's property, unless otherwise noted, for disposition in any manner not contrary to the Contract requirements and shall be removed from the site to the Contractor's own place of disposal.

B. Any equipment piping and appurtenances removed without proper authorization, which are necessary for the operation of the existing facilities shall be replaced to the satisfaction of the Engineer at no cost to the Owner.

C. Excavation caused by demolitions shall be backfilled with fill free from rubbish and debris.

D. All materials removed by demolition or excavation shall be lawfully and properly handled and disposed according to applicable local, state, and federal laws. Where materials shall be disposed at landfill, manifests and documentation shall be provided to Owner showing / documenting that materials have been properly handled and disposed.

E. Manhole frames and covers that have been removed shall become the property of the Contractor and shall be disposed on in a legal manner.

END OF SECTION

SECTION 01550 - SITE ACCESS AND STORAGE

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. Access Roads

1. The General Contractor shall construct and maintain such temporary access roads as required to perform the work of this Contract.

2. Access roads shall be located within the property lines of the Owner unless the Contractor independently secures easements for his use and convenience. Contractor shall submit written documentation to the Engineer for any Contractor secured easements across privately held property. Easement agreement shall specify terms and conditions of use and provisions for site restoration. A written release from the property owner certifying that all terms of the easement agreement have been complied by the Contractor shall be furnished to the Engineer prior to final payment.

3. Existing access roads used by the Contractor shall be suitably maintained by the Contractor at his expense during construction. Contractor shall not be permitted to restrict Owner access to existing facilities. Engineer may direct Contractor to perform maintenance of existing access roads when Engineer determines that such work is required to insure all weather access by the Owner.

4. The Contractor will maintain the primary roads to be free of mud and dirt. All mud and dirt carried from the access roads to the primary roads shall be washed and cleaned.

5. The Contractor shall obtain and pay all cost associated with any bonds required by the Kentucky Department of Transportation for the use of State maintained roads.

B. Parking Areas

1. Each Contractor shall construct and maintain suitable parking areas for his construction personnel on the project site where approved by the Engineer and the Owner.

C. Restoration

1. At the completion of the Work, the surfaces of land used for access roads and parking areas shall be restored by the Contractor to its original condition and to the satisfaction of the Engineer.

D. Traffic Regulations

1. Contractor shall obey all traffic laws and comply with all the requirements, rules and regulations of the Kentucky Transportation Cabinet, LFUCG, and other local authorities having jurisdiction to maintain adequate warning signs, lights, barriers, etc., for the protection of traffic on public roadways.

E. Storage of Equipment and Materials

1. Contractor shall store his equipment and materials at the job site in accordance with the requirements of the Contract Documents, and as hereinafter specified. All equipment and materials shall be stored in accordance with manufacturer's recommendations and as directed by the Owner or Engineer, and in conformity to applicable statutes, ordinances, regulations and rulings of the public authority having jurisdiction.

2. Contractor shall secure a site for staging area and material storage, including portable restroom facilities. Contractor shall not store materials or encroach upon private property without the written consent of the owners of such private property. Use of public lands must be with the written approval of the Owner.

3. Contractor shall not store unnecessary materials or equipment on the job site, and shall take care to prevent any structure from being loaded with a weight which will endanger its security or the safety of persons.

4. Materials shall not be placed within ten (10) feet of fire hydrants. Gutters, drainage channels and inlets shall be kept unobstructed at all times.

5. Contractor shall provide adequate temporary storage buildings/facilities, if required, to protect materials or equipment on the job site.

6. Contractor shall provide Engineer with copy of agreement with property owner of staging area. Contractor will be responsible for all restoration. Agreement between Contractor and property owner shall include language holding the Owner harmless from responsibility and liability.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01560 - TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.01 GENERAL

A. Provide and maintain equipment and temporary construction, as necessary to provide controls over environmental and safety conditions at the construction site and adjacent areas. Remove physical evidence of temporary facilities at completion of Work.

B. Prohibited Construction Activities:

1. Disposing of excess or unsuitable excavated material in wetlands or floodplains, even with the permission of the property owner.
2. Locating stockpile storage areas in environmentally sensitive areas.
3. Indiscriminate, arbitrary, or capricious operation of equipment in any stream corridors, any wetlands, any surface waters, or outside the construction limits.
4. Pumping of sediment-laden water from trenches or other excavations directly into any surface waters, any stream corridors, any wetlands, or storm sewers; all such water will be properly filtered or settled to remove silt prior to release.
5. Discharging pollutants such as chemicals, fuels, lubricants, bituminous materials, raw sewage and other harmful waste into or alongside of rivers, streams, impoundments, or into natural or manmade channels leading thereto.
6. Permanent or unspecified alteration of the flow line of any stream.
7. Damaging vegetation outside of the construction area.
8. Disposal of trees, brush, and other debris in any stream corridors, any wetlands, any surface waters, or at unspecified locations.
9. Open burning of project debris without a permit.
10. Discharging injurious silica dust concentrations into the atmosphere resulting from breaking, cutting, chipping, drilling, buffing, grinding, polishing, shaping or surfacing closer than 200 feet to places of residences or commercial, professional, quasi-public or public places of human occupation.
11. Storing construction equipment and vehicles and/or stockpiling construction materials on property, public or private, not previously authorized for such purposes as noted in Section 01550.
12. Running well point or pump discharge lines through private property or public property and rights-of-way without an easement or the written permission of the property owner and the consent of the ENGINEER.
13. Non-compliance with the Contractor's, OSHA's, or the Owner's safety requirements.
14. Operations entailing the use of vibratory hammers or compactors outside the hours listed in Section 01010 - Summary of Work, or outside the hours allowed for construction by local ordinances or regulations.

1.02 SAFETY ADVISORY

A. Scope: Sewer Installation

1. Maintaining jobsite safety
2. Maintaining traffic safety

B. LFUCG-funded projects have a contractual and legal obligation for performance and breech of contract in regard to the safety of all exposed personnel. Reference the Occupational Safety Health Administration (OSHA) Multi Employer Citation Policy: Multi-employer Worksites, The Creating Employer, The Exposing Employer, The Correcting Employer, The Controlling Employer, Multiple Roles.

C. The Contractor shall at all times conduct the work safely in order to assure a safe work site. The Contractor shall be responsible for the safety of the Contractor's employees, agents and subcontractors, Owner's personnel and all other personnel or persons at the work site. The Contractor shall be responsible for the adequacy and safety of all construction methods or procedures and the safe prosecution of the work.

D. The Contractor shall be responsible at all times to conduct the work and keep the work site in compliance with federal, state, and local safety Laws and Regulations, including but not limited to Occupational Safety and Health (OSHA) requirements. This includes shaft drilling operations, concrete moving and placement, confined space entry requirements for trench construction, including use of a trench box or other shoring to support trench walls and proper means of exit from an excavation.

E. The Contractor shall have an authorized and competent safety representative as defined above on the work site at frequent and regular intervals, or more often, as conditions require. Failure to have such a person at the site as specified herein constitutes an unsafe practice.

F. The Contractor shall be responsible to suspend Work whenever a Work method or procedure or condition at work site is unsafe.

G. The Contractor shall submit a written notification to the Owner of any accident or injury. Such notification shall include the Contractor's investigation and what measures are appropriate to avoid such accidents. Payment applications will not be authorized until such notice is provided.

H. Failure of the Contractor to comply with any provision of this Specification section or the Owner's safety requirements or any federal, state or local safety Laws and Regulations constitute just cause for the Owner to order suspension of Work.

I. None of the provisions of the section are intended to, nor shall be construed to, create any duty or responsibility on the Owner or Engineer to provide or enforce safety requirements of the Contractor. The duty, responsibility, and liability for safety shall remain with the Contractor.

1.03 AIR POLLUTION AND NOISE CONTROL

A. Contractor's vehicles and equipment shall be such as to minimize noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and in no case will noise levels be permitted which interfere with the work of the Owner or others.

1. Construction activities will be limited to hours specified in Section 01010 – Summary of Work.

2. Construction equipment will be provided with intake silencers and mufflers, as required by safety standards.

3. All construction vehicles should be equipped with proper emissions control equipment.

4. Periodically check equipment and machinery for proper tuning to minimize exhaust emissions and noise.

1.04 DUST CONTROL

A. Contractor shall be responsible for controlling objectionable dust caused by his operation of vehicles and equipment, clearing or for any reason whatever. Contractor shall apply water or use other methods subject to the Engineer's approval which will keep dust in the air to a minimum. Dust control measures shall be implemented multiple times throughout each working day if necessary.

1.05 PEST AND RODENT CONTROL

A. Provide rodent and pest control as necessary to prevent infestation of construction or storage area.

1. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties.

1.06 WATER CONTROL

A. Contractor shall comply with the Storm Water Pollution Prevention Plan (SWPPP) approved by LFUCG.

B. Provide methods to control surface water and water from excavations and structures to prevent damage to the Work, the site, or adjoining properties.

C. Provide, operate and maintain equipment and facilities of adequate size to control surface water.

D. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas and in conformance with all environmental requirements.

1.07 POLLUTION CONTROL

A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.

B. Provide equipment and personnel, perform emergency measures required to contain any spillages, and to remove contaminated soils or liquids.

1. Excavate and dispose of any contaminated earth offsite, and replace with suitable compacted fill and topsoil.

C. Take special measures to prevent harmful substances from entering public waters.

1. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.

D. Provide systems for control of atmospheric pollutants.

1. Prevent toxic concentrations of chemicals.
2. Prevent harmful dispersal of pollutants into the atmosphere.

E. All Contractor's equipment used during construction shall conform to all current federal, state and local laws and regulations.

1.08 EROSION AND SEDIMENT CONTROL

A. See Section 02372 for erosion and sediment control requirements.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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: 3 each

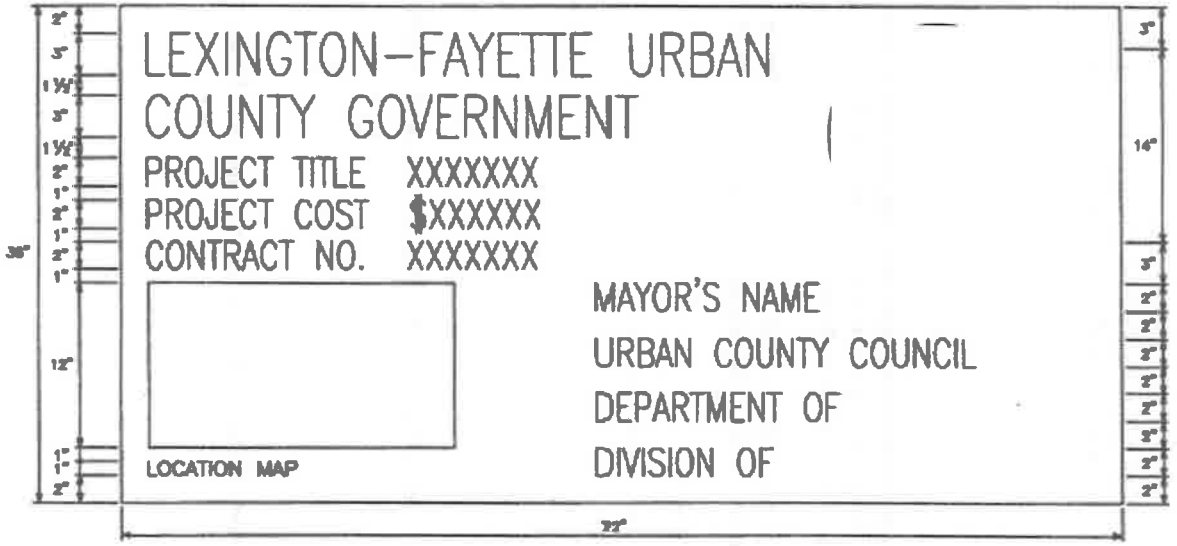
PART 3 - EXECUTION

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

STANDARD DRAWING NO. 323

APPROVAL:

CHIEF ENGINEER _____ DATE _____

ENGINEER _____ DATE _____

END OF SECTION

SECTION 01631 - PRODUCTS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. General: Substitution of materials and/or equipment is defined in the General Conditions and more fully hereinafter.

B. Substitutions: The Contractor's requests for changes in the products, materials, equipment and methods of construction required by the Contract Documents are considered requests for "substitutions", and are subject to the requirements specified herein. The following are not considered as substitutions:

1. Revisions to the Contract Documents, where requested by the Owner and Engineer are considered as "changes" not substitutions.

2. Substitutions requested during the bidding period, which have been accepted prior to the Contract Date, are included in the Contract Documents and are not subject to the requirements for substitutions as herein specified.

3. Specified Contractor options on products and construction methods included in the Contract Documents are choices available to the Contractor and are not subject to the requirements for substitutions as herein specified.

4. Except as otherwise provided in the Contract Documents, the Contractor's determination of and compliance with governing regulations and orders as issued by governing authorities do not constitute "substitutions" and do not constitute a basis for change orders.

1.02 SUBMITTALS

A. The information required to be furnished for evaluation of product substitution will be as follows:

1. Performance capabilities, and materials and construction details will be evaluated based upon conformance with the Specifications. Products that do not conform with the Specification shall not be accepted.

2. Manufacturer's production and service capabilities, and evidence of proven reliability will be acceptable if the following is furnished.

   a. Written evidence that the manufacturer has not less than (3) years' experience in the design and manufacture of the substitute product.

   b. Written evidence of at least one application, of a type and size similar to the proposed substitute product, in successful operation in a wastewater treatment plant or collection system for a period of at least one year.

   c. In lieu of furnishing evidence of a manufacturer's Experience and successful operation of an application of the product to be substituted, the Contractor has the option of furnishing a cash deposit or bond which will guarantee replacement if the product the furnished does not satisfy the other requirements specified in this section. The amount of each deposit or bond will be subject to the approval.

3. Specific reference to characteristics either superior or inferior to specified requirements will be evaluated based on their net effect on the project. Products with any

characteristics inferior to those specified will not be acceptable unless offset by characteristics that, in the opinion of the Engineer, will cause the overall effect of the product on the project to be at least equal to that of those specified.

1.03 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same generic kind, from a single source, for each unit of work.

B. Compatibility of Options: Compatibility of products is a basic requirement of product selection. When the Contractor is given the option of selecting between two or more products for use on the project, the product selected must be compatible with other products previously selected, even if the products previously selected were also Contractor options. The complete compatibility between the various choices available to the Contractor is not assured by the various requirements of the Contract Documents, but must be provided by the Contractor.

C. The detailed estimate of operating and maintenance costs will be evaluated based on comparison with similar data on the specified products. Proposed substitute products which have an operating and maintenance cost that, in the opinion of the Engineer, exceeds that of the specified products will not be considered equal and will not be acceptable.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. General: Deliver, store, and handle products in accordance with manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft. Control delivery schedules to minimize long-term storage at the site and to prevent overcrowding of construction spaces. In particular coordinate delivery and installation to ensure minimum holding or storage times for items known or recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other sources of loss.

1. Deliver products to the site in the manufacturer's sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.

2. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

3. Store heavy materials away from the project construction in a manner that will not endanger the supporting construction.

PART 2 - PRODUCTS

2.01 GENERAL PRODUCT COMPLIANCE

A. General: Requirements for individual products are indicated in the Contract Documents; compliance with these requirements is in itself a Contract Requirement. These requirements may be specified in any one of several different specifying methods, or in any combination of these methods. These methods include the following:

1. Proprietary
2. Descriptive
3. Performance
4. Compliance with Reference Standards

Compliance with codes, compliance with graphic details and similar provisions of the Contract Documents also have a bearing on the review and approval outcome.

B. Procedures for Selecting Products: Contractor's options in selecting products are limited by requirements of the Contract Documents and governing regulations. They are not controlled by industry traditions or procedures experienced by the Contractor on previous construction projects.

2.02 SUBSTITUTIONS

A. Conditions: Contractor's request for substitution will be received and considered when extensive revisions to the Contract Documents are not required, when the proposed changes are in keeping with the general intent of the Contract Documents, when the request is timely, fully documented and properly submitted, and when one or more of the following conditions is satisfied, all as judged by the Engineer; otherwise the requests will be returned without action except to record non-compliance with these requirements.

1. The Engineer will consider a request for substitution where the request is directly related to an "or equal" clause or similar language in the Contract Documents.

2. The Engineer will consider a request for substitution where the specified product or method cannot be provided within the Contract Time. However, the request will not be considered if the product or method cannot be provided as a result of the Contractor's failure to pursue the work promptly or to coordinate the various activities properly.

3. The Engineer will consider a request for substitution where the specified product or method cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

4. The Engineer will consider a request for a substitution where a substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. These additional responsibilities may include such considerations as additional compensation to the Engineer for redesign and evaluation services, the increased cost of other work by the Owner or separate contractors, and similar considerations.

5. The Engineer will consider a request for substitution when the specified product or method cannot be provided in a manner which is compatible with other materials of the work, and where the Contractor certifies that the substitution will overcome the incompatibility.

6. The Engineer will consider a request for substitution when the specified product or method cannot be properly coordinated with other materials in the work, and where the Contractor certifies that the proposed substitution can be properly coordinated.

7. The Engineer will consider a request for substitution when the specified product or method cannot receive a warranty as required by the Contract Documents and where the Contractor certifies that the proposed substitution receive the required warranty.

8. The Contractor shall reimburse the Owner any costs for review by the Engineer of proposed product substitutions which require major design changes, as determined by the Owner, to related or adjacent work made necessary by the proposed substitutions.

B. Work-Related Submittals: Contractor's submittal of and the Engineer's acceptance of shop drawings, product data or samples which relate to work not complying with requirements of the Contract Documents, does not constitute an acceptable or valid request for a substitution, nor approval thereof.

2.03 GENERAL PRODUCT REQUIREMENTS

A. General: Provide products that comply with the requirements of the Contract Documents and that are undamaged and, unless otherwise indicated, unused at the time of installation. Provide products that are complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

1. Standard Products: Where they are available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

2. Continued Availability: Where, because of the nature of its application, the Owner is likely to need replacement parts or additional amounts of a product at a later date, either for maintenance and repair or replacement, provide standard, domestically produced products for which the manufacturer has published assurances that the products and its parts are likely to be available to the Owner at a later date.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS

A. General: Except as otherwise indicated in individual sections of these Specifications, comply with the manufacturer's instructions and recommendations for installation of the products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other work. Clean exposed surfaces and protect surfaces as necessary to ensure freedom from damage and deterioration at Time of Acceptance.

END OF SECTION

SECTION 01731 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the work or to make its parts fit together properly.

C. The Contractor shall not damage or endanger any portion of the Work or the Work of the Owner or any separate contractors by cutting, patching or otherwise altering any work, or by excavation.

D. Any cutting of existing structures or facilities shall be approved in advance by Owner or Engineer. Approval shall not impact Contractor's full liability for any damage caused.

1.02 QUALITY ASSURANCE

A. Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.

1.03 WARRANTY

A. Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. Existing Materials: Use materials identical to existing materials, to the extent practicable.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the functional performance of existing materials.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

3.02 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

3.03 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.

5. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

END OF SECTION

SECTION 01770 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Liquidated Damages: Supplemental General Conditions

B. Cleaning: Section 01740.

C. Project Record Documents: Section 01785.

1.02 SUBSTANTIAL COMPLETION

A. In order to initiate project closeout procedures, the Contractor shall submit the following:

1. Written certification to Engineer that project is Substantially Complete.

2. List of major items to be completed or corrected.

B. Engineer will make an inspection within seven (7) days after receipt of certification, together with Owner's Representative.

C. Should Engineer consider that work is Substantially Complete:

1. Contractor shall prepare, and submit to Engineer, a list of items to be completed or corrected, as determined by the inspection.

2. Engineer will prepare and issue a Certificate of Substantial Completion, containing:

a. Date of Substantial Completion.

b. Contractor's list of items to be completed or corrected, verified and amended by Engineer.

c. The time within which Contractor shall complete or correct work of listed items.

d. Time and date Owner will assume possession of work or designated portion thereof.

e. Responsibilities of Owner and Contractor for:

1) Insurance

2) Utilities

3) Operation of Mechanical, Electrical, and Other Systems.

4) Maintenance and Cleaning.

5) Security.

f. Signatures of:

1) Engineer

2) Contractor

3) Owner

3. Owner occupancy of Project or Designated Portion of Project:

a. Contractor shall:

1) Obtain certificate of occupancy.

2) Perform final cleaning in accordance with Section 01740.

b. Owner will occupy Project, under provisions stated in Certificates of Substantial Completion.

4. Contractor: Complete work listed for completion or correction, within designated time.

D. Should Engineer consider that work is not Substantially Complete:

1. Engineer shall immediately notify Contractor, in writing, stating reasons.

2. Contractor: Complete work, and send second written certification to Engineer, certifying that Project or designated portion of Project is substantially complete.

3. Engineer will reinspect work.

E. Should Engineer consider that work is still not finally complete:

1. Engineer shall notify Contractor, in writing, stating reasons.

2. Contractor shall take immediate steps to remedy the stated deficiencies, and send third written notice to the Engineer certifying that the work is complete.

3. Engineer and Owner will reinspect work at Contractor's expense.

1.03 FINAL INSPECTION

A. Contractor shall submit written certification that:

1. Contract Documents have been reviewed.

2. Project has been inspected for compliance with Contract Documents.

3. Work has been completed in accordance with Contract Documents.

4. Equipment and systems have been tested in presence of Owner's Representative and are operational.

5. Project is completed, and ready for final inspection.

B. Engineer will make final inspection within seven (7) days after receipt of certification.

C. Should Engineer consider that work is finally complete in accordance with requirements of Contract Documents, he shall request Contractor to make Project Closeout submittals.

D. Should Engineer consider that work is not finally complete:

1. Engineer shall notify Contractor in writing, stating reasons.

2. Contractor shall take immediate steps to remedy the stated deficiencies, and send

second written notice to Engineer certifying that work is complete.

3. Engineer will reinspect work.

1.04 CLOSEOUT SUBMITTALS

A. Project Record Documents: To requirements of Section 01785.

B. Guarantees, Warranties and Bonds: To requirements of particular technical Specifications and Section 01782.

1.05 INSTRUCTION

A. Instruct Owner's personnel in operation of all systems, mechanical, electrical, and other equipment.

1.06 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit final applications in accordance with requirements of General Conditions.

1.07 FINAL CERTIFICATE FOR PAYMENT

A. Engineer will issue final certificate in accordance with provisions of general conditions.

B. Should final completion be materially delayed through no fault of Contractor, Engineer may issue a Semi-Final Certificate for Payment.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 02225 - EXCAVATING, BACKFILLING, AND COMPACTING FOR SEWERS

PART 1 - GENERAL

1.01 SUMMARY

A. Excavating of trenches.

B. Bedding of pipe.

C. Backfilling trenches.

D. Installing identification tape.

PART 2 - PRODUCTS

2.01 BEDDING AND BACKFILLING STONE

A. Crushed Stone material shall conform to the Kentucky Transportation Cabinet's Standard Specifications for Road and Bridge Construction, Current Edition, latest revision.

B. Bedding Stone: No. 9 Crushed Limestone

C. Backfill Stone: No. 9 Crushed Limestone

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. Trenching may be accomplished by means of a backhoe, trenching machine, hydro-excavation or by hand depending on the construction area. At the Contractor's option, trenching by a trenching machine or by backhoe is acceptable.

B. Clearing - All trees, stumps, bushes, shrubbery, and abandoned concrete or masonry structures within the limits of the trench shall be removed by the Contractor and disposed of in a manner in accordance with federal, state and local regulations. All clearing work shall be considered as incidental to the cost of laying pipe.

C. Bracing and Sheeting - Bracing and sheeting shall be provided to adequately protect the workers during pipe line installation.

1. All requirements of the Occupational Safety and Health Act (OSHA) shall be met during trenching and backfill operations.

2. As backfill is placed, the sheeting shall be withdrawn in increments not exceeding one (1) foot and the void left by the withdrawn sheeting shall be filled and with #9 stone.

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

3.02 TRENCHING

A. General:

1. The Contractor shall perform all excavation of every description and of whatever

substances encountered, including clearing over the pipeline route. All excavations for the pipeline shall be open-cut except where noted for bore and jack.

2. All material excavated, regardless of its nature or composition, shall be classified as UNCLASSIFIED EXCAVATION. Excavation shall include the removal of all soil, rock, weathered rock, rocks of all types, boulders, conduits, pipe, and all other obstacles encountered and shown to be removed within the limits of excavation shown on the Drawings or specified herein. The cost of excavation shall be included in the Unit Price for the pay item requiring excavation to be installed. Excavation for installation of the pipe shall comply with the approved pipe envelope in terms of trench width and bedding depth. No additional payment will be made for the removal of obstacles encountered within the excavation limits shown on the Drawings and specified herein.

B. Trench Width:

1. Trench widths shall be in accordance with LFUCG Standard Drawings.

2. **Contractor shall submit a shop drawing that includes a certification from the pipe manufacturer stating the recommended trench width for each pipe size and material being used.**

C. Trench Depth:

1. The trench shall be excavated to a minimum of six (6) inches below pipe grade as noted on LFUCG Standard Drawings.

3.03 BLASTING AND EXPLOSIVES

A. If rock removal by blasting methods is used, blasting must comply with Federal, State, and Local Regulations and National Codes on the purchase, transportation, storage, and use of explosive material. Codes include, but are not limited to the following:

1. Storage, security, and accountability: Bureau of Alcohol, Tobacco, and Firearms (BATF): 27 CFR Part 181.

2. Shipment: DOT, 49 CFR Parts 171-179, 390-397.

3. Safety and Health: OSHA 29 CFR Part 1926, Subpart U.

4. Transportation and Storage: NFPA 495, Chapters 3 through 6.

5. Kentucky Department of Mines and Minerals code for explosive disintegration of rock.

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

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

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

3. Complete preblast survey with signed copy to Owner.

C. Preblast survey

1. A preblast survey is to be of such quality to determine whether blasting operations damaged structures. Preblast survey shall utilize video, still images and report forms to

document each structure. Video with audible description of observations shall be used to observe general conditions of each structure and to note specific damage that exists to structure prior to blasting. Still images shall be utilized to supplement video as needed to document specific conditions of each structure. Report form shall document date of survey, and who was present during survey. Forms shall also be utilized to supplement video as to the conditions of structures. Existing damage such as cracked foundations, brick facade, and etc. shall have reference object such as a scale in image or video. Audio commentary of cracked foundations, brick facades, etc. shall denote width of cracks. The Contractor shall submit three copies of video, still images, and pdf copies of report forms on CD's.

2. A preblast survey is required for all structures and utilities within a 500 foot radius of the blasting area.

3. At least thirty (30) days before initiation of blasting, the Contractor shall notify, in writing, all residents or owners of dwellings or other structures located within 500 feet of the blasting area advising that they will have a preblast survey performed. Contractor to maintain records of notifications and responses to be submitted to the Engineer.

3.04 FORCE MAIN BEDDING

A. Refer to LFUCG Standard Drawings.

B. The trench shall be excavated to a depth to allow a minimum of 36 inches cover over the top of the pipe.

3.05 FORCE MAIN BACKFILLING

A. Refer to LFUCG Standard Drawings.

3.06 GRAVITY SEWER PIPE BEDDING

A. Refer to LFUCG Standard Drawings.

3.07 GRAVITY SEWER PIPE BACKFILLING

A. Refer to LFUCG Standard Drawings.

3.08 INSTALLING IDENTIFICATION TAPE

A. Detectable underground marking tape shall be installed over all force mains. Marking tape is not required for gravity sewers. Care shall be taken to insure that the buried marking tape is not broken when installed and shall be Lineguard brand encased aluminum foil, Type III. The identification tape is manufactured by Lineguard, Inc., P.O. Box 426, Wheaton, IL 60187

B. The identification tape shall bear the printed identification of the plastic utility line below it, such as "Caution – Buried Below". Tape shall be reverse printed; surface printing will not be acceptable. The tape shall be visible in all types and colors of soil and provide maximum color contrast to the soil. The tape shall meet the APWA color code, and shall be two (2) inches in width. Colors are green for sewer and brown for force main.

END OF SECTION

SECTION 02240 - DEWATERING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor and equipment required to dewater all excavations.

B. Dewatering of all excavations shall be the responsibility of the Contractor, and no additional compensation will be allowed for same.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. Dewatering equipment shall be of adequate size and quantity to assure maintaining proper conditions for installing pipe, concrete, backfill or other material or structure in the excavation.

B. Dewatering shall include proper removal of any and all liquid, regardless of its source, from the excavation.

C. The site shall be kept free of surface water at all times. The Contractor shall install drainage ditches, dikes and shall perform all pumping and other work necessary to divert or remove rainfall and all other accumulations of surface water from the excavations. The diversion and removal of surface water shall be performed in a manner that will prevent flooding and/or damage to other locations within the construction area where it may be detrimental.

D. The Contractor shall provide, install and operate sufficient trenches, sumps, pumps, hose piping, well points, deep wells, etc., necessary to depress and maintain the ground water level below the base of the excavation during all stages of construction operations.

E. No groundwater from the excavated area shall be discharged into the sanitary sewer system.

F. Dewatering shall be in accordance with all state and local regulations/permits/plans.

G. Trench shall be dewatered as required and never shall the trench accumulate groundwater to a depth that will cause pipe to float.

END OF SECTION

SECTION 02371 – STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

PART 1 - GENERAL

1.01 GENERAL

A. The Contract Documents include a SWPPP that has been approved by LFUCG Division of Water Quality. This SWPPP shall be used for establishing quantities and a lump sum price for providing the Erosion and Sediment Control Measures.

B. The Contractor may use this SWPPP to obtain the required permits, i.e. Land Disturbance Permit. If Contractor chooses to use this SWPPP, the Contractor takes sole responsibility for the content of the SWPPP and the implementation of the SWPPP during construction.

C. Contractor may also choose to prepare its own SWPPP and submit to LFUCG Division of Water Quality for approval. No additional payment will be allowed for the Erosion and Sediment Control and conformance with SWPPP pay item.

A. SITE DESCRIPTION

THE PROJECT KNOWN AS SHADON PARK TRUNKS, WINBURN TRUNK, AND THOROUGHBRED ACRES TRUNK SEWERS, PHASE 2 IS LOCATED IN NORTH LEXINGTON, FAYETTE COUNTY, KENTUCKY NORTH OF INTERSTATE 75 BETWEEN NORTH BROADWAY AND RUSSELL CAVE ROAD. PHASE 2 WILL MAINLY INVOLVE WORK ADJACENT TO AND WITHIN THE STREET RIGHT OF WAY. THE PROJECT WILL DISTURB APPROXIMATELY 0.5 ACRES. SEDIMENT SHALL BE CONTROLLED BY SILT FENCE, STONE SILT CHECKS AND MODIFIED SILT CHECKS AT CATCH BASINS AS SHOWN ON THE PLANS. THE EROSION CONTROL FEATURES SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREAS ARE RE-VEGETATED.

B. SEDIMENT AND EROSION CONTROL MEASURES

PRIOR TO MOBLIZATION, FOR EACH PUMP STATION DECOMMISSION, CONSTRUCTION ENTANCES, STAGING AREAS, TREE PROTECTION FENCE AND SILT FENCE SHALL BE INSTALLED.

SILT FENCES SHALL COMPLY WITH DETAILS ON SHEET 16.

THE CONSTRUCTION ENTRANCE(S) AND STAGING AREAS SHALL BE CONSTRUCTED DURING THE FIRST PHASES OF THE MOBILIZATION.

ALL MATERIALS RESULTING FROM THE CLEARING AND GRUBBING OPERATIONS SHALL BE DISPOSED OF BY THE CONTRACTOR. THE MATERIAL SHALL NOT BE BURIED. BURNING PITS SHALL BE LOCATEDAS DIRECTED BY THE ENGINEER AND APPROVED BY THE FIRE MARSHALL.

ADDITIONAL EROSION CONTROL MEASURES, IN ADDITION TO THOSE SHOWN ON THE PLANS, MAY BE REQUIRED. THE MEASURES MAY INCLUDE SEEDING, MULCHING, SILT FENCE, STRAW BALES, STONE SILT CHECKS, AND ARMORING OF SILT FENCE AS NECESSARY TO PREVENT SOIL EROSION.

THE EXISTING VEGETATION SHALL BE PRESERVED WHERE POSSIBLE.

ALL DISTURBED AREAS SHALL BE STABILIZED. PERMANENT STABILIZATION SHALL BEGIN WITHIN 14 DAYS OF COMPLETION OF ACTIVITIES. TEMPORARY STABILIZATION SHALL BE PROVIDED IN ANY PORTION OF THE SITE THAT REMAINS INACTIVE FOR MORE THAN 21 DAYS. STABILIZATION PRACTICES SHALL INCLUDE SEEDING, MULCHING, PLACING SOD, PLANTING TREES OR SHRUBS, AND USING GEOTEXTILE FABRICS AND OTHER APPROPRIATE MEASURES.

FOLLOWING CONSTRUCTION SLOPES STEEPER THAN 5:1 SHALL BE SEEDED AND PROTECTED WITH EROSION CONTROL BLANKET OR NETTING.

IF GRADING OCCURS DURING THE WINTER MONTHS, THE USE OF WINTER WHEAT OR OTHER RECOMMENDED SEED SHOULD BECONSIDERED. WHEN SEASONAL CONDITIONS PROHIBIT THE APPLICATION OF TEMPORARY OR PERMANENT SEEDING, NON-VEGETATIVE SOIL STABILIZATION PRACTICES SUCH AS MULCHING AND NETTING SHALL BE USED UNTIL SUCH TIMES AS CONDITIONS PERMIT.

THE PERFORMANCE OF THE EROSION CONTROL PLAN SHALL BE MONITORED WEEKLY AND FOLLOWING EACH SIGNIFICANT RAINFALL IN EXCESS OF 1/2". THE SILT CONTROL DEVICES ARE TO BE INSPECTED, CLEANED, AND REPAIRED, IF NECESSARY.

SILT FENCE SHALL BE CLEANED OUT/REPAIRED WHEN SILT BUILDUP REACHES 1/3 OF THE FENCE HEIGHT.

ALL STORM INLETS SHALL BE PROTECTED FROM SEDIMENT USING THE MODIFIED SILT CHECK AS SHOWN ON THE PLANS.

TOPSOIL STOCKPILES AND BORROW SITES SHALL BE SURROUNDED BY SILT FENCES, RE-SEEDED, AND PLACED WHERE SOIL EROSION WILL NOT GO INTO THE SEDIMENT BASINS.

ALL SEDIMENT CONTROL FEATURES SHALL REMAIN IN PLACE UNTILTHE SITE HAS BEEN RE-VEGETATED AND ACCEPTED BY THE ENGINEER.

C. STORM WATER MANAGEMENT DEVICES

ALL STORM WATER RUNOFF LEAVING THE PAVED PORTIONS OF THE SITE SHALL BE COLLECTED IN THE STORM SEWER SYSTEM.

ALL EXISTING DRAINAGE PATTERNS SHALL MAINTAINED.

NO ADDITIONAL STORM WATER MANAGEMENT FACILITES SHALL BE REQUIRED.

D. OTHER CONTROL MEASURES

NO SOLIDS, INCLUDING BUILDING MATERIALS, SHALL BE ALLOWED TODISCHARGE INTO WATERS OF THE COMMONWEALTH.

SEDIMENT FROM VEHICLES TRACKING ONTO PAVEMENT AND FROM DUST GENERATED ONSITE SHALL BE MINIMIZED. ALL MUD TRACKED ONTO ADJOINING ROADWAYS SHALL BE CLEANED IMMEDIATELY.

SANITARY AND WASTE DISPOSAL SHALL COMPLY WITH THE PROJECTSPECIFICATIONS, OR APPLICABLE STATE OR LOCAL REGULATIONS.

AN AREA SHALL BE DESIGNATED FOR EMPLOYEE PARKING AND STORAGE OF MATERIALS. THE AREA SHALL BE MAINTAINED THROUGHOUT THE PROJECT AND, IF NECESSARY, BE COVERED WITH STONE TO PREVENT EROSION.

E. OTHER STATE OR LOCAL PLANS

ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THELEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT'S REQUIREMENTS WITH RESPECT TO STORM WATER MANAGEMENT AND EROSION CONTROL.

ALL WORK WITHIN THE EXISTING STREAMS AND WETLANDS SHALL BE PERFORMED IN ACCORDANCE WITH THE CORP OF ENGINEERS PERMIT AND THE WATER QUALITY CERTIFICATION ISSUED BY THE KENTUCKY DIVISION OF WATER.

F. MAINTENANCE

REFER TO SECTION B FOR DISCUSSION OF MAINTENANCE OF THE SEDIMENT CONTROL FEATURES.

G. INSPECTION

REFER TO SECTION B FOR DISCUSSION OF INSPECTIONS OF THE SEDIMENT CONTROL FEATURES.

THE INSPECTIONS SHALL BE PERFORMED BY QUALIFIED REPRESENTATIVES OF THE ENGINEER OR THE DEVELOPER.

THE FINDINGS OF THE INSPECTIONS SHALL BE HAND DELIVERED OR FAXED TO THE CONTRACTOR AND THE DIVISION OF WATER QUALITY.

REVISIONS TO THE BEST MANAGEMENT PRACTICES PLAN BASED ON THE RESULTS OF AN INSPECTION SHALL BE IMPLEMENTED WITHIN (7) SEVEN DAYS.

CONTROL MEASURES SHALL BE INSPECTED TO ENSURE CORRECT OPERATION. ACCESSIBLE DISCHARGE LOCATIONS SHALL BE INSPECTEDTO INSURE THAT VELOCITY DISSIPATION DEVICES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATERS.

DISTURBED AREAS AND MATERIAL STORAGE AREAS THAT ARE EXPOSEDTO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM.

REPORTS OF THE INSPECTIONS INCLUDING THE SCOPE, NAMES AND QUALIFICATIONS OF PERSONNEL OF PERSONS MAKING THE INSPECTION, THE DATE OF THE INSPECTION, MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE BEST MANAGEMENT PRACTICES PLAN, AND ANY CORRECTIVE ACTIONS TAKEN SHALL BE MADE AND KEPT FOR A PERIOD OF THREE (3) YEARS OR UNTIL ONE (1) YEAR AFTER THE PERMIT ENDS.

THE INSPECTION REPORTS SHALL BE PROVIDED TO THE ENGINEER FOR INCORPORATION INTO THE BEST MANAGEMENT PRACTICES PLAN.

H. NON-STORM WATER DISCHARGES

THE SITE SHALL BE MAINTAINED IN A MANNER SUCH THAT NON-STORM WATER DISCHARGES INCLUDING LEAKAGES/SPILLS (I.E. HYDRAULIC FLUID, ANTIFREEZE, BRAKE FLUID, OILS, ETC.) ARE PREVENTED FROM LEAVING THE SITE. ALL NON-STORMWATER FLUIDS SHALL BE MAINTAINED IN A NEAT AND ORDERLY MANNER AND IN A LOCATION WHERE ACCIDENTAL DISCHARGES CAN BE CONTAINED.

SHOULD A NON-STORMWATER DISCHARGE OCCUR THE PROPER AUTHORITIES SHALL BE NOTIFIED (DEEM AND DIVISION OF WATER).

THE ONLY NON-STORM WATER DISCHARGES WHICH ARE PERMITTED ARE THOSE FROM FIRE FIGHTING ACTIVITIES, FIRE HYDRANT FLUSHING, POTABLE WATER SOURCES, WATER LINE FLUSHING, IRRIGATION OR LAWN WATERING, DETERGENT FREE BUILDING OR PAVEMENT WASHING WHERE SPILLS OR LEAKS OF TOXIC MATERIALS HAVE NOT YET OCCURRED OR HAVE BEEN COMPLETELY REMOVED, AIR CONDITIONING CONDENSATION, NATURAL SPRINGS, AND UNCONTAMINATED GROUND WATER SOURCES.

I. CONTRACTORS AND SUBCONTRACTORS

THE GENERAL CONTRACTOR SHALL FURNISH THE ENGINEER WITH THE CONTRACTOR OR SUBCONTRACTOR THAT IS RESPONSIBLEFOR IMPLEMENTING AND MAINTAINING EACH PORTION OF THESEDIMENT CONTROL MEASURES SHOWN ON THE PLANS OR OUTLINED IN THIS BEST MANAGEMENT PRACTICES PLAN.

ALL CONTRACTORS AND SUBCONTRACTORS SHALL SIGN A COPY OF THE CERTIFICATION STATEMENT BELOW BEFORE CONDUCTING ANY PROFESSIONAL SERVICE AT THE SITE:

"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."

COPIES OF THE CERTIFICATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR INCLUSION IN THE BEST MANAGEMENT PRACTICES PLAN.

CONTRACTOR/SUBCONTRACTOR CERTIFICATION

SHANDON PARK TRUNK, WINBURN TRUNK AND THOROUGHBRED ACRESTRUNK SEWERS PHASE 2 LEXINGTON, KENTUCKY, FAYETTE COUNTY, KENTUCKY

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

PHONE _____

"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."

SECTION 02372 - EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, and equipment required for installing, maintaining, amending, and removing temporary soil erosion, sediment, and pollutant controls as shown in the Stormwater Pollution Prevention Plan (SWPPP) and as specified herein and as required by the LFUCG Land Disturbance Permit, Chapter 16-Article X, Division 5 of the LFUCG Code of Ordinances, and the KPDES General Permit for Stormwater Discharges Associated with Construction Activities (KYR10).

B. The Contractor shall take all site management measures necessary to minimize erosion and contain sediment, construction materials (including excavation and backfill), and pollutants (such as chemicals, fuels, lubricants, bitumen, raw sewage, and other harmful waste) and prevent them from being discharged into or alongside any body of water or into natural or man-made channels leading thereto.

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

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

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

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

G. Prior to construction, the Contractor shall obtain a LFUCG Land Disturbance Permit and shall obtain coverage under the KPDES General Permit for Stormwater Discharges Associated with Construction Activities (KYR10) (see Article 3.24 in this Section). The Contractor shall be responsible for placement of pollutant, erosion, and sedimentation controls as shown in the Stormwater Pollution Prevention Plan (SWPPP) prior to excavation, fill or grade work. If during the course of construction, the state and/or LFUCG determine additional controls are required, the Contractor shall furnish, install and maintain additional mulch, blankets, sediment barriers, and/or other controls as necessary to control pollution, erosion, and sedimentation to the satisfaction of the regulatory agency.

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

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

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

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

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

J. **Erosion and Sediment Control prevention measures shall be installed prior to removal of vegetation and/or stripping of topsoil.** The Contractor is responsible for preparing and submitting the state Notice of Intent and attachments and obtaining state permit approval prior to the beginning of any construction activities.

1.02 PERMITS AND NOTIFICATION REQUIREMENTS

A. The Contractor is responsible to prepare a Stormwater Pollution Prevention Plan (SWPPP) for inclusion with permit submittals. 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 and take sole responsibility for 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 and Chapter 16-Article X, Division 5 of the LFUCG Code of Ordinances.

B. The Contractor shall submit a Notice of Intent specifically for Construction Activities (NOI-SWCA) 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. **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 have been obtained prior to initiation of construction.

1.03 RELATED WORK

A. Section 02371 – Storm Water Pollution Prevention Plan (SWPPP)

B. Section 02373 – Stream Crossings, Streambank Restoration, and Stream Buffer Restoration

C. Applicable LFUCG Storm Water Manual Standard Drawings are included at the end of this Section 02372.

PART 2 – PRODUCTS

2.01 MULCH

A. Mulch shall be used as a soil stabilization measure for any disturbed area inactive for 14 days or longer. Areas requiring stabilization during December through February shall receive only mulch held in place with bituminous material. Mulching shall be used whenever permanent or temporary seeding is used. The anchoring of mulch shall be in accordance with the Construction Drawings except all mulch placed in December through February shall be

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

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

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

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

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

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

G. Netting and mats shall be used in critical areas such as waterways where concentrated flows are expected.

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

2.02 TEMPORARY SEED

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

2.03 PERMANENT SEED

A. Permanent seeding shall be applied within 14 days after final grade has been reached, except during December through February. Permanent seeding shall also be applied on any areas that will not be disturbed again for a year even if final grades have not been reached. The use of mulch and erosion matting and netting with permanent seeding shall be in accordance with applicable sections of this Specification. "Seed mats" may be used for permanent seeding in accordance with manufacturers' recommendations.

B. Permanent seeding shall be used on disturbed areas where permanent, long-lived vegetative cover is needed to stabilize the soil and on rough graded areas that will not be brought to final grade for one year or more.

C. The area to be seeded shall be protected from excess runoff as necessary with diversions, grassed waterways, terraces, or sediment ponds.

D. Contractor shall use the following Permanent Seed Mix, with the following exceptions:

a. If a property owner landscaping agreement differs from this specification, the property owner landscaping agreement shall be followed on that property, or

b. The area to be seeded is within 25 feet of a stream bank, in which case Contractor shall follow the seed mix provided in Section 02373, or

c. The Construction Drawings identify a different seed mix.

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

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

E. Vegetative cover alone shall not be used to provide erosion control cover and prevent soil slippage on a soil that is not stable due to its structure, water movement, or excessive slope.

F. Permanent seeding may be done at any time except December through February.

G. Soil material shall be capable of supporting permanent vegetation and have at least 25 percent silt and clay to provide an adequate amount of moisture holding capacity. An excessive amount of sand will not consistently provide sufficient moisture for good growth regardless of other soil factors.

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

2.04 SOD

A. Sod shall be used for disturbed areas that require immediate vegetative cover, *e.g.*, the area surrounding a drop inlet in a grassed waterway, the design flow perimeter of a grassed waterway that will convey flow before vegetation can be established, and the inlet of a culvert. Sod may be installed throughout the year. "Seed mats" and seed with geotextiles may be used in place of sod when done in accordance with manufacturers' recommendations.

B. Contractor shall use tall fescue sod, unless another species is specified in the Construction Drawings or unless the property owner landscaping agreement differs from this specification.

C. Sod shall not be used to provide erosion control and prevent soil slippage on a soil that is not stable due to its structure, water movement, or excessive slope.

D. Sod shall be installed within 36 hours of digging and removal from the field. Sod should not be used on slopes steeper than 2H:1V. If it is to be mowed, installation should be on slopes no greater than 3H:1V.

E. Soil material shall be capable of supporting permanent vegetation and shall consist of at least 25 percent silt and clay to provide an adequate amount of moisture holding capacity. An excessive amount of sand will not consistently provide sufficient moisture for the sod regardless of other soil factors.

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

G. The sod shall consist of strips of live, vigorously growing grasses. The sod shall be free of noxious and secondary noxious weeds and shall be obtained from good, solid, thick-growing stands. The sod shall be cut and transferred to the job in the largest continuous pieces that will hold together and are practical to handle.

H. The sod shall be cut with smooth clean edges and square ends to facilitate laying and fitting. The sod shall be cut to a uniform thickness of not less than three-fourth inch measured from the crown of the plants to the bottom of the sod strips for all grasses except bluegrass. Bluegrass sod shall be cut to a uniform thickness of not less than one and one-half inches.

I. The sod shall be mowed to a height of not less than two inches and no more than four inches prior to cutting.

J. The sod shall be kept moist and covered during hauling and preparation for placement on the sod bed.

2.05 ROAD/PARKING STABILIZATION

A. Gravel or paved material shall be used to stabilize permanent roads or parking areas or roads or parking areas used repeatedly by construction traffic. Stabilization shall be accomplished within 14 days of grading or initiation of use for construction traffic. Unstabilized roads are not acceptable except in instances where the road will be used less than one month.

B. Road/parking stabilization shall be used wherever roads or parking areas are constructed, whether permanent or temporary, for use by construction traffic.

C. Stabilization shall be accomplished with a minimum depth of six inches of crushed stone. Stabilized construction roadbeds shall be at least 14 feet wide for one-way traffic and at least 20 feet wide for two-way traffic.

D. Temporary roads shall follow the contour of the natural terrain to the extent possible. Slopes shall not exceed 10 percent.

E. Temporary parking areas shall be located on naturally flat areas to minimize grading. Grades shall be sufficient to provide drainage but shall not exceed 4 percent.

F. All cuts and fills shall be 2H:1V or flatter.

G. Drainage ditches shall be provided as needed.

H. Crushed stone shall be KYTC aggregate No. 2 (1.5 to 3 inches in diameter), or equivalent.

2.06 CONSTRUCTION ENTRANCE

A. A stabilized construction entrance shall be constructed wherever vehicles are leaving a construction site to enter a public road or at any unpaved entrance/exit location where there

is a risk of transporting mud or sediment onto paved roads. A construction entrance shall be constructed at the beginning of the project before construction traffic begins to enter and exit the site.

B. A stabilized construction entrance shall be constructed of crushed stone a minimum of 6 inches thick laid over geotextile (filter fabric).

C. The width shall be at least 20 feet and as wide as the entire width of the access. At sites where traffic volume is high, the entrance shall be wide enough for two vehicles to pass safely. The length shall be at least 50 feet, and where practical, shall be extended to 100 feet. The entrance shall be flared where it meets the existing road to provide a turning radius.

D. Stormwater and wash water runoff from a stabilized construction entrance shall drain to a sediment trap or sediment pond. If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the gravel, then the tires of the vehicles shall be washed before entering a public road.

E. Pipe placed under the entrance to handle runoff shall be protected with a mountable berm.

F. Dust control shall be provided in accordance with the applicable sections of this Specification.

G. Crushed stone shall be KYTC aggregate No. 2 (1.5 to 3 inches in diameter), or equivalent.

H. Geotextile filter fabric shall be KYTC Type III.

2.07 DUST CONTROL

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

B. Construction activities shall be phased to minimize the total area unstabilized at any given time, thereby reducing erosion due to air and water movement.

C. Construction roads shall be watered as needed to minimize dust.

D. Existing trees, shrubs, and ground cover shall be retained as long as possible during the construction. Initial land clearing should be conducted only in those areas to be regraded or where construction is to occur. Areas to be cleared only for new vegetation or landscaping shall be stabilized with seed and mulch immediately following clearing.

E. Vegetative cover is the most effective means of dust and erosion control, when appropriate. See sections on Temporary Seed, Permanent Seed, Mulch, and Sod of this Specification.

F. When areas have been regraded and brought to final grade, they shall be stabilized using temporary or permanent seed and mulch or other measures.

G. Mulch with mulch binders may be used as an interim dust control measure in areas where vegetation may not be appropriate.

H. See sections on Temporary Seed, Permanent Seed, Sod, Mulch, Road/Parking Stabilization, and Construction Entrance of this Specification.

2.08 NETS AND MATS

A. Mulch netting, erosion control matting, or turf reinforcement matting (TRM) shall be used on sloping areas as indicated in the Construction Drawings. Mats or nets and permanent seeding may be used as an alternate to sod for culvert entrances and grassed waterways.

TRMs shall be used at the water line to control wave action in wet ponds. TRMs shall be used in accordance with manufacturer's recommendations. Erosion control matting may be used to stabilize channels and swales and on recently planted slopes to protect seedlings until they become established.

B. Effective netting and matting shall require firm, continuous contact between the materials and the soil. If there is no contact, the material will not hold the soil and erosion will occur underneath the material.

C. Nets and mats shall be suitable for their intended purpose and shall be as indicated in the Construction Drawings.

2.09 TEMPORARY DIVERSION DITCH

A. Temporary diversion ditches shall be used to collect sediment-laden runoff from disturbed areas and direct it to a sediment pond where applicable. Temporary ditches are those expected to be in use for less than one year. Temporary diversion ditches do not require stabilization, unless otherwise indicated on the Construction Drawings.

B. Temporary diversion ditches shall have stable outlets. The combination of conditions of site, slopes, and soils should be so that the ditch can be maintained throughout its planned life.

C. Temporary diversion ditches shall not be constructed below high sediment-producing areas unless land treatment practices or structural measures, designed to prevent damaging accumulations of sediment in the channels, are installed with or before the diversion.

D. A typical diversion cross section consists of a channel and a supporting ridge. In the case of an excavated-type diversion, the natural ground serves as the diversion ridge. Diversion cross sections shall be adapted to the equipment that will be used for their construction and maintenance.

E. The channel may be parabolic or trapezoidal in shape. V-shaped ditches shall not be constructed.

F. Diversions shall be located so that water will empty onto an established area such as a stable watercourse, waterway, or structure.

G. Any high sediment-producing area above a diversion shall be controlled by good land use management or by structural measures to prevent excessive sediment accumulation in the diversion channel.

H. Temporary diversions above steep slopes or across graded rights-of-way shall have a berm with a minimum top width of 2 feet, side slopes of 2:1 or flatter and a minimum height of 18 inches measured from the channel bottom.

I. Diversions installed to intercept flow on graded rights-of-way shall be spaced 200 to 300 feet apart.

J. A level lip spreader shall be used at diversion outlets discharging onto areas already stabilized by vegetation.

2.10 LEVEL SPREADER

A. Level spreaders shall be constructed at the outlets of temporary diversion ditches. Level spreaders shall also be constructed at outlets of permanent constructed waterways where they terminate on undisturbed areas.

B. The length of the level spreader shall be constructed as shown on the Construction Drawings.

2.11 PERMANENT CONSTRUCTED WATERWAY

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

2.12 PIPE SLOPE DRAIN

A. Pipe slope drains shall be used whenever it is necessary to convey water down a steep slope, which is not stabilized or which is prone to erosion, unless paved ditch (flume) is installed.

B. Contractor shall use a 10-inch diameter pipe or larger to convey runoff from areas up to one-third acre; 12-inch or larger pipe for up to half-acre drainage areas; and 18-inch pipe for areas up to one acre, unless otherwise specified in the Construction Drawings. Multiple pipes shall be required for large areas, spaced as shown on the Construction Drawings.

C. The pipe shall be heavy duty flexible tubing designed for this purpose, *e.g.*, non-perforated, corrugated plastic pipe, or specially designed flexible tubing.

D. A standard flared end section or a standard T-section fitting secured with a watertight fitting shall be used for the inlet.

E. Extension collars shall be 12-inch long sections of corrugated pipe. All fittings shall be watertight.

2.13 IMPACT STILLING BASIN

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

2.14 CHECK DAM

A. Check dams shall be limited to use in small, open channels that drain 10 acres or less.

B. Check dams shall not be used in streams.

C. Check dams can be constructed of stones, coir logs, or wood fiber logs.

D. Check dams shall be constructed prior to the establishment of vegetation.

E. The maximum height of a check dam shall be three feet above the ground on which the rock is placed.

F. The center of the portion of the check dam above the flat portion of the channel shall be at least 1 foot lower than the outer edges. The outer edges of the check dam shall extend up the side slopes of the channel to a point 3 feet in elevation above the center portion of the check dam or to the top of the side slopes.

G. The maximum spacing between rock check dams in a ditch should be such that the toe of the

upstream dam is at the same elevation as the top of the next downstream dam.

H. The spacing of coir and wood fiber check dams is one log every 100 feet for velocities of 5 fps, 50 feet for velocities between 5 and 7.5 fps, and 25 feet for velocities greater than 10 fps, unless otherwise shown in the Construction Documents.

I. Stone check dams shall be constructed of KYTC Class II channel lining.

J. Coir log or wood fiber log check dams shall be constructed of a single log with a diameter of at least 20 inches.

2.15 SEDIMENT TRAP

A. Sediment traps shall be installed below all disturbed areas of less than 5 acres that do not drain to a sediment pond.

B. Erosion control practices such as seeding, mulching, sodding, diversion dikes, etc., shall be used in conjunction with sediment traps to reduce the amount of sediment flowing into the trap. The amount of sediment entering a trap can be reduced by the use of stabilized diversion dikes and ditches.

C. The trap shall not be located in a stream. It shall be located to trap sediment-laden runoff before it enters the stream.

D. Trap depth shall be at least 2 feet at the inlet and 4 feet at the outlet. Effective trap width shall be at least 10 feet and trap length shall be at least 30 feet.

E. The Construction Drawings shall indicate the final disposition of the sediment trap after the upstream drainage area is stabilized. The Construction Drawings shall indicate methods for the removal of excess water lying over the sediment, stabilization of the pond site, and the disposal of any excess material.

2.16 SEDIMENT POND

A. A sediment pond shall be installed at the outlet of a disturbed area of 5 acres or more. The maximum drainage area for a single pond is 100 acres.

B. Design and construction shall comply with all federal, state, and local laws, ordinances, rules, and regulations regarding dams.

C. Erosion control practices such as seeding, mulching, sodding, diversion dikes, etc., shall be used in conjunction with sediment ponds to reduce the amount of sediment flowing into the pond.

D. The pond shall not be located in a stream. It shall be located to trap sediment-laden runoff before it enters the stream.

E. Contractor shall construct the sediment pond as shown on the Construction Drawings.

F. Permanent ponds designed for stormwater detention or water quality treatment may serve as temporary sediment ponds if site conditions make the use of these structures desirable. At the time of conversion from a sediment pond to a permanent stormwater management pond, excess sediment shall be cleaned from the pond. If the pond is converted to a water quality basin, the sand in the sand filter outlet shall be replaced with clean sand unless it is shown to be clean.

G. The Construction Drawings shall indicate the final disposition of the sediment pond after the

upstream drainage area is stabilized. The Construction Drawings shall indicate methods for the removal of excess water lying over the sediment, stabilization of the pond site, and the disposal of any excess material.

H. Vegetation shall be established upon completion of construction of the embankment, emergency spillway and other areas disturbed by construction.

2.17 SILT FENCE

A. Silt fence shall be installed down-slope of areas to be disturbed prior to clearing and grading. Silt fence shall be situated such that the total area draining to the fence is not greater than one-fourth acre per 100 feet of fence. Silt fence shall be used for storm drain drop inlet protection and around soil stockpiles.

B. Under no circumstances shall silt fences be constructed in streams or in swales or ditch lines or any area of concentrated flow where discharge rates are likely to exceed 1 cubic foot per second (cfs).

C. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, and polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

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

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

E. Posts for synthetic fabric silt fences shall be either 2-inch by 2-inch wood or 1.33 pounds per linear foot steel with a minimum length of 5 feet. Steel posts shall have projections for fastening wire to them.

F. Wire fence reinforcement for silt fences shall be a minimum of 36 inches in height, a minimum of 14 gauge and shall have a mesh spacing of no greater than 6 inches.

2.18 STORM DRAIN INLET PROTECTION

A. Storm drain inlet protection may be utilized on drop inlets and curb inlets.

B. Storm drain inlet protection shall only be used around drop inlets when the up-slope area draining to the inlet has no other or inadequate sediment control.

C. The drainage area shall be no greater than 1 acre.

D. The inlet protection device shall be constructed in a manner that will facilitate cleanout and disposal of trapped sediment and minimize interference with construction activities.

E. Inlet protection devices shall be constructed in such a manner that any resultant ponding of stormwater will not cause flooding or excessive inconvenience or damage to adjacent areas, roadways, properties, or structures.

F. Inlet protection devices are low flow filter devices, and as such shall be constructed in such a manner as to allow for higher flows to bypass into the storm drain system to prevent flooding of the roadway or downstream properties.

2.19 FILTER STRIP

A. Filter strips shall be used on each side of permanent constructed channels.

B. Filter strips shall only be used to remove sediment from overland flow. Filter strips are not effective in removing sediment from concentrated flows.

C. If vegetative filters are proposed as a sediment control device and they do not already exist, they shall be planted and established prior to initiating land disturbing activities.

D. The minimum filter strip width shall be 50 feet for streams, wetlands, and sinkholes. The minimum filter strip width shall be ten feet for constructed waterways.

E. Where a post development floodplain or wet weather conveyance is being protected, filter strips shall be provided on each side. When a wetland or sinkhole is being protected, filter strips shall be provided around the perimeter.

F. Contractor shall construct the filter strips as shown on the Construction Drawings.

G. Existing grass or grass/legume mixtures used as filter strips shall be dense and well established, with no bare spots. When establishing new seeding, consideration shall be given to wildlife needs and soil conditions on the site. The following chart provides a list of alternative grass and grass/legume mixtures:

SEEDING MIXTURE AND SITE SUITABILITY CHART

Seeding Mixture	Rate lbs/acre	Soil Suitability
Alfalfa *Or* Red Clover *Plus* Timothy *Or* Orchardgrass *Or* Bromegrass	6 10 4 6 6	Well Drained
Ladino *Plus* Timothy *Or* Orchardgrass *Or* Bromegrass	.05 4 6 8	Wet or Well-Drained

Notes:

1. All seeding shall be in accordance with the seeding sections of this Specification.

2. Well drained sites include sites that are drained with tile as well as naturally well drained and droughty sites. Wet sites include sites that are excessively wet only a portion of the growing season.

2.20 STREAM CROSSING

A. Stream crossings shall be used in cases where construction traffic, permanent traffic, or utilities must cross existing post development floodplains. If the drainage area exceeds 1 square mile and a structure is necessary, the structure must be designed by a professional engineer licensed in Kentucky, and shall be considered a permanent structure.

B. Temporary stream crossings are applicable to flowing streams with drainage areas less than one square mile. Temporary stream crossings shall be planned to be in service for the shortest practical period of time and to be removed as soon as their function is completed.

C. All such structures, whether temporary or permanent, are subject to the rules and regulations of the U.S. Army Corps of Engineers for in-stream modifications (404 Permitting) and the Kentucky Division of Water (401 Certification). No stream crossing shall be installed without first obtaining all applicable local, state, and federal permits.

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

D. All stream crossings shall be constructed in such a manner as to avoid flooding or excessive inconvenience or damage to adjacent areas, roadways, properties, or structures.

E. When using a culvert crossing, the top of a compacted earth fill shall be covered with six inches of KYTC No. 57 stone.

F. KYTC No. 57 stone shall also be used for the stone pads forming the crossing approaches.

2.21 PUMP AROUND FLOW DIVERSION

A. A pump-around flow diversion shall be used to divert flow around construction activities occurring in a stream when those activities are reasonably expected to cause the erosion of sediment or deposition of sediment in the stream.

B. Check dams to form the diversion shall span the banks of the stream. Maintain 1-foot freeboard (minimum) on the upstream and downstream checks.

C. Check dams may be constructed of sandbags or may be a water-filled bladder such as an Aqua-Barrier.

D. The dewatering flow from the work area shall be treated in a sediment-trapping device prior to discharge to the stream.

E. Sandbags shall be woven polypropylene bags with approximate dimensions of 18-1/2 inches by 28 inches. Contractor shall tie the ends of filled bags closed using either draw strings or wire ties.

2.22 CONSTRUCTION DEWATERING

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

PART 3 – EXECUTION

3.01 GENERAL

A. Erosion and sediment control practices shall be consistent with the requirements of the state and local regulatory agencies and in any case shall be adequate to prevent erosion of disturbed and/or regraded areas.

B. Contractor is responsible for notifying the state regulatory agency concerning inclusion under the KPDES General Permit for Storm Water Discharges Associated with Construction Activities.

C. Gravity sewer lines, force mains and water lines that cross streams shall be constructed by methods that maintain normal stream flow and allow for a dry excavation. Water pumped from the excavation shall be contained and allowed to settle prior to reentering the stream. Excavation equipment and vehicles shall operate outside of the flowing portion of the stream. Spoil material from the line excavation shall not be allowed to enter the flowing portion of the stream. The provisions of this condition shall apply to all types of utility line stream crossings.

D. Removal of riparian vegetation in the utility line right-of-way shall be limited to that necessary for equipment access. Effective erosion and sedimentation control measures shall be employed at all times during the project to prevent degradation of waters of the Commonwealth. Site regrading and reseeding shall be accomplished with 14 days after disturbance.

3.02 MULCH

A. Seed shall be applied prior to mulching except where seed is to be applied as part of a hydroseeder slurry containing mulch.

B. Lime and fertilizer shall be incorporated and surface roughening accomplished as needed prior to mulching in accordance with applicable sections of this Specification.

C. Mulch materials shall be spread uniformly by hand or mechanically so the soil surface is covered. During or immediately following application, the mulch shall be anchored or otherwise secured to the ground according to one of the following methods:

1. Mechanical – Use a disk, crimper, or similar type tool set straight to punch or anchor the mulch material into the soil.

2. Mulch Tackifiers/Nettings/Emulsions – Use according to the manufacturer's recommendations. This is a superior method in areas of water concentration to hold mulch in place.

3. Wood Fiber – Wood fiber hydroseeder slurries may be used to tack straw mulch. This combination treatment is well suited to steep slopes and critical areas, and severe climate conditions.

D. Mulch shall be anchored using a mulch anchoring tool, a liquid binder/tackifier, or mulch nettings. Nets and mats shall be installed to obtain firm, continuous contact between the material and the soil. Without such contact, the material is useless and erosion occurs.

E. A mulch anchoring tool is a tractor-drawn implement that is typically used for anchoring straw and is designed to punch mulch approximately two inches into the soil surface. Machinery shall be operated on the contour and shall not be used on slopes steeper than 3H:1V.

F. When using liquid mulch binders and tackifiers, application shall be heaviest around edges of areas and at crests of ridges and banks to prevent wind blow. Remainder of area shall have binders/tackifiers spread uniformly in accordance with manufacturer's recommendations.

G. When using a mulch net, it shall be used in conjunction with an organic mulch and shall be installed immediately after the application and spreading of the mulch. Mulch net shall be installed over the mulch except when the mulch manufacturer recommends otherwise.

H. Excelsior blankets and mats with mulch are considered protective mulches and may be used alone on erodible soils and during all times of year. Erosion control mats shall be installed in accordance with manufacturer's recommendations.

I. Mulched areas shall be inspected at least weekly and after each rainfall of one-half inch or more. When mulch material is found to be loosened or removed, the mulch cover shall be replaced within 48 hours.

3.03 TEMPORARY SEED

A. The site shall be graded as needed to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and anchoring.

B. The needed erosion control practices, such as diversions, temporary waterways for diversion outlets, and sediment ponds, shall be installed prior to seeding.

C. Prior to seeding, lime and fertilizer shall be worked into the soil with a disk harrow, springtooth harrow, or similar tools to a depth of two inches. On sloping areas, the final operation shall be on the contour.

D. The seed shall be applied uniformly with a cyclone seeder, drill, cultipacker, seeder, or hydroseeder (slurry may include seed and fertilizer) preferably on a firm, moist seedbed. Seed shall be sown no deeper than one-fourth inch to one-half inch.

E. The seedbed shall be firmed following seeding operations with a cultipacker, roller, or light drag.

F. On sloping land, seeding operations shall be on the contour wherever possible.

G. Mulch shall be applied, in the amounts described in the mulch section of this Specification, to protect the soil and provide a better environment for plant growth.

H. New seed shall have adequate water for growth, through either natural means or irrigation, until plants are firmly established.

I. Seeded areas shall be inspected at least weekly after planting and after each rainfall of one-half inch or more. Areas requiring additional seed and mulch shall be repaired within 48 hours.

J. If vegetative cover is not established within 21 days, the area shall be reseeded.

3.04 PERMANENT SEED

A. During site preparation, topsoil shall be stockpiled for use in establishing permanent vegetation.

B. The site shall be graded as needed to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and anchoring.

C. The needed erosion control practices, such as diversions, temporary waterways for diversion outlets, and sediment ponds, shall be installed prior to seeding.

D. Prior to seeding, lime and fertilizer shall be worked into the soil with a disk harrow, springtooth harrow, or similar tools to a depth of four inches. On sloping areas, the final operation shall be on the contour.

E. Where compacted soils occur, they shall be broken up sufficiently to create a favorable rooting depth of six to eight inches.

F. The seed shall be applied uniformly with a cyclone seeder, drill, cultipacker, seeder, or hydroseeder (slurry may include seed and fertilizer) preferably on a firm, moist seedbed. Seed shall be sown no deeper than one-fourth inch to one-half inch.

G. The seedbed shall be firmed following seeding operations with a cultipacker, roller, or light drag.

H. On sloping land, seeding operations shall be on the contour wherever possible.

I. Mulch shall be applied, in the amounts described in the mulch section of this Specification, to protect the soil and provide a better environment for plant growth.

J. New seed shall have adequate water for growth, through either natural means or irrigation, until plants are firmly established.

K. Seeded areas shall be inspected at least weekly after planting and after each rainfall of 0.5 inches or more. Areas requiring additional seed and mulch shall be repaired within 48 hours.

L. If vegetative cover is not established (>70%) within 21 days, the area shall be reseeded. If 40 to 70 percent groundcover is established, seed and fertilize, using half of rates originally applied, and mulch. If less than 40 percent groundcover is established, follow original seedbed preparation methods, seeding and mulching specifications, and apply lime and fertilizer as needed according to soil tests.

3.05 SOD

A. The area to be sodded shall be protected from excess runoff, as necessary, with appropriate BMPs.

B. Prior to sodding, the soil surface shall be cleared of all trash, debris, and stones larger than one and one-half inches in diameter, and of all roots, brush, wire, and other objects that would interfere with the placing of the sod.

C. Compacted soils shall be broken up sufficiently to create a favorable rooting depth of six to eight inches.

D. Lime and fertilizer shall be worked into the soil with a disk harrow, springtooth harrow, or other suitable field equipment to a depth of four inches.

E. After the lime and fertilizer have been applied and just prior to the laying of the sod, the soil in the area to be sodded shall be loosened to a depth of one inch. The soil shall be thoroughly dampened immediately after the sod is laid if it is not already in a moist condition.

F. No sod shall be placed when the temperature is below 32°F. No frozen sod shall be placed nor shall any sod be placed on frozen soil.

G. When sod is placed during the periods of June 15 to September 1 or October 15 to March 1, it shall be covered immediately with a uniform layer of straw mulch approximately one-half inch thick or so the green sod is barely visible through the mulch.

H. Sod shall be carefully placed and pressed together so it will be continuous without any voids between the pieces. Joints between the ends of strips shall be staggered.

I. On gutter and channel sodding, the sod should be carefully placed on rows or strips at right angles to the centerline of the channel (*i.e.*, at right angles to the direction of flow). The edge of the sod at the outer edges of all gutters shall be sufficiently deep so that surface water will flow over onto the top of the sod.

J. On steep graded channels, each strip of sod shall be staked with at least two stakes not more than 18 inches apart.

K. On slopes 3H:1V or steeper, or where drainage into a sod gutter or channel is one-half acre or larger, the sod shall be rolled or tamped and then chicken wire, jute, or other netting shall be pegged over the sod for protection in the critical areas. The netting and sod shall be staked with at least two stakes not more than 18 inches apart. The netting shall be stapled on the side of each stake within two inches of the top of the stake. The stake should then be driven flush with the top of the sod.

L. When stakes are required, the stakes shall be wood and shall be approximately 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 may be applied beneath the stone for additional stability in accordance with fabric manufacturer's specifications.

D. Both temporary and permanent roads and parking areas may require periodic top dressing with new gravel. Seeded areas adjacent to the roads and parking areas shall be checked regularly to ensure that a vigorous stand of vegetation is maintained. Roadside ditches and

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

3.07 CONSTRUCTION ENTRANCE

A. Vegetation, roots, and all other obstructions shall be cleared in preparation for grading. Prior to placing geotextile (filter fabric), the entrance shall be graded and compacted to 80% of standard proctor density.

B. To reduce maintenance and loss of aggregate, the geotextile shall be placed over the existing ground before placing the stone for the entrance. Stone shall be placed to depth of 6 inches or greater for the entire width and length of the stabilized construction entrance.

C. If wash racks are used, they shall be installed according to manufacturer's specifications.

D. The stabilized construction entrance shall be inspected once each week and after there has been a high volume of traffic or a storm event greater than 0.2 inches.

E. The entrance shall be maintained in a condition that will prevent tracking or flow of sediments onto public rights-of-way. This may require periodic top dressing with additional stone, as conditions demand, and repair and/or cleanout of any structures used to trap sediment.

F. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately.

3.08 DUST CONTROL

A. See Articles on Temporary Seed, Permanent Seed, Sod, Mulch, Road/Parking Stabilization, and Construction Entrance of this Specification Section.

B. When construction is active on the site, dust control shall be implemented as needed.

C. When using tillage as a dust control measure, Contractor shall begin plowing on windward side of area. Chisel-type plows spaced about 12 inches apart, spring-toothed harrow, and similar plows are examples of equipment that may produce the desired effect.

D. The site shall be observed daily for evidence of windblown dust and reasonable steps shall be taken to reduce dust whenever possible. When construction on a site is inactive for a period, the site shall be inspected at least weekly for evidence of dust emissions or previously windblown sediments. Dust control measures shall be implemented or upgraded if the site inspection shows evidence of wind erosion.

3.09 NETS AND MATS

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

3.10 TEMPORARY DIVERSION DITCH

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

fencerows, or other obstructions that will interfere with the successful operation of the diversion shall be removed.

B. The base for the diversion ridge shall be prepared so that a good bond is obtained between the original ground and the fill material. Vegetation shall be removed and the base shall be thoroughly disked prior to placement of fill.

C. The earth materials used to construct the earth fill portions of the diversions shall be obtained from the diversion channel or other approved source.

D. The earth fill materials used to construct diversions shall be compacted by running the construction equipment over the fill in such a manner that the entire surface of the fill will be traversed by not less than one tread track of the equipment.

E. When an excess of earth material results from cutting the channel cross section and grade, it shall be deposited adjacent to the supporting ridge unless otherwise directed.

F. The completed diversion shall conform to the cross section and grade shown on the Construction Drawings.

G. Temporary or permanent seeding and mulch shall be applied to the berm or ditch immediately following its construction. Contractor shall triple-seed areas below the flow line, and shall use erosion control blankets or turf reinforcement mats as needed.

H. Bare and vegetated diversion channels shall be inspected regularly to check for points of scour or bank failure; rubbish or channel obstruction; rodent holes, breaching, or settling of the ridge; and excessive wear from pedestrian or construction traffic.

I. Damaged channels or ridges shall be repaired at the time damage is detected. Sediment deposits shall be removed from diversion channels and adjoining vegetative filter strips regularly.

J. Diversions shall be reseeded and fertilized as needed to establish vegetative cover.

3.11 LEVEL SPREADER

A. The minimum acceptable width shall be 6 feet. The depth of the level spreader as measured from the lip shall be at least 6 inches and the depth shall be uniform across the entire length of the measure.

B. The grade of the channel for the last 15 feet entering the level spreader shall be less than or equal to 1%.

C. The level lip of the spreader shall be constructed on zero percent grade to insure uniform conversion of channel flow to sheet flow.

D. Level spreaders shall be constructed on undisturbed soil.

E. The entrance to the spreader shall be graded in a manner to insure that runoff enters directly onto the zero percent graded channel.

F. Storm runoff converted to sheet flow shall discharge onto undisturbed areas stabilized with vegetation.

G. All disturbed areas shall be stabilized immediately after construction is completed in accordance with the mulching and vegetation requirements of this Specification.

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

3.12 PERMANENT CONSTRUCTED WATERWAY

A. All ditches or other depressions to be crossed shall be filled before construction begins or as part of construction, and the earth fill used to fill the depressions shall be compacted using the treads of the construction equipment. All old terraces, fence rows, or other obstructions that will interfere with the successful operation of the channel shall be removed.

B. The earth materials used to construct the earth fill portions of the channel shall be obtained from the excavated portion of the channel or other approved source.

C. The earth fill materials used to construct the channel shall be compacted by running the construction equipment over the fill in such a manner that the entire surface of the fill will be traversed by at least one tread track of the equipment.

D. The completed channel shall conform to the cross section and grade shown on the Construction Drawings.

E. Channels shall be inspected regularly to check for points of scour or bank failure; rubbish or channel obstruction; rodent holes; breaching; and excessive wear from pedestrian or construction traffic.

F. Channels shall be repaired at the time damage is detected. Sediment deposits shall be removed from adjoining vegetative filter strips when they are visible.

G. Channels shall be reseeded and fertilized as needed to establish vegetative cover.

H. The subgrade of paved channels shall be constructed to the required elevations. All soft sections and unsuitable material shall be removed and replaced with suitable material. The subgrade shall be thoroughly compacted and shaped to a smooth, uniform surface. The subgrade shall be moist when pouring concrete.

I. Before permanent stabilization of the slope, the structure shall be inspected after each rainfall. Any damages to the paved channel or slope shall be repaired immediately.

3.13 PIPE SLOPE DRAIN

A. The pipe slope drain shall be placed on undisturbed or well-compacted soil.

B. Soil around and under the entrance section shall be hand-tamped in 4-inch to 8-inch lifts to the top of the dike to prevent piping failure around the inlet.

C. Filter fabric shall be placed under the inlet and extended 5 feet in front of the inlet and be keyed in 6 inches on all sides to prevent erosion.

D. Backfilling around and under the pipe with stable soil material hand compacted in lifts of 4 inches to 8 inches shall be done to ensure firm contact between the pipe and the soil at all points.

E. The pipe slope drain shall be securely staked to the slope using grommets provided for this purpose at intervals of 10 feet or less.

F. All slope drain sections shall be securely fastened together and have watertight fittings.

G. The pipe shall be extended beyond the toe of the slope and discharged at a non-erosive velocity into a stabilized area or to a sediment trap or pond.

H. The pipe slope drain shall have a minimum slope of 3 percent or steeper.

I. The height at the centerline of the earth dike shall range from a minimum of 1.0 foot over the pipe to twice the diameter of the pipe measured from the invert of the pipe. It shall also be at least 6 inches higher than the adjoining ridge on either side. At no point along the dike will the elevation of the top of the dike be less than 6 inches higher than the top of the pipe.

J. All areas disturbed by installation or removal of the pipe slope drain shall be immediately stabilized.

K. The pipe slope drain shall be inspected after every rainfall and at least weekly. Any necessary repairs shall be made immediately.

L. Contractor shall check to see that water is not bypassing the inlet and undercutting the inlet or pipe. If necessary, Contractor shall install headwall or sandbags.

M. Contractor shall check for erosion at the outlet point and shall check the pipe for breaks or clogs. Contractor shall install additional outlet protection if needed and immediately repair the breaks and clean any clogs.

N. Contractor shall not allow construction traffic to cross the pipe slope drain and shall not place any material on it.

O. If a sediment trap has been provided, it shall be cleaned out when the sediment level reaches 1/3 the design volume.

P. The pipe slope drain shall remain in place until the slope has been completely stabilized or up to 30 days after permanent slope stabilization.

3.14 IMPACT STILLING BASIN

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

3.15 CHECK DAM

A. Stone shall be placed by hand or mechanically as necessary to achieve complete coverage of the ditch and to ensure that the center of the dam is at least 1 foot lower than the outer edges. Stone shall also be placed to extend 3 feet in elevation above the center portion of the check dam or to the top of the channel side slopes.

B. Coir and wood fiber logs shall be laid on the channel bottom.

C. Check dams shall be removed when their useful life has been completed. In temporary ditches and swales, check dams shall be removed and the ditch filled in when it is no longer needed. In permanent channels, check dams shall be removed when a permanent lining can be installed. In the case of grass-lined ditches, check dams shall be removed when the grass has matured sufficiently to protect the ditch or swale. The area beneath the check dams shall be seeded and mulched or sodded (depending upon velocity) immediately after check dams are removed.

D. If stone check dams are used in grass-lined channels that will be mowed, care shall be taken to remove all stone from the channel when the dam is removed. This shall include any stone that has washed downstream.

E. Regular inspections shall be made to ensure that the check dam is in good working order and

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

F. Check dams shall be checked for sediment accumulation after each rainfall. Sediment shall be removed before or when it reaches one-third of the original height.

G. Check dams shall remain in place and operational until the drainage area and channel are completely stabilized, or up to 30 days after the permanent site stabilization is achieved.

3.16 SEDIMENT TRAP

A. The area to be excavated shall be cleared of all trees, stumps, roots, brush boulders, sod, and debris. All channel banks and sharp breaks shall be sloped to no steeper than 1:1. All topsoil containing excessive amounts of organic matter shall be removed.

B. Seeding, fertilizing, and mulching of the material taken from the excavation shall comply with the applicable soil stabilization sections of this Specification.

C. Construction specifications for sediment traps are provided in the Construction Drawings.

D. Any material excavated from the trap shall be placed in one of the following ways so that it will not be washed back into the trap by rainfall:

1. uniformly spread to a depth not exceeding 3 feet and graded to a continuous slope away from the trap

2. uniformly placed or shaped reasonably well with side slopes assuming the natural angle of repose for the excavated material behind a berm width not less than 12 feet.

E. Sediment shall be removed from the trap when the capacity is reduced to one third of the design volume. Contractor shall follow the methods for disposing of sediment removed from the trap as shown in the Construction Drawings.

3.17 SEDIMENT POND

A. The foundation area shall be cleared of all trees, stumps, roots, brush boulders, sod, and debris. All channel banks and sharp breaks shall be sloped to no steeper than 1:1. All topsoil containing excessive amounts of organic matter shall be removed. The surface of the foundation area shall be thoroughly scarified before placement of the embankment material.

B. A cutoff trench shall be backfilled with suitable material. The trench shall be kept free of standing water during backfill operations.

C. The pipe conduit barrel shall be placed on a firm foundation. Selected backfill material shall be placed around the conduit in layers, and each layer shall be compacted to at least the same density as the adjacent embankment. All compaction within 2 feet of the pipe spillway shall be accomplished with hand-operated tamping equipment.

D. All borrow areas outside the pond and in the drainage area shall be graded and left in such a manner that water will not be ponded.

E. The material placed in the fill shall be free of all sod, roots, frozen soil, stones more than 6 inches in diameter, and other objectionable material. The placing and spreading of the fill material shall occur in approximately 6-inch horizontal layers or of such thickness that the required compaction can be obtained with the equipment used. Each layer shall be compacted in a way that will result in achieving 95 percent of the maximum standard dry

density.

F. The distribution and gradation of materials throughout the fill shall be such that there will be no lenses, pockets, stakes, or layers of material differing substantially in texture or gradation from the surrounding material. Where it is necessary to use materials of varying texture and gradation, the more impervious material shall be placed in the upstream and center portions of the fill.

G. The moisture content of fill material shall be such that the required degree of compaction can be obtained with the equipment used.

H. Fill shall not be placed on frozen, slick, or saturated soil.

I. The topsoil material saved in the site preparation shall be placed as a top dressing on the surface of the emergency spillways, embankments, and borrow areas. It shall be evenly spread.

J. A protective cover of herbaceous vegetation shall be established on all exposed surfaces of the embankment, spillway, and borrow areas to the extent practical under prevailing soil and climatic conditions.

K. Seedbed preparation, seeding, fertilizing, and mulching shall comply with the applicable sections of this Specification.

L. Any material excavated from the pond shall be placed in one of the following ways so that its weight will not endanger the stability of the side slopes and where it will not be washed back into the pond by rainfall:

1. uniformly spread to a depth not exceeding 3 feet and graded to a continuous slope away from the pond.

2. uniformly placed or shaped reasonably well with side slopes assuming the natural angle of repose for the excavated material behind a berm width not less than 12 feet.

M. Sediment shall be removed from the pond when the capacity is reduced to one third of the design volume. Contractor shall follow the methods for disposing of sediment removed from the pond as shown in the Construction Drawings.

3.18 SILT FENCE

A. This Article provides construction specifications for silt fences using synthetic fabric. See the Construction Drawings for additional detail.

B. Posts shall be spaced a maximum of 10 feet apart at the barrier location and driven securely into the ground (minimum of 12 inches). When necessary because of rapid runoff, post spacing shall not exceed 6 feet.

C. A trench shall be excavated at least 6 inches wide and 6 inches deep along the line of posts and upslope from the barrier.

D. A wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy-duty wire staples at least 1 inch long, tie wires or hog rings. The wire shall extend into the trench a minimum of 2 inches and shall not extend more than 36 inches above the original ground surface.

E. The filter fabric shall be stapled or wired to the fence, and 12 inches of the fabric shall be extended into the trench. The fabric shall not extend more than 30 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.

F. At joints, filter fabric shall be lapped with terminating posts with a minimum overlap of 3 feet.

G. The trench shall be backfilled and soil compacted over the filter fabric.

H. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

I. Silt fences and filter barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately. Knocked down fences shall be repaired at the end of each day.

J. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and if the barrier is still necessary, the fabric shall be replaced promptly.

K. Sediment deposits shall be removed after each storm event or when deposits reach approximately one-third the height of the barrier.

L. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded.

M. Silt fences shall be replaced every 6 months.

3.19 STORM DRAIN INLET PROTECTION

A. For silt fence drop inlet protection, the following specifications apply:

1. For stakes, Contractor shall use 2 x 4-inch wood (preferred) or equivalent metal with a minimum length of 3 feet.

2. Stakes shall be evenly spaced around the perimeter of the inlet a maximum of 3 feet apart and securely driven into the ground, approximately 18 inches deep.
3. To provide needed stability to the installation, Contractor shall frame with 2 x 4-inch wood strips around the crest of the overflow area at a maximum of 1.5 feet above the drop inlet crest and shall brace diagonally.

4. Contractor shall place the bottom 12 inches of the fabric in a trench and backfill the trench with at least 4 inches of crushed stone or 12 inches of compacted soil.

5. Contractor shall fasten fabric securely to the stakes and frame. Joints shall be overlapped to the next stake.

B. For sod drop inlet protection, sod shall be placed to form a turf mat covering the soil for a distance of 4 feet from each side of the inlet structure. Soil preparation and sod placement shall be in accordance with the section entitled Sod.

C. For gravel curb inlet protection, the following specifications apply:

1. Wire mesh with ½-inch openings shall be placed over the curb inlet opening so that at least 12 inches of wire extends across the concrete gutter from the inlet opening.

2. KYTC No. 2 Coarse Aggregate shall be piled against the wire so as to anchor it against the gutter and inlet cover and to cover the inlet opening completely.

3. This type of device must never be used where overflow may endanger an exposed fill slope. Consideration shall also be given to the possible effects of ponding on traffic movement, nearby structures, working areas, and adjacent property.

D. For block and gravel curb inlet protection, the following specifications apply:

1. Two concrete blocks shall be placed on their sides abutting the curb at either side of the inlet opening to act as spacer blocks.

2. A 2-inch by 4-inch stud shall be cut and placed through the outer holes of each spacer block to help keep the front blocks in place.

3. Concrete blocks shall be placed on their sides across the front of the inlet and abutting the spacer blocks.

4. Wire mesh shall be placed over the outside of the concrete blocks to prevent stone from being washed through the holes in the blocks. Wire with ½-inch openings shall be used

5. KYTC No. 2 Coarse Aggregate shall be piled against the wire to the top of the barrier.

E. For stone-filled corrugated pipe curb inlet protection, the following specifications apply:

1. Two concrete "L" blocks shall be placed on their sides, with one leg fitting into the mouth of the curb opening.

2. A 6-inch corrugated pipe shall be filled with stone and covered with a filter sock.

3. The stone-filled pipe will be placed in front of the two concrete "L" blocks, and extend a minimum of the width of the curb inlet opening on either side. The total length of the stone filled pipe shall be three times the width of the curb inlet opening.

F. The structure shall be inspected after each rain, and repairs made as needed.

G. Sediment shall be removed and the device restored to its original dimensions when the sediment has accumulated to one-third the design depth of the filter. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.

H. If a stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the blocks, cleaned, and replaced.

I. Structures shall be removed after the drainage area has been properly stabilized.

3.20 FILTER STRIP

A. When planting filter strips, Contractor shall prepare seedbed, incorporate fertilizer, and apply mulch consistent with the seeding sections of this Specification. Filter strips using areas of existing vegetation shall be over seeded, as necessary, with the specified mixtures to obtain an equivalent density of vegetation. The over seeding shall be accomplished prior to any land disturbing activities.

B. Filter strips shall be inspected regularly to ensure that a healthy vegetative growth is maintained. Any bare spots or spots where sediment deposition could lead to the destruction of vegetation shall be repaired.

C. Filter strips shall be fertilized once each year in the fall.

D. Irrigation shall be used as necessary to maintain the growth of the vegetation in the filter strip.

E. Sediment shall be removed when it becomes visible in the filter.

F. Construction traffic shall not be driven on or over filter strips.

3.21 STREAM CROSSING

A. Clearing and excavation of the streambed and banks shall be kept to a minimum.

B. The structure shall be removed as soon as it is no longer necessary for project construction.

C. Upon removal of the structure, the stream shall immediately be reshaped to its original cross section and properly stabilized.

D. The approaches to the structure shall consist of stone pads with a minimum thickness of 6 inches, a minimum width equal to the width of the structure, and a minimum approach length of 25 feet on each side.

E. The structure shall be inspected after every rainfall and at least once a week and all damages repaired immediately.

3.22 PUMP-AROUND FLOW DIVERSION

A. Operations shall be scheduled such that diversion installation, in-stream excavation, in-stream construction, stream restoration, and diversion removal are completed as quickly as possible. Contractor shall not construct in a stream when rainfall is expected during the time excavation will be occurring in the stream.

B. Check dams shall be installed across the stream during low flow conditions.

C. Stream flow shall be pumped around the check dams. Outlet protection shall be installed as required at the discharge point.

D. Contractor shall dewater the work area and pump into a sediment trapping device.

E. Contractor shall complete construction activities across the stream.

F. Contractor shall restore the streambed and banks.

G. Contractor shall remove sandbags and shut down pumping operation. (Salvage sandbags for future use if multiple stream crossings are required on the project.) Contractor shall remove all sandbags from the stream, including damaged and empty bags.

H. Pumps shall be manned around-the-clock when the pump-around diversion is in the stream.

I. This control provides short-term diversion of stream flow (typically 1 day to 3 days). Additional sandbags or pumps may be required to maintain 1-foot freeboard on the sandbag checks if flow conditions change.

J. Contractor shall add sandbags as required to seal leaks in checks.

3.23 CONSTRUCTION DEWATERING

A. Contractor shall follow the specifications for sediment traps and basins. The manufacturer's recommendations shall be followed for commercial products.

B. The dewatering structure shall be inspected frequently to ensure it is functioning properly and not overtopping. Accumulated sediment shall be spread out on site and stabilized or disposed of offsite.

3.24 KPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

A. The Contractor is responsible for electronically filing the appropriate state Notice of Intent (NOI-SWCA) letter at least seven (7) days prior to start of construction activity. The Notice of Intent (NOI) is a Kentucky Pollution Discharge Elimination System (KPDES) permit application as provided by the Kentucky Revised Statutes, Chapter 224. This application is required to be submitted for construction projects that disturb one or more acres of land.

B. The NOI requires the inclusion of the descriptions of (but is not limited to) the following items:

1. Names and designated uses of any receiving waters

2. Anticipated number and locations of discharge points

3. Identification of planned construction in or along a water body

C. A topographic map showing project boundaries, areas to be disturbed, locations of anticipated discharge points and receiving waters is also required to be submitted with the NOI.

D. If the construction site is near a designated "High Quality/Impaired Waters" or a "Cold Water Aquatic Habitat Waters, Exceptional Waters, Outstanding National/State Resource Waters," additional items and/or individual permits will be required.

E. The NOI form requires an SIC code. The link to the SIC codes is http://www.osha.gov/pls/imis/sicsearch.html. The following are the typical construction SIC codes utilized:

1542 – Building Construction, nonresidential, except industrial and warehouses
1623 – Water Main Construction, Sewer Construction
1629 – Water and Wastewater Treatment Plant Construction
1711 – Water Pump Installation
1781 – Drilling Water Wells

F. The Contractor is responsible for 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 must 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.

N. Upon completion of the project and establishment of all permanent erosion and sediment control structures and devices, the Contractor shall submit the Notice of Termination (NOT) form to the Kentucky Division of Water, the LFUCG Division of Water Quality, and the LFUCG Division of Engineering.

O. All subcontractors shall be required to comply with the requirements of the state permit and the Stormwater Pollution Prevention Plan (SWPPP).

P. Where to submit:

1. Complete KPDES FORM NOI-SW at the following website:
   https://dep.gateway.ky.gov/eForms/default.aspx?FormID=7

2. Do not initiate work until receiving approval from the Kentucky Division of Water.

3. A complete copy of the NOI submittal shall also be provided to the following for approval/coverage verification:

   Division of Water Quality
   125 Lisle Industrial Avenue, Suite 180
   Lexington, KY 40511

   Division of Engineering
   Lexington-Fayette Urban County Government
   101 E. Vine St.
   4th Floor
   Lexington, KY 40507

3.25 LFUCG Land Disturbance Permit

A. The Contractor shall obtain a Land Disturbance Permit from the LFUCG Division of Engineering, after the LFUCG Division of Water Quality inspects the installation of the best management practices as required by the Stormwater Pollution Prevention Plan (SWPPP). The site grading plan shall show the original and finish grade contours. The grading plan shall be in conformance with the SWPPP.

B. Where to obtain:

Division of Engineering
Lexington-Fayette Urban County Government
101 E. Vine St.
4th Floor
Lexington, KY 40507
(859) 258-3410
Attn: Land Disturbance Permit Section

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 must be permitted in accordance with these specifications.

LFUCG LAND DISTURBANCE PERMIT APPLICATION AND ESC PLAN CHECKLIST

OWNER / DEVELOPER Name: _____ **Date:** _____ **Zone:** _____

Address: _____ **City:** _____ **State:** _____ **Zip:** _____

Contractor Name and Address: _____ **Reg #:** _____

Contact Name, Phone/ FAX/Email: _____

ITEM DESCRIPTION	Y	N	N/A	PAGE #	NOTES
I. Permits:					
KY Construction Permit (KYR10 or Indvid)	☐	☐	☐		
USCOE 404 Permit	☐	☐	☐		
KYDOW 401 Water Quality Cert.	☐	☐	☐		
KY Stream Construction Permit	☐	☐	☐		
FEMA LOMR or CLOMR	☐	☐	☐		
II. BMPS:					
Site Preparation:					
Phasing plan for large projects	☐	☐	☐		Maximum disturbed area = 25 acres
Limits of disturbance clearly marked	☐	☐	☐		25 foot undisturbed buffer strip along streams
Construction Entrance/ Exit Pad	☐	☐	☐		No. 2 stone w/ filter fabric, min. 50 ft long (100' where practical)
Temporary Diversion (Berm or Ditch)	☐	☐	☐		Offsite (clean) water routed around disturbed area
Stream Crossings	☐	☐	☐		Not allowed without US Army Corps 404 permit
Concrete Washout Area	☐	☐	☐		One washout pit for every 40 lots
Soil Stabilization:					
Seeding/sodding schedule/timing	☐	☐	☐		Applied within 14 days of reaching final grade or suspending work
Slope Protection:					
Silt Fence downslope of bare areas	☐	☐	☐		
Silt Fence installed along contour	☐	☐	☐		
Erosion Control Blankets on slopes	☐	☐	☐		Conforms with Fig. 11-1 in LFUCG Stormwater Manual
Drainage System Control:					
Inlets Protected	☐	☐	☐		
Pipe Outfall Erosion Prevention	☐	☐	☐		
Channel Lining	☐	☐	☐		Sodding or seed w/ blankets/mats immediately after construction
Check Dams	☐	☐	☐		Max drainage area = 10 acres
Sediment Basins and Traps:					
Sediment Traps (drainage area < 5 ac)	☐	☐	☐		Minimum volume = 2yr-24hr runoff volume
Sediment Basins (drainage area = > 5 ac)	☐	☐	☐		Minimum volume = 2yr-24hr runoff volume
Good Housekeeping:					
Material storage addressed	☐	☐	☐		
Spill Prevention and Control addressed	☐	☐	☐		
Dust control addressed	☐	☐	☐		
Dewatering operations are filtered	☐	☐	☐		
Narrative:					
Schedule/sequence for BMP installation	☐	☐	☐		
BMP Inspection Requirement	☐	☐	☐		Every 7 days, or every 14 days and after 0.5" of rainfall
BMP Maintenance Requirement	☐	☐	☐		
Roadway Cleaning	☐	☐	☐		

LFUCG USE ONLY: **Review Date:** _____ **Status:** In Compliance: Y N Additional Info Needed: Y N

Reviewed By: _____ **Department:** _____

Comments / Items Missing or Incomplete:

Form Effective Date - January 13, 2011

Kentucky Best Management Practices Plan • Construction Site Inspection Report

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

Field Inspection Observations

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

Sediment Traps and Basins				Storage volume is at least 134 cubic yards for each acre of bare soil area drained Trap or basin is seeded/mulched and stabilized; no collapsing sidewalls or banks Outlet structure is stable and consists of rock-lined notched overflow or outlet riser Rock overflow is 6" lower in center to control overflow discharge Outlet riser pipe has concrete & rock base, ½ inch holes every 3" to 6", and trash rack Area near pipe outlet or overflow is stable, with no scour or erosion Sediment removed before trap or basin is halfway full; disposal is away from ditches
Maintenance of EPSC Management Practices				Sediment behind silt fence and other filters does not reach halfway to top Sediment traps and basins are less than half full of sediment Gullies repaired, silt fences and other controls inspected and repaired/replaced Written documentation of controls installed, inspection results, and repairs performed All controls removed and areas graded, seeded, and stabilized before leaving site
Materials Storage, Handling, and Cleanup				Materials that may leach pollutants stored under cover and out of the weather Fuel tanks located in protected area with double containment system Fuel and/or other spills cleaned up promptly; no evidence of unmanaged spills No evidence of paint, concrete, or other material washouts near drain inlets No storage of hazardous or toxic materials near ditches or water bodies
Waste Disposal				Trash, litter, and other debris in proper containers or properly managed No litter or trash scattered around on the construction site Provisions made for restroom facilities and/or other sanitary waste management Sanitary waste facilities clean and serviced according to schedule No disposal of any wastes into curb or other inlets, ditches, streams, or water bodies

Inspection Notes and Key Observations

List of Stabilized Areas: Vegetation is Established; Ditches are Stabilized; No Exposed Soil
Other Notes or Observations:
Corrective Actions Taken and/or Proposed Revisions to BMP Plan:

I certify under penalty of law that I understand the terms and conditions of the general Kentucky Pollutant Discharge Elimination System (KPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

Signature of Inspector: _____

CONTRACTOR AND SUBCONTRACTOR CERTIFICATIONS

SWPPP Files, Updates, and Amendments

This SWPP Plan and related documents (e.g., NOI, inspection reports, US ACE permits, etc.) will be kept on file at the construction site by _____ (name and title). The SWPPP will be updated by the Owner and/or Site Manager to reflect any and all significant changes in site conditions, selection of BMPs, the presence of any unlisted potential pollutants on site, or changes in the Site Manager, contractor, subcontractors, or other key information. Updates and amendments will be made in writing within 7 days and will be appended to the original BMP Plan and available for review.

Stormwater Pollution Prevention Plan Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____ Date: _____

Title: _____

I certify under penalty of law that I understand the terms and conditions of the general KPDES permit that authorizes the storm water discharges associated with the construction site activity identified as part of this certification.

Subcontractor Certification

The subcontractors below certify under penalty of law that they understand the terms and conditions of the general KPDES permit that authorizes the storm water discharges associated with the construction site activity identified as part of this certification.

Signed: _____ Date: _____

Title: _____

Signed: _____ Date: _____

Title: _____

Signed: _____ Date: _____

Title: _____

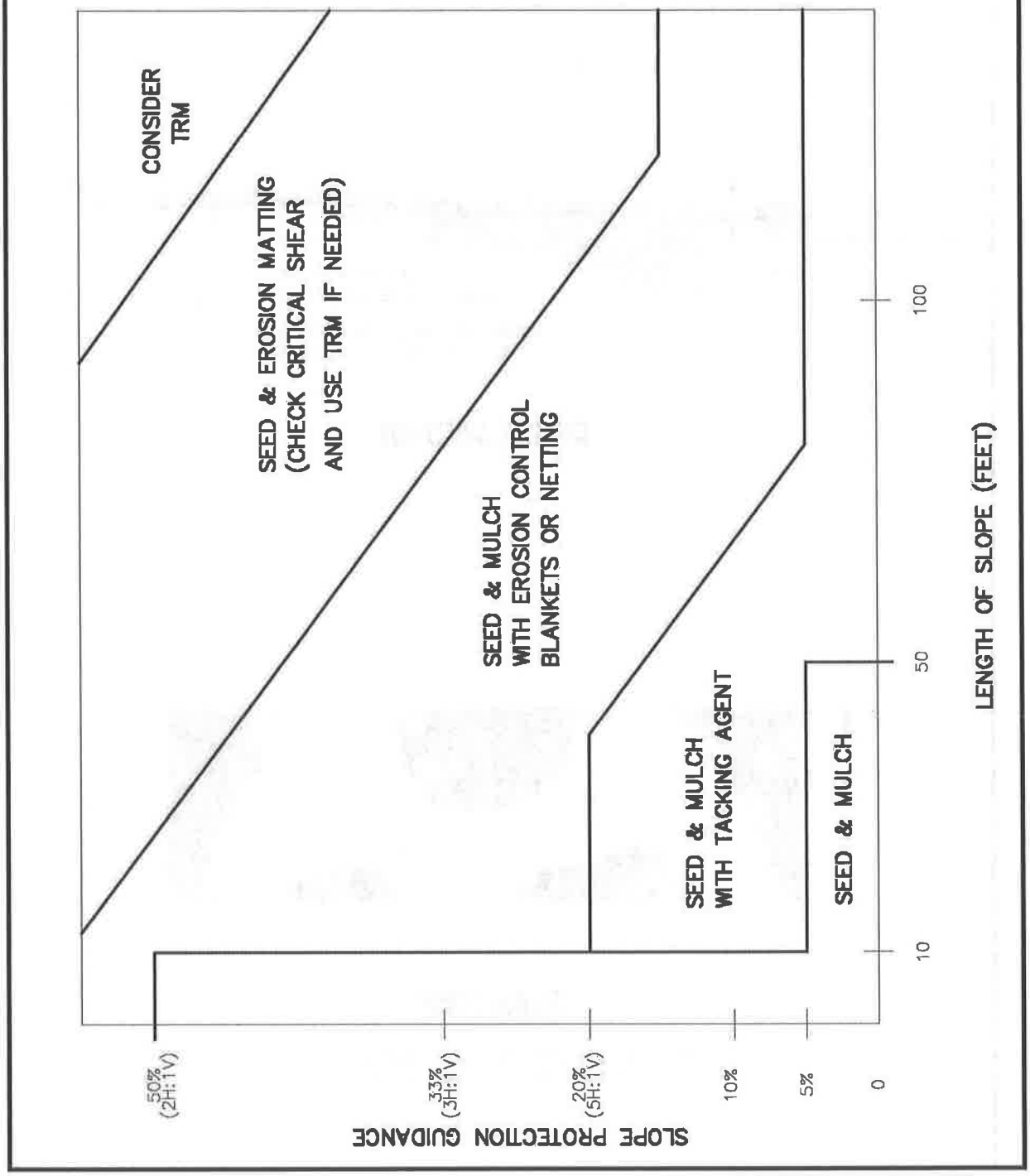
STORMWATER MANUAL

FIGURE 11–1

SLOPE PROTECTION GUIDANCE

(OCTOBER 1, 2016)

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.



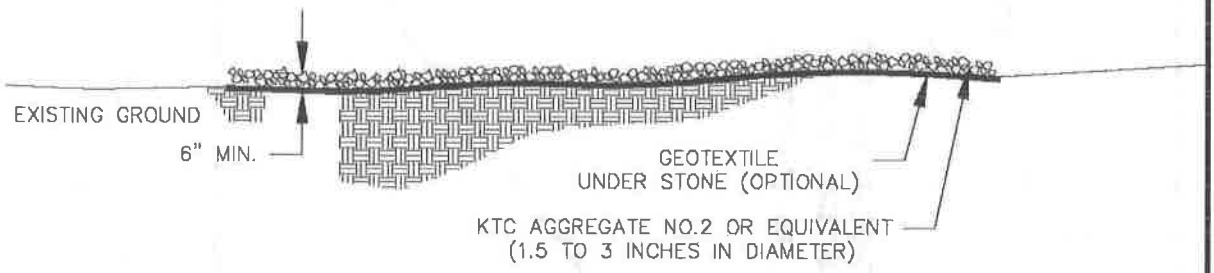
STORMWATER MANUAL

FIGURE 11–2

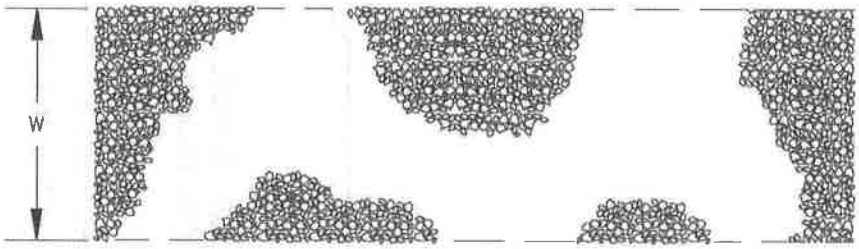
ROAD\PARKING STABILIZATION

(OCTOBER 1, 2016)

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.



CROSS SECTION



PLAN VIEW

W = 14' MIN. FOR ONE WAY TRAFFIC
20' MIN. FOR TWO WAY TRAFFIC

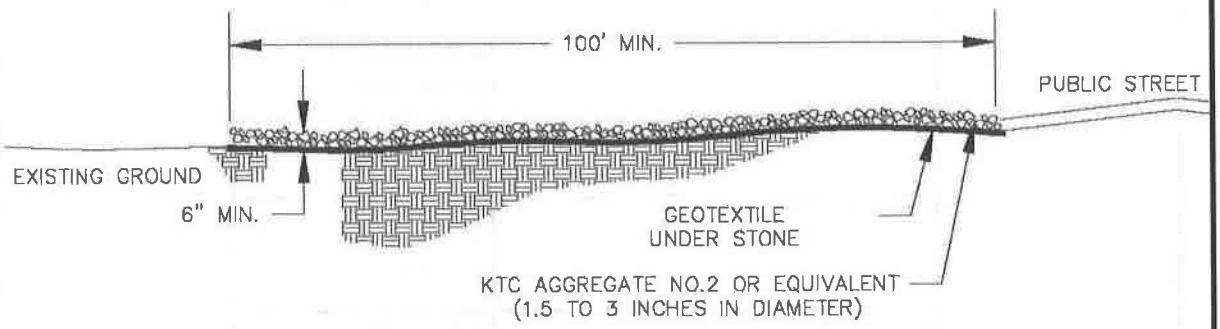
STORMWATER MANUAL

FIGURE 11-3

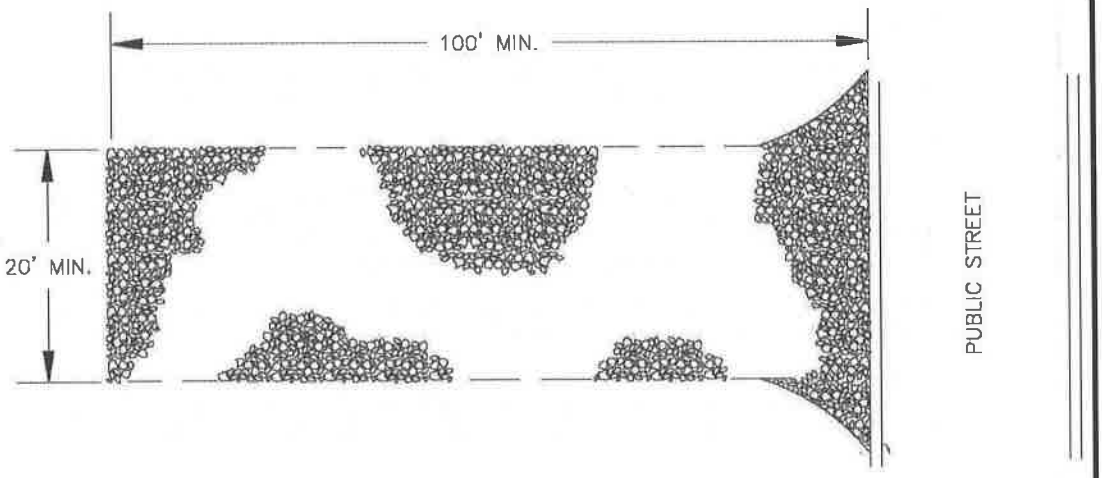
CONSTRUCTION ENTRANCE

(OCTOBER 1, 2016)

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.



CROSS SECTION



PLAN VIEW

STORMWATER MANUAL

FIGURE 11–4

CONSTRUCTION ENTRANCE NOTES AND SPECIFICATIONS

(OCTOBER 1, 2016)

SPECIFICATIONS FOR GEOTEXTILE FABRIC

GRAB TENSILE STRENGTH	220 LBS. (MIN.) (ASTM D1682)
ELONGATION FAILURE	60% (MIN.) (ASTM D1682)
MULLEN BURST STRENGTH	430 LBS. (MIN.) (ASTM D3768)
PUNCTURE STRENGTH	125 LBS. (MIN.) (ASTM D751) (MODIFIED)
EQUIVALENT OPENING	SIZE 40–80 (US STD SIEVE) (CW–02215)

NOTES

1. A STABILIZED ENTRANCE PAD OF CRUSHED STONE SHALL BE LOCATED WHERE TRAFFIC WILL ENTER OR LEAVE THE CONSTRUCTION SITE ONTO A PUBLIC STREET.
2. SOIL STABILIZATION FABRIC SHALL BE USED AS A BASE FOR THE CONSTRUCTION ENTRANCE.
3. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS OR EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS WARRANT AND REPAIR OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
4. ANY SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC STREETS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.
5. WHEN APPROPRIATE, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING A PUBLIC STREET. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN.

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11-5

STAPLE PATTERN FOR STRAW OR EXCELSIOR MATS

(OCTOBER 1, 2016)

SLOPES UP TO 1.5H:1V

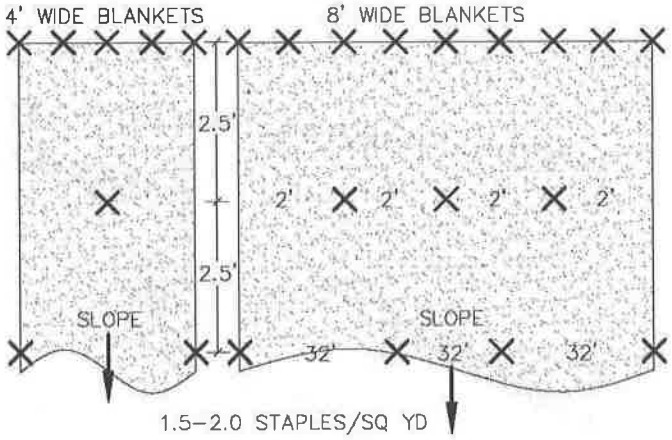
- INSTALL BLANKET VERTICALLY OR HORIZONTALLY
- USE 12" STAPLE SPACING ON STARTER ROW.

COHESIVE SOILS:

- NO OVERLAP REQUIRED ON SIDE SEAMS
- USE 6" STAPLE LENGTH

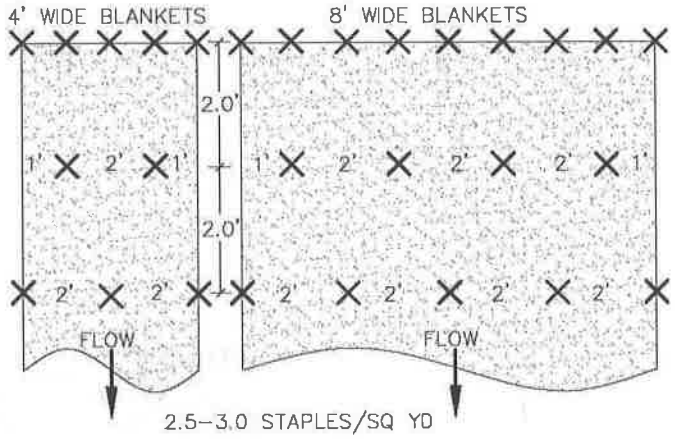
NON-COHESIVE SOILS:

- USE 6" SIDE SEAM OVERLAP
- USE 8" STAPLE LENGTH
- USE 6" ANCHOR TRENCH AT TOP OF SLOPE



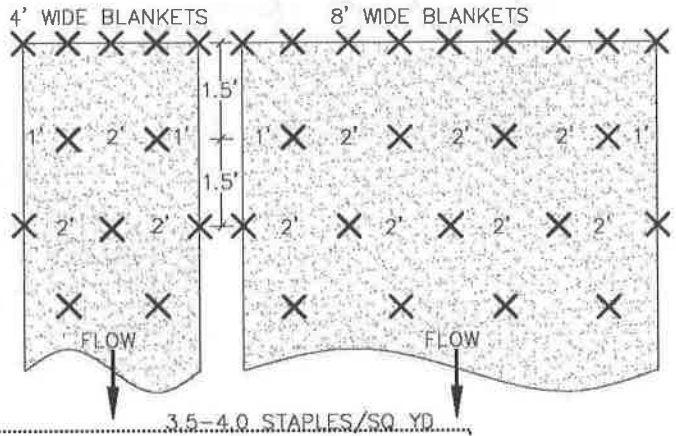
CHANNELS IN COHESIVE SOILS

- USE 6" SIDE SEAM OVERLAP
- USE 6" STAPLE LENGTH
- USE 6" TRANSVERSE ANCHOR TRENCH AT 100-FT. INTERVALS
- USE 12" STAPLE SPACING ON STARTER ROW.
- UPSTREAM BLANKET SHOULD OVERLAP DOWNSTREAM BLANKET A DISTANCE OF 12" IN A "SHINGLE" FASHION AND BURY THE FINISHED TOE AT LEAST 6".



CHANNELS IN NON-COHESIVE SOILS

- USE 6" SIDE SEAM OVERLAP
- USE 8" STAPLE LENGTH
- USE 6" TRANSVERSE ANCHOR TRENCH AT 50-FT. INTERVALS
- USE 12" STAPLE SPACING ON STARTER ROW.
- UPSTREAM BLANKET SHOULD OVERLAP DOWNSTREAM BLANKET A DISTANCE OF 12" IN A "SHINGLE" FASHION AND BURY THE FINISHED TOE AT LEAST 6".



NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

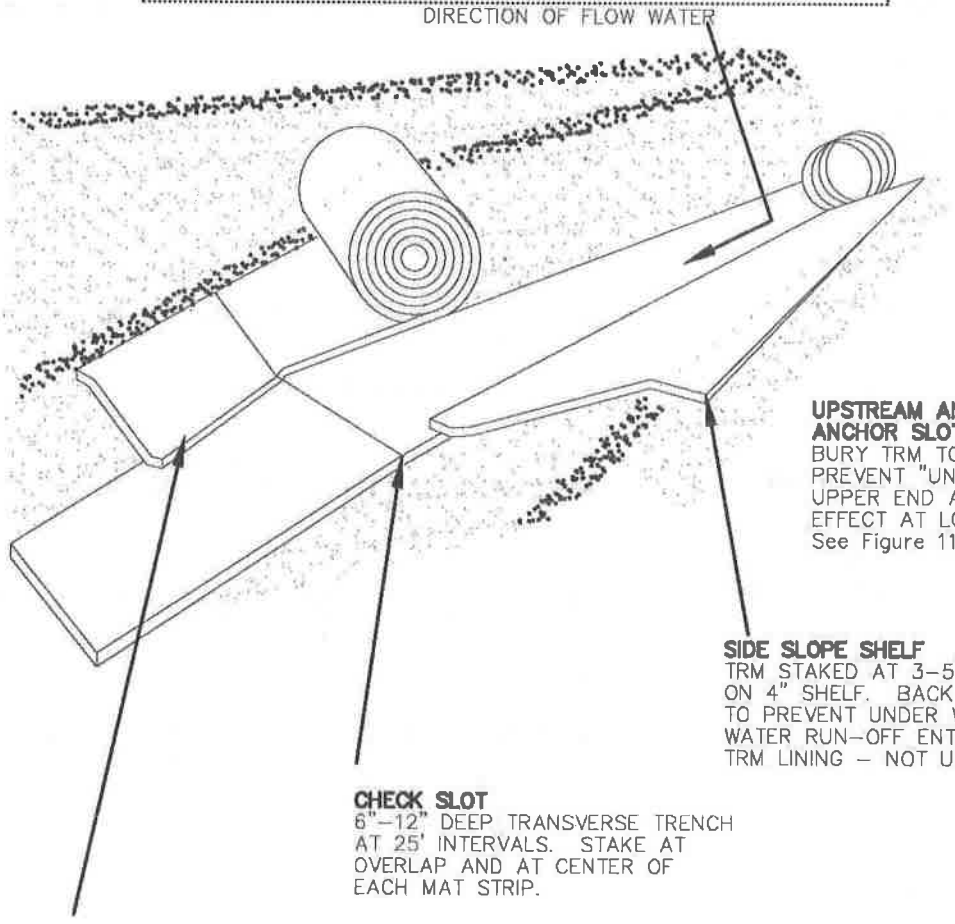
STORMWATER MANUAL

FIGURE 11–6

PLACEMENT OF TRM IN CHANNEL

(OCTOBER 1, 2016)

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.



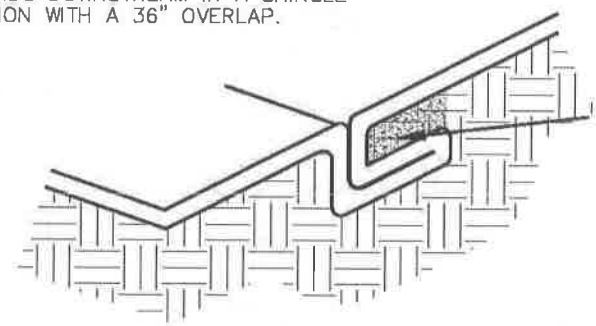
UPSTREAM AND DOWNSTREAM ANCHOR SLOTS
BURY TRM TO 12" DEPTH TO PREVENT "UNDER FLOW" AT UPPER END AND "WATERFALL" EFFECT AT LOWER END.
See Figure 11–7

SIDE SLOPE SHELF
TRM STAKED AT 3–5' INTERVALS ON 4" SHELF. BACK FILL AND TAMP TO PREVENT UNDER WASHING. WATER RUN–OFF ENTERS ONTO TRM LINING – NOT UNDER IT.

CHECK SLOT
6"–12" DEEP TRANSVERSE TRENCH AT 25' INTERVALS. STAKE AT OVERLAP AND AT CENTER OF EACH MAT STRIP.

OVERLAP IN A SHINGLE FASHION
4" OVERLAP STAKED AT 3–5' INTERVALS

WHEN ROLL TERMINATES, IT IS STAKED OVER THE ROLL WHICH EXTENDS DOWNSTREAM IN A SHINGLE FASHION WITH A 36" OVERLAP.



CHECK SLOT DETAIL
STAKE AND BACK FILL IN CHECK SLOT BEFORE CONTINUING TO PLACE UPSLOPE

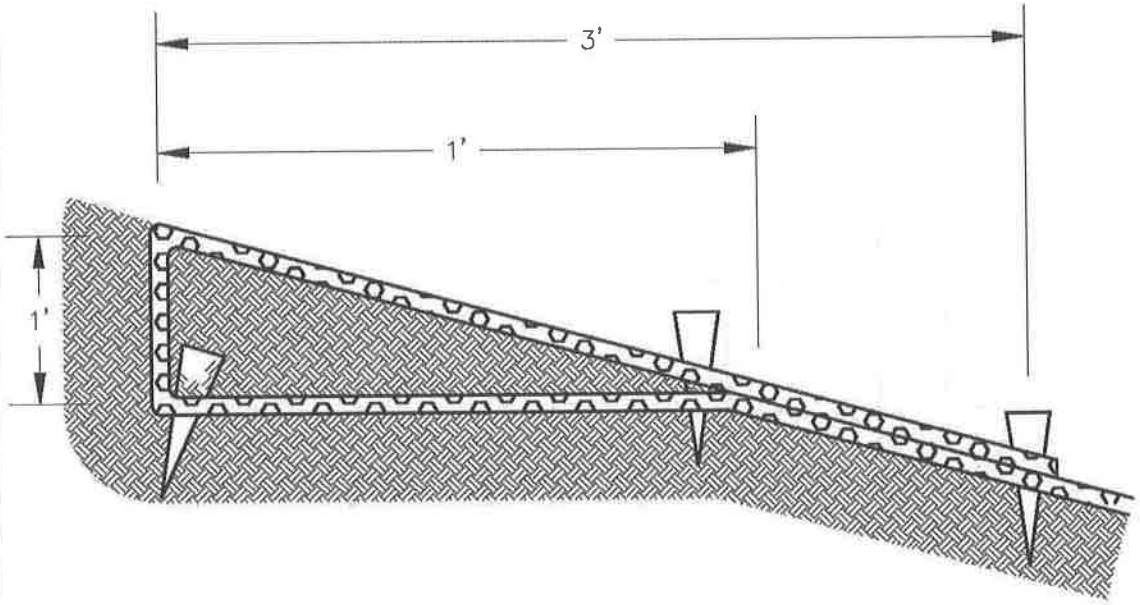
STORMWATER MANUAL

FIGURE 11–7

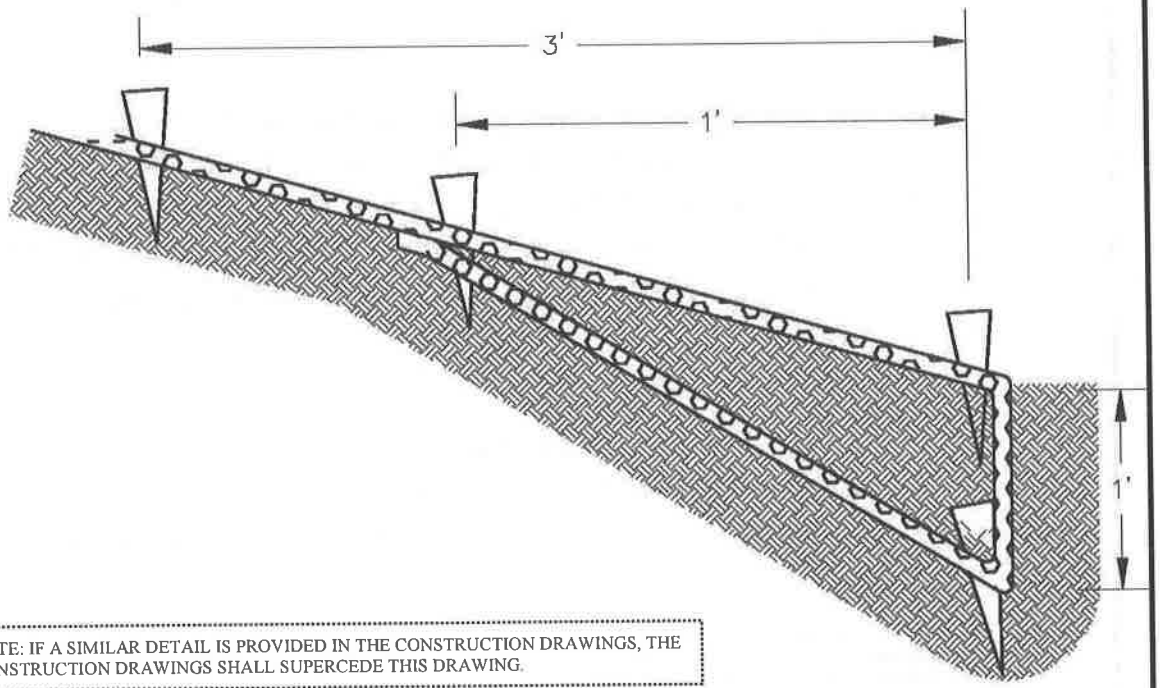
ANCHOR SLOT DETAILS FOR TRM

(OCTOBER 1, 2016)

UPSTREAM ANCHOR SLOT DETAIL



DOWNSTREAM ANCHOR SLOT DETAIL



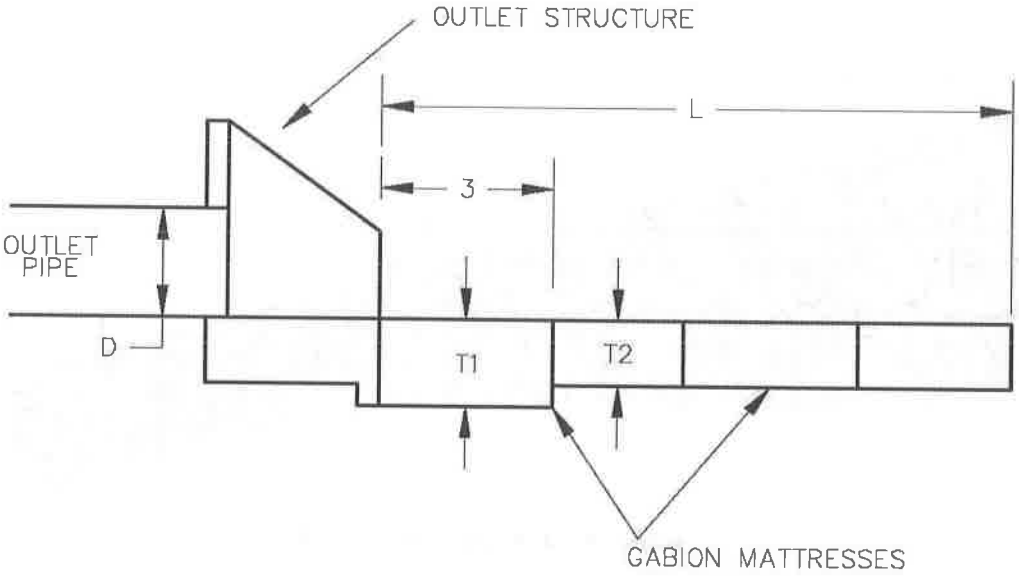
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–8

CROSS SECTION AT GABION MATTRESS OUTLET PROTECTION

(OCTOBER 1, 2016)



T1 = THICKNESS OF FIRST 3 FEET OF GABION MATTRESS TO MATCH DEPTH OF OUTLET STRUCTURE FOUNDATION

T2 = THICKNESS OF REMAINING GABION MATTRESS, 12 INCHES MINIMUM AND 18 INCHES MINIMUM FOR CALCULATED OUTLET VELOCITIES OF 10 TO 15 FEET PER SECOND.

FOR D < 36 INCHES, L = 12 FEET

FOR D > 36 INCHES, L = 4 x D FEET

D = HEIGHT OR WIDTH OF OUTLET, WHICHEVER IS GREATER

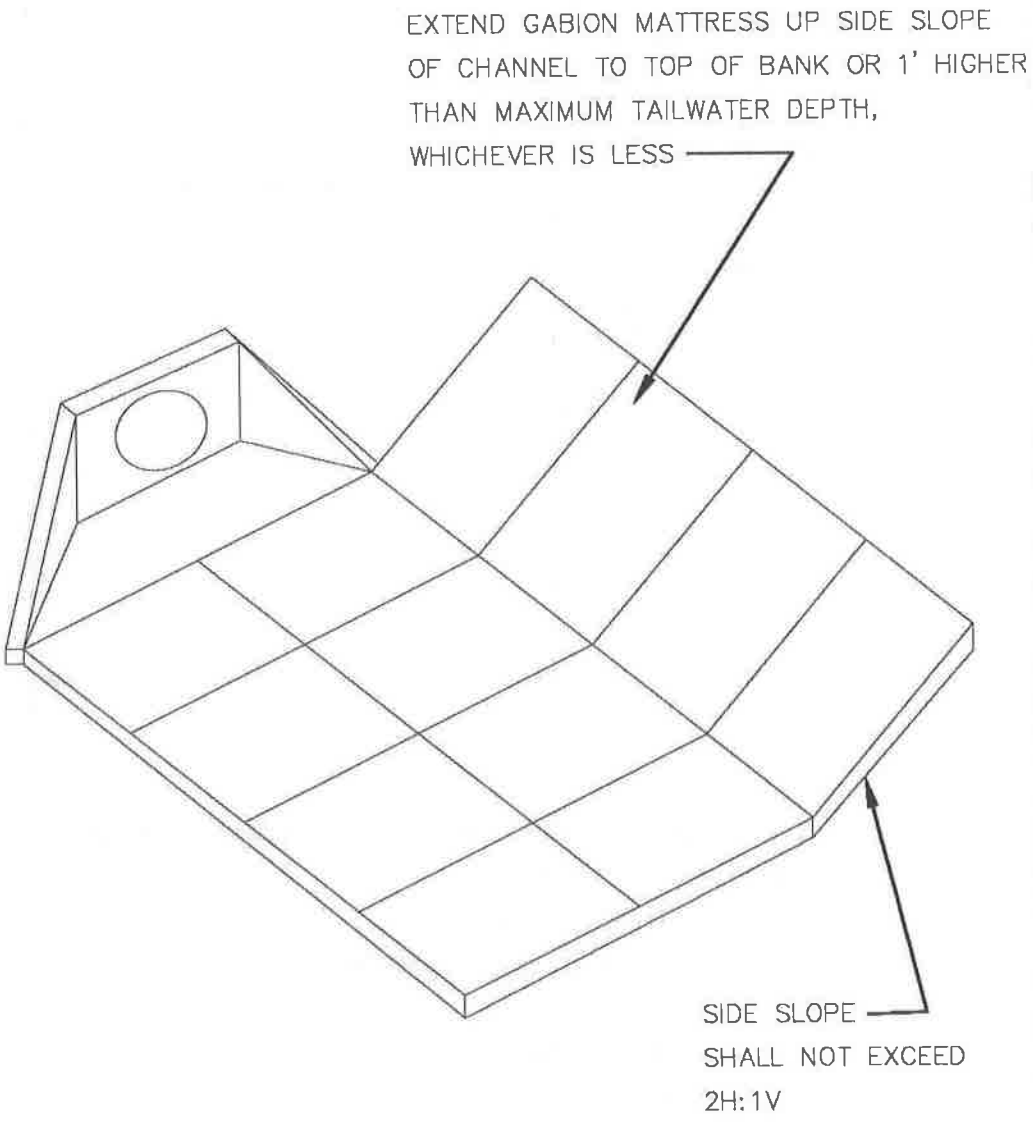
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–9

GABION MATTRESS AT OUTLET INTO WELL–DEFINED CHANNEL

(OCTOBER 1, 2016)



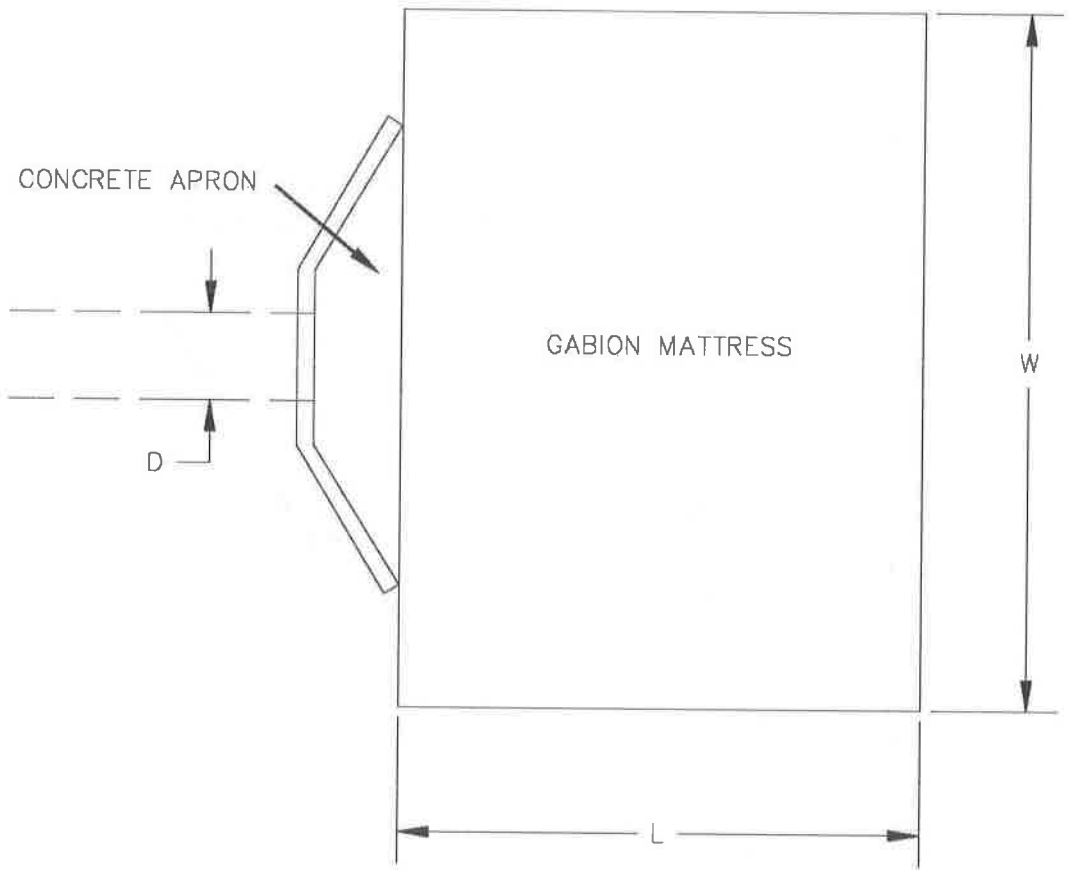
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–10

PLAN VIEW OF GABION MATTRESS AT OUTLET INTO FLAT AREA

(OCTOBER 1, 2016)



D = HEIGHT OR WIDTH OF OUTLET, WHICHEVER IS GREATER

FOR D <= 36 INCHES:

L = 12 FEET MINIMUM

W = (18 + D) FEET MINIMUM

FOR D > 36 INCHES:

L = 4 x D FEET MINIMUM

W = (2 L + D) FEET MINIMUM

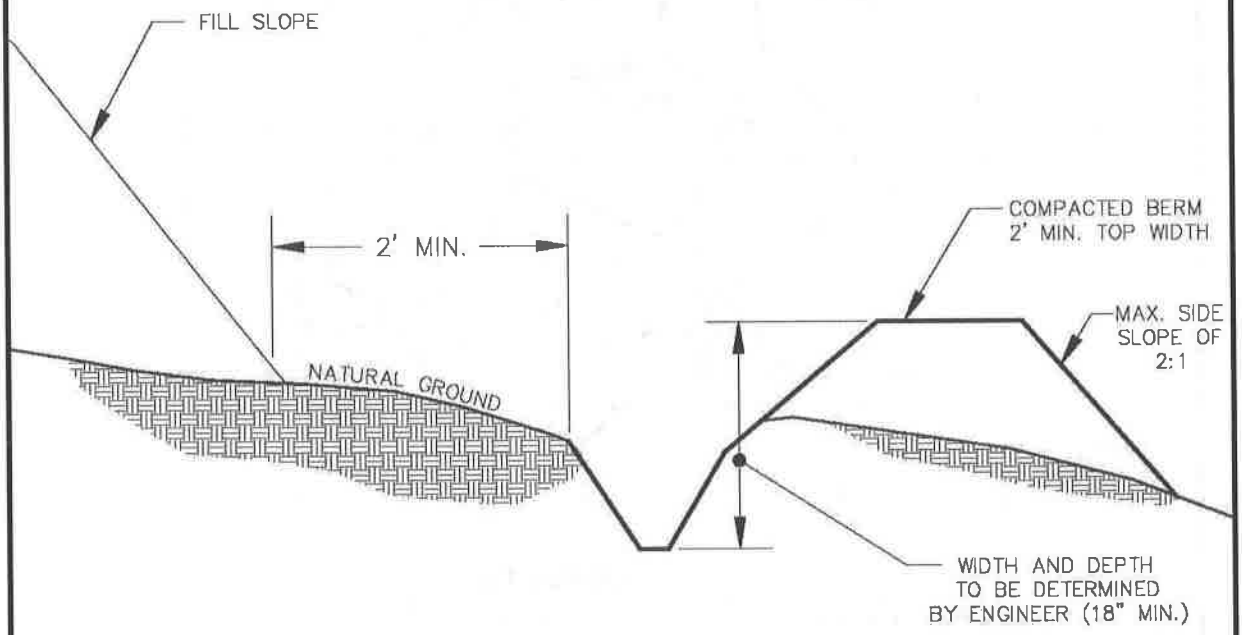
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–12

TEMPORARY DIVERSION DITCH

(OCTOBER 1, 2016)



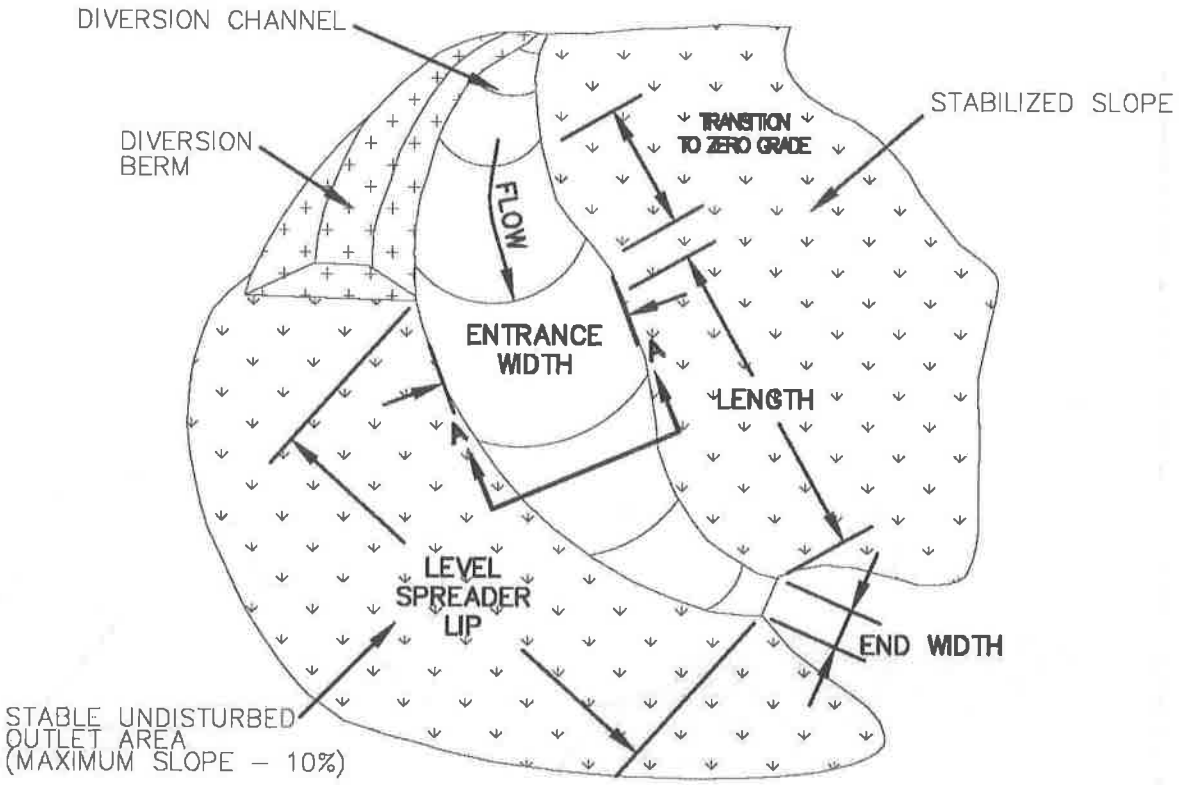
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–13

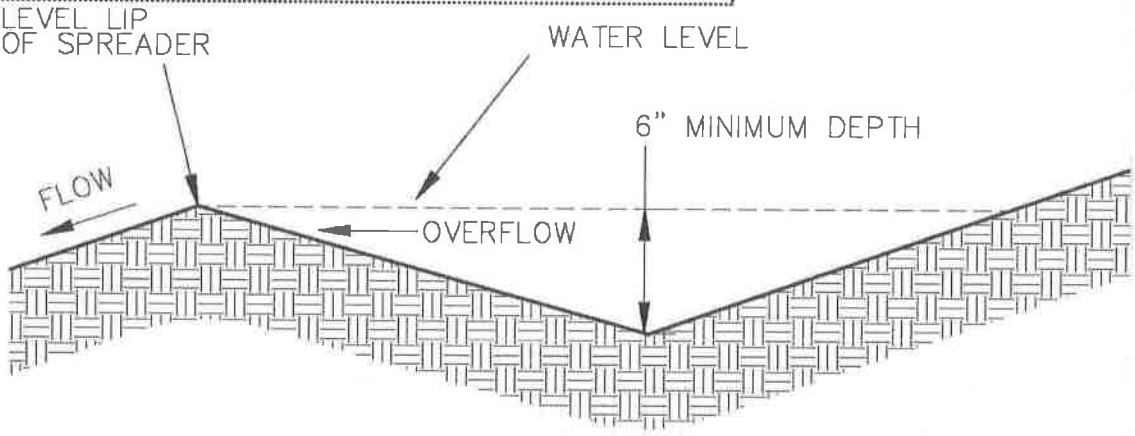
LEVEL SPREADER

(OCTOBER 1, 2016)



PERSPECTIVE

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.



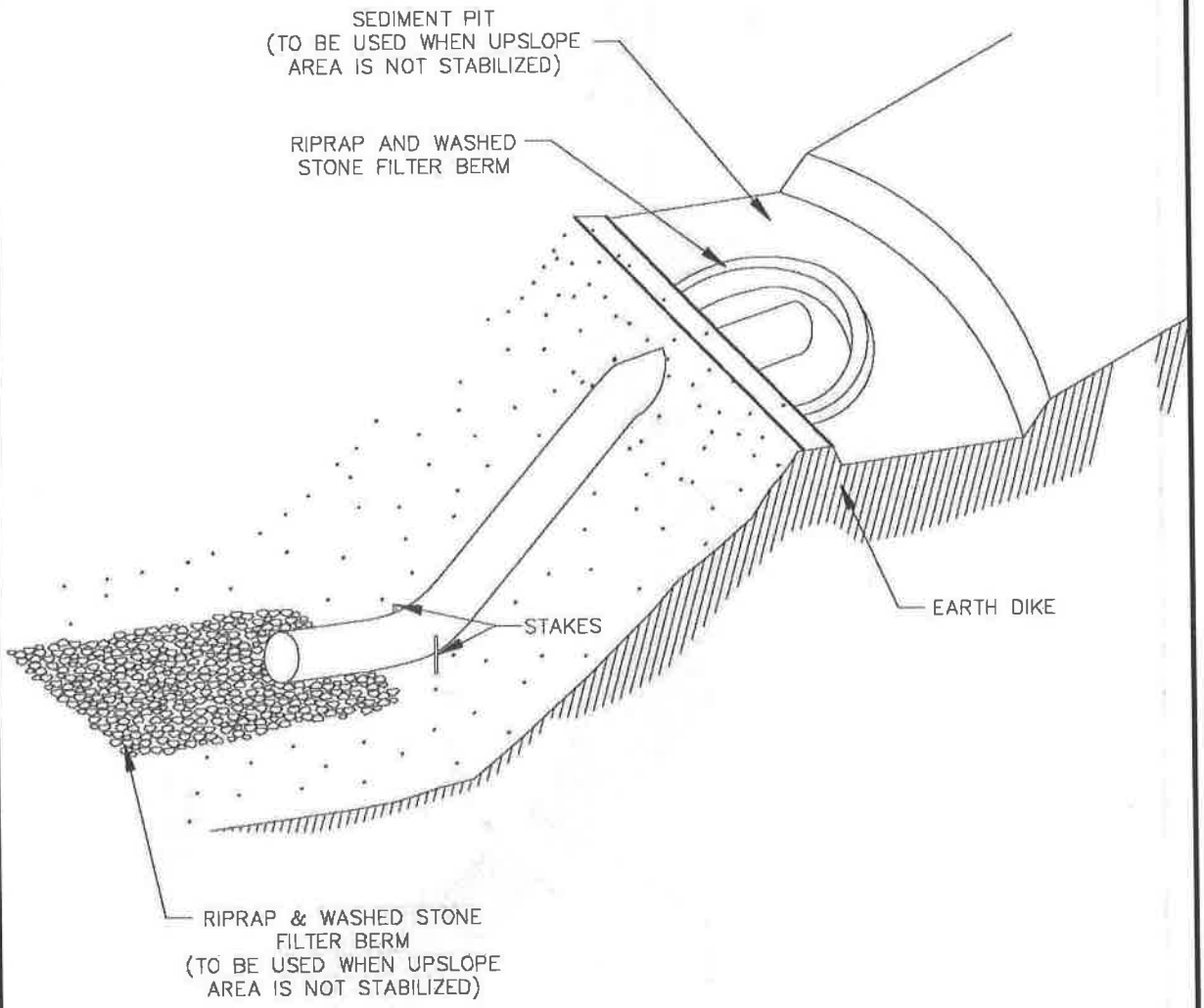
SECTION A–A

STORMWATER MANUAL

FIGURE 11–14

FLEXIBLE PIPE SLOPE DRAIN

(OCTOBER 1, 2016)



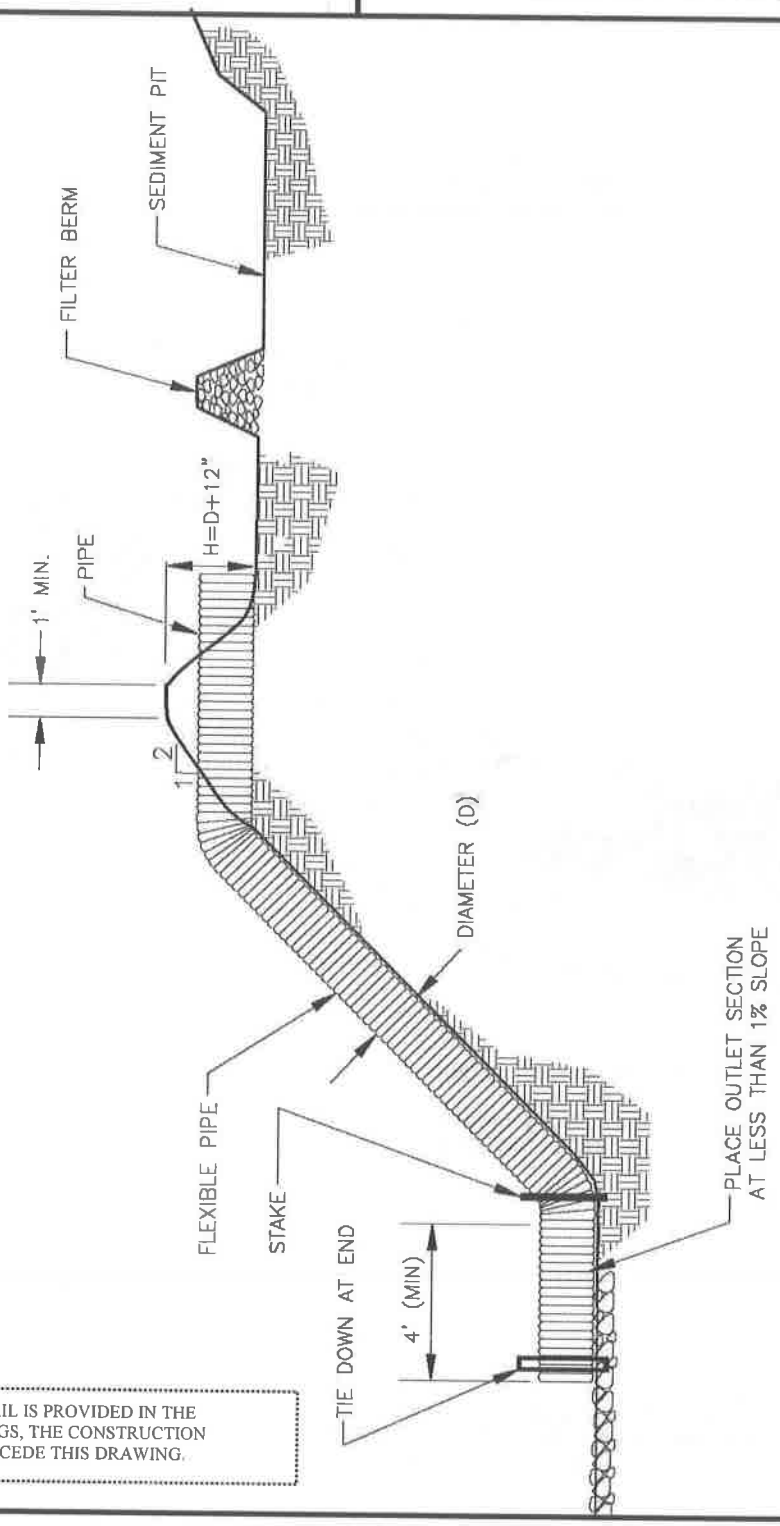
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–15

SLOPE DRAIN – PROFILE

(OCTOBER 1, 2016)



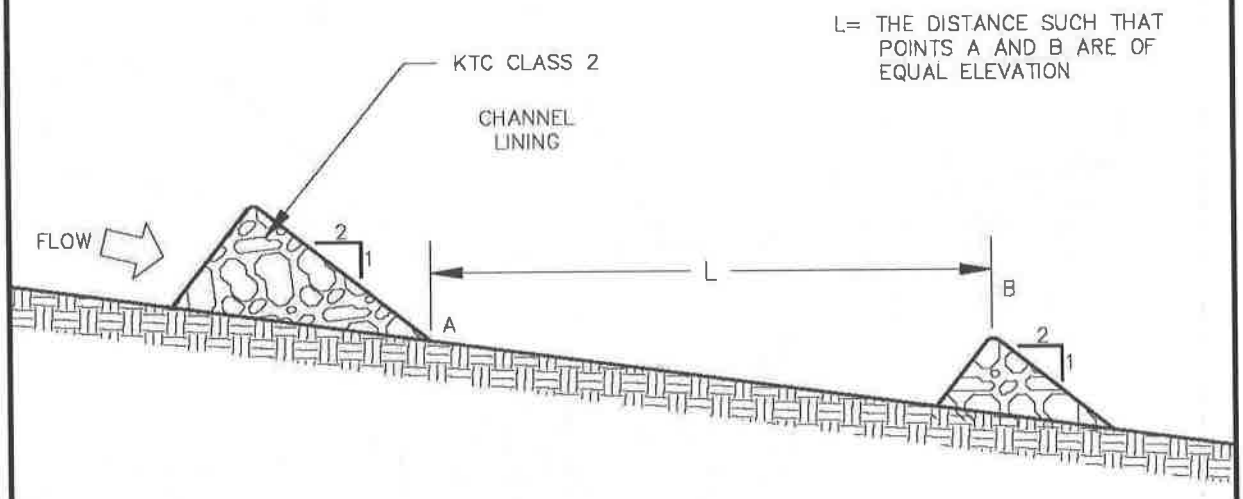
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

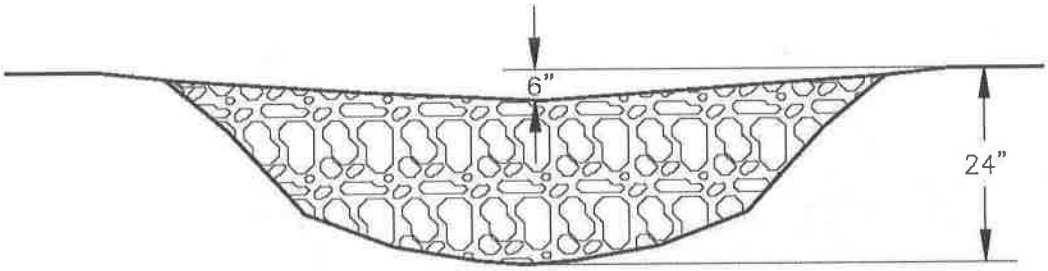
FIGURE 11-16

ROCK CHECK DAM

(OCTOBER 1, 2016)



LONGITUDINAL SECTION SHOWING SPACING BETWEEN CHECK DAMS



SECTION ACROSS CHANNEL

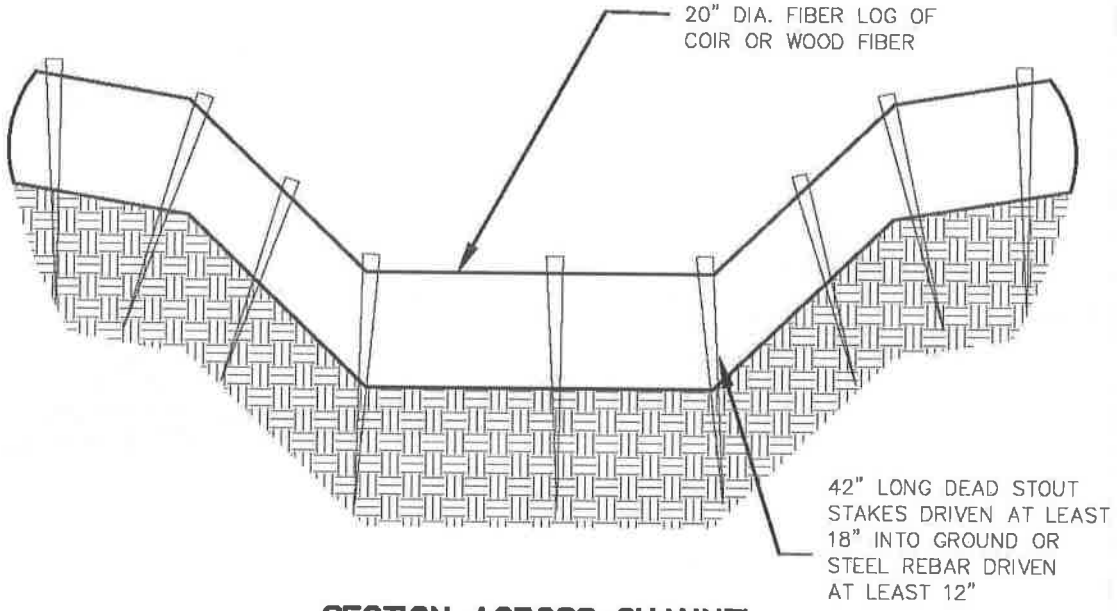
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–17

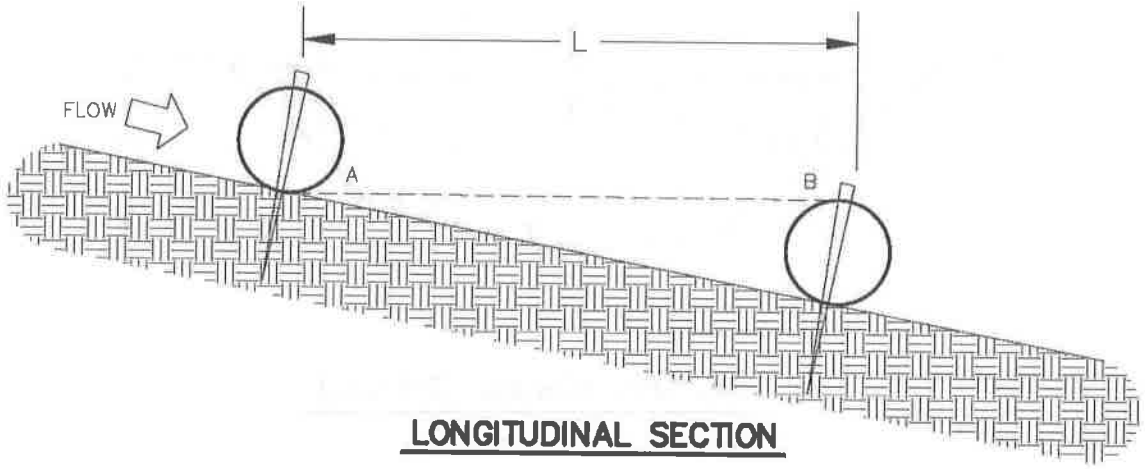
FIBER LOG CHECK DAM

(OCTOBER 1, 2016)



SECTION ACROSS CHANNEL

STAKES SHALL BE SPACED NO FURTHER THAN 24" AND SHALL BE DRIVEN AT EACH SIGNIFICANT SLOPE BREAK AND WITHIN 6" OF EACH END.



LONGITUDINAL SECTION

L = DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION

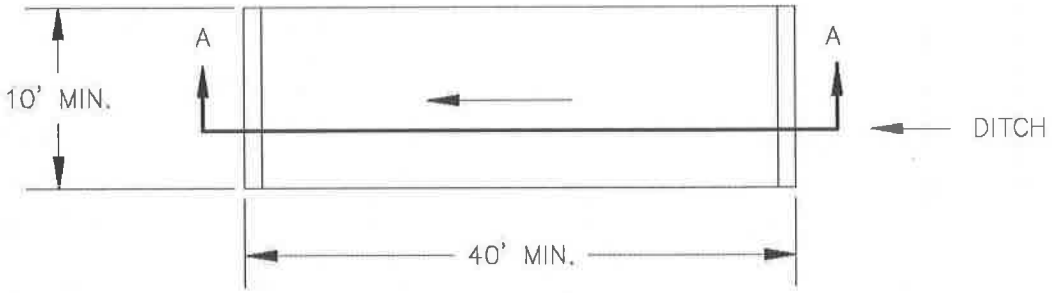
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

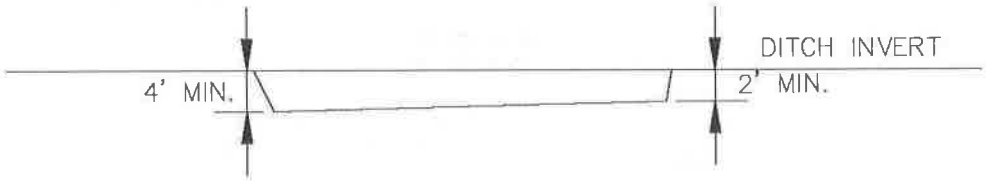
FIGURE 11–18

SEDIMENT TRAP

(OCTOBER 1, 2016)



PLAN VIEW



SECTION A–A

NOTES:

1) THE SIZE, SHAPE AND LOCATION OF TRAP MAY BE ADJUSTED FROM THAT SHOWN IN THE CONSTRUCTION PLANS, AS DIRECTED BY THE ENGINEER.
2) THE SEDIMENT TRAP MAY BE CONSTRUCTED AS DIRECTED BY THE ENGINEER AS LONG AS THE AREA AND DEPTH IS AT LEAST AS THAT INDICATED ON THE PLANS.
3) SEDIMENT TRAP SHALL BE CONSTRUCTED BY EXCAVATING THE BASIN IN NATURAL OR EXCAVATED CHANNELS. SEDIMENT DEPOSITS IN TRAP SHALL BE REMOVED EACH TIME THE TRAP IS APPROXIMATELY 50 PERCENT FILLED. WHEN THEIR USEFULNESS HAS ENDED, THE TRAPS SHALL BE REMOVED, SURPLUS MATERIAL DISPOSED OF AND THE ENTIRE DISTURBED AREA SHALL BE SEEDED AND PROTECTED, OR SODDED, AS DIRECTED. SEDIMENT TRAPS MAY REMAIN IN PLACE UPON COMPLETION OF THE PROJECT ONLY WHEN PERMITTED BY THE ENGINEER OR THE PLANS.

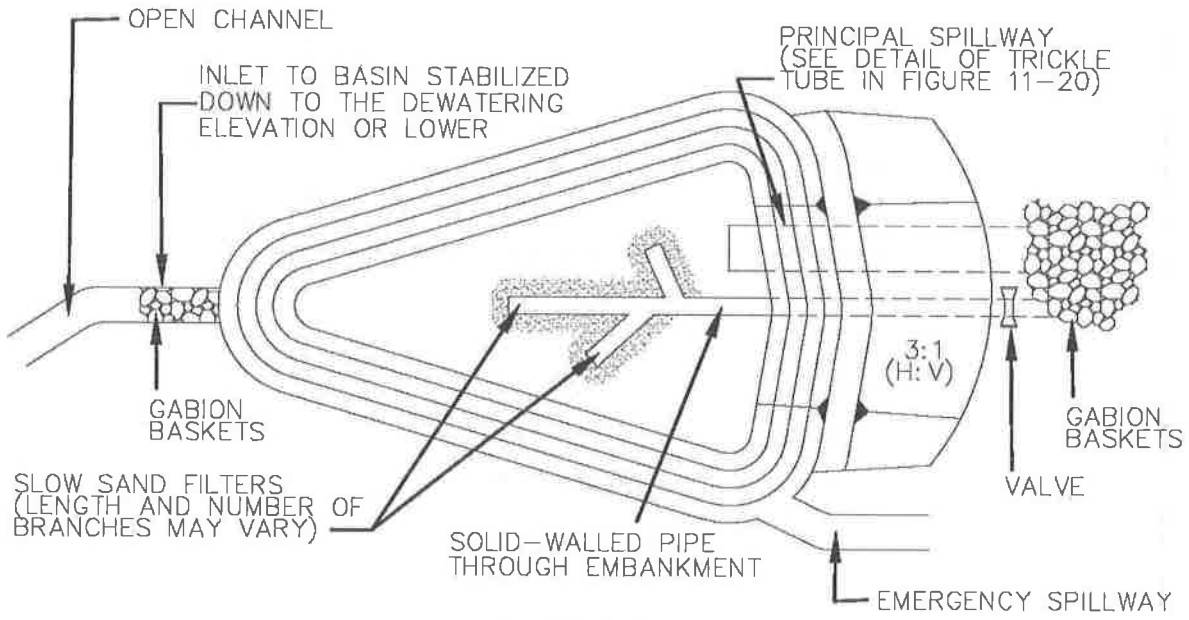
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–19

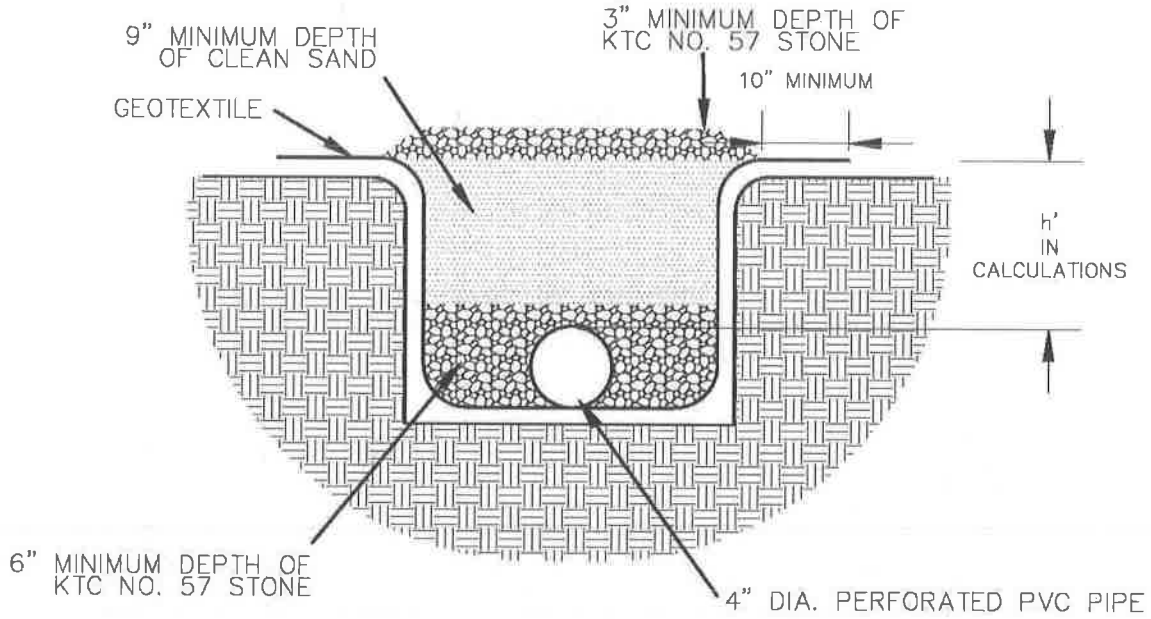
SEDIMENT POND WITH SAND FILTER OUTLET

(OCTOBER 1, 2016)



PLAN VIEW

N.T.S.



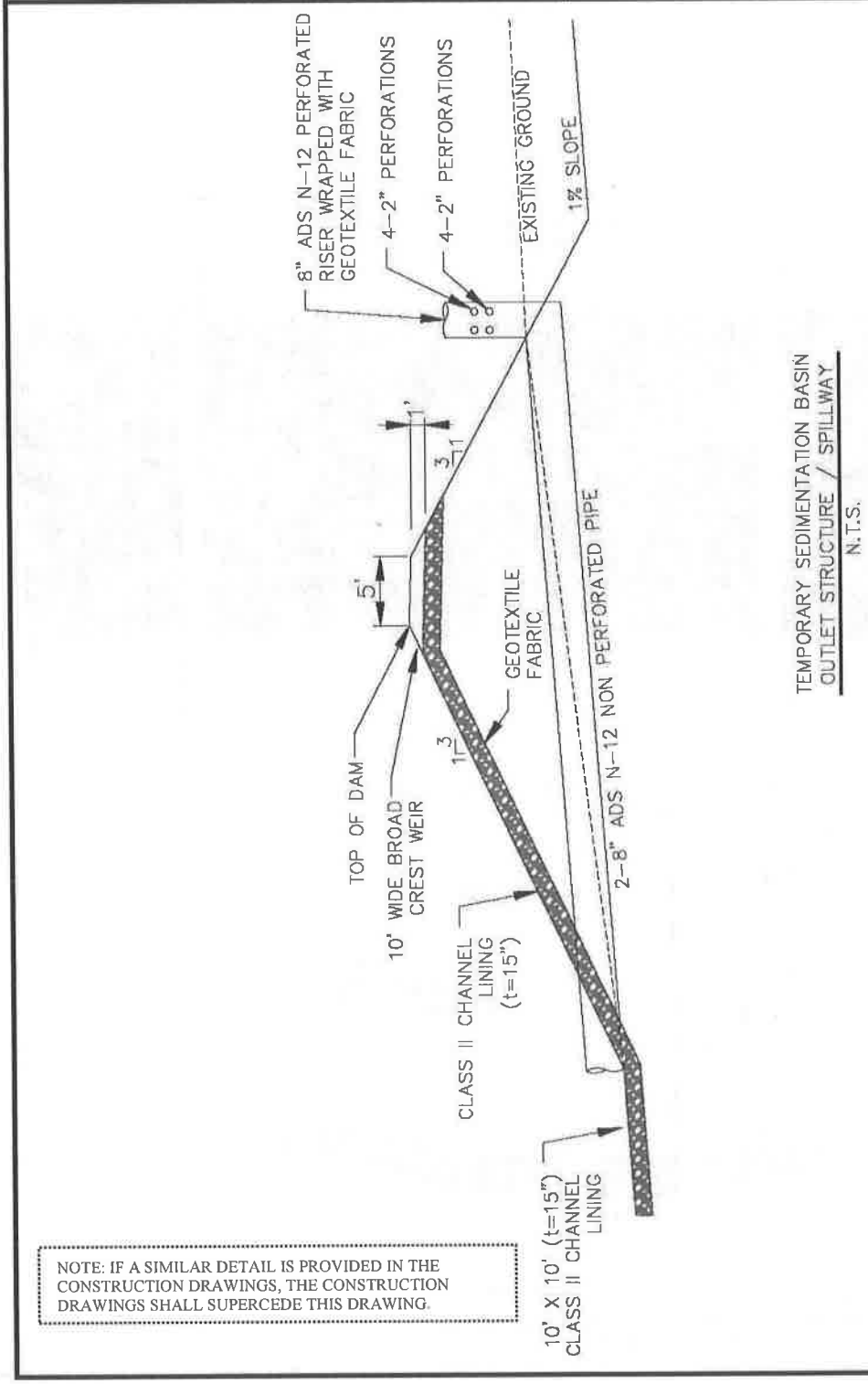
TYPICAL SECTION

N.T.S.

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–20
TEMPORARY SEDIMENTATION BASIN
OUTLET STRUCTURE / SPILLWAY
DETAIL
(OCTOBER 1, 2016)



TEMPORARY SEDIMENTATION BASIN
OUTLET STRUCTURE / SPILLWAY
N.T.S.

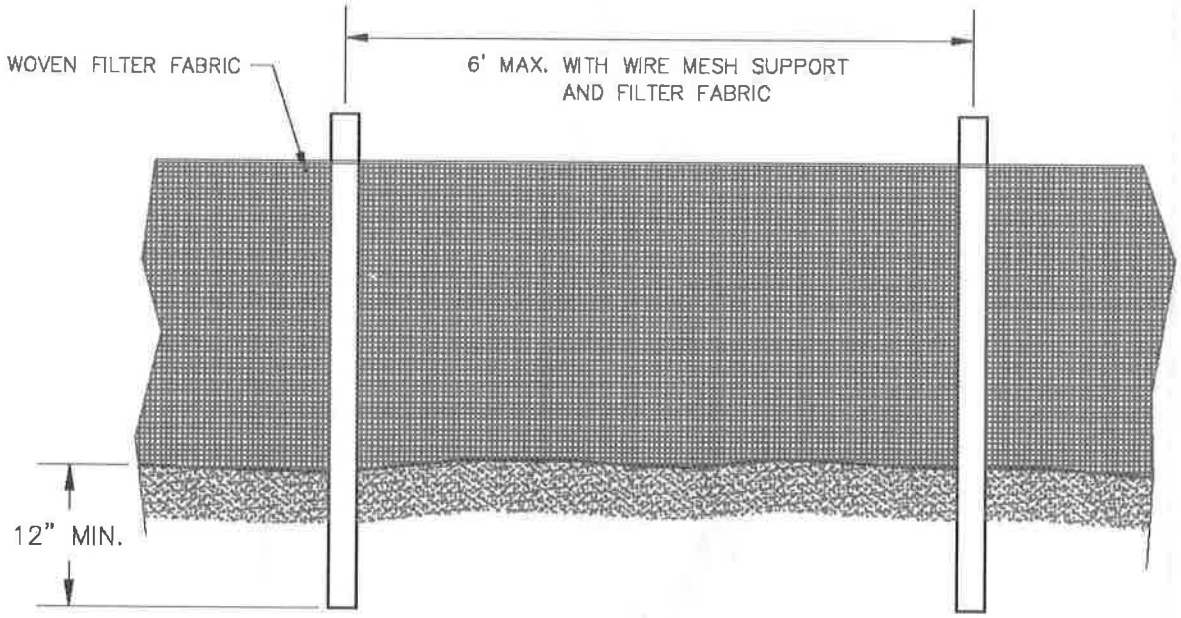
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

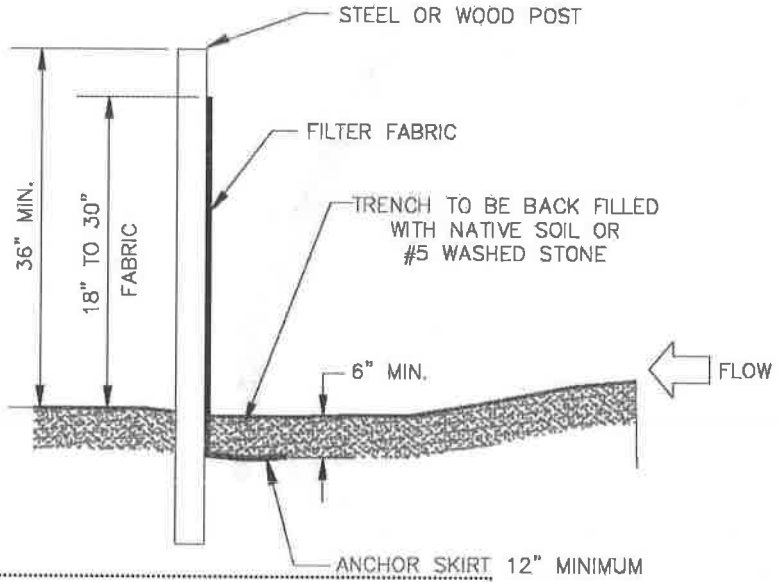
STORMWATER MANUAL

FIGURE 11–21

TEMPORARY SILT FENCE

(OCTOBER 1, 2016)





NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–22

TEMPORARY SILT FENCE
GENERAL NOTES

(OCTOBER 1, 2016)

GENERAL NOTES

1. FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL AND CUT TO THE LENGTH OF THE BARRIER. WHEN JOINTS CANNOT BE AVOIDED, FILTER FABRIC SHALL BE SPLICED TOGETHER ONLY AT A POST WITH 3 FOOT MIN. OVERLAP, AND SECURELY SEALED.
2. POSTS SHALL BE SPACED AT 6 FOOT INTERVALS IN AREAS OF RAPID RUNOFF.
3. POSTS SHALL BE AT LEAST 5 FEET IN LENGTH.
4. STEEL POSTS SHALL HAVE PROJECTIONS FOR FASTENING WIRE AND FABRIC.
5. WOOD POSTS SHALL BE 2 INCHES BY 2 INCHES OR EQUIVALENT. STEEL POSTS SHALL BE 1.33 LBS PER LINEAR FOOT.
6. A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH IN LENGTH, WIRE TIES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 2 INCHES AND SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
7. WASHED STONE SHALL BE USED TO BURY SKIRT WHEN SILT FENCE IS USED ADJACENT TO A CHANNEL, CREEK, OR POND.
8. TURN SILT FENCE UP SLOPE AT ENDS.

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

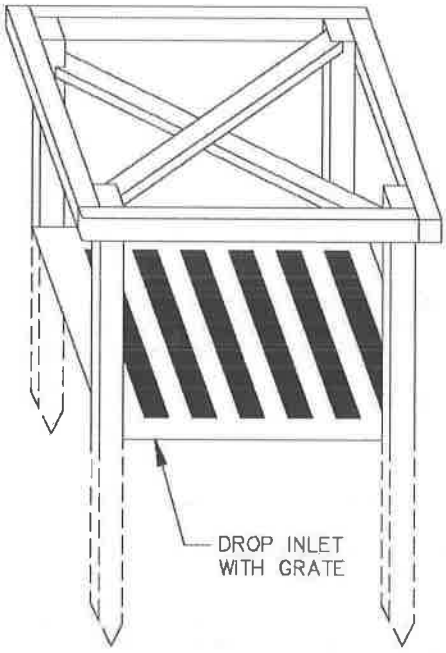
STORMWATER MANUAL

FIGURE 11–23

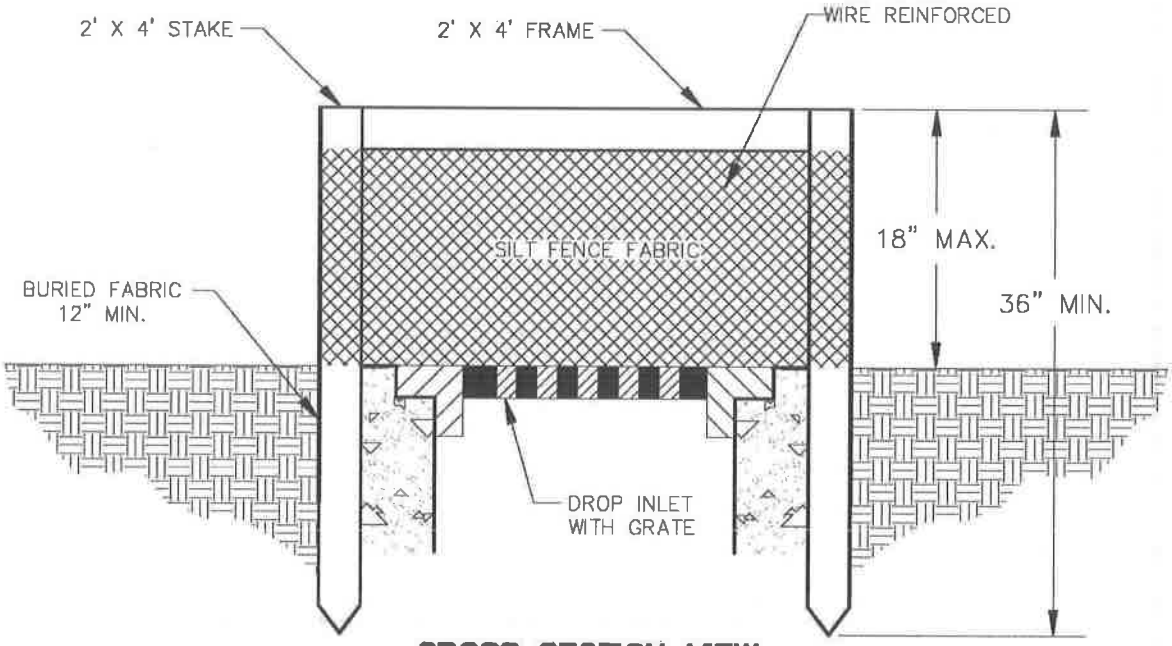
DROP INLET PROTECTION
USING SILT FENCE

(OCTOBER 1, 2016)

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.



ISOMETRIC VIEW OF
2 X 4 WOOD FRAME



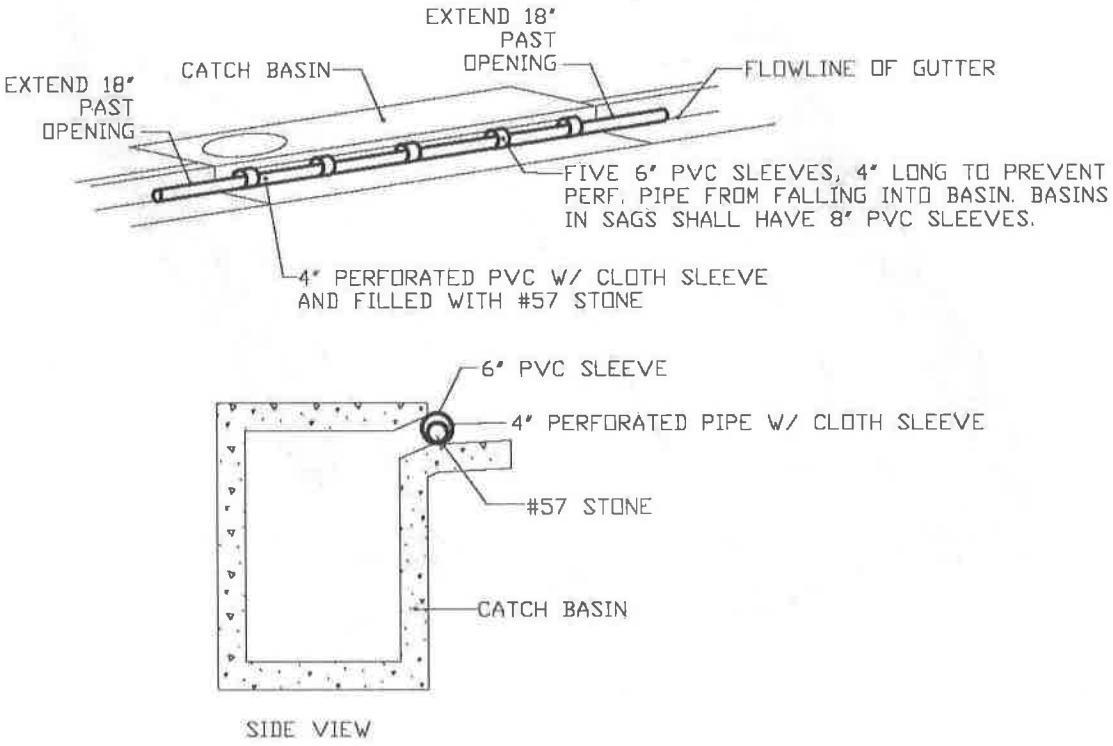
CROSS SECTION VIEW

STORMWATER MANUAL

FIGURE 11–24

CATCH BASIN INLET PROTECTION DETAIL

(OCTOBER 1, 2016)



CATCH BASIN INLET PROTECTION DETAIL

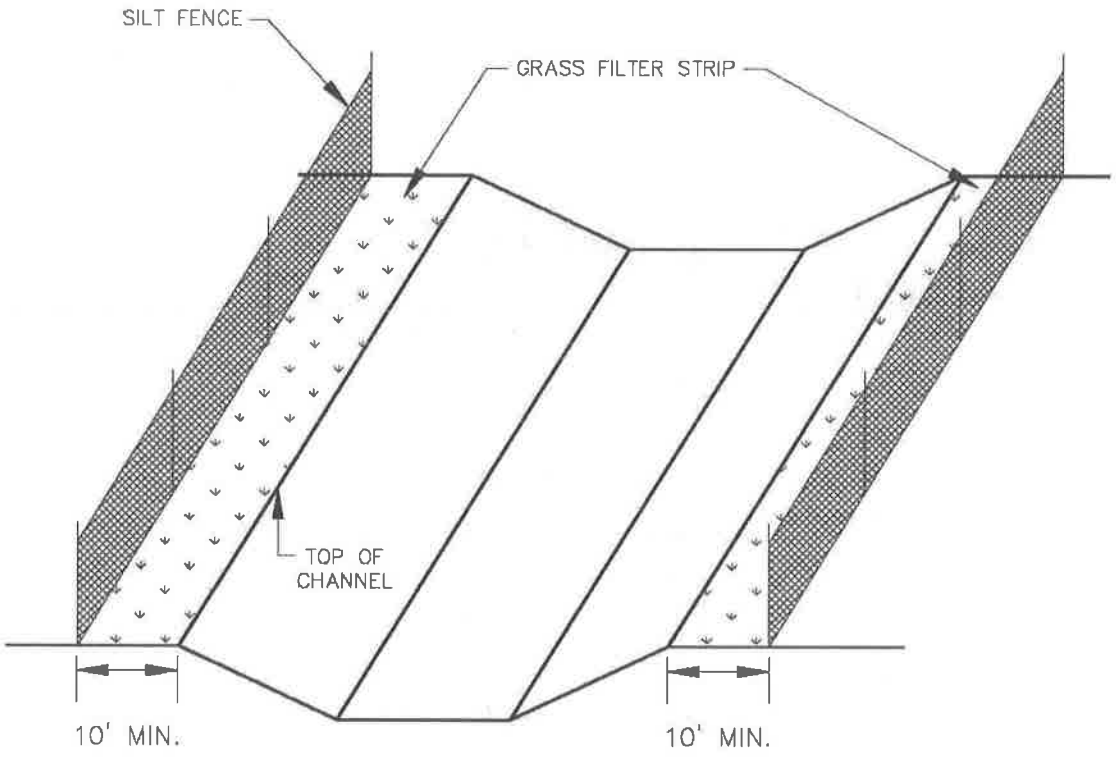
N.T.S.

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

FIGURE 11–25
FILTER STRIP FOR CONSTRUCTED CHANNEL

(OCTOBER 1, 2016)



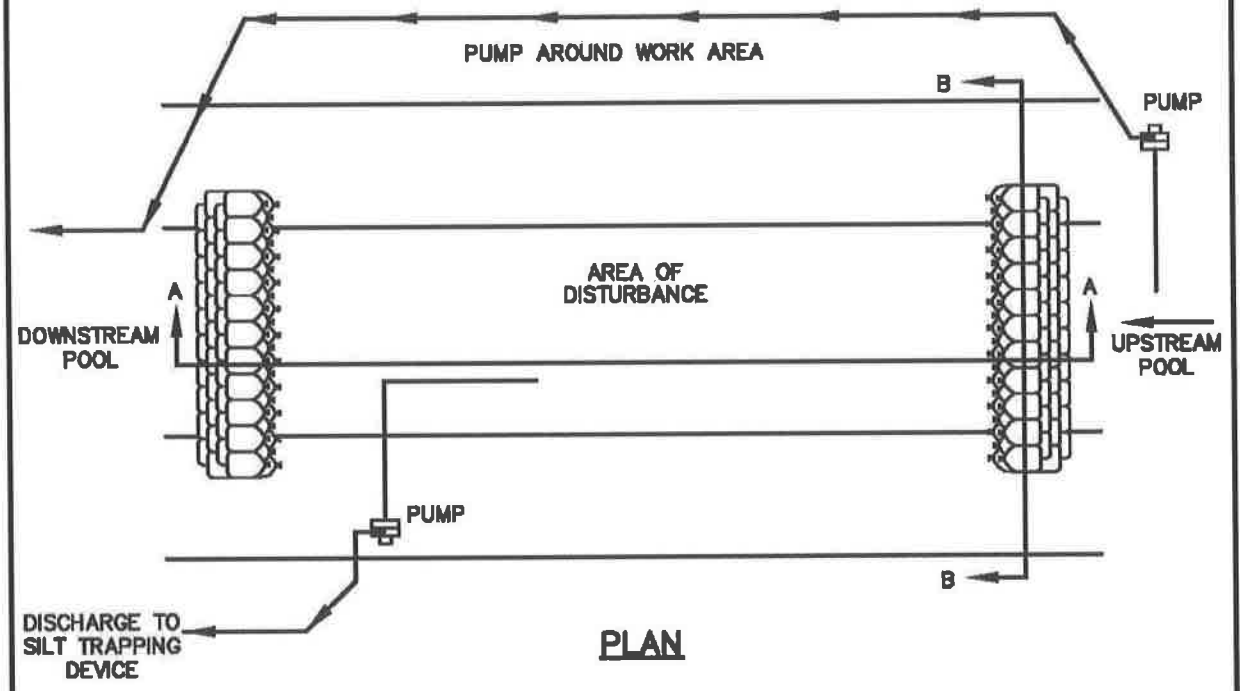
NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

STORMWATER MANUAL

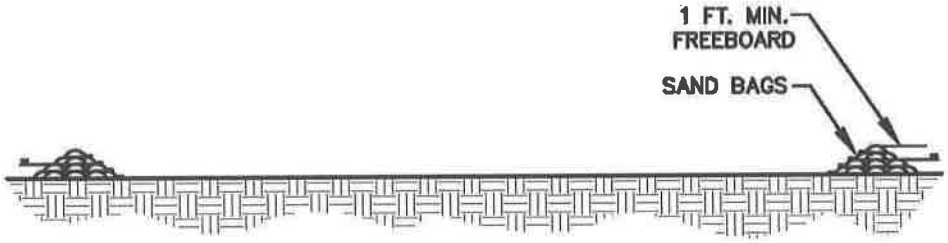
FIGURE 11–26

PUMP–AROUND FLOW DIVERSION

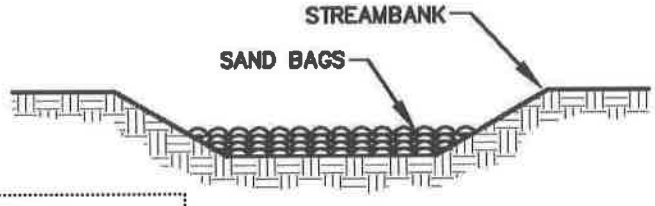
(OCTOBER 1, 2016)



PLAN



SECTION A–A



SECTION B–B

NOTE: IF A SIMILAR DETAIL IS PROVIDED IN THE CONSTRUCTION DRAWINGS, THE CONSTRUCTION DRAWINGS SHALL SUPERCEDE THIS DRAWING.

END OF SECTION

SECTION 02373 – STREAM CROSSINGS, STREAMBANK RESTORATION, AND STREAM BUFFER RESTORATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, and equipment required for installing all structural and vegetative features associated with stream crossings, streambank restoration, and stream buffer restoration areas. Work in this section may include installation of Constructed Riffles, Temporary Stream Crossings, Streambank Restoration, and/or Stream Buffer Restoration.

B. The Contractor shall take all measures necessary to minimize the use of equipment within the banks of a stream.

1.02 PERMIT REQUIREMENTS

A. The Contractor is responsible to meet and follow all of the requirements and provisions in all project permits. A copy of applicable permits acquired by the Owner is included in Section 00890 – Permits.

PART 2 – PRODUCTS

2.01 STREAM BUFFER PERMANENT SEEDING

A. Stream buffer seeding shall be used for permanent seeding where land disturbance has occurred within 25 feet of the stream bank, with the following exceptions:

1. If a property owner landscaping agreement differs from this specification, the property owner landscaping agreement shall be followed on that property, or

2. The Construction Drawings identify a different location and/or seed mix.

B. The Stream Buffer Permanent Seed Mix shall consist of the following mix spread at a rate of 20 lbs/acre:

Common Name	Scientific Name	%	Lbs/ac
Redtop	*Agrostis alba*	10%	2
Elm-leaved Goldenrod	*Solidago ulmifolia*	5%	1
Big Bluestem	*Andropodon gerardii*	20%	4
Virginia Wild Rye	*Elymus virginicus*	20%	4
Prairie Switchgrass	*Panicum virgatum*	15%	3
Cutleaf Coneflower	*Rudbeckia laciniata*	5%	1
Ox Eye Sunflower	*Heliopsis helianthoides*	5%	1
River Oats	*Chasmanthium latifolium*	15%	3
Black-eyed Susan	*Rudbeckia hirta*	5%	1
TOTAL		**100%**	**20**

2.02 WOVEN COIR FABRIC

A. The Contractor shall submit a shop drawing for the proposed material for review and approval by the Owner's Engineer prior to placement.

B. Woven Coir Fabric shall be woven from machine twisted coir twines made of bristle coir. Woven Coir Fabric shall be Rolanka BioD-Mat 90 or approved equal meeting the following minimum requirements:

PROPERTY	TEST METHOD	TYPICAL
Mass/Unit Area (oz/yd^2)	ASTM D 3776	29
Tensile Strength (Machine Direction) (lbs./ft)	ASTM D 4595	1776
Tensile Strength (Transverse Directions) (lbs./ft)	ASTM D 4595	936
Elongation (Machine Direction) (%)	ASTM D 4595	52
Elongation (Transverse Direction) (%)	ASTM D 4595	24
Thickness (in.)	ASTM D 1777	0.35
Recommended Shear Stress ($lbs./ft.^2$)	N/A	5
Recommended Flow (ft/s)	N/A	16

C. Wooden stakes to fasten coir fabric to the soil shall be hardwood stakes that are solid and free of rot, with the following approximate dimensions: 1" x 2" x 18" (tapered to a point). The Contractor may fabricate or purchase stakes.

D. Sod staples for anchoring void spaces of the coir fabric shall be bio-degradable wooden stakes.

2.03 CONTAINER PLANTS

A. Tree and shrub plant species and quantities shall be in accordance with those listed or shown on the Construction Drawings. All trees and shrubs shall be in containers grown with air-root pruned technique, spin-out containers or equivalent.

B. Woody plants shall exhibit a fully developed fibrous root system that allows the root ball to remain intact after removal from the container. Roots shall not be pot-bound or spiraling in the container.

C. Double shredded hardwood mulch shall consist of the bark from hardwood trees which has been milled and screened to a maximum 4 inch particle size. Mulch shall provide a uniform texture free from sawdust, weed seeds, foreign materials and any artificially introduced chemical compounds detrimental to plant life. Mulch shall be well aged (a minimum age of 6 months).

D. Nursery stock material shall be identified with attached, durable, waterproof labels and weatherproof ink. Labels shall state the scientific name of the specified plants. Common names are not acceptable. The scientific names must match those in the project plans. Plants that are unlabeled or improperly labeled shall not be accepted. Plant material shall be protected during delivery to prevent desiccation and damage to branches, trunk, root system, or earth ball.

E. Plant material shall be checked for unauthorized substitution and to establish nursery grown status. Plant material showing desiccation, abrasion, sun-scald injury, disfigurement, or unauthorized substitution shall be rejected. Container-grown plant material shall show new

fibrous roots and the root mass shall contain its shape when removed from the container. Plant material with broken containers shall be rejected. All rejected plant material shall be removed from the project site by the Contractor by the close of each working day.

F. Fertilizer for container plants shall be MYCOtabs 20-10-5 slow release mycorrhizal fertilizer tablets or equivalent.

2.04 LIVE STAKES

A. Live stake plant species shall be silky dogwood unless otherwise denoted in the Construction Drawings. Cuttings shall be alive, but dormant, with side branches removed and bark intact.

B. Cuttings shall be ½ to 2-inch diameter stock and 3 feet in length.

C. The basal ends of the cuttings shall be cut on an angle to facilitate insertion into the soil.

D. The materials may be collected or purchased.

E. No species shall be substituted without prior written approval from the Owner.

F. Cuttings shall be bagged and/or bundled by species and shall be identified with durable and waterproof labeling and/or weatherproof ink. Labels shall state the scientific name of the plant species grouping. Common names are not acceptable. The scientific names must match those in the specification. Plants that are unlabeled or improperly labeled shall not be accepted.

G. Plant material that is damaged or desiccated, or does not meet the material specifications shall not be accepted. All rejected plant material shall be removed from the project site by the Contractor by the close of the working day.

2.05 BRANCH PACKING

A. Material may consist of branches of silky dogwood species. Branches should be a minimum of 5 feet long and should be installed the same day that they are prepared, if harvested locally. Materials can be either harvested from existing living trees or purchased from a vendor. If immediate planting cannot be performed, the basal end of the plant shall be kept in water and the plant shall be refrigerated.

2.06 STONE

A. All stone shall consist of clean limestone of the specified size; hard, durable, and angular in shape, and resistant to weathering. Stone shall not contain deleterious amounts of shale, as determined by the Engineer. Porous or friable stone shall not be accepted.

B. Stone shall be of the size and quantity as shown on the Construction Drawings.

2.07 TOPSOIL

A. Topsoil shall consist of the upper portion of the soil profile and shall be loose, friable soil that is free of stones larger than one inch (1"), sub-soil, refuse and other debris including stumps, roots, brush, weeds, and non-organic materials. The acceptable soil texture classification for topsoil, in accordance with the U.S. Department of Agriculture is: clay (40% maximum), silt (70% maximum), and sand (60% maximum). Manure and/or partially composted materials are not acceptable. Topsoil (both salvaged and furnished) shall meet the following minimum

standards through analytical testing, unless otherwise directed by LFUCG or the Owner's Engineer:

Organic Matter	> 3%
pH (range)	5.8 – 7.0
Soluble Salts	< 500 parts per million

The Owner's Engineer shall visually approve representative samples of topsoil. All operations involved in the placing, spreading, and rolling of the topsoil shall be subject to the approval of the Owner. Selected topsoil shall be obtained from approved stockpiles of materials from excavation, from stripping, from borrow areas, or from other approved sources.

PART 3 – EXECUTION

3.01 GENERAL

A. All work within and along a stream shall be consistent with all project permits and the requirements of the state and local regulatory agencies.

B. The Contractor shall take care to prevent the deposition of sediment into the stream.

C. Stream diversion operations shall be scheduled such that work is completed as quickly as possible. Contractor shall not construct in a stream when rainfall is expected during the time excavation will be occurring in the stream.

D. Gravity sewer lines, force mains and water lines that cross streams shall be constructed by methods that maintain normal stream flow and allow for a dry excavation. Water pumped from the excavation shall be contained and allowed to settle prior to reentering the stream. Excavation equipment and vehicles shall operate outside of the flowing portion of the stream. Spoil material from the line excavation shall not be allowed to enter the flowing portion of the stream. The provisions of this condition shall apply to all types of utility line stream crossings.

E. Removal of riparian vegetation in the stream buffer and on the stream banks shall be limited to that necessary for equipment access. Effective erosion and sedimentation control measures shall be employed at all times during the project to prevent degradation of waters of the Commonwealth. Within 25 feet of a stream, site regrading and reseeding shall be accomplished within 7 days after disturbance.

3.02 STREAM BUFFER PERMANENT SEEDING

A. Stream Buffer Permanent Seeding shall be conducted in accordance with the specifications of Section 02372, Article 3.04 - Permanent Seed using the seed mix listed in this Section 02373, Article 2.01 - Stream Buffer Permanent Seeding.

3.03 WOVEN COIR FABRIC

A. When placing woven coir fabric, the surface of the soil should be smooth and free of rocks, roots and other obstructions.

B. Seed the prepared soil areas in accordance with Section 02372, Article 3.04 – Permanent Seed prior to the installation of the coir fabric.

C. Fabric shall be trenched, placed and staked in according to the Construction Drawings.

D. Biodegradable wooden stakes shall be inserted sporadically within void spaces and areas with puckers in the fabric.

3.04 CONTAINER PLANTS

A. Planting operations shall be performed only during periods when successful results are likely. To minimize stress or transplant shock, no plants shall be installed when ambient temperatures are forecasted to rise above 90°F at any point during a forty-eight (48) hour period following installation. In addition, no plants shall be installed when ambient temperatures are forecasted to drop below freezing. In general, trees and shrubs do best when planted in early spring or fall.

B. If trees and shrubs are not planted through erosion control blanket, then mulch in the form of hardwood mulch or mulch mats shall be used.

C. The Contractor shall mulch and fertilize.

D. All trees and shrubs should be fertilized with MYCOtabs 20-10-5 slow release mycorrhizal fertilizer tablets or equivalent. Each containerized plant should receive one 21 gram tablet. All fertilizer tablets are to be installed 4 inches below and 4 inches to the side of the plant roots.

E. All plants shall be watered thoroughly once unloaded and immediately after planting. Water until saturated once per week for the first four to six weeks and once every other week through the fall season. Water shall not contain elements toxic to plant life.

F. Prior to shipping to the site, the Contractor shall request approval of trees, shrubs, and fertilizer ordered. A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery of trees and shrubs.

G. If plants are not planted on the day of delivery, the plants shall be stored onsite in a shaded location and will be kept moist and cool.

H. Each root ball from containerized woody stock shall be carefully removed from the container without damaging the root system or plant.

I. When digging a planting hole for containerized woody stock, the diameter of the planting hole shall be at least 30% greater than the diameter of the root ball.

J. Trees and shrubs shall be placed in the center of the hole with top of root ball 1 inch above finished grades.

K. Following planting, each hole shall be backfilled with soil removed from the hole when the hole was formed.

L. Where the removed soil is unacceptable, a soil amendment shall be required.

M. Each planted tree and shrub shall have a minimum depth of 6 inches of organic material.

N. Organic soil amendment may consist of composted wood chips, composted leaf mulch, or other suitable and available natural organic material.

O. If amending the planting areas with topsoil, acceptable topsoil shall meet the material requirements of this Section 02373, Article 3.08 - Topsoil.

P. Containerized trees and shrubs planted through erosion control blanket shall be planted through clean incisions in the blanket. Incisions shall be parallel to the direction of flow in the stream.

Q. Portions of the erosion control blanket shall not be removed.

R. The blanket incision shall be securely closed with wire staples or stakes.

S. 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.

T. If vegetative cover is not established within 21 days, the area shall be reseeded.

3.05 LIVE STAKES

A. Live stakes shall be installed at any time during their dormant period when the ground is not frozen. Live stakes shall not be installed after dormancy is broken or after sprouting. Stakes that begin sprouting before planting will be rejected.

B. Prior to shipping to the site, the Contractor shall request approval from the Owner's Engineer of live stakes ordered. A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery of live stakes.

C. Plants shall be stored in a continuously cool, covered, and moist state.

D. Live stakes shall be soaked for 24 hours prior to installation in clear water, with the basal end of the plant in the water and shall be removed from the water no more than 1 hour before planting.

E. Live stakes shall not be soaked for a length greater than ten (10) days.

F. The angled end of the live stakes shall be inserted into the soil manually or with the use of a dead blow hammer with the uncut end protruding for approximately 3/5 of the cutting length.

G. In rock toe, live stakes shall be inserted to one-half their length into soil below stone fill with a minimum of two buds exposed above the stone fill. An iron bar or a stinger attached to a backhoe bucket can be used to make a pilot hole in firm or rocky soil.

H. If a pilot hole is used, the diameter of the pilot hole shall be less than the diameter of the smallest live stake to ensure firm contact with the soil.

I. Each live stake shall be positioned perpendicular to the slope at a 45° angle facing downstream followed by foot compaction around each cutting.

J. Live stakes shall be installed in a random configuration.

K. Live stakes that become split or "mushroomed" during installation shall be replaced at the Contactor's expense.

3.06 BRANCH PACKING

A. Prior to shipping to the site, the Contractor shall request approval from the Owner's Engineer of live stakes ordered. A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery of live stakes.

B. Plants shall be stored in a continuously cool, covered, and moist state.

C. Branches shall be soaked for 24 hours prior to installation in clear water, with the basal end of the plant in the water and shall be removed from the water no more than 1 hour before planting.

D. Branches shall not be soaked for a length greater than ten (10) days.

E. The live branches should be placed in a crisscross configuration with the growing tips generally oriented toward the slope face.

F. The density of the branches shall be 10-15 branches per linear foot.

G. After the live branches are configured, cover with a thin layer of soil approximately 1" thick.

3.07 STONE

A. All stone shall consist of clean limestone of the specified size; hard, durable, and angular in shape, and resistant to weathering. Stone shall not contain deleterious amounts of shale, as determined by the Engineer. Porous or friable stone shall not be accepted.

B. Stone shall be of the size and quantity as shown on the Construction Drawings and shall be placed in the manner shown in Construction Drawings.

3.08 TOPSOIL

A. All proposed planted areas, not including stream banks, are to be covered with a minimum of 6 inches of topsoil prior to seeding or planting. Do not place topsoil within a stream channel or on a stream bank where full bank flow could erode and remove the material.

B. Topsoil shall be evenly placed and spread over the graded area to a depth of 6 inches.

C. Minimize compaction during all operations by utilizing equipment having low unit pressure ground contact and by limiting repeat passes over the same areas.

3.09 PUMP AROUND FLOW DIVERSION FOR STREAM CROSSINGS

A. For stream crossings, the Contractor shall install, maintain, and operate all cofferdams, pumps, and protective works needed to divert stream flow and other surface water through and around the project work zone.

B. The Contractor is responsible to determine the number and sizes of pumps necessary for dewatering needs.

C. The Contractor shall inform the Owner's Engineer of a plan for diverting the stream flow. The de-watering plan must be approved by the Owner prior to the start of work and it shall include information on the type, sizes of pumps, dam construction techniques, discharge outfall protection, and other relevant information.

D. Operations shall be scheduled such that diversion installation, in-stream excavation, in-stream construction, stream restoration, and diversion removal are completed as quickly as possible.

E. The Contractor shall not construct in a stream when rainfall is expected during the time excavation will be occurring in the stream.

F. To capture or divert water flows, cofferdams can be used across the stream channel and secondary drainageways above (up-slope from) the work side as follows:

1. Cofferdams shall be constructed of materials that will have a minimal impact on the stream system. Cofferdams constructed of soil or material from the site shall not be used unless specifically directed by the Owner's Engineer.

2. Acceptable materials shall include stone, water structures, plastic barriers, or sand bags filled with clean and washed sand.

3. Contractor shall add sand bags filled with clean and washed sand as required to seal leaks in rock cofferdams.

4. The Contractor is responsible to install all cofferdams/diversion structures in a safe and correct manner. Cofferdams must be installed so as to withstand the pressures exerted by the stream flow or ponded water against the cofferdam.

5. Commercial projects used as cofferdams (i.e. water structures, plastic barriers) shall be installed in accordance with the manufacturer's specifications.

6. The Contractor is permitted to make only minor disturbances to the streambed or banks as may be required to properly install the cofferdam.

G. Stream flow shall be pumped around the cofferdams and discharged back into the same drainageway that the water was taken from.

H. The Contractor shall be responsible to provide all pumps, hoses, pipelines, fuel tanks, and other items required to pump the stream flow around the work site, and for providing supervision of the pumping operation during all hours the pumps are running.

1. The Contractor shall be responsible for calculating the required pump capacity to handle the average stream flow in the area of the work.

2. The Contractor shall provide pumps that are in good operating order and free of leaks. Pumps that are leaking fuel, lubricants, or other material, shall be immediately repaired or replaced as necessary. All pump equipment shall be properly equipped with mufflers and other noise suppression equipment to minimize noise impacts on the surrounding residences.

3. Discharge hoses shall be reasonably free of leaks at either the fittings or the discharge hose casing. No leaks from discharge lines shall be allowed to cause erosion.

4. The Contractor shall provide adequate suction hose length to allow the pumps to be placed back from the immediate edge of the stream. Electric sump type pumps are exempt from this requirement.

5. Only clean water will be allowed to enter the storm system or stream. The pumping operation shall not allow for sediment from the stream bottom to be pulled into the pump.

I. Contractor shall dewater the work area and pump the work zone dewatering water into a sediment trapping device.

J. Outlet protection shall be installed as required at the discharge point to prevent erosion of soils and the streambed or bank.

K. Contractor shall complete construction activities across the stream.

L. Contractor shall restore the streambed and banks.

M. Contractor shall remove all materials placed for the cofferdam and outfall protection and shut down pumping operation. (Salvage sandbags for future use if multiple stream crossings are

required on the project.) Contractor shall remove all sandbags from the stream, including damaged and empty bags.

3.10 TEMPORARY STREAM CROSSING

A. Clearing and excavation of the streambed and banks shall be kept to a minimum.

B. The structure shall be removed as soon as it is no longer necessary for project construction.

C. Upon removal of the structure, the stream shall immediately be reshaped to its original cross section and properly stabilized.

D. The approaches to the structure shall consist of stone pads with a minimum thickness of 6 inches, a minimum width equal to the width of the structure, and a minimum approach length of 25 feet on each side.

E. The structure shall be inspected after every rainfall and at least once a week and all damages repaired immediately.

END OF SECTION

SECTION 02374 – ESC PERMITTING, INSPECTION, AND PERMITTING PROCEDURES

[Note to engineer: Verify that the most up to date version is included prior to advertising the project.]

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SECTION 02400 - BORING AND JACKING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Provide all labor, materials, equipment and services required to furnish and install all bored and jacked carrier pipes in encasement pipes under railroad and highway crossings as shown on the Drawings and/or specified herein.

1.02 SUBMITTALS

A. Descriptive literature, catalog cuts, or dimensional prints clearly indicating all dimensions and materials of construction, shall be submitted on all items specified herein to the Engineer for review before ordering. The submitted documents shall provide information indicating that the materials are in conformance with the Contract Documents.

B. At the time of submission, the Contractor shall, in writing, call the Engineer's attention to any deviations that the submittals may have from the requirements of the Contract Drawings and Specifications.

PART 2 - PRODUCTS

2.01 CARRIER PIPE

A. Carrier pipe shall be as specified in Section 02532 - Sewage Collection Lines or Section 02531 – Sewage Force Mains.

2.02 CASING PIPE

A. Casing pipe shall be steel, plain end, have a minimum yield point strength of 35,000 psi and conform to ASTM A 252 Grade 2 or ASTM A 139 Grade B without hydrostatic tests. The steel pipe shall have welded joints and be in at least 18 foot lengths.

B. The minimum diameter of the casing pipe shall be determined by engineer. The difference between the bell OD of the carrier pipe and the ID of the casing shall be 8-inches minimum.

C. The wall thickness of the casing pipe shall be as follows:

Carrier Pipe Nominal Diameter (Inches)							
Under 20	20 & 22	24	30	36	38	42	48
Casing Pipe Nominal Thickness (Inches)							
0.250	0.281	0.312	0.406	0.469	0.500	0.562	0.625

However, should casing pipe thickness be specified or required on Highway or Railroad permit approval sheets, said permit thickness requirement shall govern. Permit approval sheets will be made available to the Contractor.

2.03 CASING SPACERS

A. Stainless Steel Casing Spacers: Stainless steel casing spacers shall be bolt-on style with a shell made in two (2) sections of heavy T-304 stainless steel. Connecting flanges shall be ribbed for extra strength. The shell shall be lined with a PVC liner .090" thick with 85-90 durometer. All nuts and bolts are to be 18-8 stainless steel. Runners shall be made of ultra high molecular weight polymer with inherent high abrasion resistance and a low coefficient of friction. Runners shall be supported by risers made of heavy T-304 stainless steel. The supports shall be mig welded to the shell and all welds shall be fully passivated. Stainless steel casing spacers shall be made by Cascade Waterworks Mfg. Co., or equal.

B. Solid Polyethylene Casing Spacers (to be used with PVC pipe only): Solid polyethylene casing spacers shall be bolt-on style with a shell made in two (2) sections. Carrier pipe shall be wrapped with rubber strap inside casing spacer to prevent slippage. All nuts and bolts are to be 18-8 stainless steel. Solid polyethylene casing spacers shall be made by Calpico Inc., Advance Products & Systems, Inc., or equal.

2.04 CASING END SEALS

A. The ends of the casing shall be filled with concrete brick or cap block and mortar with two weep holes at the bottom. Weep holes shall use 1-inch PVC pipe.

PART 3 - EXECUTION

3.01 CROSSINGS - GENERAL

A. Steel casing pipe for crossings shall be bored and jacked (or open cut installed where indicated on the Drawings) into place to the elevations shown on the drawings. All joints between lengths shall be solidly butt-welded with a smooth non-obstructing joint inside. The casing pipe shall be installed without bends. The carrier pipe shall be installed after the casing pipe is in place, and shall extend a minimum of two (2) feet beyond each end of the casing to facilitate making joint connections. The carrier shall be braced and centered with casing spacers within the casing pipe to preclude possible flotation. Casing spacers shall be installed a maximum of eight (8) feet apart along the length of the carrier pipe within the casing pipe, within two (2) feet of each side of a pipe joint, and the rest evenly spaced. Manufacturer's recommendations may govern these requirements.

B. At each end of the casing pipe, the carrier pipe shall be sealed with casing end seals. The end seals shall extend a minimum of 12 inches in each direction from the end of the casing pipe.

C. Wood skids are <u>not</u> an acceptable method of supporting the carrier pipe.

3.02 CROSSING - RAILROAD

A. All sewer line crossings of railroads shall be prominently marked at railroad right-of-way lines, on both sides of the track crossing, by durable, fiberglass line markers located over the center of the sewer line. When possible, signs shall be located so that when standing at one sign, the other marker is visible. Signs shall show the following:

1. Name and address of Owner.
2. Contents of pipe.
3. Pressure in pipe.
4. Pipe depth below grade at point of sign.
5. Emergency telephone number in event of pipe rupture.

B. Contractor must adhere to all safety requirements of the Railway line involved in the crossing.

1. All operations shall be conducted so as to not interfere with, interrupt, or endanger the operation of trains nor damage, destroy, or endanger the integrity of railroad facilities. Operations will be subject to inspection at any and all time.

2. All cranes, lifts, or other equipment that will be operated in the vicinity of the railroad's electrification and power transmission facilities shall be electrically grounded in an approved manner.

3. Whenever equipment or personnel are working closer than fifteen (15) feet from the centerline of an adjacent track, that track shall be considered as being obstructed. Operations closer than fifteen (15) feet from the centerline of the track shall be conducted only with the permission of, and as directed by, a duly qualified railroad employee present at the site of the work.

4. Crossing the tracks at grade by equipment and personnel is prohibited except by prior arrangement with, and as directed by, the railroad line. A separate permit must be obtained, by the Contractor, for any "at grade" crossing of the tracks.

C. All railroad costs incurred by the Railway line due to work associated with the crossing (inspection, flagging, track work, etc.) shall be paid by the Owner. However, it is the Contractor's responsibility to coordinate the work with the Railway.

D. Contractor shall notify the Railway line's area engineer a minimum of 14 working days prior to desired start of construction.

3.03 BORING AND JACKING

A. The Contractor shall excavate his own pits, as he may deem necessary, and will set his grade which shall be checked by the Engineer. Permits, as required, will be furnished or obtained by the Owner, but shall be in the Contractor's hands before any excavating is commenced.

B. The boring method shall consist of pushing the pipe into the earth with a boring auger rotating within the pipe to remove the spoil.

1. The boring operation shall be progressed until the leading edge of the pipe has reached the receiving pit.

2. The front of the pipe shall be provided with mechanical arrangements or devices that will positively prevent the auger from leading the pipe so that there will be no unsupported excavation ahead of the pipe.

3. The auger and cutting head arrangement shall be removable from within the pipe in the event an obstruction is encountered.

4. The face of the cutting head shall be arranged to provide a reasonable obstruction to the free flow of soft or poor material.

5. Any method which does not have this boring arrangement will not be permitted. Contractor's boring arrangement plans and methods must be submitted to, and approved by, the Engineer.

C. In the event an obstruction is encountered in boring which cannot be removed and it becomes necessary to withdraw the casing and commence elsewhere, the hole from which the casing is withdrawn shall be completely backfilled with flowable fill concrete.

D. Insurance to be furnished by the Contractor to cover this type of work shall be adequate to meet the requirements of the Railroad and/or State or County Highway Departments.

3.04 CONTRACTOR'S RESPONSIBILITIES

A. Obtain a copy of the highway or railroad encroachment permit from LFUCG before beginning construction.

B. Attend a preconstruction meeting, if requested by the Owner, at the construction site with the Owner, Highway Inspector Engineer, and Contractor being present.

END OF SECTION

SECTION 02531 – SEWAGE FORCE MAINS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Provide all labor, materials, equipment and services required for furnishing and installing all force main pipe and appurtenances as specified and shown on Drawings.

PART 2 - PRODUCTS

2.01 POLYVINYL CHLORIDE (PVC) PLASTIC PRESSURE PIPE

A. AWWA C905 (Outside Diameter compatible with Cast Iron O.D.)

1. 14-inch through 36-inch PVC plastic pipe shall conform to ANSI/AWWA C905. Pipe shall be pressure Class 165, DR 25 for 14-inch through 16-inch; pressure Class 200, DR 21 for 18-inch through 36-inch. PVC pipe shall have a minimum laying length of 12 feet, with bell end and elastomeric gasket, and with plain end for cast-iron or ductile-iron fittings. Elastomeric gasket shall conform with the requirements of ASTM F-477. The seal of the National Sanitation Foundation Testing Laboratory must appear on each pipe.

2. Joints for polyvinyl chloride (PVC) mains shall be integral bell and spigot type joints with rubber o-ring gasket. The cleaning and assembling of the pipe joints shall be in accordance with manufacturer's recommendations.

3. Pipe color shall be green.

4. Fittings shall be DI in the same pressure class as pipe with Protecto 401 lining as specified in this Section.

B. AWWA C900 (Outside Diameter compatible with Cast Iron O.D.)

1. 8-inch through 12-inch PVC plastic pipe shall conform to ANSI/AWWA C900. Pipe shall be pressure Class 165, DR 25. PVC pipe shall have a minimum laying length of 12 feet, with bell end and elastomeric gasket, and with plain end for cast-iron or ductile-iron fittings. Elastomeric gasket shall conform with the requirements of ASTM F-477. The seal of the National Sanitation Foundation Testing Laboratory must appear on each pipe.

2. Joints for polyvinyl chloride (PVC) mains shall be integral bell and spigot type joints with rubber o-ring gasket. The cleaning and assembling of the pipe joints shall be in accordance with manufacturer's recommendations.

3. Pipe color shall be green.

4. Fittings shall be DI in the same pressure class as pipe with Protecto 401 lining as specified in this Section.

C. Pipe shall be as manufactured by JM Eagle, H & W Pipe Company, Diamond Plastics, or equal.

2.02 RESTRAINT DEVICES FOR POLYVINYL CHLORIDE PLASTIC (PVC) PIPE

A. Each restraint system shall be manufactured of ductile iron conforming to ASTM A536. A backup ring shall be utilized behind the PVC Bell. A restraint ring incorporating a plurality of individually actuating gripping surfaces shall be used to grip the pipe then bolted to the

backup ring. The restraint shall be the Series 2000PV (mechanical joint restraint to fittings) or 2800 (pipe harness) as manufactured by EBAA Iron, Inc. or approved equal.

B. Restraint devices for mechanical joint fittings and appurtenances shall conform to either AWWA C111, or AWWA C153. The working pressure for the restraint shall equal that of the pipe on which it is used.

C. Mechanical joint restraints, 4" through 24", shall meet or exceed the requirements of ASTM F1674.

D. Mechanical joint restraint shall be Series 2800 produced by EBAA Iron, Inc. or approved equal.

E. Mechanical joint retainer glands and pipe bell harnesses shall receive a fluoropolymer corrosion protective coating (EBAA Iron Mega-Bond or equal).

2.03 DUCTILE IRON (DI) PIPE AND FITTINGS

A. **Ductile iron pipe and fittings shall be furnished with Protecto 401 lining as specified herein.** Ductile iron pipe shall be furnished with rubber gasket push-on joints except as may otherwise be noted on the drawings or in difficult working areas and with approval of the Engineer. All pipe inside of casing pipe shall have restraining gaskets as specified in this Section.

B. Pressure class shall be minimum 150 psi for mechanical and push-on joint pipe.

C. Thickness design of ductile iron shall conform in all aspects to the requirements of ANSI/AWWA C150/A 21.50 latest revision.

D. Manufacture and testing of ductile iron pipe shall conform in all aspects to the requirements of ANSI/AWWA C151/A 21.51 latest revision.

E. Pipe Coatings

1. Interior Lining

a. Condition of Ductile Iron Prior to Surface Preparation

All ductile pipe and fittings shall be delivered to the application facility without asphalt, cement lining, or any other lining on the interior surface. Because removal of old linings may not be possible, the intent of this specification is that the entire interior of the ductile iron pipe and fittings shall not have been lined with any substance prior to the application of the specified lining material and no coating shall have been applied to the first six (6) inches of the exterior of the spigot ends.

b. Lining Material

The standard of quality is Protecto 401 Ceramic Epoxy. The material shall be an amine cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment. Any request for substitution must be accompanied by a successful history of lining pipe and fittings for sewer service, a test report verifying the following properties, and a certification of the test results.

(1) A permeability rating of 0.00 when tested according to Method A of ASTM E-96-66, Procedure A with a test duration of 30 days.

(2) The following test must be conducted on coupons from factory lined ductile iron pipe:

(a) ASTM B-117 Salt Spray (scribed panel) – Results to equal 0.0 undercutting after two years.

(b) ASTM G-95 Cathodic Disbondment 1.5 volts @ 77°F. Results to equal no more than 0.5 mm undercutting after 30 days.

(c) Immersion Testing rated using ASTM D-714-87.

i. 20% Sulfuric Acid – no effect after two years
ii. 25% Sodium Hydroxide – No effect after two years
iii. 160°F Distilled Water – No effect after two years
iv. 120° Tap Water (scribed panel) – 0.0 undercutting after two years with no effect.

(3) An abrasion resistance of no more than 4 mils (.10 mm) loss after one million cycles European Standard EN 598: 1994 section 7.8 Abrasion resistance.

c. Application

(1) Applicator

The lining shall be applied by a competent firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.

(2) Surface Preparation

Prior to abrasive blasting, the entire area to receive the protective compound shall be inspected for oil, grease, etc. Any areas where oil, grease, or any substance which can be removed by solvent is present, shall be solvent cleaned using the guidelines outlined in DIPRA-1 Solvent Cleaning. After the surface has been made free of grease, oil, or other substances, all areas to receive the protective compounds shall be abrasively blasted using compressed air nozzles with sand or grit abrasive media. The entire surface to be lined shall be struck with the blast media so that all rust, loose oxides, etc., are removed from the surface. Only slight stains and tightly adhering annealing oxide may be left on the surface. Any area where rust reappears before lining must be reblasted.

(3) Lining

After the surface preparation and within eight (8) hours of surface preparation, the interior of the pipe shall receive 40 mils nominal dry film thickness of Protecto 401. No lining shall take place when the substrate or ambient temperature is below 40 degrees Fahrenheit. The surface also must be dry and dust free. If flange pipe or fittings are included in the project, the lining shall not be used on the face of the flange.

(4) Coating of Bell Sockets and Spigot Ends

Due to the tolerances involved, the gasket area and spigot end up to six (6) inches back from the end of the spigot end must be coated with 6 mils nominal, 10 mils maximum Protecto Joint Compound. The joint compound shall be applied by brush to ensure coverage. Care should be taken that the joint compound is smooth without excess buildup in the gasket seat or on the spigot ends. Coating of the gasket seat and spigot ends shall be done after the application of the lining.

(5) Number of Coats

The number of coats of lining material applied shall be as recommended by the lining manufacturer. However, in no case shall this material be applied above the dry thickness per coat recommended by the lining manufacturer in printed literature. The maximum or minimum time between coats shall be that time recommended by the lining material manufacturer. **No material shall be used for lining which is not indefinitely recoatable with itself without roughening of the surface.**

(6) Touch-Up and Repair

Protecto Joint Compound shall be used for touch-up or repair in accordance with manufacturer's recommendations.

d. Inspection and Certification

(1) Inspection

(a) All ductile iron pipe and fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined in SSPC-PA-2 Film Thickness Rating.

(b) The interior lining of all pipe barrels and fittings shall be tested for pinholes with a non-destructive 2,500-volt test. Any defects found shall be repaired prior to shipment.

(c) Each pipe joint and fitting shall be marked with the date of application of the lining system along with its numerical sequence of application on that date and records maintained by the applicator of his work.

(2) Certification

The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified.

e. Handling

Protecto 401 lined pipe and fittings must be handled only from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc., shall be placed inside the pipe and fittings for lifting, positioning, or laying.

2. Exterior Coating

Bituminous outside coating shall be in accordance with ANSI/AWWA C151/A 21.51 for pipe and ANSI/AWWA C110/A 21.10 for fittings.

F. Fittings and gaskets for mechanical and push-on joint ductile and cast iron pipe shall conform to the latest revisions of ANSI/AWWA C110/A 21.10 for mechanical and push-on joint fittings, ANSI/AWWA C111/A 21.11 for gaskets and ANSI/AWWA C153/A 21.53 for mechanical and push-on joint compact fittings. Mechanical and push-on joint fittings shall have pressure class rating of 150 psi minimum.

G. All ductile and cast iron fittings shall be ductile iron grade 80-60-03 in accordance with ASTM A339-55.

H. Restrained joint pipe and fittings shall use Mega-Lug pipe restraints or be a boltless system equal to "Field-Lok" restraining gaskets or "TRFLEX Joint" as manufactured by U.S. Pipe and Foundry Company.

I. Pipe shall be as manufactured by U.S. Pipe and Foundry Company, Clow, American Pipe Company, or equal.

J. Pipe or fitting shall have the ANSI/AWWA standard, pressure (or thickness) class, diameter, DI or ductile noted, manufacturer, and country and year where cast on the outside of the body.

2.04 FIBERGLASS REINFORCED POLYMER MORTAR PIPE (FRPM)

A References

1. ASTM D3754 – Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer and Industrial Pressure Pipe.

2. ASTM D4161 – Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastorneric Seals.

3. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.

4. ASTM D3681 – Standard Test Method for Chemical Resistance of "Fiberglass" Pipe in a Deflected Condition.

5. ASTM D638 – Test Method for Tensile Properties of Plastics.

B. Materials

1. Pipe Class: Pipe shall be stiffness class 46 (SN) for depths 30 feet or less; SN 72 for depths greater than 30 feet. [Design Engineer must specify pressure class as required]

2. Resin Systems: The manufacturer shall use only polyester resin systems with a proven history of performance in this particular application. The historical data shall have been acquired from a composite material of similar construction and composition as the proposed product.

3. Glass Reinforcements: The reinforcing glass fibers used to manufacture the components shall be of highest quality commercial grade E-glass filaments with binder and sizing compatible with impregnating resins.

4. Silica Sand: Sand shall be minimum 98% silica with a maximum moisture content of 0.2%.

5. Additives: Resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., when used, shall not detrimentally effect the performance of the product.

6. Elastomeric Gaskets: Gaskets shall meet ASTM F477 and be supplied by qualified gasket manufactures and be suitable for the service intended.

C. Manufacture and Construction

1. Pipes: Manufacture pipe to result in a dense, nonporous, corrosion-resistant, consistent composite structure. The interior surface of the pipes exposed to sewer flow shall be manufactured using a resin & glass reinforced liner or resin with a 50% elongation (minimum) when tested in accordance with D638. The interior surface shall provide crack resistance and abrasion resistance. The exterior surface of the pipes shall be comprised of a glass reinforced resin or sand and resin layer which provides UV protection to the exterior. Pipes shall be Type 1, Liner 1, Grade 1 or Type 1, Liner 2, Grade 3 per ASTM D362.

2. Joints: Unless otherwise specified, the pipe shall be field connected with fiberglass sleeve couplings that utilized elastomeric sealing gaskets as the sole means to maintain joint watertightness. The joints must meet the performance requirements of ASTM D4161. Joints at tie-ins, when needed, may utilize gasket-sealed closure couplings.

3. Fittings: Flanges. Elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber-reinforced overlays. Fittings shall be FRPM. Tees with 6 inch stub for laterals may have stubs constructed of FRPM or PVC SDR 35. Ductile iron (DI) fittings may be substituted for FRPM fittings. The **DI fittings shall be lined with Protecto 401 coating, or approved equal, and in accordance with DI pipe specification in this Section 02531.**

4. Acceptable Manufacturer: HOBAS Pipe USA or Flowtite.

D. Dimensions

1. Diameters: The actual outside diameter (18 inches to 48 inches) of the pipes shall be in accordance with ASTM D3754 and be in cast iron pipe sizes. For other diameters, OD's shall be per manufacturer's literature.

2. Lengths: Pipe shall be supplied in nominal lengths of 20 to 40 feet. Actual laying length shall be nominal +1, -4 inches. At least 90% of the total footage of each size and class of pipe, excluding special order lengths, shall be furnished in nominal length sections.

3. Wall Thickness: The minimum wall thickness shall be the stated design thickness.

4. End Squareness: Pipe ends shall be square to the pipe axis with a maximum tolerance of 1/8".

E. Testing

1. Pipes: Pipes shall be manufactured and tested in accordance with ASTM D3754.

2. Joints: Coupling joints shall meet the requirements of ASTM D4161.

3. Stiffness: Minimum pipe stiffness when tested in accordance with ASTM D2412 shall normally be 36 psi.

F. Installation

1. Burial: The bedding and burial of pipe and fittings shall be in accordance with the project plans and specifications and the manufacturer's requirements.

2. Pipe Handling: Use textile slings, other suitable materials or a forklift. Use of chains or cables is not allowed.

3. Jointing:

a. Clean ends of pipe and coupling components

b. Apply joint lubricant to pipe ends and elastomeric seals of coupling. Use only lubricants approved by the pipe manufacturer.

c. Use suitable equipment and end protection to push or pull the pipes together.

d. Do not exceed forces recommended by the manufacturer for coupling pipe.

e. Join pipes in straight alignment then deflect to required angle. Do not allow the

deflection angle to exceed the deflection permitted by the manufacturer.

4. Field Tests:

   a. Testing shall be in accordance with specification hereinafter in this Section 02531.

2.05 PRESTRESSED CONCRETE CYLINDER PIPE (PCCP)

A. Unless otherwise specified, the design materials and workmanship for pipe shall conform to the requirements of AWWA C301. Core and coating thickness for pipe shall be as specified in AWWA C301.

B. Prestressed concrete cylinder pipe and fittings shall be manufactured by Hanson Pressure Pipe, Grand Prairie, TX or equal.

C. Design Conditions

1. Pipe shall be designed in accordance with the AWWA C304 Standard, using the following design conditions; these conditions shall also be used in designing fittings that include a Portland cement mortar interior and exterior coating of the steel cylinder:

   a. External Loading

      (1) The earth load shall be taken as the greater of the following:

         (a) Depth from existing ground level to top of pipe as shown on plans, or

         (b) Five feet minimum in all cases.

      (2) Earth loads shall be computed using the following parameters:

         (a) Unit Soil Weight = 120 pounds per cubic foot

         (b) TYPE R___ Bedding

         (c) Bedding angle = ___°

      (3) Live loads shall be calculated as:

         (a) Pipe in streets and other paved areas: AASHTO HS-20 for two trucks passing

         (b) Pipe within railroad right-of-way: AREA Cooper E-80

         (c) Both HS-20 and E-80 live loads shall be computed in accordance with the American Concrete Pipe Association "Concrete Pipe Design Manual" or "Concrete Pipe Handbook".

   b. Internal Pressure

      (1) Design working pressure (Pw) shall be ____ psi

      (2) Surge Pressure (Pt) shall be ____ psi.

      (3) Field Test Pressure (Pft) shall be ____ psi.

D. Fittings

1. Steel thickness of all fittings shall be designed in accordance with Chapter 8 of the AWWA M9 Manual. Fittings shall be designed for the same conditions as the adjacent pipe.

2. Fabrication of the fittings shall be as per AWWA M9 Manual and C301.

3. Interior and exterior concrete/mortar coating shall be as per AWWA C301.

E. The date of manufacture or a serial number traceable to the date of manufacture and the design strength classification shall be clearly marked by stencil with waterproof paint at the end of the pipe barrel. Unsatisfactory or damaged pipe will be permanently rejected, repaired in the field if permitted by the Engineer and the pipe manufacturer, or returned to the pipe plant for repairs. Pits, blisters, rough spots, minor concrete or mortar breakage, and other imperfections may be repaired unless prohibited by the Engineer. Repairs shall be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 3,000 psi at the end of 7 days and 4,500 psi at the end of 28 days, when tested in cylinders stored in the standard manner. Major breakage or spalling from interior of pipe may be reason for the rejection of pipe. Pipe may be repaired under unloaded conditions (removal of prestressing wire). Cement mortar used for repair shall have a minimum compressive strength of 3,000 psi at 7 days and 4,500 psi at 28 days when tested as standard cylinders. New prestressing wire may be applied when the compressive strength as determined by cylinder testing equals or exceeds the strength required for prestressing as stated in AWWA C301.

F. Cement shall be Type II and shall be in accordance with ASTM C150.

G. The pipe core shall be produced by the centrifugal method or the vertical casting method.

H. Wire shall be a minimum of No.6 gauge and shall meet the requirements of ASTM A648, Class III. Wire of a class strength greater than Class III will not be permitted.

I. Steel cylinders shall be No. 16 gauge minimum thickness and shall be hot rolled.

J. Mortar coating shall consist of one part cement to a maximum of three parts fine aggregate by weight. Rebound not to exceed one fourth of the total mix weight may be used provided the rebound is treated as fine aggregate.

K. Bell and spigot joint rings shall be steel, self-centering type, and otherwise specified in AWWA C301. Surfaces of the joint rings that will be exposed after fabrication is complete shall receive a zinc metalized coating of 4 mils thickness (0.004"). In areas of the alignment where the pipe will be subject to unbalanced hydrostatic thrust forces (bends, tees, bulkheads, wyes, and valves), the pipe joints shall be restrained (harnessed) by field welding joints or by mechanically restrained joints.

Lengths of restrained joint pipe shall be determined using the computational method as contained in Chapter 9 of the AWWA M9 Manual for Concrete Pressure Pipe. The steel cylinder thickness in pipe sections between the location of the maximum thrust force and the end of the harnessed section can be prorated on the basis of zero longitudinal thrust at the end of the harnessed section.

Two acceptable types of mechanically harnessed or restrained joints are the harness clamp and Snap Ring® types of flexible restrained joints. The clamp type consists of two semicircular steel clamps which fit over steel lugs that are factory welded or rolled into the steel bell and spigot sections. The semicircular clamps are drawn together by bolts at the springline on both sides of the pipe to form a flexible restrained joint.

The Snap Ring® type of flexible restrained joint consists of a split steel ring which is recessed in the special steel bell section of the pipe until the joint is made. Once the joint is made, the split steel ring is drawn down into position to form a lock between the bell and spigot by tightening a

single steel bolt.

Both joint types shall be capable of transmitting the longitudinal thrust forces due to working pressure and test pressure and must be encased in grout after the joint has been completed and before the line is pressurized using special grout bands supplied by the pipe manufacturer.

Field welding of the joints for thrust restraint during initial installation can be done from inside the pipe or outside the pipe as permitted by the pipe manufacturer and applicable safety regulations.

L. The rubber gaskets shall be in accordance with AWWA C301 and shall be designed and manufactured so that the completed joint will withstand an internal water pressure in excess of the highest pressure to which the pipe will be subjected without showing any leakage by the gasket or displacement of it.

M. Bell and spigot wall fittings shall be the manufacturer's standard design. Wall fittings shall be supplied with adequate bracing to keep them round and true during transportation and installation.

N. Alignment for long-radius, curved sections as specified on the drawings may be produced by joint deflections of joints not to exceed that recommended by the manufacturer. Required deflections which are in excess of those recommendations shall be produced by beveling the spigot end of the pipe.

O. All Prestressed Concrete Cylinder Pipe shall include full thickness internal protection to prevent microbiologically induced corrosion with concrete admixture ConShield Technologies, Inc. or approved equal.

P. Pipe Manufacturer's Field Service Representative:

1. Pipe manufacturer shall provide a qualified Field Service Representative, who shall be available to be on the project site, with proper notice, from the Contractor's, Engineer's, or Owner's representative.

2. The Field Service Representative, who shall be an employee of the pipe manufacturer, must have experience as a representative of the pipe manufacturer in the area of providing such services. The individual may be a Registered Professional Engineer possessing a minimum of 2 years of experience in the area of manufacture of pipe, sales and service representation.

3. It is the intent of the Owner to be assured that the installation of this pipeline is performed in accordance with the specified standards and manufacturer's recommendations. Good installation procedures will assure integrity of the pipeline with the minimum amount of pipe joints required for completion of the main. Therefore, the Contractor shall include in his Bid as a minimum that the pipe manufacturer's Field Service Representative will be on-site for the following periods:

   a. Initial construction training and monitoring.
   b. Provide problem-solving assistance during construction.

2.06 COUPLING AND ADAPTORS

A. Flexible couplings shall be of the sleeve type with a middle ring, two wedge shaped resilient gaskets at each end, two follower rings, and a set of steel trackhead bolts. The middle ring shall be flared at each end to receive the wedge portion of the gaskets. The follower rings shall confine the outer ends of the gaskets, and tightening of the bolts shall cause the follower rings to compress the gaskets against the pipe surface, forming a leak-proof seal. Flexible couplings shall be steel with minimum wall thickness of the middle ring or sleeve installed on pipe being 5/16-inch for pipe smaller than 10 inches, 3/8-inch for pipe 10 inches

or larger. The minimum length of the middle ring shall be 5 inches for pipe sizes up to 10 inches and 7 inches for pipe 10 inches to 30 inches. The pipe stop shall be removed. Gaskets shall be suitable for 250 psi pressure rating or at rated working pressure of the connecting pipe. Couplings shall be harnessed and be designed for 250 psi.

B. Flanged adapters shall have one end suitable for bolting to a pipe flange and the other end of flexible coupling similar to that described hereinbefore. All pressure piping with couplings or adapters shall be harnessed with full threaded rods spanning across the couplings or adapters. The adapters shall be furnished with bolts of an approved corrosion resistant steel alloy, extending to the adjacent pipe flanges. Flanges on flanged adapter (unless otherwise indicated or required) shall be faced and drilled ANSI B16.1 Class 125.

C. Flexible couplings and flanged adapters shall be as manufactured by Dresser, Rockwell, or equal, unless otherwise specified and/or noted on the Drawings.

2.07 CONCRETE PIPE ANCHORS, THRUST BLOCKS, CRADLE OR ENCASEMENT

A. Where indicated on the Drawings, required by the specifications or as directed by the Engineer, concrete pipe anchors, thrust blocks, cradles or encasements shall be installed. Concrete shall be Class A. Thrust blocking shall be in accordance with LFUCG Standard Drawings.

2.08 ELECTRONIC MARKERS

A. Electronic markers shall be installed along the force main at intervals of 500 feet maximum, at all bends, and as noted on drawings or directed by Engineer. Maximum depth shall be 36". Markers shall be used regardless of the pipe material. Markers shall be green Tempo Omni Markers or equal.

2.09 AIR RELEASE VALVES (ARVs)

A. Air release, air vacuum valves, and/or combination air valves shall be installed along the force main as noted on drawings or directed by Engineer. ARVs shall be ARI or approved equal. [Note to Engineer: include size/model as required based on hydraulic calculations.]

PART 3 – EXECUTION

3.01 EXCAVATION FOR PIPELINE TRENCHES

A. See Section 02225 for trenching specification.

B. Minimum cover of 36" shall be provided for all force mains.

3.02 PIPE BEDDING

A. Bedding shall be in accordance with LFUCG Standard Drawings.

3.03 LAYING PIPE

A. The laying of pipe in finished trenches shall be commenced so the spigot ends point in the direction of flow.

B. All pipes shall be laid with ends abutting and true to line and grade as given by the Engineer.

Supporting of pipes shall be as set out hereinbefore under "Pipe Bedding" and in no case shall the supporting of pipes on blocks be permitted.

C. Before each piece of pipe is lowered into the trench, it shall be thoroughly inspected to insure it's clean. Each piece of pipe shall be lowered separately unless special permission is given otherwise by the Engineer. No piece of pipe or fitting which is known to be defective shall be laid or placed in the lines. If any defective pipe or fitting shall be discovered after the pipe is laid, they shall be removed and replaced with a satisfactory pipe or fitting without additional charge. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe.

D. Pipe shall not be laid on solid rock. Pipe bedding shall be installed prior to laying pipe. Irregularities in subgrade in an earth trench shall be corrected by use of #9 crushed limestone.

E. When ordered by the Engineer, unsuitable materials in subgrades shall be removed below ordinary trench depth in order to prepare a proper bed for the pipe.

F. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood or fabricated plug fitted into the pipe bell, so as to exclude earth or other material, and precautions taken to prevent flotation of pipe by runoff into trench.

G. No backfilling (except for securing pipe in place) over pipe will be allowed until the Engineer has had an opportunity to make an inspection of the joints, alignment and grade, in the section laid.

3.04 BACKFILLING PIPELINE TRENCHES

A. Backfilling shall be in accordance with LFUCG Standard Drawings.

3.05 SETTLEMENT OF TRENCHES

A. Whenever lines are in, or cross, driveways and streets, the Contractor shall be responsible for any trench settlement which occurs within these rights-of-way within one year from the time of final acceptance of the work. If paving shall require replacement because of trench settlement within this time, it shall be replaced by the Contractor at no extra cost to the Owner. Repair of settlement damage shall meet the approval of the Owner and/or the State Department of Transportation.

3.06 CONCRETE THRUST BLOCKS OR ENCASEMENT

A. Concrete thrust blocks shall be formed and placed at all bends or where shown on the Drawings. Encasement of pipe bends or fittings shall only occur at the direction of the Engineer.

B. All bends and fittings shall be wrapped with a minimum of 6 mil plastic prior to concrete placement.

C. Concrete thrust blocks shall be placed against undisturbed or compacted earth.

D. Concrete trust blocks shall be 3000 psi concrete.

3.07 INSTALLATION OF PCCP AND FITTINGS

A. Prestressed concrete cylinder pipe and fittings shall be installed in accordance with requirements of AWWA M9, except as otherwise provided herein. A firm, even bearing

throughout the length of the pipe shall be provided by tamping select fill in the haunch area and at the side of the pipe to achieve the required bedding support angle. BLOCKING WILL NOT BE PERMITTED.

B. Gasket, gasket groove, and bell sealing surfaces shall be cleaned and lubricated with a lubricant furnished by the pipe manufacturer. The lubricant shall be approved for use in potable water and shall be harmless to the rubber gasket. Use only lubricant supplied by the pipe manufacturer. Pipe shall be laid with bell ends looking ahead in the direction of laying. As soon as the spigot ring is centered in the bell of the previously laid pipe, it shall be forced home with approved equipment. After the gasket is compressed, verify the position of the gasket in the spigot ring groove with a feeler gage provided by the pipe manufacturer.

C. The grout diaper for PCCP shall consist of a Typar synthetic fabric layer (gray in color) and a layer of closed cell foam. These layers are sewn together along with a pair of 5/8" wide steel bands at each edge which are used to secure the diaper to the pipe exterior. Use only grout diapers supplied by the pipe manufacturer. A stretching tool is used to tighten the steel bands. Once the bands are pulled tight, a steel clip is crimped around the bands to hold them in position. It is important that the diaper be carefully placed against the exterior surface of the pipe to insure that it is flush with no gaps or gathers. The closed cell foam surface is to be placed against the pipe exterior.

   The wet grout will flow down to the bottom of the diaper and begin to bulge it out. It is often helpful to place some bedding material (or sandbags) directly under the diaper at the bottom to support the weight of the wet grout. Take care to not push excessive amounts of bedding material under the diaper such that the diaper is pushed up into the joint recess impeding the flow of wet grout.

   Mix the grout using one part ASTM C150 Type 1 or Type 2 portland cement to not more than three parts clean sand with sufficient water to achieve a pourable consistency. The grout should look and pour like a thick cream. Carefully pour the mixed grout into the gap at the top of the diaper. As the pouring proceeds, the workers must inspect the diaper around the joint periphery to insure that the grout is flowing all around. Once the diaper is full and wet grout is puddling at the gap at the top, apply a stiffer mix the consistency of wet brick mortar over the joint insuring that all steel components of the joint are covered.

3.08 TESTING

A. All ductile iron and PVC force mains shall be given a hydrostatic test to 150 psi or 250% of working design pressure, whichever is greater, and tested at the lowest level of the pipeline. In no case shall the pipe be tested at a pressure exceeding the pressure class rating of the pipe.

B. All prestressed concrete cylinder pipe shall be given a hydrostatic test to 120% of working design pressure, and tested at the lowest level of the pipeline. In no case shall the pipe be tested at a pressure exceeding the pressure class rating of the pipe.

C. Loss of pressure during the test shall not exceed 0 psi in a 4 hour period and 2 psi in a 24 hour period. Any test results that do not meet either of these requirements shall constitute a failure of the pressure test.

D. Leakage in force mains, when tested under the hydrostatic test described above, shall not exceed 10 gallons per 24 hours per inch of diameter per mile of pipe.

E. Contractor shall furnish a recording gauge and water meter for measuring water used during leakage test and recording pressure charts during duration of test. Recording pressure charts shall be turned over to the Engineer at conclusion of tests. The pressure recording device shall be suitable for outside service, with a range from 0-200 psig, 24-hour spring wound clock, designed for 9-inch charts, and shall be approved by the Engineer.

F. Duration of test shall be not less than 24 hours.

G. Where leaks are visible at exposed joints, evident on the surface where joints are covered and/or identified by isolating a section of pipe, the joints shall be repaired.

H. All pipe, fittings, valves, and other materials found to be defective under test shall be removed and replaced at no additional expense to the owner.

I. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are complied with.

J. The Contractor will provide water for testing the pressure piping.

END OF SECTION

SECTION 02532 – SEWAGE COLLECTION LINES

PART 1 – GENERAL

1.01 SUMMARY

A. The Contractor shall furnish all labor, material, and equipment necessary to install gravity sewer piping together with all appurtenances as shown and detailed on the Drawings and specified herein.

PART 2 – PRODUCTS

2.01 DUCTILE IRON (DI) PIPE

A. Ductile iron pipe shall be furnished cement lined in accordance with ANSI/AWWA C104/A21.4 with bituminous seal coat unless otherwise noted on the drawings or in Bid Form. Ductile iron pipe shall be furnished with rubber gasket push-on joints except as may otherwise be noted on the drawings or in difficult working areas and with approval of the Engineer. All pipe inside of casing pipe shall have restraining gaskets as specified in this Section. **All DI pipe and fittings within 2,000 LF downstream or to nearest manhole beyond 2,000 LF of a force main discharge shall be lined with Protecto 401 coating, or approved equal as specified hereinafter.**

B. Thickness design of ductile iron shall conform in all aspects to the requirements of ANSI/AWWA C150/A 21.50 latest revision.

C. Manufacture and testing of ductile iron pipe shall conform in all aspects to the requirements of ANSI/AWWA C151/A 21.51 latest revision.

D. Pipe Coatings

1. Interior Lining

a. Condition of Ductile Iron Prior to Surface Preparation

All ductile pipe and fittings shall be delivered to the application facility without asphalt, cement lining, or any other lining on the interior surface. Because removal of old linings may not be possible, the intent of this specification is that the entire interior of the ductile iron pipe and fittings shall not have been lined with any substance prior to the application of the specified lining material and no coating shall have been applied to the first six (6) inches of the exterior of the spigot ends.

b. Lining Material

The standard of quality is Protecto 401 Ceramic Epoxy. The material shall be an amine cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment. Any request for substitution must be accompanied by a successful history of lining pipe and fittings for sewer service, a test report verifying the following properties, and a certification of the test results.

(1) A permeability rating of 0.00 when tested according to Method A of ASTM E-96-66, Procedure A with a test duration of 30 days.

(2) The following test must be run on coupons from factory lined ductile iron pipe:

(a) ASTM B-117 Salt Spray (scribed panel) – Results to equal 0.0 undercutting after two years.

(b) ASTM G-95 Cathodic Disbondment 1.5 volts @ 77°F. Results to equal no more than 0.5 mm undercutting after 30 days.

(c) Immersion Testing rated using ASTM D-714-87.

i. 20% Sulfuric Acid – No effect after two years.
ii. 25% Sodium Hydroxide – No effect after two years.
iii. 160°F Distilled Water – No effect after two years.
iv. 120°F Tap Water (scribed panel) – 0.0 undercutting after two years with no effect.

(3) An abrasion resistance of no more than 4 mils (.10mm) loss after one million cycles – European Standard EN 598: 1994 section 7.8 Abrasion resistance.

c. Application

(1) Applicator

The lining shall be applied by a competent firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.

(2) Surface Preparation

Prior to abrasive blasting, the entire area to receive the protective compound shall be inspected for oil, grease, etc. Any areas where oil, grease, or any substance which can be removed by solvent is present, shall be solvent cleaned using the guidelines outlined in DIPRA-1 Solvent Cleaning. After the surface has been made free of grease, oil, or other substances, all areas to receive the protective compounds shall be abrasively blasted using compressed air nozzles with sand or grit abrasive media. The entire surface to be lined shall be struck with the blast media so that all rust, loose oxides, etc., are removed from the surface. Only slight stains and tightly adhering annealing oxide may be left on the surface. Any area where rust reappears before lining must be reblasted.

(3) Lining

After the surface preparation and within eight (8) hours of surface preparation, the interior of the pipe shall receive 40 mils nominal dry film thickness of Protecto 401. No lining shall take place when the substrate or ambient temperature is below 40 degrees Fahrenheit. The surface also must be dry and dust free. If flange pipe or fittings are included in the project, the lining shall not be used on the face of the flange.

(4) Coating of Bell Sockets and Spigot Ends

Due to the tolerances involved, the gasket area and spigot end up to six (6) inches back from the end of the spigot end must be coated with 6 mils nominal, 10 mils maximum Protecto Joint Compound. The Joint Compound shall be applied by brush to ensure coverage. Care should be taken that the Joint Compound is smooth without excess buildup in the gasket seat or on the spigot ends. Coating of the gasket seat and spigot ends shall be done after the application of the lining.

(5) Number of Coats

The number of coats of lining material applied shall be as recommended by the lining manufacturer. However, in no case shall this material be applied above the dry thickness per coat recommended by the lining manufacturer in printed

literature. The maximum or minimum time between coats shall be that time recommended by the lining material manufacturer. **No material shall be used for lining which is not indefinitely recoatable with itself without roughening of the surface.**

(6) Touch-Up and Repair

Protecto Joint Compound shall be used for touch-up or repair in accordance with manufacturer's recommendations.

d. Inspection and Certification

(1) Inspection

(a) All ductile iron pipe and fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined in SSPC-PA-2 Film Thickness Rating.

(b) The interior lining of all pipe barrels and fittings shall be tested for pinholes with a non-destructive 2,500-volt test. Any defects found shall be repaired prior to shipment.

(c) Each pipe joint and fitting shall be marked with the date of application of the lining system along with its numerical sequence of application on that date and records maintained by the applicator of his work.

(2) Certification

The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified.

e. Handling

Protecto 401 lined pipe and fittings must be handled only from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc., shall be placed inside the pipe and fittings for lifting, positioning, or laying.

2. Exterior Coating

Bituminous outside coating shall be in accordance with ANSI/AWWA C151/A 21.51 for pipe and ANSI/AWWA C110/A 21.10 for fittings.

E. Fittings and gaskets for mechanical and push-on joint ductile and cast iron pipe shall conform to the latest revisions of ANSI/AWWA C110/A 21.10 for mechanical and push-on joint fittings, ANSI/AWWA C111/A 21.11 for gaskets, and ANSI/AWWA C153/A 21.53 for mechanical and push-on joint compact fittings.

F. All ductile and cast iron fittings shall be ductile iron grade 80-60-03 in accordance with ASTM A339-55.

G. Restrained joint pipe and fittings shall be a boltless system equal to "Field-Lok" restraining gaskets or "TRFLEX Joint" as manufactured by U.S. Pipe & Foundry Company.

H. Pipe shall be as manufactured by U.S. Pipe & Foundry Company, Clow, American Pipe Company, or equal.

I. Pipe or fitting shall have the ANSI/AWWA standard, pressure (or thickness) class, diameter, DI or ductile noted, manufacturer, and country and year where cast on the outside of the body.

2.02 POLYVINYL CHLORIDE (PVC) PIPE (SOLID WALL)

A. Bury depth 20 feet or less or encased in steel pipe: PVC pipe and fittings less than 15 inches in diameter shall conform to the requirements of ASTM Standard Specifications for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings, Designation D 3034. Pipe and fittings shall have a minimum cell classification of 12454B or 12454C as defined in ASTM D-1784. For depths 10 feet and less, pipe shall have a pipe diameter to wall thickness ratio (SDR) of 35. For depths greater than 10 feet up to 20 feet maximum, pipe shall be SDR 26. If the PVC pipe is encased in a steel pipe, PVC pipe shall be SDR 35 regardless of buried depth.

B. Bury depth 20 feet or less or encased in steel pipe: PVC pipe and fitting with diameters 18-inch and larger shall conform to the requirements of ASTM D-17845 and ASTM F-679. Pipe and fittings shall have a minimum cell classification of 14545C. The minimum wall thickness shall conform to T-1 as specified in ASTM F-679. For depths 10 feet and less, pipe shall have pipe stiffness 46 (SDR 35). For depths greater than 10 feet up to 20 feet maximum, pipe shall have pipe stiffness of 115 (SDR 26). If the PVC pipe is encased in a steel pipe, PVC pipe shall be SDR 35 regardless of buried depth.

C. Bury depth greater than 20 feet: PVC pipe 8 inches through 12-inch PVC plastic pipe shall conform to ANSI/AWWA C900. Pipe 14-inch through 36-inch PVC plastic pipe shall conform to ANSI/AWWA C905. Pipe shall be pressure Class 165, DR 25. PVC pipe shall have bell end and elastomeric gasket, and with plain end for cast-iron or ductile-iron fittings. Elastomeric gasket shall conform with the requirements of ASTM F-477. The seal of the National Sanitation Foundation Testing Laboratory must appear on each pipe.

C. Joints shall be push-on bell and spigot type using elastomeric ring gaskets conforming to ASTM D 3212 and F 477. The gaskets shall be securely fixed into place in the bells so that they cannot be dislodged during joint assembly. The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and groundwater, and which will endure permanently under the conditions of the proposed use.

D. Pipe shall be furnished in lengths of at least 12 feet. The centerline of each pipe section shall not deviate from a straight line drawn between the centers of the openings at the ends by more than 1/16 inch per foot of length.

E. PVC pipe shall not have a filler content greater than ten percent (10%) by weight relative to PVC resin in the compound.

F. PVC pipe shall be clearly marked at intervals of 5 feet or less with the manufacturer's name or trademark, nominal pipe size, PVC cell classification, the legend "Type PSM SDR 35 PVC Sewer Pipe" and the designation "ASTM D 3034", or "ASTM F-679". Fittings shall be clearly marked with the manufacturer's name or trademark, nominal size, the material designation "PVC", "PSM" and the designation 'ASTM D 3034", or "ASTM F-679".

G. PVC pipe installation shall conform to ASTM D-2321 latest revision.

H. Pipe shall be as manufactured by JM Eagle, H & W Pipe Company, Diamond Plastics, or equal.

2.03 FIBERGLASS REINFORCED POLYMER MORTAR PIPE (FRPM)

A References

1. ASTM D3262 – Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.

2. ASTM D4161 – Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.

3. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.

4. ASTM D3681 – Standard Test Method for Chemical Resistance of "Fiberglass" Pipe in a Deflected Condition.

5. ASTM D638 – Test Method for Tensile Properties of Plastics.

B. Materials

1. Pipe Class: Pipe shall be stiffness class 46 (SN) for depths 30 feet or less; SN 72 for depths greater than 30 feet.

2. Resin Systems: The manufacturer shall use only polyester resin systems with a proven history of performance in this particular application. The historical data shall have been acquired from a composite material of similar construction and composition as the proposed product.

3. Glass Reinforcements; The reinforcing glass fibers used to manufacture the components shall be of highest quality commercial grade E-glass filaments with binder and sizing compatible with impregnating resins.

4. Silica Sand: Sand shall be minimum 98% silica with a maximum moisture content of 0.2%.

5. Additives: Resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., when used, shall not detrimentally effect the performance of the product.

6. Elastomeric Gaskets: Gaskets shall meet ASTM F477 and be supplied by qualified gasket manufactures and be suitable for the service intended.

C. Manufacture and Construction

1. Pipes: Manufacture pipe to result in a dense, nonporous, corrosion-resistant, consistent composite structure. The interior surface of the pipes exposed to sewer flow shall be manufactured using a resin & glass reinforced liner or resin with a 50% elongation (minimum) when tested in accordance with D638. The interior surface shall provide crack resistance and abrasion resistance. The exterior surface of the pipes shall be comprised of a glass reinforced resin or sand and resin layer which provides UV protection to the exterior. Pipes shall be Type 1, Liner 1, Grade 1 or Type 1, Liner 2, Grade 3 per ASTM D362.

2. Joints: Unless otherwise specified, the pipe shall be field connected with fiberglass sleeve couplings that utilized elastomeric sealing gaskets as the sole means to maintain joint watertightness. The joints must meet the performance requirements of ASTM D4161. Joints at tie-ins, when needed, may utilize gasket-sealed closure couplings.

3. Fittings: Flanges. Elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber-reinforced overlays. Fittings shall be FRPM. Tees with 6 inch stub for laterals may have stubs constructed of FRPM or PVC SDR 35. Ductile iron (DI) fittings may be substituted for FRPM fittings. The **DI fittings shall be lined with Protecto 401 coating, or approved equal, and in accordance with DI pipe specification in this Section 02531.**

4. Acceptable Manufacturer: HOBAS Pipe USA or Flowtite.

D. Dimensions

1. Diameters: The actual outside diameter (18 inches to 48 inches) of the pipes shall be in accordance with ASTM D3262 and be in cast iron pipe sizes. For other diameters, OD's shall be per manufacturer's literature.

2. Lengths: Pipe shall be supplied in nominal lengths of 20 to 40 feet. Actual laying length shall be nominal +1, -4 inches. At least 90% of the total footage of each size and class of pipe, excluding special order lengths, shall be furnished in nominal length sections.

3. Wall Thickness: The minimum wall thickness shall be the stated design thickness.

4. End Squareness: Pipe ends shall be square to the pipe axis with a maximum tolerance of 1/8".

E. Testing

1. Pipes: Pipes shall be manufactured and tested in accordance with ASTM D3262.

2. Joints: Coupling joints shall meet the requirements of ASTM D4161.

3. Stiffness: Minimum pipe stiffness when tested in accordance with ASTM D2412 shall normally be 36 psi.

4. Strain Corrosion: The extrapolated 50-year strain corrosion value meet the requirements of Table 4 in ASTM D3262 when tested in accordance with ASTM 3681.

F. Installation

1. Burial: The bedding and burial of pipe and fittings shall be in accordance with the project plans and specifications and the manufacturer's requirements.

2. Pipe Handling: Use textile slings, other suitable materials or a forklift. Use of chains or cables is not allowed.

3. Jointing:

a. Clean ends of pipe and coupling components

b. Apply joint lubricant to pipe ends and elastomeric seals of coupling. Use only lubricants approved by the pipe manufacturer.

c. Use suitable equipment and end protection to push or pull the pipes together.

d. Do not exceed forces recommended by the manufacturer for coupling pipe.

e. Join pipes in straight alignment then deflect to required angle. Do not allow the deflection angle to exceed the deflection permitted by the manufacturer.

4. Field Tests:

a. Testing shall be in accordance with specification hereinafter in this Section 02531.

2.04 PRESTRESSED CONCRETE CYLINDER PIPE (PCCP)

A. Unless otherwise specified, the design materials and workmanship for pipe shall conform to

the requirements of AWWA C301. Core and coating thickness for pipe shall be as specified in AWWA C301.

B. Prestressed concrete cylinder pipe and fittings shall be manufactured by Hanson Pressure Pipe, Grand Prairie, TX or equal.

C. Design Conditions

1. Pipe shall be designed in accordance with the AWWA C304 Standard, using the following design conditions; these conditions shall also be used in designing fittings that include a Portland cement mortar interior and exterior coating of the steel cylinder:

a. External Loading

(1) The earth load shall be taken as the greater of the following:

(a) Depth from existing ground level to top of pipe as shown on plans, or

(b) Five feet minimum in all cases.

(2) Earth loads shall be computed using the following parameters:

(a) Unit Soil Weight = 120 pounds per cubic foot

(b) TYPE R3 Bedding

(c) Bedding angle = ___°

(3) Live loads shall be calculated as:

(a) Pipe in streets and other paved areas: AASHTO HS-20 for two trucks passing

(b) Pipe within railroad right-of-way: AREA Cooper E-80

(c) Both HS-20 and E-80 live loads shall be computed in accordance with the American Concrete Pipe Association "Concrete Pipe Design Manual" or "Concrete Pipe Handbook".

D. Fittings

1. Steel thickness of all fittings shall be designed in accordance with Chapter 8 of the AWWA M9 Manual. Fittings shall be designed for the same conditions as the adjacent pipe.

2. Fabrication of the fittings shall be as per AWWA M9 Manual and C301.

3. Interior and exterior concrete/mortar coating shall be as per AWWA C301.

E. The date of manufacture or a serial number traceable to the date of manufacture and the design strength classification shall be clearly marked by stencil with waterproof paint at the end of the pipe barrel. Unsatisfactory or damaged pipe will be permanently rejected, repaired in the field if permitted by the Engineer and the pipe manufacturer, or returned to the pipe plant for repairs. Pits, blisters, rough spots, minor concrete or mortar breakage, and other imperfections may be repaired unless prohibited by the Engineer. Repairs shall be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 3,000 psi at the end of 7 days and 4,500 psi at the end of 28 days, when tested in cylinders stored in the standard manner. Major breakage or spalling from interior of pipe may be reason for the rejection of pipe. Pipe may be repaired under unloaded conditions (removal of prestressing wire). Cement mortar used for repair shall have a

minimum compressive strength of 3,000 psi at 7 days and 4,500 psi at 28 days when tested as standard cylinders. New prestressing wire may be applied when the compressive strength as determined by cylinder testing equals or exceeds the strength required for prestressing as stated in AWWA C301.

F. Cement shall be Type II and shall be in accordance with ASTM C150.

G. The pipe core shall be produced by the centrifugal method or the vertical casting method.

H. Wire shall be a minimum of No.6 gauge and shall meet the requirements of ASTM A648, Class III. Wire of a class strength greater than Class III will not be permitted.

I. Steel cylinders shall be No. 16 gauge minimum thickness and shall be hot rolled.

J. Mortar coating shall consist of one part cement to a maximum of three parts fine aggregate by weight. Rebound not to exceed one fourth of the total mix weight may be used provided the rebound is treated as fine aggregate.

K. Bell and spigot joint rings shall be steel, self-centering type, and otherwise specified in AWWA C301. Surfaces of the joint rings that will be exposed after fabrication is complete shall receive a zinc metalized coating of 4 mils thickness (0.004").

Joints must be encased in grout after the joint has been completed and before the line is testing using special grout bands supplied by the pipe manufacturer.

L. The rubber gaskets shall be in accordance with AWWA C301 and shall be designed and manufactured so that the completed joint will withstand an internal water pressure in excess of the highest pressure to which the pipe will be subjected without showing any leakage by the gasket or displacement of it.

M. Bell and spigot wall fittings shall be the manufacturer's standard design. Wall fittings shall be supplied with adequate bracing to keep them round and true during transportation and installation.

N. All Prestressed Concrete Cylinder Pipe shall include full thickness internal protection to prevent microbiologically induced corrosion with concrete admixture ConShield Technologies, Inc. or approved equal.

O. Pipe Manufacturer's Field Service Representative:

1. Pipe manufacturer shall provide a qualified Field Service Representative, who shall be available to be on the project site, with proper notice, from the Contractor's, Engineer's, or Owner's representative.

2. The Field Service Representative, who shall be an employee of the pipe manufacturer, must have experience as a representative of the pipe manufacturer in the area of providing such services. The individual may be a Registered Professional Engineer possessing a minimum of 2 years of experience in the area of manufacture of pipe, sales and service representation.

3. It is the intent of the Owner to be assured that the installation of this pipeline is performed in accordance with the specified standards and manufacturer's recommendations. Good installation procedures will assure integrity of the pipeline with the minimum amount of pipe joints required for completion of the main. Therefore, the Contractor shall include in his Bid as a minimum that the pipe manufacturer's Field Service Representative will be on-site for the following periods:

   a. Initial construction training and monitoring.
   b. Provide problem-solving assistance during construction.

2.05 POLYPROPYLENE (PP) PIPE (TRIPLE-WALL)

A. Only Polypropylene Pipe with a triple-wall construction shall be acceptable. Triple wall pipe shall meet ASTM F2764.

B. Pipe shall have a minimum pipe stiffness of 46 pii when tested in accordance with ASTM D2412.

C. Bury depth shall be in accordance to the table below. The table below does not consider hydrostatic pressure. The presence of hydrostatic pressure will lower the maximum bury depths listed. Contractor shall contact the manufacturer for fill height limits involving hydrostatic pressure and include recommendations in the pipe submittal. Compaction levels shown are for standard Proctor density.

Maximum Cover Pipe, ft.			
Diameter, in.	Class 1	Class 2	
	Compacted	95%	90%
30	30	21	15
36	29	21	15
42	32	22	16
48	33	23	16
60	31	21	15

D. Pipe shall be joined using a bell and spigot joint meeting the requirements of ASTM F2764. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and groundwater, and which will endure permanently under the conditions of the proposed use. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gaskets are free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly. 30- through 60-inch diameters shall have a reinforced bell with a polymer composite band installed by the manufacturer.

E. Fittings shall conform to ASTM F2764. Bell and spigot connections shall utilize a welded or integral bell and valley or inline gaskets meeting the watertight joint performance requirements of ASTM D3212.

F. To assure watertightness, field performance verification may be accomplished by testing in accordance with ASTM F1417 or ASTM 2487. Appropriate safety precautions must be used with field-testing any pipe material. Contact the manufacturer for recommended leakage rates.

G. Polypropylene compound for pipe and fitting production shall be an impact modified copolymer meeting the material requirements of ASTM F2764.

H. Installation shall be in accordance with ASTM D2321 and manufacturers recommended installation guidelines.

I. When backfilling trench with flowable fill, Contractor shall use an anchoring system and incremental lifts to avoid pipe flotation. Contractor shall consult pipe manufacturer for requirements to avoid pipe flotation in flowable fill installations.

J. Pipe shall be manufactured by Advanced Drainage Systems, Inc. or equal.

2.06 CONNECTION TO EXISTING GRAVITY PIPE

A. Connections between new and existing gravity pipe shall use a Fernco Strong Back, Straub-Flex coupling, Arpol or approved equal.

B. Connections between ductile iron and ductile iron, a Maxifit Mechanical Ductile Iron coupling as manufactured by Viking Johnson, or approved equal, may be used.

C. For pipes 12 inches in diameter and larger, concrete cradle shall be poured under each coupling. The length of the cradle (longitudinally along the pipe) shall be at least one pipe diameter and centered on the coupling. The depth of the cradle shall be half a pipe diameter (measured from the bottom of the cradle to the invert of the pipe). Cradles shall be formed and poured in place and reach from springline to springline.

PART 3 – EXECUTION

3.01 PIPE LAYING

A. Excavation, trenching, backfilling, and bedding requirements are set forth in Section 02225.

B. All pipe shall be laid with ends abutting and true to the lines and grades indicated on the Drawings. The pipe shall be laid straight between changes in alignment and at uniform grade between changes in grade. Pipe shall be fitted and matched so that when laid in the trench, it will provide a smooth and uniform invert.

C. Before each piece of pipe is lowered into the trench, it shall be thoroughly swabbed out to insure its being clean. Any piece of pipe or fitting which is known to be defective shall not be laid or placed in the lines. If any defective pipe or fitting shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without additional charge. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe and beveled to match the factory bevel for insertion into gasketed joints. Bevel can be made with hand or power tools.

D. The interior of the pipe, as work progresses, shall be cleaned of dirt, jointing materials, and superfluous materials of every description. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitted into the pipe bell so as to exclude earth or other material and precautions taken to prevent flotation of pipe by runoff into trench.

E. All pipe shall be laid starting at the lowest point and installed so that the spigot ends point in the direction of flow.

3.02 JOINTING

A. All joint surfaces shall be cleaned immediately before jointing the pipe. The bell or groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. All pipe shall be provided with home marks to insure proper gasket seating. Details of gasket installation and joint assembly shall follow the direction of the manufacturer's of the joint material and of the pipe. The resulting joints shall be watertight and flexible**. No solvent cement joints shall be allowed.**

3.03 INSTALLATION OF PCCP AND FITTINGS

A. Prestressed concrete cylinder pipe and fittings shall be installed in accordance with requirements of AWWA M9, except as otherwise provided herein. A firm, even bearing

throughout the length of the pipe shall be provided by tamping select fill in the haunch area and at the side of the pipe to achieve the required bedding support angle. BLOCKING WILL NOT BE PERMITTED.

B. Gasket, gasket groove, and bell sealing surfaces shall be cleaned and lubricated with a lubricant furnished by the pipe manufacturer. The lubricant shall be approved for use in potable water and shall be harmless to the rubber gasket. Use only lubricant supplied by the pipe manufacturer. Pipe shall be laid with bell ends looking ahead in the direction of laying. As soon as the spigot ring is centered in the bell of the previously laid pipe, it shall be forced home with approved equipment. After the gasket is compressed, verify the position of the gasket in the spigot ring groove with a feeler gage provided by the pipe manufacturer.

C. The grout diaper for PCCP shall consist of a Typar synthetic fabric layer (gray in color) and a layer of closed cell foam. These layers are sewn together along with a pair of 5/8" wide steel bands at each edge which are used to secure the diaper to the pipe exterior. Use only grout diapers supplied by the pipe manufacturer. A stretching tool is used to tighten the steel bands. Once the bands are pulled tight, a steel clip is crimped around the bands to hold them in position. It is important that the diaper be carefully placed against the exterior surface of the pipe to insure that it is flush with no gaps or gathers. The closed cell foam surface is to be placed against the pipe exterior.

The wet grout will flow down to the bottom of the diaper and begin to bulge it out. It is often helpful to place some bedding material (or sandbags) directly under the diaper at the bottom to support the weight of the wet grout. Take care to not push excessive amounts of bedding material under the diaper such that the diaper is pushed up into the joint recess impeding the flow of wet grout.

Mix the grout using one part ASTM C150 Type 1 or Type 2 portland cement to not more than three parts clean sand with sufficient water to achieve a pourable consistency. The grout should look and pour like a thick cream. Carefully pour the mixed grout into the gap at the top of the diaper. As the pouring proceeds, the workers must inspect the diaper around the joint periphery to insure that the grout is flowing all around. Once the diaper is full and wet grout is puddling at the gap at the top, apply a stiffer mix the consistency of wet brick mortar over the joint insuring that all steel components of the joint are covered.

3.04 UTILITY CROSSING CONCRETE ENCASEMENT

A. At locations shown on the Drawings, required by the Specifications, or as directed by the Engineer, concrete encasement shall be used when the clearance between the proposed sanitary sewer pipe and any existing utility pipe is 18 inches or less. Utility pipe includes underground water, gas, telephone and electrical conduit, storm sewers, and any other pipe as determined by the Engineer.

B. There are two cases of utility crossing encasement. Case I is applicable when the proposed sanitary sewer line is below the existing utility line. Case II is applicable when the proposed sanitary sewer line is laid above the utility line. In either case, the concrete shall extend to at least the spring line of each pipe involved.

C. Concrete shall be Class A and shall be mixed sufficiently wet to permit it to flow between the pipes to form a continuous bridge. In tamping the concrete, care shall be taken not to disturb the grade or line of either pipe or damage the joints.

3.05 TESTING OF GRAVITY SEWER LINES

A. After the gravity piping system has been brought to completion, and prior to final inspection, the Contractor shall rod out the entire system by pushing through each individual line in the system, from manhole to manhole, appropriate tools for the removal from the line of any and

all dirt, debris, and trash. If necessary during the process of rodding the system, water shall be turned into the system in such quantities to carry off the dirt, debris, and trash.

B. During the final inspection the Engineer will require all flexible sanitary sewer pipe (PVC, FRP, DI, and PP) to be mandrel deflection tested after installation.

1. The mandrel (go/no-go) device shall be cylindrical in shape and constructed with nine (9) evenly spaced arms of prongs. The mandrel dimension shall be 95 percent of the flexible pipe's published ASTM average inside diameter. Allowances for pipe wall thickness tolerances of ovality (from shipment, heat, shipping loads, poor production, etc.) shall not be deducted from the ASTM average inside diameter, but shall be counted as part of the 5 percent allowance. The contact length of the mandrel's arms shall equal or exceed the nominal diameter of the sewer to be inspected. Critical mandrel dimensions shall carry a tolerance ± 0.001 inch.

2. The mandrel inspection shall be conducted no earlier than 30 days after reaching final trench backfill grade provided, in the opinion of the Engineer, sufficient water densification or rainfall has occurred to thoroughly settle the soil throughout the entire trench depth. Short-term (tested 30 days after installation) deflection shall not exceed 5 percent of the pipe's average inside diameter. The mandrel shall be hand pulled by the contractor through all sewer lines. Any sections of the sewer not passing the mandrel test shall be uncovered and the Contractor shall replace and recompact the embedment backfill material to the satisfaction of the Engineer. These repaired sections shall be retested with the go/no-go mandrel until passing.

3. The Engineer shall be responsible for approving the mandrel. Proving rings may be used to assist in this. Drawings of the mandrel with complete dimensioning shall be furnished by the Contractor to the Engineer for each diameter and type of flexible pipe.

C. Low-pressure air tests shall be performed on all gravity sanitary sewers to verify water tightness of pipe joints and connections. The Contractor shall perform testing on each manhole-to-manhole section of sewer line after placement of backfill.

1. Testing of Polyvinyl Chloride (PVC), Fiberglass Reinforced Polymer Mortar (FRPM), Ductile Iron (DI), and Polypropylene (PP) pipe sewer lines shall be performed in accordance with the current editions of ASTM F1417, "Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air," and UNI-B-6, "Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe," respectively.

2. All testing equipment shall be inspected by the Engineer to ensure that equipment is functioning properly.

3. The rate of air loss in the section under test shall be determined by the time-pressure drop method. The time required in minutes for the pressure in the section under test to decrease from 3.5 to 2.5 psig shall be not less than that indicated in the referenced standards.

4. Immediately following the low-pressure air test, the Contractor shall notify the Engineer of the test results. A Low-Pressure Air Test Report shall be completed by the Contractor during testing. The report shall be completed according to the procedures outlined in LFUCG's Construction Inspection Manual, current edition. A copy of the completed Low-Pressure Air Test Report shall be provided to the Engineer and LFUCG-Division of Water Quality for each test.

5. Pipes failing the pressure test will not be accepted and shall be repaired or replaced until a successful test is achieved.

6. When conducting a low-pressure air test, the Contractor shall securely install and brace

all plugs prior to pressurizing the pipe. Personnel shall not be permitted to enter manholes when the sewer pipe is pressurized.

D. TV Survey

1. TV survey and cleaning shall be performed on all gravity sewers.

2. Hydraulic cleaning and vacuum must be done prior to TV survey.

3. TV survey must be of dry pipe.

4. TV survey shall be Pipe Assessment Certification Program (PACP) level of quality and TV equipment must include a slope-inclinometer.

5. Acceptance of TV survey, completed sewers, and the repairs needed are to be determined at sole discretion of LFUCG.

6. TV survey shall include:

   a. Video file and shall be re-named to LFUCG's assets.

   b. PACP database must be in Microsoft Access format, version 4.4.2 which includes photos embedded in database.

   c. Report shall be provided in electronic version in PDF format.

E. The Contractor shall furnish suitable test plugs, water pumps, and appurtenances, and all labor required to properly conduct the tests. Suitable bulkheads shall be installed, as required, to permit the test of the sewer. The Contractor shall construct weirs or other means of measurements as may be necessary.

F. Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing the leaks and retesting as the Engineer may require without additional compensation.

END OF SECTION

SECTION 02540 – PIPE ABANDONMENT

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. This Section covers pipe abandonment procedures. The Contractor shall furnish all labor, materials and equipment to abandon pipe as described here or as shown on the Drawings.

B. Unless otherwise indicated, pipes 18-inches and larger which are located under pavement with public access shall be safeloaded. All other abandoned sewer pipe shall be plugged.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02225 – Excavating, Backfilling, and Compacting

B. Section 02240 - Dewatering

PART 2 – PRODUCTS

2.01 LEAN CONCRETE

A. Fill shall be a flowable, lean mix of concrete and sand, by the mix given as follows, per cubic yard batch:

Cement	30 pounds
Fly Ash, Class F	300 pounds
Natural Sand (S.S.D.)	3,000 pounds
Water (Maximum)	550 pounds

PART 3 - EXECUTION

3.01 SAFELOAD

A. The Contractor shall safeload the pipe by utilizing the lean concrete mix as described in paragraph 2.01 of this specification.

3.02 PLUG

A. The Contractor shall expose and cut the pipeline where shown or directed and construct a minimum 9-inch thick 3,000 psi concrete plug at the pipe openings. Approved mechanical plug may be used in lieu of the concrete plug.

END OF SECTION

SECTION 02608 – MANHOLES

PART 1 - GENERAL

1.01 SUMMARY

A. The Contractor shall furnish all labor, material, and equipment necessary to construct manholes for sanitary storm sewers, including steps, frames, and covers, together with all appurtenances as shown and detailed on the Drawings and specified herein. Manhole materials shall be precast concrete.

1.02 DEFINITIONS

A. Standard Manhole: A standard manhole is defined as any manhole that is greater than 5 feet in depth, as measured from the invert of the manhole base at its center to the top (rim) of the manhole cover.

B. Shallow Manhole: A shallow manhole is defined as any manhole that is 5 feet or less in depth, as measured in the preceding sentence.

PART 2 - PRODUCTS

2.01 CONCRETE MANHOLES - GENERAL

A. Manholes shall conform in shape, size, dimensions, materials, and other respects as shown on the Drawings or specified herein.

B. All concrete manholes shall have precast reinforced concrete developed bases. No other type of base will be allowed. Invert channels shall be factory constructed when the base is made. Sloping invert channels shall be constructed whenever the difference between the inlet and outlet elevation is 2 feet or less.

C. The concrete manhole walls (barrels and cones) and base shall be precast concrete sections manufactured with **cementitious crystalline admixture at dosage of 3.5% by weight of cement.** The cementitious crystalline admixture shall be **Xypex C-1000 RED, KIM K-301, or Crystal-X Admix-R**. The top of the cone shall be built of reinforced concrete to allow adjustment rings to be added for adjustment of the frame to meet the finished surface. Minimum strength of the concrete for the precast sections shall be 4,000 psi at the time of shipment.

D. Manholes that receive sewage from a force main discharge, and within 2,000 LF downstream or to the nearest manhole beyond the 2,000 LF, shall have concrete admixture ConShield (in addition to the cementitious crystalline admixture listed in paragraph 2.01.C above), or approved equal.

E. Manholes located in the 100-year floodplain shall have a concrete base that includes an anti-flotation collar. The collar shall have a radius 6-inches larger than the exterior wall of the base section.

F. For concrete manholes, the inverts of the developed bases shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent, within the manhole, to the centerlines of adjoining pipelines.

G. For concrete manholes, the cast iron frames and covers shall be the standard frame and cover as indicated on the LFUCG Standard Drawings.

H. Manholes shall be manufactured by Sherman Dixie, Oldcastle Precast or approved equal.

2.02 PRECAST CONCRETE SECTIONS

A. Precast concrete sections and appurtenances shall conform to the ASTM Standard Specifications for Precast Reinforced Concrete Manhole Sections, Designation C478, latest revision, with the following exceptions and additional requirements.

B. The base section shall be monolithic for 4-foot and 5-foot diameter manholes. Manholes with diameter of 6 feet or larger shall have a monolithic base or base slab.

C. The wall sections shall be not less than 5 inches thick.

D. Type II or type III cement shall be used except as otherwise permitted.

2.03 CONCRETE MANHOLE - FRAMES AND COVERS

A. The Contractor shall furnish all cast iron manhole frames and covers as shown in LFUCG Standard Drawings.

B. Castings shall be designed for H-20 traffic loading.

C. The castings shall be of good quality, strong, tough, evengrained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.

D. Frames shall be set in mastic and bolted down in non-traffic areas with four ¾" SS Hilti anchor bolts and washers. Hilti anchor bolts shall be embedded a minimum of 4-inches into precast concrete cone section. In traffic areas, the frame shall be set in mastic and Class A concrete donut poured around frame to the top of concrete cone section. The concrete donut shall be 12-inches in width and in depth up to within 1 ½-inches of surface for bituminous asphalt pavement.

E. All casting shall be thoroughly cleaned and subject to a careful hammer inspection.

F. Castings shall be at least Class 25 conforming to the ASTM Standard Specifications for Gray Iron Casting, Designation A48, latest revision.

G. Unless otherwise specified, manhole covers shall be 22-3/4 inches in diameter, weighing not less than 305 pounds per frame and cover. Manhole covers shall set neatly in the rings, with contact edges machined for even bearings and tops flush with ring edge. They shall have sufficient corrugations to prevent slipperiness. The covers shall have two (2) pick holes about 1-1/4 inches wide and 1/2 inch deep with 3/8-inch undercut all around. Covers shall not be perforated. Frames and covers shall be J.R. Hoe and Sons Mc-350, or approved equal.

H. Watertight lids shall have neoprene T-gasket and concealed pickhole.

I. All covers shall be marked in large letters "LEXINGTON KENTUCKY SANITARY SEWER" as shown in LFUCG Standard Drawings.

2.04 MANHOLE STEPS (CONCRETE MANHOLES)

A. Manholes steps shall be the polypropylene plastic type reinforced with a 1/2 inch diameter deformed steel rod. The step shall be 10-3/4 inches wide and extend 5-3/4 inches from the manhole wall. Steps shall line up over the downstream invert of the manhole. The steps shall be embedded into the manhole wall a minimum of 3-3/8 inches. Steps shall be uniformly spaced at 12-inch to 16-inch intervals.

B. Manhole steps shall be in accordance with LFUCG Standard Drawings.

2.05 PREMOLDED ELASTOMERIC-SEALED JOINTS

A. All holes for pipe connections in concrete barrels and bases shall have a factory-installed flexible rubber gasket to prevent infiltration. The manhole boots shall conform to the latest revision of ASTM-C923. The boots shall be Contour Seal or Kor-N-Seal manufactured by National Pollution Control Systems, Inc., Nashua, NH; A-Lok Manhole Pipe Seal manufactured by A-Lok Corporation, Trenton, NJ; or an approved equal.

2.06 MANHOLE DIAPHRAGM (FOR WATERTIGHT LID APPLICATIONS)

A. Diaphragm manhole inserts shall be manufactured from corrosion-proof material suitable for atmospheres containing hydrogen sulfide and diluted sulfuric acid. Diaphragm shall be installed in manholes susceptible to inflow as indicated on the Drawings.

B. The body of the manhole insert shall be made of high density ethylene hexene-1 copolymer material meeting ASTM Specification D 1248, Class A, Category 5 (the insert shall have a minimum impact brittleness temperature of -180 degrees Fahrenheit). The thickness shall be uniform 1/8 inch or greater. The manhole insert shall be manufactured to dimensions as shown on the Drawings to allow easy installation within the manhole frame.

C. Gaskets shall be made of closed cell neoprene. The gasket shall have a pressure sensitive adhesive on one side and shall be placed under the weight bearing surface of the insert by the manufacturer. The adhesive shall be compatible with the manhole insert material so as to form a long lasting bond in either wet or dry conditions.

D. Lift strap shall be attached to the rising edge of the bowl insert. The lift strap shall be made of 1 inch wide woven polypropylene web and shall be seared on all cut ends to prevent unraveling. The lift strap shall be attached to the manhole insert by means of a stainless steel rivet. Location of the lift strap shall provide easy visual location.

E. Standard ventilation shall be by means of a valve or vent hole. Vent holes shall be on the side wall of the manhole insert approximately 3/4 inch below the lip. The valve or vent hole will allow a maximum release of 5 gallons per 24 hours when the insert is full.

F. The manhole insert shall be manufactured to fit the manhole frame rim upon which the manhole cover rests. The Contractor is responsible for obtaining specific measurements of each manhole cover to insure a proper fit. The manhole frame shall be cleaned of all dirt, scale and debris before placing the manhole insert on the rim.

G. Diaphragm shall be Rainstopper manufactured by Rainstopper, Inc. in color white, or approved equal.

2.07 CLEANOUTS

A. Cleanouts shall be cast iron and extend to the finish grade and capped with a clean-out plug in accordance with details and at locations shown on the Drawings. Pipe shall be the same size as the gravity sewer line in which the cleanout is located. A 4-inch thick concrete pad,

with 6" x 6", 1.9 x 1.9 wire mesh, 24 inches square, with the valve box lid section, shall be provided around each cleanout.

B. Cleanouts shall be in accordance with LFUCG Standard Drawings.

2.08 DROP CONNECTIONS

A. Drop connections shall be installed on exterior of manhole as shown on the LFUCG Standard Drawings. The pipe material inside the drop manhole shall be of the same material as the sanitary sewer line.

PART 3 - EXECUTION

3.01 FABRICATION - PRECAST SECTIONS

A. Manhole sections shall contain manhole steps accurately positioned and embedded in the concrete when the section is cast.

B. All precast concrete manhole sections shall be cured in a manner to assure the highest quality:

1. Results of initial set tests (per ASTM C 403) shall be provided upon request. New test will be run in the event of change of cement supplier, mix design, or as otherwise necessary to maintain a quality product.
2. Forms on wet-cast concrete shall not be removed until the concrete attains compressive strength equal to 2500 psi based upon field-cured cylinders, cured under conditions which equal the most severe conditions to which the product is exposed.
3. Test cylinders for determining "shipping strength" shall be cured with similar methods as the product that they represent. In lieu of actual curing with the product, cylinders may be cured in curing chambers correlated in temperature and humidity with the product conditions.
4. Any precast concrete manhole section which freezes before attaining 500 psi compressive strength will be rejected.

C. No more than two (2) lifting hooks may be cast or drilled in each section.

D. Flat slab tops shall have a minimum thickness of 6 inches and reinforcement in accordance with ASTM C478.

E. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the precast sections.

F. Acceptance of the sections will be on the basis of material tests and inspection of the completed product and test cylinders if requested by the Engineer.

G. Cones shall be precast sections of similar construction.

H. It shall be the responsibility of the precast manufacturer to handle all materials in such a manner as to avoid all damage to the product before and during delivery. This damage is defined as, but is not limited to, structural or spiderweb cracking, chips, spalls, pop-outs, or other damage.

I. All precast concrete manhole sections shall be stored in a manner that will maintain product quality, as well as provide damage protection from yard traffic. All concrete pipe greater than 36" in diameter shall be "stulled" with a minimum of two each, 4" x 4" wood posts providing vertical support during storage. This requirement shall apply both at the manufacturer's

storage yard and on the jobsite.

J. No precast concrete manhole sections shall be delivered to a jobsite or transported from the facility of origin until adequate quality and maturity has been attained, as described in these specifications.

1. All precast concrete manhole sections shall be a minimum age of 7 days.
2. All precast concrete manhole sections shall attain compressive strength equal to 4000 psi.
3. No precast concrete manhole sections shall be delivered without Certification. Any product delivered without acceptable Certification will be subject to rejection.

3.02 SETTING PRECAST MANHOLE SECTIONS

A. Precast-reinforced concrete manhole sections shall be set so as to be vertical and with sections and steps in true alignment.

B. Butyl mastic sealant shall be installed in all manhole joints in accordance with the manufacturer's recommendations and as shown in LFUCG Standard Drawings. Butyl mastic sealant shall meet Federal Spec SS-S-210A, AASHTO M-19875l, and ASTM C990. Butyl mastic sealant shall be NPC Bidco C-56 as manufactured by Trelleborg Engineered Systems, or approved equal. Sealant shall be a minimum bead of 1 inch in rope configuration.

C. All holes in sections used for their handling shall be thoroughly plugged with rubber plugs made specifically for this purpose.

3.03 ADJUSTING MANHOLE FRAMES AND COVERS TO GRADE

A. Except where shown on the Drawings, the top of the precast concrete eccentric cone of a standard manhole or the top of the flat slab of a shallow manhole shall terminate 6 inches below existing grade in an unpaved non-traffic area except in a residential yard and 13 inches below existing grade in a paved or unpaved traffic area and in a residential yard. The remainder of the manhole shall be adjusted to the required grade.

B. When a manhole is located in an unpaved non-traffic area other than in a residential yard, the frame and cover shall be adjusted to an elevation 1 inch above the existing grade at the center of the cover. If field changes have resulted in the installed manhole invert elevation to be lower than the invert elevation shown on the Drawings, the adjustment to an elevation of 1 inch above existing grade shall be accomplished by the use of precast concrete or cast iron adjusting rings. The area around the adjusted frame and cover shall be filled with the required material, sloping it away from the cover at a grade of 1 inch per foot.

C. When a manhole is located in a bituminous, concrete, or crushed stone traffic area, or in a residential yard, the frame and cover shall be adjusted to the grade of the surrounding area by the use of precast concrete or cast iron adjusting rings. The adjusted cover shall conform to the elevation and slope of the surrounding area.

1. The Contractor shall coordinate elevations of manhole covers in paved streets with the local public works department. If resurfacing of the street in which sewers are laid is expected within twelve (12) months, covers shall be set 1-1/2 inches above the existing pavement surface in anticipation of the resurfacing operations.

3.04 ADJUSTING SECTIONS

A. Only clean adjusting sections shall be used. Each adjusting section shall be laid in a bead of butyl mastic sealant and shall be thoroughly bonded.

3.05 SETTING MANHOLE FRAMES AND COVERS

A. Manhole frames shall be set with the tops conforming to the required elevations set forth hereinbefore. Frames shall be set concentric with the top of the concrete and in a full bead (1") of butyl mastic sealant so that the space between the top of the masonry and the bottom flange of the frame shall be completely watertight.

B. Manhole covers shall be left in place in the frames on completion of other work at the manholes.

3.06 VACUUM TESTING (ASTM C1244)

A. Scope

1. This test method covers procedures for testing precast concrete manhole sections when using the vacuum test method to demonstrate the integrity of the installed materials and the construction procedures. This test method is used for testing concrete manhole sections utilizing mortar, mastic, or gasketed joints.

B. References, ASTM Standards:

1. C 822 Terminology Relating to Concrete Pipe and Related Products.

2. C 924 Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method.

3. C 969 Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.

C. Summary of Practice

All lift holes and any pipes entering the manhole are to be plugged. A vacuum will be drawn and the vacuum drop over a specified time period is used to determine the acceptability of the manhole.

D. Significance and Use

This is not a routine test. The values recorded are applicable only to the manhole being tested and at the time of testing.

E. Preparation of the Manhole

1. All lift holes shall be plugged.

2. All pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into the manhole.

F. Procedure

1. The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.

2. A vacuum of 10 inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 inches of mercury.

3. The manhole shall pass if the **minimum time** for the vacuum reading to drop from 10 inches of mercury to 9 inches of mercury **exceeds 60 seconds (one minute)**.

4. If the manhole fails the initial test, necessary repairs shall be made by an approved method. The manhole shall then be retested until a satisfactory test is obtained.

5. Use or failure of this vacuum test shall not preclude acceptance by appropriate water infiltration or exfiltration testing, (see Practice C 969), or other means.

G. Precision and Bias

No justifiable statement can be made either on the precision or bias of this procedure, since the test result merely states whether there is conformance to the criteria for the success specified.

END OF SECTION

SECTION 02650 - SEWER LINE CLEANING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required to clean all sewer pipe, laterals and fittings installed and/or rehabilitated, as specified herein.

B. Cleaning shall include the proper high pressure water jetting, rodding, snaking, bucketing, brushing and flushing of sewers, laterals, and manholes prior to inspection by closed circuit television, pipeline rehabilitation or replacement, point repairs, manhole preparation, and testing operations.

C. Cleaning shall dislodge, transport and remove all sludge, mud, sand, gravel, rocks, bricks, grease, roots, sticks, and all other debris from the interior of the sewer pipe and manholes as required for pipeline rehabilitation.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Hydraulically propelled Sewer Cleaning Equipment

1. Hydraulically propelled sewer cleaning equipment shall be the movable dam type constructed such that a portion of the dam may be collapsed during cleaning to prevent flooding of the sewer.

2. The movable dam shall be the same diameter as the pipe being cleaned and shall provide a flexible scraper around the outer periphery to ensure total removal of grease.

3. Contractor shall take precautions against flooding prior to using sewer cleaning balls or other such equipment that cannot be collapsed instantly.

B. High Velocity Hydro-Cleaning Equipment shall have the following:

1. A minimum of 500-ft of high pressure hose.

2. Two or more high velocity nozzles capable of producing a scouring action from 15 to 45 degrees in all size lines to be cleaned.

3. A high velocity gun for washing and scouring manhole walls and floor.

4. Capability of producing flows from a fine spray to a long distance solid stream.

5. A water tank, auxiliary engines and pumps and a hydraulically driven hose reel.

6. Equipment operating controls located above ground.

C. Mechanical cleaning equipment for sewer mains shall be either power buckets or power rodders by the Sewer Equipment Company of America or equal.

1. Bucket machines

a. Be furnished with buckets in pairs

b. Use V-belts for power transmission or have an overload device. No direct drive

machines will be permitted.

c. Be equipped with a take up drum and a minimum of 500-ft of cable.

d. Have sufficient dragging power to perform the work efficiently.

2. Power rodding machine

a. Either sectional or continuous.

b. Hold a minimum of 750-ft of rod.

c. The machine shall have a positive rod drive to produce 2000 pounds of rod pull.

PART 3 - EXECUTION

3.01 PERFORMANCE

A. Selection of cleaning equipment shall be based on the conditions of the manholes and lines at the time the work commences based on the pre-construction CCTV inspection to be conducted by the Contractor under this Contract.

B. Use properly selected equipment to remove all dirt, grease, rock and other deleterious materials and obstructions.

C. Protect existing sewer lines from damage caused by improper use of cleaning equipment.

D. Take precautions to avoid damage or flooding to public or private property being served by the line being cleaned.

E. Use sewage flow in the sewer lines to provide necessary pressures for hydraulic cleaning devices whenever possible.

F. Removal of Materials

1. Remove all solids and semi-solids at the downstream manhole of the section being cleaned.

2. Passing material from one section of a line to another will not be permitted.

G. Remove from the site and properly dispose of all solids or semi-solids recovered during the cleaning operation.

H. No sewer cleaning shall take place in a particular sewer segment until all upstream pipe segments have been cleaned. If cleaning is done in a downstream pipe segment in order to facilitate overall cleaning operations, the segment shall be re-cleaned at no additional cost, after all pipes upstream of that segment have been cleaned.

3.02 FIELD QUALITY CONTROL

A. Acceptance of this portion of the work shall be dependent upon the results of the television inspection. Lines not acceptably clean as to permit television inspection and rehabilitation shall be re-cleaned and re-inspected at no additional cost to the Owner.

3.03 FINAL SEWER CLEANING

A. Prior to final inspection and acceptance of each manhole-to-manhole section of the sewer system by the Engineer, the sewer shall be cleaned. Remove all accumulated construction debris, rocks, gravel, sand, silt and other foreign material from the sewer system. Once the large debris is removed, the sewer shall be flushed.

B. Following final cleaning, the Contractor shall inspect each manhole-to-manhole section in accordance with Specifications Section 2651 – Television Inspection.

C. Upon the Engineer's final manhole-to-manhole inspection of the sewer system, if any foreign matter is still present in the system, clean the sections and portions of the lines as required.

D. Place the new line in service as soon as is practical after acceptance by the Engineer.

END OF SECTION

SECTION 02651 - TELEVISION INSPECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all necessary labor, materials, equipment, services and incidentals required to visually inspect by means of closed-circuit television (CCTV) designated sewer line sections and sewer laterals, including, but not limited to, recording and playback equipment, materials and supplies.

B. The inspection shall be performed on one sewer line section (i.e. manhole to manhole) or one sewer lateral (i.e. sewer main toward property) at a time. The section being inspected shall be suitably isolated from the remainder of the sewer system.

C. Video recordings shall be made of the television inspections and copies of both the recordings and printed inspection logs shall be supplied to the Owner.

D. Contractor may have to perform point repairs, remove obstructions or remove protruding service connections to complete pre-rehabilitation TV inspection.

PART 2 - PRODUCTS

2.01 EQUIPMENT

A. The television camera used for sewer main inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera, television monitor and other components of the video system shall be capable of producing a minimum 500-line resolution color video picture. Picture quality and definition shall be to the satisfaction of the Engineer and if unsatisfactory, inspection shall be performed again with the appropriate changes made as designated by the Engineer at no additional cost to the Owner. The television inspection equipment shall have an accurate footage counter that shall display on the monitor, the exact distance of the camera from the centerline of the starting manhole.

PART 3 - EXECUTION

3.01 PROCEDURE

A. The camera shall be moved through the sewer main in either direction at a uniform rate, stopping when necessary to ensure proper documentation of the sewer's condition but in no case will the television camera be pulled at a speed greater than 30 fpm. Manual winches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire sewer line section, the equipment shall be removed and repositioned in a manner so that the inspection can be performed from the opposite manhole. All set-up costs for the inspection shall be included in the unit prices bid. If, again, the camera fails to pass through the entire section, the Contractor shall perform point repairs as required on the Drawings, remove or cut protruding service connections, or re-clean or further remove roots or blockage at no additional cost to the Owner.

B. Whenever non-remote powered and controlled winches are used to pull the television camera through the line, telephones, radios, or other suitable means of communication shall be set up between the two manholes of the sewer line being inspected to ensure that good communications exist between members of the crew.

C. Measurement for location of defects shall be above ground by means of a meter device. Marking on cable, or the like, which would require interpolation for depth of manhole, shall not be allowed. Measurement meters shall be accurate to two-tenths of a foot over the length of the sewer line section being inspected. Accuracy of the measurement meters shall be checked daily by use of a walking meter, roll-a-tape, or other suitable device, and the accuracy shall be satisfactory to the Owner's representative.

D. The camera height shall be adjusted such that the camera lens is always centered (1/2 I.D. or higher) in the pipe being televised. Flow shall be controlled such that depth of flow shall not exceed 20% of pipe's diameter.

E. Lighting system shall be adequate for quality pictures.

3.02 RECORDING OF FIELD OBSERVATIONS

A. Television Inspection logs

1. Printed location records shall be kept which shall clearly show the location, in relation to adjacent manholes, of each source of infiltration discovered. In addition, other data of significance including the locations of building and house service connections, along with an estimation of infiltration from such services, joints, unusual conditions, roots, storm sewer connections, cracked or collapsed sections, presence of scale and corrosion, sewer line sections that the camera failed to pass through and reasons for the failure and other discernible features shall be recorded and annotated using the PACP system and a copy of such records shall be supplied to both the Owner and the Engineer.

B. Digital Recordings

1. The purpose of digital recording shall be to supply a visual and audio record of areas of interests of the pipe segments that may be replayed by the Owner. Digital recording playback shall be at the same speed that it was recorded and shall be made in color. The Contractor shall be required to have all digital media and necessary playback equipment readily accessible for review by the Owner/Engineer during the project.

2. The Contractor shall perform CCTV inspection of each newly installed or rehabilitated pipe segment (manhole to manhole) after testing and before re-introducing any sewage flow into the pipe. Each test shall be witnessed by the Engineer and/or Owner.

3. The Contractor shall record each CCTV inspection on a DVD and submit such recordings to the Engineer as a prerequisite for Partial Utilization/Substantial Completion.

4. CCTV inspections shall be performed after all backfill has been placed and final grades have been established, and after all manhole and pipe testing has been performed and approved by the Engineer.

5. CCTV inspections shall be performed by a PACP certified and trained person.

6. Inspections shall include narration that notes the location and type of defects, if any.

7. At the completion of the project, the Contractor shall furnish all of the original digital recordings to the Owner. Each disc shall be labeled as to its contents. Labels shall include the disc number, date televised, sewer segment reach designation, street location, and manhole numbers on the disc. The Contractor shall keep a copy of the discs for 30 days after the final payment for the project, at which time the discs may be erased at the Contractor's option.

END OF SECTION

SECTION 02700 - ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The asphalt concrete paving replacement work includes the construction of an aggregate base course, asphalt binder and wearing courses to match existing courses and as specified herein. This work is to replace paving disturbed by the construction and any damages to paving by Contractor's operations, as well as new pavement and driveways, within the limits shown on the plans.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. The general provisions of the Contract apply to the Work specified in this Section.

B. Section 02225 – Excavating, Backfilling and Compacting for Sewers

PART 2 - PRODUCTS

2.01 MATERIALS

A. All roads in Fayette County shall be constructed in accordance with the following sections of the Kentucky Transportation Cabinet's (KTC) Standard Specifications for Road and Bridge Construction. Items not covered by the KTC specifications shall require a special design by the Engineer and shall be approved by LFUCG.

1.	Embankment	Division 200
2.	Excavation	Division 200
3.	Subgrade	Division 200
4.	Dense Graded Aggregate	Division 300
5.	Bituminous Concrete	Division 400
6.	Concrete Paving	Division 500
7.	Chemical Stabilization	Division 200

2.02 SUBGRADE

A. The subgrade shall be free from ruts, large stones, and excessive dust. The subgrade shall be subjected to a subgrade proof-roll test so that soft, wet, or pumping areas may be identified. The minimum total weight of the loaded dump truck shall be 37 tons. The truck shall be operated at walking speed over the entire subgrade. Any excessive deflections such as rutting or pumping shall be stabilized as directed by the Engineer.

B. Typical treatments of soft or wet areas of the pavement subgrade include removal and replacement (undercutting), "working-in" No. 2 stone, or installation of a geogrid/geotextile system and crushed stone. The extent and performance requirements of such improvements shall be set forth in the Contract Documents or as directed by the Engineer. Other means to stabilize the subgrade such as lime stabilization or cement modification as described in KTC Section 304, may be necessary.

C. The pavement subgrade shall be compacted to a uniform density throughout according to the requirements of the Contract Documents. If the density of the subgrade has been diminished by exposure or weather, after having been previously compacted, it shall be recompacted to the required density and moisture content.

D. Subgrade drainage systems or perforated pipe underdrains shall be installed in accordance with LFUCG Standard Drawings where indicated on the Improvement Plans.

2.03 GRANULAR BASE COURSE

A. The granular base course shall consist of compacted dense-graded aggregate (DGA) meeting the requirements set forth in Kentucky Transportation Cabinet's (KTC) Standard Specifications for Road and Bridge Construction. The Contractor shall submit to the Engineer the results of physical tests performed on the material to verify that it meets the requirements referenced above.

B. The DGA shall be applied in thicknesses of no less than 3 inches and no more than 6 inches in thickness. Each lift of DGA shall be compacted to a density no less than 84 percent of the solid volume density based on the oven-dry bulk specific gravity as determined by KM 64-607. A field density test of DGA placement may be required if deemed necessary by Engineer. The tests shall be conducted at a frequency of one test per 2,000 square feet with a minimum of one test per shift during which DGA is placed. The DGA shall be compacted using a vibratory roller or vibratory plate. The DGA shall be placed to achieve a moisture content less than 5%, and shall be stable with no rutting or pumping.

C. Before arriving at the site, the DGA shall be adequately mixed with water in a pugmill. During transportation and storage on site, the DGA shall be covered to prevent loss of moisture. If drying of the DGA occurs, the Contractor shall add water to the DGA and shall thoroughly mix the material before its placement.

2.04 ASPHALT BASE AND SURFACE COURSES

A. The materials and methods for construction for the asphalt base course and surface course shall meet the requirement of Kentucky Transportation Cabinet's (KTC) Standard Specifications for Road and Bridge Construction. The Contractor shall submit test results of the aggregate gradation and asphalt content to the Engineer.

B. The pavement course thicknesses and construction tolerances shall be specified in the Contract Documents. The surface of each course shall be checked with templates, straightedges, and/or stringlines for uniformity. All irregularities exceeding the allowable tolerances must be repaired as required by the Contract Documents or as directed by the Engineer.

2.05 TACK COAT

A. The tack coat shall be type SS-1h. Before applying the tack coat the area to receive pavement shall be cleaned. The tack coat shall be applied well in advance of the paving operation to allow all water to evaporate before the surface course is placed. Work shall be planned so that no more tack coat than is necessary for the day's operation is placed on the surface.

END OF SECTION

SECTION 02775 - SIDEWALKS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and services required for constructing concrete sidewalks where shown on the Drawings and as specified herein.

PART 2 - PRODUCTS

2.01 GENERAL

A. Sidewalks shall be in accordance with LFUCG Standard Drawings.

2.02 CRUSHED STONE

A. Stone for sidewalk base shall be dense grade aggregate (DGA).

2.03 CONCRETE

A. Concrete for sidewalks shall be Class A concrete per Section 03300.

2.04 PREMOLDED EXPANSION JOINT FILLER

A. Premolded expansion joint filler shall be closed cell polyethylene foam type, Sonneborn Sonoflex F, Williams Products Expand-O-Foam, or equal. Seal joint with one-part self-leveling polyurethane sealant, Sonneborn Sonolastic SL 1, or equal, maximum 3/8 inches deep. Prepare and prime joints per manufacturer's instructions.

2.05 CURING COMPOUND

A. A white pigmented curing compound is required on all sidewalks per LFUCG Standard Drawings.

PART 3 - EXECUTION

3.01 BASE

A. Following finished grading, a base course of DGA shall be placed to a compacted thickness of four (4) inches. Immediately prior to placing concrete, DGA base shall be thoroughly wetted.

3.02 SURFACE

A. Concrete shall be in thickness shown on LFUCG Standard Drawings, struck off and worked with a float until mortar appears on the top. After surface has been thoroughly floated, it shall be brushed to leave markings of a uniform type, providing non-slip finish. No dusting or plastering will be allowed. Water shall not be added to the surface of the concrete at any time during the finishing procedure.

3.03 FINISHING

A. All joints and edges shall be finished with an edging tool. Dummy joints shall be formed about five (5) feet apart to form rectangular blocks. Expansion joints of 1/2 inch premolded expansion joint material shall be provided at the intersection of all vertical surfaces with the sidewalks slabs and at approximately 32 foot intervals along the walks.

END OF SECTION

SECTION 02800 - FENCE

1. DESCRIPTION

This work shall consist of furnishing and erecting fence and gates of the height and type shown on the plans, or otherwise directed during construction.

2. MATERIALS

A. Materials shall conform to requirements specified in the following KDOH Sections:

Woven Wire Fencing Materials (12 ga)	816
Concrete	601

B. The CONTRACTOR may select any class of concrete specified in Section 601, unless otherwise specified.

3. REFERENCES

A. ASTM F 11B4 Standard Specifications for Industrial and Commercial Horizontal Slide Gates, Type II, Class 2, Sec 3.02B.

B. American Welding Society AWS D1.2 Structural Welding Code.

4. SUBMITTALS

A. Product Data

1. Provide manufacturers catalog cuts with printed specifications and installation instructions.

2. Furnish two copies of operation and maintenance data for operating system.

B. Shop Drawings

1. Supply shop drawings showing the gate system, including details of all major components.

2. Include complete details of gate construction, gate height, and post spacing dimensions.

6. CONSTRUCTION REQUIREMENTS

A. Fence and gates shall be constructed with new materials in accordance with KDOH Section 722.

B. Fence shall be constructed in accordance with the KDOH Standard Drawing RFC-001-07 and RPG-005-05 for chain link right-of-way fence and gates.

C. Four plank fencing shall be constructed in accordance with the Standard Drawings (Appendix A). The fence shall be painted black.

D. Diamond Mesh Fencing

1. Fence fabric shall be manufactured from Class 3 galvanized steel wire, 4, 000 pounds minimum breaking strength, and painted black with application rate approved by the ENGINEER.

2. Horizontal wire shall be double twisted 12.5 gauge, spaced 4 inches apart. Vertical angled wire shall be 14 gauge, woven around horizontal wire, and spaced 2 inches apart at the widest point.

3. Fence posts shall be 5-inch diameter pressure treated pine, 8 feet in length, and painted black with application rate as approved by ENGINEER.

4. Corner posts and end posts shall be 8-inch diameter pressure treated pine, 9 feet in length, and painted black with application rate approved by ENGINEER.

5. Fence rail shall be Centaur design, or equal, 5-inch-wide-flexible rail and shall be painted black with application rate approved by the ENGINEER.

6. Tensioners and mounting brackets for 5-inch-wide-flexible rail and shall be painted black with application rate approved by ENGINEER.

7. 4-inch wood brace shall be installed at the corner posts and end posts as shown in the Drawings and as recommended by the manufacturer.

8. Brace wire shall be installed at the corner posts and end posts as down in the Drawing and as recommended by the manufacturer.

7. INSTALLATION (DIAMOND MESH FENCING)

A. Fence posts shall be 8 feet on center, and shall be driven 2 feet-6 inches into the ground with tops cut at an angle to drain.

B. Corner posts and end posts shall be placed 3 feet-6 inches into the ground, and placed into a 4-foot deep by 18-inch-diameter-concrete footing. Concrete footing shall be Class B concrete in accordance with Section 601 of the KDOH Standard Specification.

C. Staples shall be placed to overlock wire joints and the same row of diamonds shall be used from top to bottom to ensure wire is square on posts.

D. When finishing fence ends, diamond mesh shall be cut leaving approximately 8 inches after the staples on the post. Strip the diamond mesh wire leaving the horizontal double cabled wires, always leaving 1 diamond after the fence staples. Horizontal wires shall be wrapped around the posts, pulled tight and stapled down to the back of the post.

9. METHOD OF MEASUREMENT

Fence will be measured in linear feet along the top of the fence from outside to outside of end posts of fence installed, with deductions made for gates, complete and accepted in the final work. Gates will be measured in individual units, complete and accepted in the final work.

10. BASIS OF PAYMENT

The accepted quantities for poor flank and diamond mesh fence and gates shall be paid for at the unit prices per linear foot and each, respectively.

Payment shall be made under:

PAY ITEM	PAY UNIT
Four Plank Fence	Linear Foot

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. Provide all labor, equipment, materials and services necessary for the manufacture, transportation and placement of all plain and reinforced concrete work, as shown on the Drawings or as ordered by the Engineer.

B. Concrete shall be in accordance with the latest edition of Standard Specifications for Road and Bridge Construction issued by the Kentucky Transportation Cabinet.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03600 - Grout

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of the Specifications, all work herein shall conform to or exceed the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. Kentucky Dept. of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition.
2. Kentucky Building Code
3. ACI 214 Recommended Practice for Evaluation of Strength Test Results of Concrete
4. ACI 304 Guide for Measuring, Mixing, Transporting, and Placing Concrete
5. ACI 305 Hot Weather Concreting
6. ACI 306 Cold Weather Concreting
7. ACI 318 Building Code Requirements for Structural Concrete
8. ACI 350 Code Requirements for Environmental Engineering Concrete Structures
9. ASTM C 31 Standard Methods of Making and Curing Concrete Test Specimens in the Field
10. ASTM C 39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
11. ASTM C 42 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
12. ASTM C 94 Standard Specification for Ready-Mixed Concrete
13. ASTM C 143 Standard Test Method for Slump of Portland Cement Concrete
14. ASTM C 172 Standard Method of Sampling Fresh Concrete
15. ASTM C 260 Standard Specification for Air-Entraining Admixtures for Concrete

16. ASTM C 457 Standard Recommended Practice for Microscopical Determination of Air-Void Content and Parameters of the Air-Void System in Hardened Concrete

17. ASTM C 1567 Standard Test Method for Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300, Submittals.

1. Sources of all materials and certifications of compliance with specifications for all materials.

2. Certified current (less than 1 year old) chemical analysis of the Portland Cement or Blended Cement to be used.

3. Certified current (less than 1 year old) chemical analysis of fly ash or ground granulated blast furnace slag to be used.

4. Aggregate test results showing compliance with required standards, i.e., sieve analysis, aggregate soundness tests, petrographic analysis, mortar bar expansion testing per ASTM C 1567, etc.

5. Manufacturer's data on all admixtures stating compliance with required standards.

6. Concrete mix design for each class of concrete specified herein.

7. Field experience records and/or trial mix data for the proposed concrete mixes for each class of concrete specified herein.

PART 2 - PRODUCTS

2.01 CONCRETE

A. Sidewalks, entrance pavements, concrete pavement subbase for asphaltic surface course, concrete pavement, curb gutter, and thrust blocking shall be Class A.

B. Concrete shall be as specified in the following table excerpted from Standard Specifications for Road and Bridge Construction, Edition of 2012, Kentucky Transportation Cabinet:

CONCRETE PROPORTIONIZING AND REQUIREMENTS KYDOT 601.03.03

INGREDIENT PROPORTIONS AND REQUIREMENTS FOR VARIOUS CLASSES OF CONCRETE

Class of Concrete	Approximate Percent Fine to Total Aggregate		Maximum Free Water by W/C Ratio (lb/lb)	28-Day Compressive Strength[1] (psi)	Slump[4] (inches)	Minimum Cement Factor (lb/yd^3)	Air Content (%)
	Gravel	Stone					
A[5]	36	40	0.49	3,500	2-4[7]	564	6 ± 2
A Mod	36	40	0.47	3,500	4-7	658	6 ± 2
AA[2]	36	40	0.42	4,000	2-4 [12]	620	6 ± 2[11]
AAA[8]	36	40	0.40	5,500	3-7	686	6 ± 2[11]
B	40	44	0.66	2,500	3-5	451	6 ± 2
D[3]	35	39	0.44	4,000	3-5[6]	639	6 ± 2
D Mod[3]	35	39	0.42	5,000	3-5[6]	733	6 ± 2
M1[8] w/Type I Cement	36	40	0.33	4,000[9]	7 max.	800	6 ± 2
M2[8] w/Type III Cement	36	40	0.38	4,000[9]	7 max.	705	6 ± 2
P[5]	35	38	0.49	3,500	---[13]	564[10]	6 ± 2[11]

(1) The Department may direct non-payment, additional construction, or removal and replacement for concrete which test cylinders indicate low compressive strength and follow-up investigations indicate inadequate strength. The Department may require some classes to attain the required compressive strength in less than 28 hours.

(2) When the ambient air temperature while placing slab concrete is 71°F or more, add to the concrete a water-reducing and retarding admixture. The Engineer may require or allow, water-reducing and retarding admixture in slab concrete for ambient air temperatures of less than 71°F. Only use one type of admixture for concrete placed during any individual contiguous pour.

(3) The Department will require a compressive strength of 5,000 psi or greater when specified in the Contract, at or before 28 days of prestressed members.

(4) The Engineer will allow slumps less than the minimum provided concrete is workable.

(5) The Department will allow the use of JPC pavement mixture for non-structural construction.

(6) At the option of the prestressed product fabricator, the Department will allow the slump of Class D or Class D Modified concrete to be increased to a maximum of 8 inches for all items, except products with voids. For products with voids, the slump may be increased to 7 inches. Provide a high range water reducer (Type F or G) in an amount not to exceed the following water/cement ratios:

Summer mix designs – 0.39
Spring and Fall mix designs – 0.37
Winter mix designs – 0.34

(7) The precast fabricator may increase the slump of Class A concrete to a maximum of 7 inches provided the fabricator uses a high range water reducer (Type F or G) and maximum water/cement ratio of 0.46.

(8) Use a high range water reducer (Type F or G).

(9) The Department will require 3,000 psi compressive strength before opening to traffic and 4,000 psi at 28 days.

(10) 611 lb/yd^3 when using coarse aggregate sizes No. 8, 78, or 9-M.

(11) 7 ± 2% when using coarse aggregate sizes No. 8, 78 or 9-M.

(12) The Department may allow the slump of AA concrete to be increased up to a 6 inch maximum, provided the W/C ratio does not exceed 0.40 and a high range water reducer (Type F or G) is used. Trial Batches will be required if producer has not previously supplied.

(13) The Department does not have slump requirements for Class P concrete mixes except for the edge slump requirements of Section 501.03.19.

2.02 FLOWABLE FILL

A. Flowable fill shall conform to Section 601 of the Standard Specifications for Road and Bridge Construction, Edition of 2012.

B. Flowable fill shall consist of a mixture of cement, sand, fly ash, and water. The loss on ignition for Class F fly ash shall not exceed 12 percent. Ensure that the concrete producer certifies mix proportions for flowable fill as follows:

Flowable Fill for Pipe Backfill. Proportion as follows, per cubic yard batch:

Cement	30 pounds
Fly Ash, Class F	300 pounds
Natural Sand (S.S.D.)	3,000 pounds
Water (Maximum)	550 pounds

C. Flowable fill shall obtain an average compressive strength of 50 to 100 psi at 28 days for application as pipe backfill. For applications requiring early opening to traffic or placement of pavement as soon as possible, the mixture shall conform to the following general guidelines:

1. Mixture bleeds freely within 10 minutes

2. Mixture supports a 150-pound person within three hours.

PART 3 – EXECUTION

3.01 PRODUCTION OF CONCRETE

A. All concrete shall be machine mixed. Hand mixing of concrete will not be permitted. The Contractor shall supply concrete from a ready mix plant. In selecting the source for concrete production the Contractor shall carefully consider its capability for providing quality concrete at a rate commensurate with the requirements of the placements so that well bonded, homogenous concrete, free of cold joints, is assured. Ready mixed concrete shall be in accordance with ASTM C94.

B. Each and every concrete delivery shall be accompanied by a delivery ticket containing at least the following information:

1. Date and truck number
2. Ticket number
3. Mix designation of concrete
4. Cubic yards of concrete
5. Cement brand, type and weight in pounds
6. Weight in pounds of fine aggregate (sand)
7. Weight in pounds of coarse aggregate (stone)
8. Air entraining agent, brand, and weight in pounds and ounces
9. Other admixtures, brand, and weight in pounds and ounces
10. Water, in gallons, stored in attached tank
11. Water, in gallons, maximum that can be added without exceeding design water/cement ratio
12. Water, in gallons, actually used (by truck driver)
13. Time of loading
14. Time of delivery to job (by truck driver)

C. Any truck delivering concrete to the job site, which is not accompanied by a delivery ticket showing the above information will be rejected and such truck shall immediately depart from the job site.

3.02 CONCRETE PLACEMENT

A. No concrete shall be placed prior to approval of the concrete mix design. Concrete placement shall conform to the recommendations of ACI 304.

3.03 CONCRETE WORK IN COLD WEATHER

A. Cold weather concreting procedures shall conform to the requirements of ACI 306.

B. The Engineer may prohibit the placing of concrete at any time when air temperature is 40°F. or lower. If concrete work is permitted, the concrete shall have a minimum temperature, as placed, of 55°F. for placements less than 12" thick, 50°F. for placements 12" to 36" thick, and 45°F. for placements greater than 36" thick. The temperature of the concrete as placed shall not exceed the aforementioned minimum values by more than 20°F, unless otherwise approved by the Engineer.

C. The addition of admixtures to the concrete to prevent freezing is not permitted. All reinforcement, forms, and concrete accessories with which the concrete is to come in contact shall be defrosted by an approved method. No concrete shall be placed on frozen ground.

3.04 CONCRETE WORK IN HOT WEATHER

A. Hot weather concreting procedures shall conform to the requirements of ACI 305.

B. When air temperatures exceed 85°F, or when extremely dry conditions exist even at lower temperatures, particularly if accompanied by high winds, the Contractor and his concrete supplier shall exercise special and precautionary measures in preparing, delivering, placing, finishing, curing and protecting the concrete mix. The Contractor shall consult with the Engineer regarding such measures prior to each day's placing operation and the Engineer reserves the right to modify the proposed measures consistent with the requirements of this Section of the Specifications. All necessary materials and equipment shall be on hand an in position prior to each placing operation.

C. Preparatory work at the job site shall include thorough wetting of all forms, reinforcing steel and, in the case of slab pours on ground or subgrade, spraying the ground surface on the preceding evening and again just prior to placing. No standing puddles of water shall be permitted in those areas which are to receive the concrete.

D. The temperature of the concrete mix when placed shall not exceed 90°F.

E. Delivery schedules shall be carefully planned in advance so that concrete is placed as soon as practical after it is properly mixed. For hot weather concrete work (air temperature greater than 85°F), discharge of the concrete to its point of deposit shall be completed within 60 minutes from the time the concrete is batched.

F. The Contractor shall arrange for an ample work force to be on hand to accomplish transporting, vibrating, finishing, and covering of the fresh concrete as rapidly as possible.

3.05 QUALITY CONTROL

A. Field Testing of Concrete

1. The Contractor shall coordinate with the Owner's testing firm personnel as required for concrete testing.

2. Concrete for testing shall be supplied by the Contractor at no additional cost to the Owner, and the Contractor shall provide assistance to the testing laboratory in obtaining samples. The Contractor shall dispose of and clean up all excess material.

3. For every placement of concrete that is 10 cubic yards or less, the following tests shall be performed (as described in paragraphs B through E below):

   a. Consistency
   b. Unit Weight
   c. Air content
   d. Compressive Strength
   e. Temperature

4. For every placement of concrete that is larger than 10 cubic yards, the following tests shall be performed for every 50 cubic yards (as described in paragraphs B through E below):

   a. Consistency – test the first truck and one additional truck randomly selected by the Owner's Resident Project Representative (RPR).
   b. Unit Weight – test one truck randomly selected by the RPR
   c. Air content - test the first truck and one additional truck randomly selected by the RPR.
   d. Compressive Strength - test one truck randomly selected by the RPR
   e. Temperature - test one truck randomly selected by the RPR

   The sampling of concrete is approved at the truck discharge. If a concrete pump is employed, the Contractor is advised that 1.5-3.0% air is lost in pumping and such should be accounted for at the point of testing. Therefore, the air content should be adjusted to ensure that the air content meets the specification at the point of placement.

   The first truck is defined as the first truck as accepted by the RPR. The RPR shall have the authority of the Owner to accept or reject all concrete.

1. Sampling is at the discretion of the RPR.

2. Additional testing may be required as deemed necessary by the Owner.

B. Consistency

1. The consistency of the concrete will be checked by the Owner's testing firm by standard slump cone tests. The Contractor shall make any necessary adjustments in the mix as the Owner or Engineer may direct and shall upon written order suspend all placing operations in the event the consistency does not meet the intent of the specifications. No payment shall be made for any delays, material or labor costs due to such eventualities.

2. Slump tests shall be made in accordance with ASTM C 143.

3. Concrete with a specified nominal slump shall be placed having a slump within 1" (higher or lower) of the specified slump. Concrete with a specified maximum slump shall be placed having a slump less than the specified slump.

C. Unit Weight

1. Samples of freshly mixed concrete shall be tested for unit weight by the Owner's testing firm in accordance with ASTM C 138.

D. Air Content

1. Samples of freshly mixed concrete will be tested for entrained air content by the Owner's testing firm in accordance with ASTM C 231.

2. In the event test results are outside the limits specified, additional testing shall occur. Upon discovery of incorrect air entrainment, the concrete shall be removed from the jobsite.

E. Compressive Strength

1. Samples of freshly mixed concrete will be taken by the Owner's testing firm and tested for compressive strength in accordance with ASTM C 172, C 31 and C 39, except as modified herein.

2. Each sampling shall consist of at least five (5) 6x12 cylinders or (8) 4x8 cylinders. Each cylinder shall be identified by a tag, which shall be hooked or wired to the side of the container. The Owner's testing firm will fill out the required information on the tag, and the Contractor shall satisfy himself that such information shown is correct.

3. The Contractor shall be required to furnish labor to the Owner for assisting in preparing test cylinders for testing. The Contractor shall provide approved curing boxes for storage of cylinders on site. The insulated curing box shall be of sufficient size and strength to contain all the specimens made in any four consecutive working days and to protect the specimens from falling over, being jarred or otherwise disturbed during the period of initial curing. The box shall be erected, furnished and maintained by the Contractor. Such box shall be equipped to provide the moisture and to regulate the temperature necessary to maintain the proper curing conditions required by ASTM C 31. Such box shall be located in an area free from vibration such as pile driving and traffic of all kinds and such that all specimen are shielded from direct sunlight and/or radiant heating sources. No concrete requiring inspection shall be delivered to the site until such storage curing box has been provided. Specimens shall remain undisturbed in the curing box until ready for delivery to the testing laboratory but not less than sixteen hours.

4. The Contractor shall be responsible for maintaining the temperatures of the curing box during the initial curing of test specimens with the temperature preserved between 60°F and 80°F as measured by a maximum-minimum thermometer. The Contractor shall maintain a written record of curing box temperatures for each day curing box contains test specimens. Temperature shall be recorded a minimum of three times a day with one recording at the start of the work day and one recording at the end of the work day.

5. When transported, the cylinders shall not be thrown, dropped, allowed to roll, or be damaged in any way.

F. Evaluation and Acceptance of Concrete

1. Evaluation and acceptance of the compressive strength of concrete shall be according to the requirements of ACI 214, ACI 318, and ACI 350.

2. The strength level of concrete will be considered satisfactory if all of the following conditions are satisfied.

   a. Every arithmetic average of any three consecutive strength tests equals or exceeds the minimum specified 28-day compressive strength for the mix (see Article 2.07).

   b. No individual compressive strength test results falls below the minimum specified strength by more than 500 psi.

   c. No more than 10% of the compressive tests have strengths greater than the maximum strength specified.

3. In the event any of the conditions listed above are not met, the mix proportions shall be corrected for the next concrete placing operation.

4. In the event that condition 2B is not met, additional tests in accordance with Article 3.10, paragraph H shall be performed.

5. When a ratio between 7-day and 28-day strengths has been established by these tests, the 7-day strengths shall subsequently be taken as a preliminary indication of the 28-day strengths. Should the 7-day test strength from any sampling be more than 10% below the established minimum strength, the Contractor shall:

   a. Immediately provide additional periods of curing in the affected area from which the deficient test cylinders were taken.

   b. Maintain or add temporary structural support as required.

   c. Correct the mix for the next concrete placement operation, if required to remedy the situation.

6. All concrete which fails to meet the ACI requirements and these specifications is subject to removal and replacement at no additional cost to the Owner.

H. Additional Tests

1. In the event the 28-day test cylinders fail to meet the minimum strength requirements as outlined in Article 3.10, paragraph F, the Contractor shall have concrete core specimens obtained and tested from the affected area immediately.

   a. Three cores shall be taken by the Owner's testing firm for each sample in which the strength requirements were not met.

   b. The concrete in question will be considered acceptable if the average compressive strength of a minimum of three test core specimens taken from a given area equal or exceed 85% of the specified 28-day strength and if the lowest core strength is greater than 75% of the specified 28-day strength.

2. Concrete placed with compressive strengths greater than the maximum strength specified shall be removed and replaced or repaired as deemed necessary by the Engineer.

3.06 CARE AND REPAIR OF CONCRETE

A. The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the Owner. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Care shall be exercised to avoid jarring forms or placing any strain on the ends of projecting reinforcing bars. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at no additional cost to the Owner.

B. Areas of honeycomb shall be chipped back to sound concrete and repaired as directed by the Engineer.

C. Concrete formwork blowouts or unacceptable deviations in tolerances for formed surfaces due to improperly constructed or misaligned formwork shall be repaired as directed by the

Engineer. Bulging or protruding areas, which result from slipping or deflecting forms shall be ground flush or chipped out and redressed as directed by the Engineer.

D. Areas of concrete in which cracking, spalling, or other signs of deterioration develop prior to final acceptance shall be removed and replaced, or repaired as directed by the Engineer. This stipulation includes concrete that has experienced cracking due to drying or thermal shrinkage of the concrete. Structural cracks shall be repaired using an epoxy injection system approved by the Engineer. Non-structural cracks shall be repaired using a hydrophilic resin pressure injected grout system approved by the Engineer, unless other means of repair are deemed necessary and approved by the Engineer. Extensive repair or replacement will be considered for concrete placed having compressive strengths greater than maximum strength specified. All repair work shall be performed at no additional cost to the Owner.

END OF SECTION

SECTION 03600 - GROUT

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. Furnish all materials, labor, and equipment required to provide all grout used in concrete work in accordance with the Contract Documents.

1.02 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1.	CRD-C 621	Corps of Engineers Specification for Non-shrink Grout
2.	ASTM C 109	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch or 50 mm cube Specimens)
3.	ASTM C 531	Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts and Monolithic Surfacings
4.	ASTM C 579	Test Method for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacings
5.	ASTM C 827	Standard Test Method for Early Volume Change of Cementitious Mixtures
6.	ASTM C 144	Standard Specification for Aggregate for Masonry Mortar
7.	ASTM C 1107	Standard Specification for Packaged Dry, Hydraulic Cement Grout (Nonshrink)

1.03 SUBMITTALS

A. Submit the following in accordance with Section 01300 - Submittals.

1. Certified test results verifying the compressive strength and shrinkage and expansion requirements specified herein.

2. Manufacturer's literature containing instructions and recommendations on the mixing, handling, placement and appropriate uses for each type of grout used in the work.

1.04 QUALITY ASSURANCE

A. Field Tests (required for pump station and storage tank projects)

1. Compression test specimens will be taken during construction from the first placement of each type of grout and at intervals thereafter as selected by the Engineer to insure continued compliance with these Specifications. The specimens will be made by the Contractor and observed by Engineer.

a. Compression tests and fabrication of specimens for cement grout and non-shrink grout will be performed as specified in ASTM C 109 at intervals during construction as selected by the Engineer. A set of three specimens will be made for testing at seven days, 28 days and any additional time period as appropriate.

b. Compression tests and fabrication of specimens for epoxy grout will be performed as specified in ASTM C 579, Method B, at intervals during construction as selected by the Engineer. A set of three specimens will be made for testing at seven days and any other time period as appropriate.

2. The cost of all laboratory tests on grout will be borne by the Owner, but the Contractor shall assist the Engineer in obtaining specimens for testing. The Contractor shall be charged for the cost of any additional tests and investigation on work performed which does not meet the specifications. The Contractor shall supply all materials necessary for fabricating the test specimens, at no additional cost to the Owner.

3. All grout, already placed, which fails to meet the requirements of these Specifications, is subject to removal and replacement at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Non-Shrink Cement Grout (Applicable for projects with Gravity Sewers and Force Mains)

1. Non-shrink grout shall conform to CRD-C 621 and ASTM C 1107, Grade B or C when tested at a max. fluid consistency of 30 seconds per CDC 611/ASTM C939 at temperature extremes of 45°F and 90°F and an extended working time of 15 minutes. Grout shall be non-metallic, non-stain, and non-shrink and color similar to concrete. Grout shall have a min. 28-day strength of 7,000 psi. Non-shrink grout shall be, "Euco N-S" by the Euclid Chemical Company, "Sikagrout 212" by Sika Corporation, Conspec 100 Non-Shrink Non-Metallic Grout by Conspec, Masterflow 555 Grout by BASF Construction Chemicals.

B. Epoxy Grout (Applicable for projects with Structures)

1. Epoxy grout shall be "Sikadur 32 Hi-Mod" by Sika Corporation, "Duralcrete LV" by Tamms Industries, or "Euco #452 Series" by Euclid Chemical, Concresive 1090 by BASF Construction Chemicals.

2. Epoxy grout shall be modified as required for each particular application with aggregate per manufacturer's instructions.

C. Epoxy Base Plate Grout (Applicable for projects with Structures)

1. Epoxy base plate grout shall be Sikadur 42, Grout-Pak by Sika Corporation, or Masterflow MP by BASF Construction Chemicals.

PART 3 - EXECUTION

3.01 GENERAL

A. Concrete surfaces shall be cleaned of all dirt, grease and oil-like films. Additionally, concrete surfaces shall be free of debris, including chipping or roughening the surface if a laitance or poor concrete is evident. The finish of the grout surface shall match that of the adjacent concrete.

B. All mixing, surface preparation, handling, placing, consolidation, and other means of execution for prepackaged grouts shall be done according to the instructions and recommendations of the manufacturer.

C. The Contractor, through the manufacturer of a non-shrink grout and epoxy grout, shall provide on-site technical assistance upon request, at no additional cost to the Owner.

3.02 CONSISTENCY

A. The consistency of grouts shall such that it is able to completely fill the space to be grouted. Dry pack consistency is such that the grout is plastic and moldable but will not flow.

3.03 MEASUREMENT OF INGREDIENTS

A. Measurements for cement grout shall be made accurately by volume using containers. Shovel measurement shall not be allowed.

B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

3.04 GROUT INSTALLATION

A. Grout shall be placed quickly and continuously, shall completely fill the space to be grouted and be thoroughly compacted and free of air pockets. The grout may be poured in place, pressure grouted by gravity, or pumped. The use of pneumatic pressure or dry-packed grouting requires approval of the Engineer. For grouting beneath base plates, grout shall be poured form one side only and thence flow across to the open side to avoid air-entrapment.

END OF SECTION

APPENDIX A

LFUCG STANDARD DRAWINGS 2017

APPENDIX A

LFUCG STANDARD DRAWINGS 2017

MAYOR JIM GRAY

LEXINGTON

DOUG BURTON, P.E.
DIRECTOR
ENGINEERING

September 22, 2017

Users of Lexington – Fayette Urban County Engineering Standard Drawings

Re: Standard Drawings 2017

Attached is the latest edition of the LFUCG Standard Drawings for construction of storm, sanitary sewers, streets and roads in Lexington – Fayette County. These drawings supersede any and all Standard Drawings previously issued by the Division of Engineering.

These drawings become effective as of September 22, 2017 and any projects dedicated to public use after the above date must comply with or contain references to these Standard Drawings or revisions thereof where applicable.

Questions or comments should be directed to:

Urban County Engineer
Division of Engineering
Fourth Floor
101 E. Vine Street
Lexington, KY 40507
859-258-3410

Sincerely,

W. Douglas Burton, P.E.
Urban County Engineer

WDB;MHF

LEXINGTON

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
STANDARD DRAWINGS 2017
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103 (INC.)	Manhole Frames, Covers and Steps
104 (N/A)	Storm Sewer Manhole Circular Slabs 4'-0" and 5'-0" Diameter
105 (N/A)	Storm Sewer Manhole Circular Slabs 6'-0" Diameter
106 (N/A)	Storm Sewer Manhole Circular Slabs 7'-0" Diameter
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110 (N/A)	Reinforcement Detail 6' Non-Circular M.H. Less Than 10' Depth, 8" Walls, 10" Slab
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112 (N/A)	Reinforcement Detail 6' Non-Circular M.H. 15' to 20' Depth, 10" Walls, 12" Slab
113 (N/A)	Reinforcement Detail 7' Non-Circular M.H. Less Than 10' Depth, 8" Walls, 10" Slab
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162 (N/A)	Sloped and Flared Box Inlet - Outlet 18" - 24" - 30" - 36" All Skews
163 (N/A)	Grates for Sloped and Flared Box Inlet - Outlet
164 (N/A)	Impact Stilling Basin 15" - 24" Pipes
165 (N/A)	Impact Stilling Basin 27" - 48" Pipes
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	See Chapter 11 of *LFUCG Stormwater Manual* for Approved Design Details

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STANDARD DRAWINGS 2017
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201-1 (INC.)	Trenching, Laying, Backfilling and Bedding Under Street Pavement
201-2 (INC.)	Trenching, Laying, Backfilling and Bedding Under Street Pavement Using Flowable Fill
201-3 (N/A)	Utility Trench Restoration Beneath Existing Paved Roads (Section View)
201-4 (N/A)	Utility Trench Restoration Beneath Existing Paved Roads (Plan View)
204 (N/A)	Sanitary Sewer Pipe: Types and Maximum Allowable Fill Heights
206-209	(Future)
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211 (INC.)	Typical Standard Precast Concrete Manhole Pipes Up To 24"
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213 (INC.)	Standard Manhole Junction and Water Stop Details
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220 (INC.)	Standard Circular Manhole Frame and Cover
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250 (INC.)	Grease Interceptor Typical Configuration

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307-1 (INC.)	Residential Entrance Details
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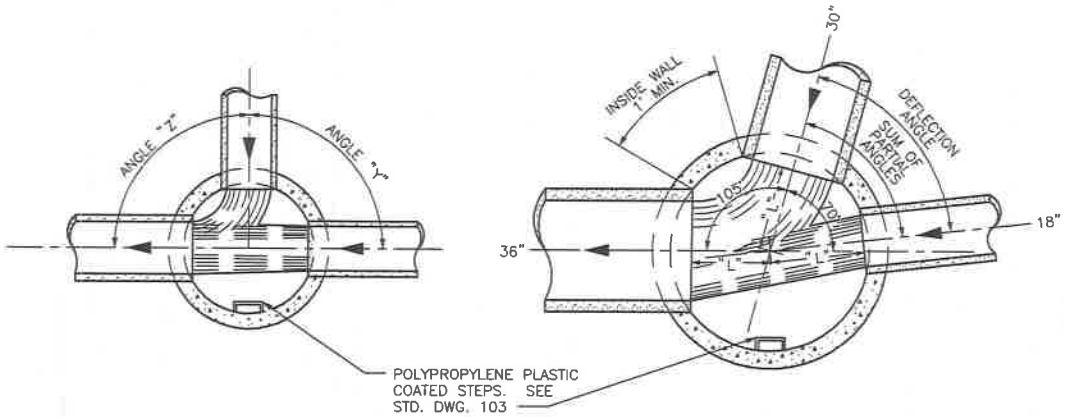
TABLE I
OF
MINIMUM PARTIAL ANGLE

PIPE SIZE	MANHOLE SIZE 4'-0" P. ANGLE	4'-0" L. DIST.	5'-0" P. ANGLE	5'-0" L. DIST.	6'-0" P. ANGLE	6'-0" L. DIST.	7'-0" P. ANGLE	7'-0" L. DIST.	8'-0" P. ANGLE	8'-0" L. DIST.
15"	38°	1'-10"	30°	2'-4"	25°	2'-11"	22°	3'-5"	19°	3'-11"
18"	43°	1'-9"	34°	2'-4"	28°	2'-10"	24°	3'-4"	21°	3'-11"
24"	53°	1'-7"	41°	2'-2"	34°	2'-9"	29°	3'-3"	25°	3'-10"
27"	—	—	45°	2'-1"	37°	2'-8"	32°	3'-3"	28°	3'-9"
30"	—	—	49°	2'-0"	40°	2'-7"	34°	3'-2"	30°	3'-8"
33"	—	—	54°	1'-10"	44°	2'-6"	37°	3'-1"	32°	3'-8"
36"	—	—	—	—	47°	2'-4"	40°	3'-0"	34°	3'-7"
42"	—	—	—	—	55°	2'-1"	46°	2'-9"	39°	3'-5"
48"	—	—	—	—	63°	1'-9"	52°	2'-6"	44°	3'-2"
54"	—	—	—	—	—	—	59°	2'-3"	50°	2'-11"
60"	—	—	—	—	—	—	67°	1'-10"	56°	2'-8"



TYPE "A" MANHOLE – CIRCULAR WALLS
CAST–IN–PLACE OR PRECAST CONCRETE

GENERAL NOTES:

1. ALL DIMENSIONS ARE BASED ON SIZE OF LARGEST PIPE IN MANHOLE.
2. MANHOLES FOR PIPE LARGER THAN 60" SHALL BE SPECIALLY DESIGNED.
3. IN CASES WHERE DEFLECTION ANGLES EXCEED MAXIMUM SHOWN N TABLES, MANHOLE SHALL BE INCREASED IN SIZE OR SPECIALLY DESIGNED.
4. BOTTOM SLAB OF MANHOLES SHALL BE SPECIALLY DESIGNED WITH REGARD TO AREA, THICKNESS, AND REINFORCING IN SITUATIONS WHERE HIGH WATER TABLE OR UNSTABLE SOIL CONDITIONS EXIST.
5. MANHOLE BENCH SHALL SLOPE AT LEAST 1" PER FT. FROM WALLS TO CHANNELS AND SHALL HAVE SMOOTH FLOAT AND BRUSH FINISH.
6. ELEVATIONS OF PIPES IN MANHOLES SHALL BE SUCH THAT THE TOP OF ALL INFLUENT PIPES WILL BE AT AN ELEVATION EQUAL TO OR GREATER THAN THE TOP OF THE EFFLUENT PIPE.
7. INFLUENT PIPES MAY ENTER MANHOLES AT AN ELEVATION ABOVE THE CHANNELS AS REQUIRED TO AVOID CONFLICT WITH LARGER PIPES IN THE MANHOLE.

NOTES:

1. PRECAST CONCRETE MANHOLE BARREL SHALL BE ASTM C–478, CLASS II PIPE TO 12' DEPTH AND C–76 CLASS III GREATER THAN 12' DEPTH.
2. BASE SECTION OF CIRCULAR MANHOLES MAY BE CAST–IN–PLACE CONCRETE, OR CUSTOM PRECAST CONCRETE WITH OPENINGS FOR PIPE.
3. BASE SECTIONS MAY BE SIMILAR TO SANITARY SEWER MANHOLE.
4. PROVIDE STEPS WITHIN 18" OF BENCH.

CIRCULAR MANHOLE NOTES:

1. THE ANGLE BETWEEN ANY TWO PIPES (e.g. ANGLE "Y" OR "Z") MUST BE GREATER THAN THE SUM OF THE PARTIAL ANGLES FROM TABLE I FOR THE MANHOLE SIZE SELECTED. FOR SMALLER ANGLES BETWEEN PIPES, LARGE MANHOLES MUST BE SELECTED. (SEE EXAMPLE BELOW)
2. THE MAXIMUM DEFLECTION ANGLE BETWEEN ANY INCOMING PIPE AND THE DISCHARGE PIPE SHALL BE NO MORE THAN 90° FOR PIPES UP TO 24" IN DIAMETER. THE MAXIMUM DEFLECTION ANGLE FOR 27" TO 42" PIPES SHALL BE 75° AND FOR PIPES LARGER THAN 42" THE MAXIMUM DEFLECTION ANGLE SHALL BE 60°.

EXAMPLE FOR MANHOLE SIZE SELECTION:

FOR MANHOLE SHOWN ABOVE, THE ANGLE BETWEEN 18" AND 30" PIPE IS 70° AND THE ANGLE BETWEEN 30" AND 36" PIPE IS 110°. THE TABLE INDICATES THAT FOR A 6'–0" DIAMETER MANHOLE THE MINIMUM PARTIAL ANGLE FOR AN 18" PIPE IS 28° AND FOR A 30" PIPE IS 40°. THE SUM OF THE PARTIAL ANGLES IS 68° THIS SUM IS LESS THAN THE 70°. THEREFORE, A 6'–0" MANHOLE DIAMETER IS ACCEPTABLE.

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STORM SEWER
MANHOLE TYPE "A"–
CIRCULAR WALLS

STANDARD DRAWING NO. 100

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

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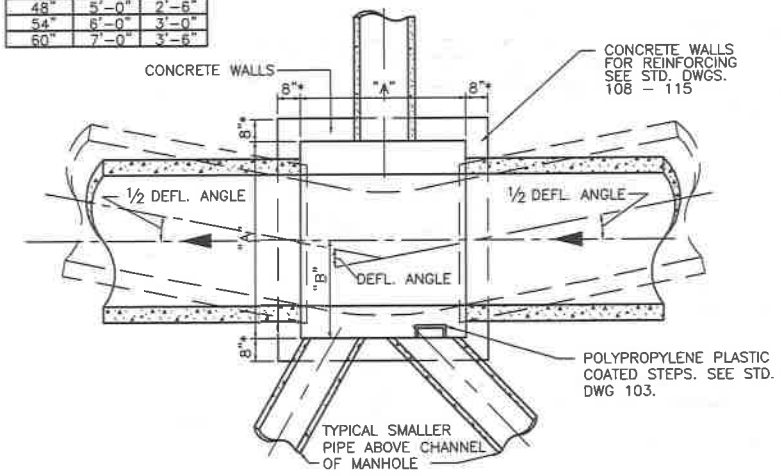
PIPE SIZE	DIM. "A"	DIM. "B"
12"	5'-0"	2'-6"
15"-42"	5'-0"	2'-6"
48"	5'-0"	2'-6"
54"	6'-0"	3'-0"
60"	7'-0"	3'-6"

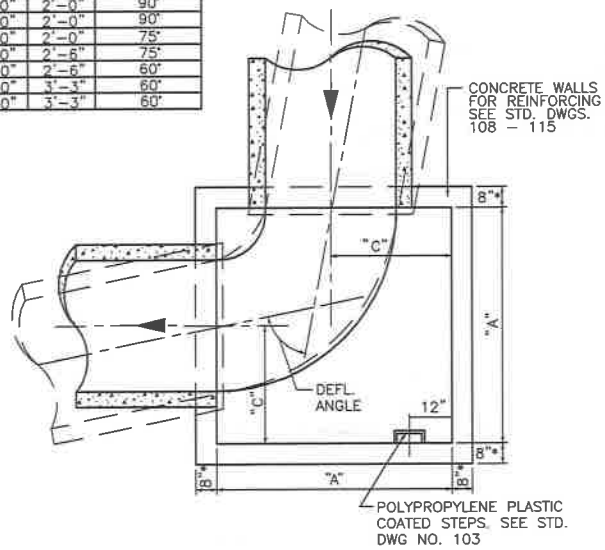


0°–22° DEFLECTION ANGLE

* WALL THICKNESS FOR MANHOLES

DEPTH TO INV.	A=5'-0"	A=6'-0"	A=7'-0"
UP TO 10'	8"	8"	8"
10' TO 15'	8"	8"	10"
15' TO 20'	8"	10"	10"

PIPE SIZE	DIM. "A"	DIM. "C"	MAXIMUM DEFL. ANGLE
12"	5'-0"	2'-0"	90°
15"-33"	5'-0"	2'-0"	90°
36"	5'-0"	2'-0"	75°
42"	6'-0"	2'-6"	75°
48"	6'-0"	2'-6"	60°
54"	7'-0"	3'-3"	60°
60"	7'-0"	3'-3"	60°

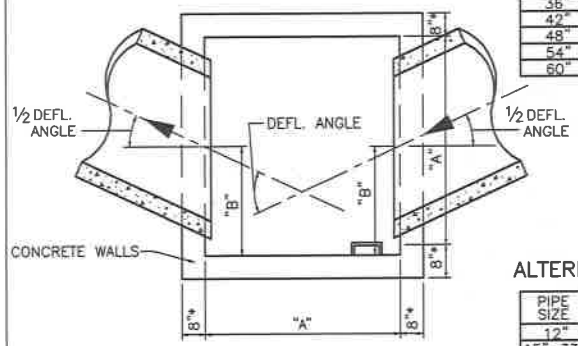


GREATER THAN 68° DEFLECTION ANGLE

TYPE "B" MANHOLE – NON–CIRCULAR WALLS, CAST–IN–PLACE CONCRETE

ALTERNATE–22°–50°

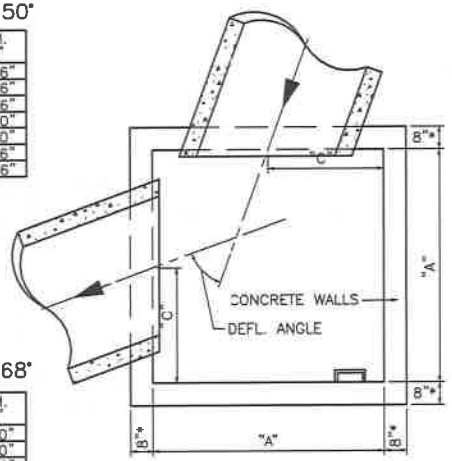
PIPE SIZE	DIM. "A"	DIM. "B"
12"	5'-0"	2'-6"
15"-33"	5'-0"	2'-6"
36"	5'-0"	2'-6"
42"	6'-0"	3'-0"
48"	6'-0"	3'-0"
54"	7'-0"	3'-6"
60"	7'-0"	3'-6"



22°–50° DEFLECTION ANGLE

ALTERNATE–50°–68°

PIPE SIZE	DIM. "A"	DIM. "C"
12"	5'-0"	2'-0"
15"-33"	5'-0"	2'-0"
36"	5'-0"	2'-0"
42"	6'-0"	2'-6"
48"	6'-0"	2'-6"
54"	7'-0"	3'-3"
60"	7'-0"	3'-3"



50°–90° DEFLECTION ANGLE

NOTES:

1. ALL DIMENSIONS ARE BASED ON SIZE OF LARGEST PIPE IN MANHOLE.
2. MANHOLES FOR PIPE LARGER THAN 60" SHALL BE SPECIALLY DESIGNED.
3. PIPES SHALL ENTER MANHOLE WALLS, NOT CORNERS. ALLOW 2" MINIMUM TO INSIDE CORNER FOR WALL CUT.
4. IN CASES WHERE DEFLECTION ANGLES EXCEED MAXIMUM SHOWN IN TABLES, MANHOLE SHALL BE SPECIALLY DESIGNED.
5. BOTTOM SLAB OF MANHOLES SHALL BE SPECIALLY DESIGNED WITH REGARD TO AREA, THICKNESS, AND REINFORCING IN SITUATIONS WHERE HIGH WATER TABLE OR UNSTABLE SOIL CONDITIONS EXIST.
6. MANHOLE BENCH SHALL SLOPE AT LEAST 1" PER FT. FROM WALLS TO CHANNELS AND SHALL HAVE SMOOTH FLOAT AND BRUSH FINISH.
7. THE TOP OF ALL INFLUENT PIPES WILL BE AT AN ELEVATION EQUAL TO THE TOP OF THE EFFLUENT PIPE.
8. INFLUENT PIPES MAY ENTER MANHOLES AT AN ELEVATION ABOVE THE CHANNELS AS REQUIRED TO AVOID CONFLICT WITH LARGER PIPES IN THE MANHOLE.
9. THE MAXIMUM DEFLECTION ANGLE BETWEEN ANY INCOMING PIPE AND OUT GOING PIPE SHALL BE NO MORE THAN 90° FOR PIPES UP TO 24" IN DIAMETER. THE MAXIMUM DEFLECTION ANGLE FOR 27" TO 42" PIPES SHALL BE 75° AND FOR PIPES LARGER THAN 42" THE MAX. DEFLECTION ANGLE SHALL BE 60°.
10. FOR REINFORCING SEE STD. DWGS. 108 – 115.

TYPE "B" MANHOLE FOR DEFLECTION ANGLES BETWEEN 22° & 90°

LEXINGTON – FAYETTE URBAN COUNTY GOVERNMENT

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STORM SEWER MANHOLE TYPE "B"– NON–CIRCULAR WALLS

STANDARD DRAWING NO. 101

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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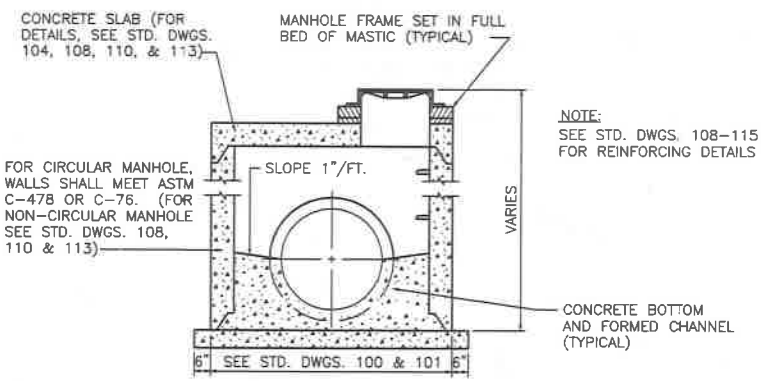
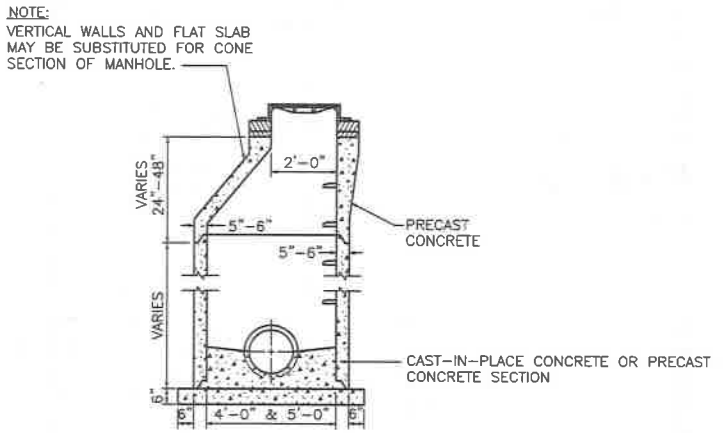
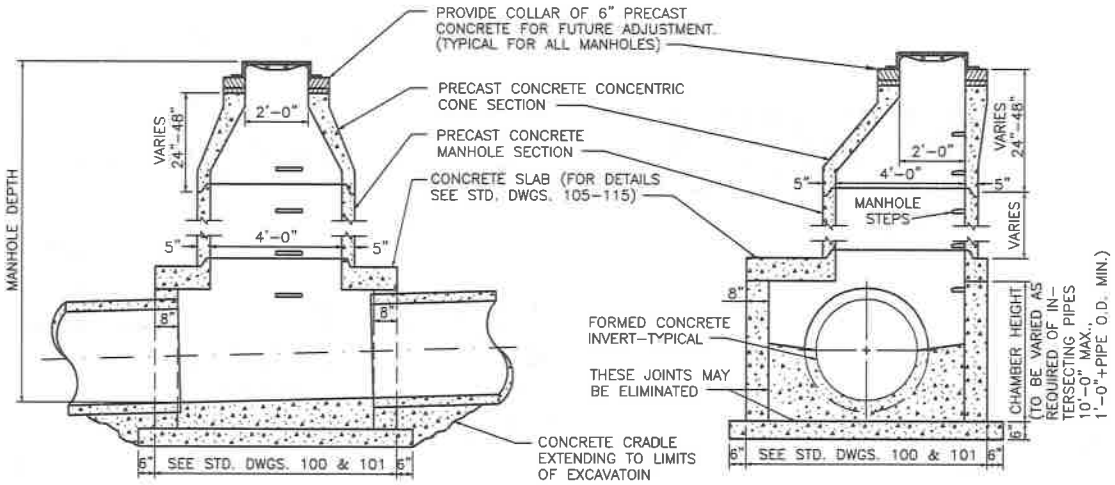


CIRCULAR AND NON–CIRCULAR WALLS (TYPE "A" & TYPE "B")



STANDARD 4'–0" DIA. & 5'–0" CIRCULAR WALLS (TYPE "A")



TYPICAL LONGITUDINAL SECTION

TYPICAL TRANSVERSE SECTION

NOTES:

1. BASE SECTION OF CIRCULAR MANHOLES MAY BE CAST–IN–PLACE CONCRETE OR CUSTOM PRECAST CONCRETE WITH OPENINGS FOR PIPE.
2. 6" OVERHANG IN BOTTOM SLAB IS NOT REQUIRED IF PRECAST MANHOLES ARE USED.
3. FLAT SLABS IN PAVED AREAS SHALL BE USED ONLY AS APPROVED BY ENGINEER.

STANDARD CIRCULAR MANHOLE – 6'–0" DIAMETER & LARGER TYPE "A" AND NON–CIRCULAR WALL MANHOLE – ALL SIZES TYPE "B"

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STORM SEWER MANHOLE DETAILS

STANDARD DRAWING NO.: 102

APPROVAL:

URBAN COUNTY ENGINEER — DATE: 9/22/17

COMMISSIONER — DATE: 9/22/17

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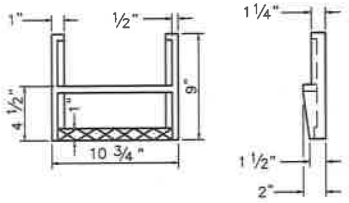
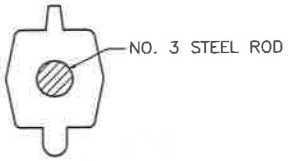
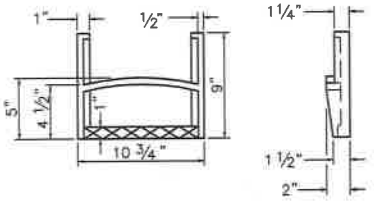


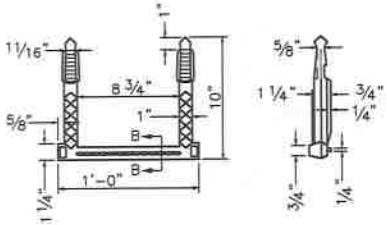
STEP TYPE NO. 1



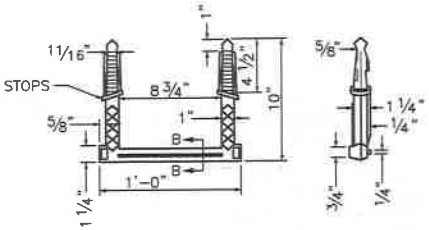
SECTION B–B



STEP TYPE NO. 2



STEP TYPE NO. 3

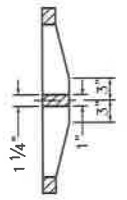


STEP TYPE NO. 4

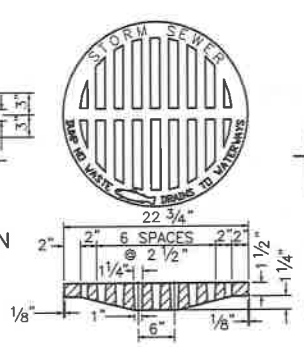
MANHOLE STEPS

NOTES:

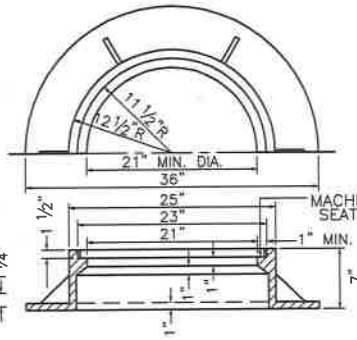
1. STEPS SHALL BE POLYPROPYLENE PLASTIC COATED STEEL ROD OR OF A TYPE AND SIZE APPROVED BY THE ENGINEER.
2. STEPS SHALL BE SPACED 12" O.C. VERTICALLY SO AS TO FORM A CONTINUOUS LADDER.
3. STEPS SHALL BE REQUIRED IN MANHOLES WHEN THE STRUCTURE IS 4 FEET AND GREATER IN DEPTH. (MEASURE FROM FLOWLINE OF LOWEST PIPE TO TOP OF STRUCTURE.)
4. THE TREADS OF ALL STEPS SHALL HAVE ANTI–SKID PROPERTIES FOR HAND AND FOOT GRIPS.
5. MANHOLE STEPS SHALL BE INSTALLED IN A VERTICAL LINE AND SHALL COMPLY WITH OSHA STANDARDS IN ALL RESPECTS.
6. FOR CAST–IN–PLACE OR PRECAST CIRCULAR AND NON–CIRCULAR MANHOLES.
7. FIRST STEP SHALL BE 12" – 18" FROM TOP OF PRECAST CONE SECTION, AND SHALL BE VERTICALLY LOCATED TO MAXIMIZE THE DISTANCE OF ANY STEP FROM THE JOINT OF A MANHOLE SECTION.



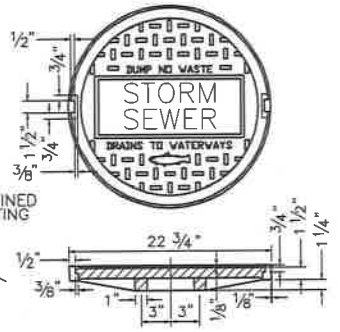
SECTION



GRATING COVER



FRAME



SOLID COVER

NOTES:

1. MINIMUM WEIGHT FOR THE 7" FRAME SHALL BE 185 LBS.
2. MINIMUM WEIGHT FOR THE SOLID COVER SHALL BE 120 LBS.
3. CASTINGS TO MEET ASTM A–48 CLASS 35.

MANHOLE FRAME AND COVERS

LEXINGTON

DIVISION OF ENGINEERING

MANHOLE FRAMES, COVERS, & STEPS

STANDARD DRAWING NO. 103

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE

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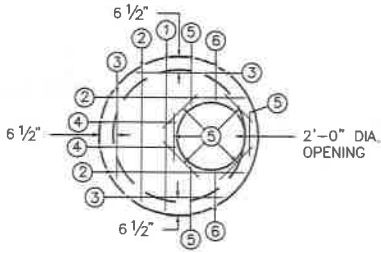
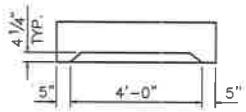


4'-0" DIA. SHALLOW MANHOLES

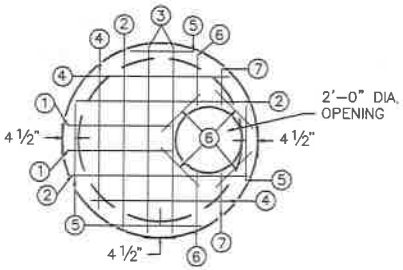
MARK	NO.	SIZE	LENGTH	TYPE
1	1	4	4'-5"	STR.
2	3	"	4'-0"	"
3	3	"	2'-8"	"
4	2	"	2'-0"	"
5	8	"	1'-6"	"
6	2	"	1'-0"	"

NOTES:

1. FOR PIPE SIZES 15" TO 24".
2. 9" O.C. SPACING EACH WAY.
3. 8" THICK SLAB.
4. 4'-10" O.D.
5. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
6. CIRCULAR REBAR MAY BE USED, OR MARK 5 BARS AS SHOWN.



SIDE VIEW

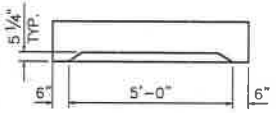


5'-0" DIA. SHALLOW MANHOLES

MARK	NO.	SIZE	LENGTH	TYPE
1	2	4	3'-2"	STR.
2	3	"	5'-3"	"
3	2	"	5'-8"	"
4	3	"	4'-2"	"
5	4	"	2'-2"	"
6	6	"	1'-6"	"
7	2	"	1'-0"	"

NOTES:

1. FOR PIPE SIZES 21" TO 33".
2. 9" O.C. SPACING EACH WAY.
3. 8" THICK SLAB.
4. 6'-0" O.D.
5. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
6. CIRCULAR REBAR MAY BE USED, OR MARK 6 BARS AS SHOWN.



SIDE VIEW

NOTE:
SLAB OUTER DIAMETER TO VARY WITH MANHOLE WALL THICKNESS, TO COMPLETELY COVER MANHOLE WALLS.

LEXINGTON

DIVISION OF ENGINEERING

STORM SEWER
MANHOLE CIRCULAR SLABS
4'-0" & 5'-0" DIAMETER

STANDARD DRAWING NO. 104

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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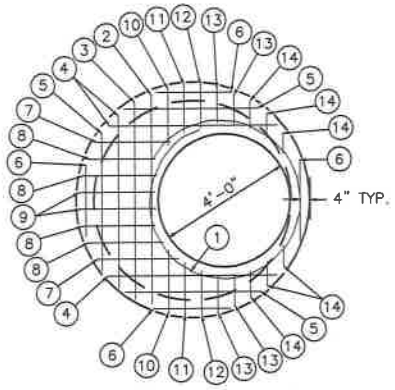
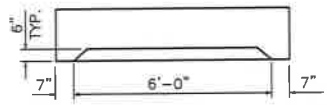


MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'-10"	A
2	1	6	6'-6"	STR.
3	1	"	5'-11"	"
4	3	"	5'-3"	"
5	3	"	4'-3"	"
6	4	"	2'-6"	"
7	2	"	2'-7"	"
8	4	"	2'-3"	"
9	2	"	2'-2"	"
10	2	"	1'-10"	"
11	2	"	1'-6"	"
12	2	"	1'-3"	"
13	4	"	1'-0"	"
14	6	"	0'-10"	"

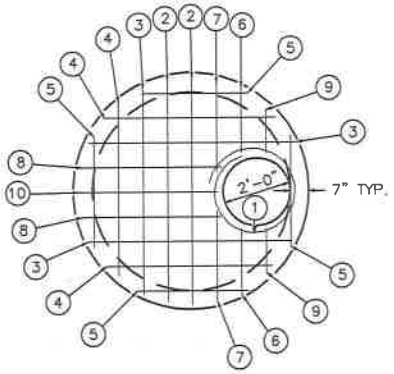
6'-0" DIA. STANDARD MANHOLES



SIDE VIEW

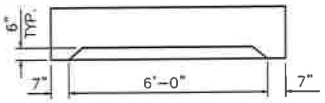
NOTES:

1. FOR PIPE SIZES 15" TO 48".
2. 6" O.C. SPACING EACH WAY.
3. 12" THICK SLAB.
4. 7'-2" O.D.
5. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.



MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	9'-6"	A_1
2	2	5	6'-9"	STR.
3	3	"	6'-3"	"
4	3	"	5'-3"	"
5	4	"	3'-3"	"
6	2	"	1'-10"	"
7	2	"	2'-9"	"
8	2	"	4'-4"	"
9	2	"	1'-5"	"
10	1	"	4'-3"	"

6'-0" DIA. SHALLOW MANHOLES

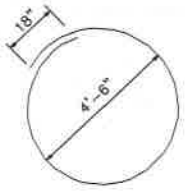


SIDE VIEW

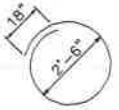
NOTES:

1. FOR PIPE SIZES 15" TO 36".
2. 9" O.C. SPACING EACH WAY.
3. 8" THICK SLAB.
4. 7'-2" O.D.
5. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.

SPECIAL BAR BENDS



TYPE A



TYPE A_1

NOTE:
SLAB OUTER DIAMETER TO VARY WITH MANHOLE WALL THICKNESS, TO COMPLETELY COVER MANHOLE WALLS.

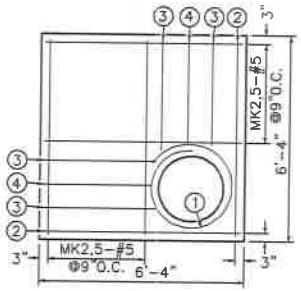
LEXINGTON

DIVISION OF ENGINEERING

STORM SEWER
MANHOLE CIRCULAR SLABS
6'-0" DIAMETER

STANDARD DRAWING NO. 105

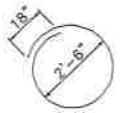
APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17



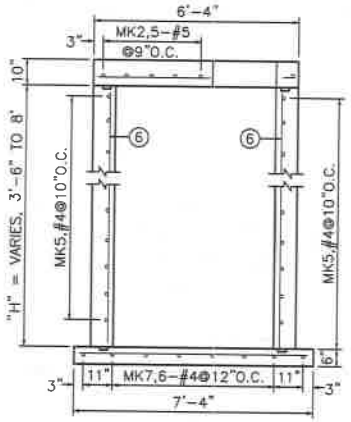
TOP SLAB
2'–0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	9'–6"	A_1
2	12	5	6'–0"	STR.
3	4	5	3'–8"	"
4	2	5	3'–4"	"

SPECIAL BAR BENDS



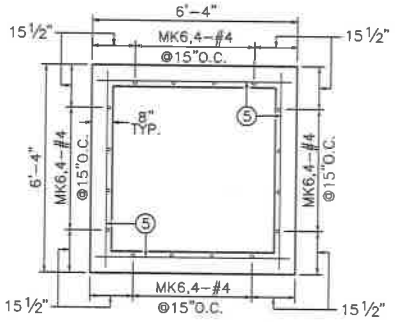
TYPE A_1



VERT. SECTION

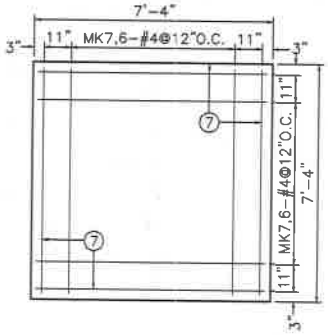
MARK	NO.	SIZE	LENGTH	TYPE
5	*	4	6'–0"	STR.

* 4 X (HEIGHT OF WALL (INCH)/10) (ROUNDED UP TO THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
6	16	4	DIM. "H"–2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
7	16	4	7'–0"	STR.

NOTES:

1. PROVIDE 2" x 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

LEXINGTON

DIVISION OF ENGINEERING

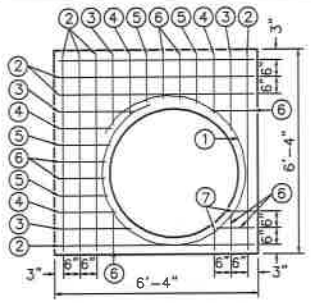
REINFORCEMENT DETAIL
5' NON–CIRCULAR M.H.
LESS THAN 10' DEPTH,
8" WALLS, 10" SLAB

STANDARD DRAWING NO. 108

APPROVAL:

URBAN COUNTY ENGINEER — DATE 5/22/17

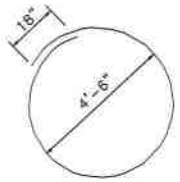
COMMISSIONER — DATE 5/23/17



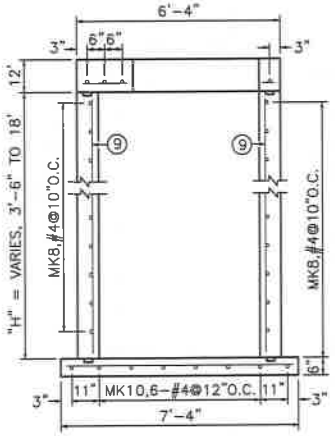
TOP SLAB
4'-0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'-10"	A
2	8	5	6'-0"	STR.
3	4	5	2'-4"	"
4	4	5	1'-9"	"
5	4	5	1'-5"	"
6	8	5	1'-4"	"
7	2	5	0'-10"	"

SPECIAL BAR BENDS



TYPE A



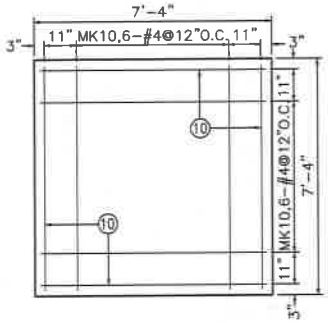
VERT. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
8	*	4	6'-0"	STR.

* 4 X (HEIGHT OF WALL (INCH)/10) (ROUNDED UP TO THE NEXT WHOLE NUMBER)

MARK	NO.	SIZE	LENGTH	TYPE
9	16	4	DIM. "H"-2"	STR.

HORIZ. SECTION



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
10	16	4	7'-0"	STR.

NOTES:

1. PROVIDE 2" x 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN THE TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

LEXINGTON

DIVISION OF ENGINEERING

REINFORCEMENT DETAIL
5' NON-CIRCULAR M.H.
7'-6" TO 20' DEPTH,
8" WALLS, 12" SLAB

STANDARD DRAWING NO. 109

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/25/17

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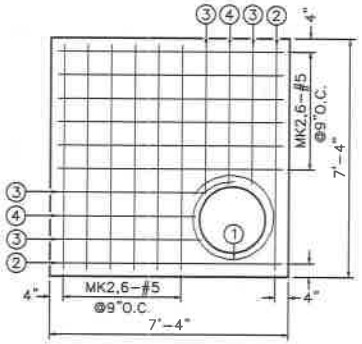
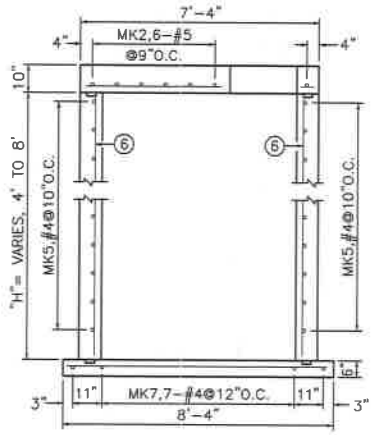


TOP SLAB
2'–0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	9'–6"	A_1
2	14	5	7'–0"	STR.
3	4	5	4'–8"	"
4	2	5	4'–4"	"

SPECIAL BAR BENDS

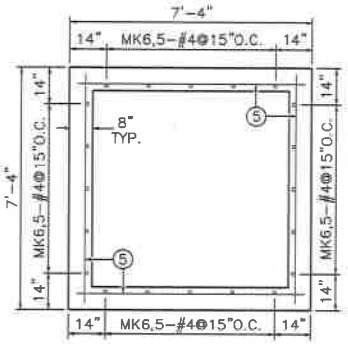
TYPE A_1



VERT. SECTION

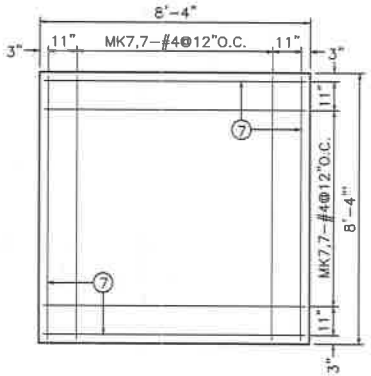
MARK	NO.	SIZE	LENGTH	TYPE
5	*	4	7'–0"	STR.

* 4 X (HEIGHT OF WALL (INCH)/10) (ROUNDED UP THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
6	20	4	DIM. "H"–2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
7	18	4	8'–0"	STR.

NOTES:

1. PROVIDE 2" x 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

LEXINGTON

DIVISION OF ENGINEERING

REINFORCEMENT DETAIL
6' NON–CIRCULAR M.H.
LESS THAN 10' DEPTH,
8" WALLS, 10" SLAB

STANDARD DRAWING NO. 110

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/26/17

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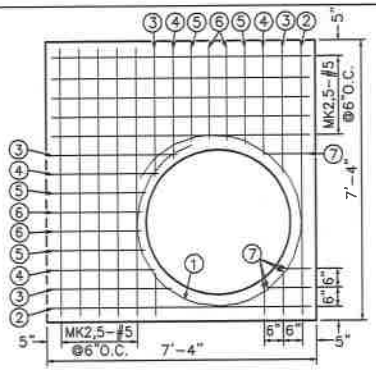
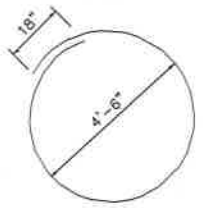


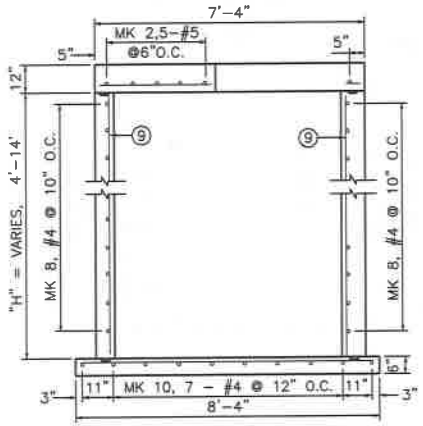
TOP SLAB
4'–0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'–10"	A
2	12	5	7'–10"	STR.
3	4	5	3'–4"	"
4	4	5	2'–9"	"
5	4	5	2'–5"	"
6	4	5	2'–4"	"
7	6	5	0'–10"	"

SPECIAL BAR BENDS



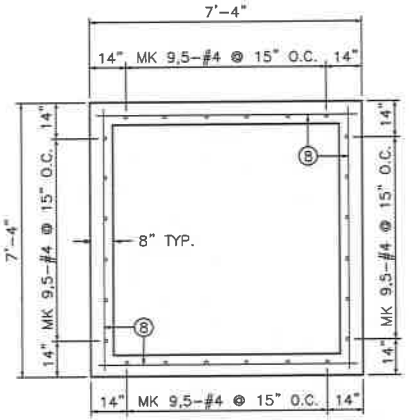
TYPE A



VERT. SECTION

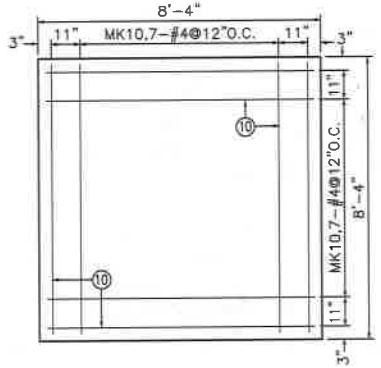
MARK	NO.	SIZE	LENGTH	TYPE
8	*	4	7'–0"	STR.

* 4 X (HEIGHT OF WALL (INCH)/10) (ROUNDED UP TO THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
9	20	4	DIM. "H"–2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
10	18	4	8'–0"	STR.

NOTES:

1. PROVIDE 2" x 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

LEXINGTON

DIVISION OF ENGINEERING

REINFORCEMENT DETAIL
6' NON–CIRCULAR M.H.
8' TO 15' DEPTH,
8" WALLS, 12" SLAB

STANDARD DRAWING NO. 111

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

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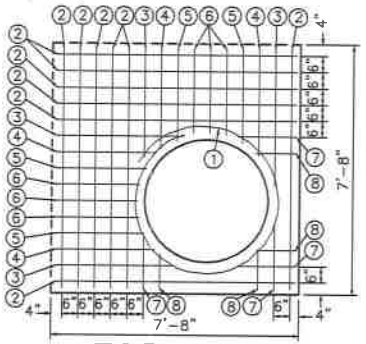
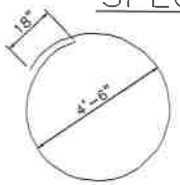


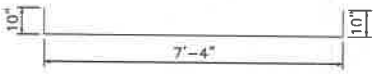
TOP SLAB
4'-0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'-10"	A
2	12	5	7'-4"	STR.
3	4	5	3'-3"	"
4	4	5	2'-9"	"
5	4	5	2'-7"	"
6	6	5	2'-6"	"
7	4	5	1'-2"	"
8	4	5	0'-10"	"

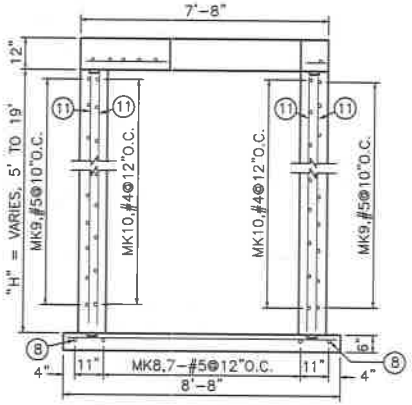
SPECIAL BAR BENDS



TYPE A



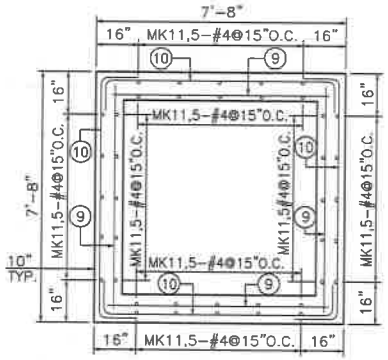
TYPE C



VERT. SECTION

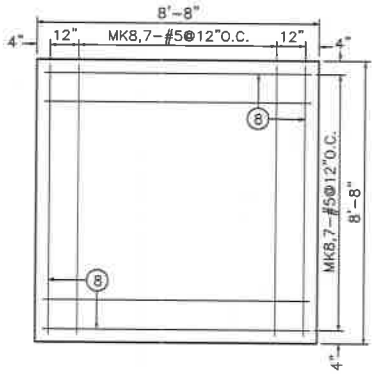
MARK	NO.	SIZE	LENGTH	TYPE
9	*1	5	7'-4"	STR.
10	*2	4	9'-0"	C

*1 4 X (WALL HEIGHT (INCH)/10)
*2 4 X (WALL HEIGHT (INCH)/12)
(ROUNDED UP TO THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
11	40	4	DIM. "H"-2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
8	18	5	8'-4"	STR.

NOTES:

1. PROVIDE 2" x 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

LEXINGTON

DIVISION OF ENGINEERING

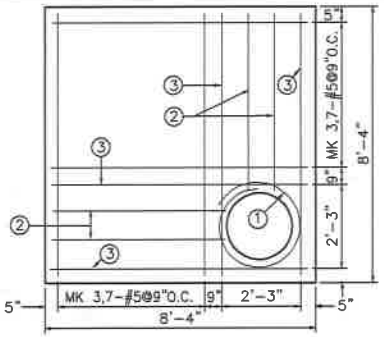
REINFORCEMENT DETAIL
6' NON-CIRCULAR M.H.
15' TO 20' DEPTH,
10" WALLS, 12" SLAB

STANDARD DRAWING NO. 112

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

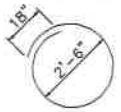
COMMISSIONER — DATE 9/22/17



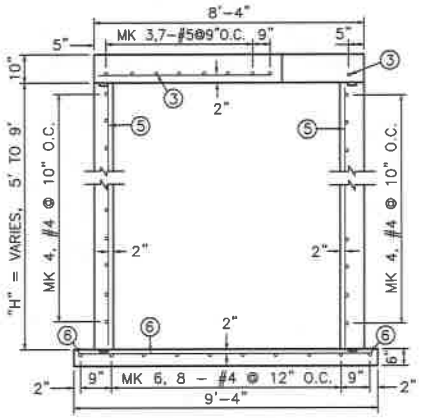
TOP SLAB
2'-0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	9'-6"	A_1
2	4	5	5'-5"	STR.
3	18	5	8'-0"	"

SPECIAL BAR BENDS



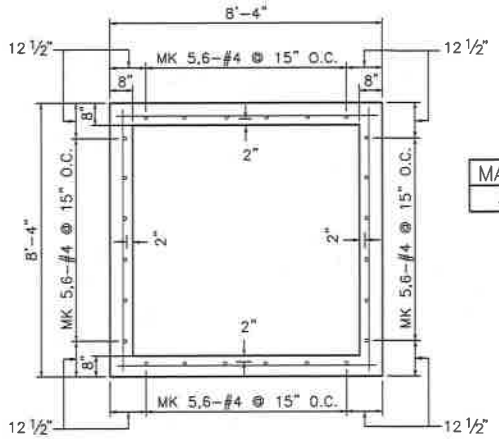
TYPE A_1



VERT. SECTION

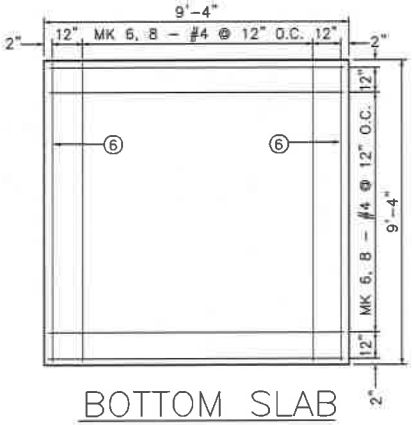
MARK	NO.	SIZE	LENGTH	TYPE
4	*	4	8'-0"	STR.

* 4 X (HEIGHT OF WALL) (INCH)/10 (ROUNDED TO THE NEXT WHOLE NUMBER.)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
5	24	4	DIM."H"-2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
6	20	4	9'-0"	STR.

NOTES:

1. PROVIDE 2" X 4" KEYS FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFAFCE TO M.H. INVERT.

LEXINGTON

DIVISION OF ENGINEERING

REINFORCEMENT DETAIL
7' NON-CIRCULAR M.H.
LESS THAN 10' DEPTH,
8" WALLS, 10" SLAB

STANDARD DRAWING NO. 113

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE

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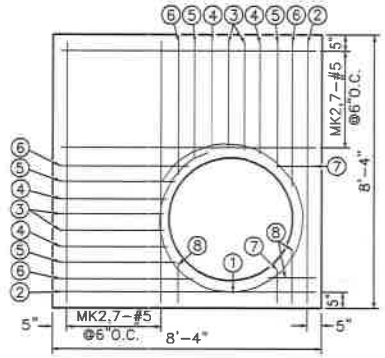
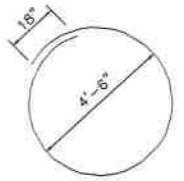


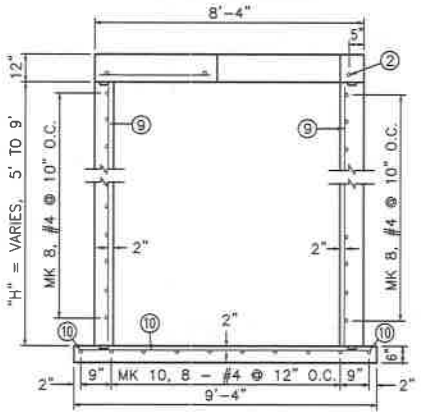
TOP SLAB
4'-0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'-10"	A
2	16	5	8'-0"	STR.
3	4	5	3'-4"	"
4	4	5	3'-5"	"
5	4	5	3'-9"	"
6	4	5	4'-4"	"
7	2	5	0'-10"	"
8	3	5	1'-4"	"

SPECIAL BAR BENDS



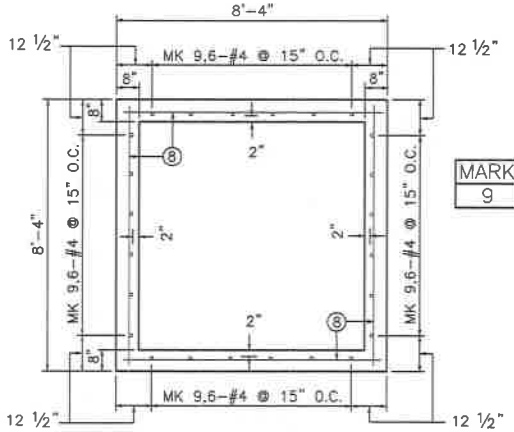
TYPE A



VERT. SECTION

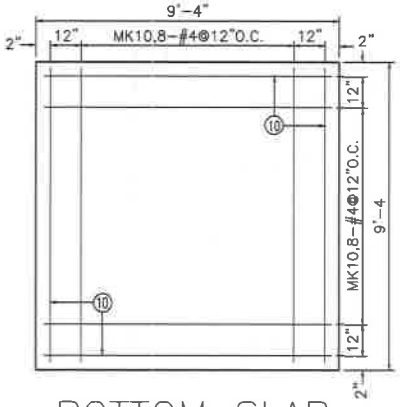
MARK	NO.	SIZE	LENGTH	TYPE
8	*	4	8'-0"	STR.

* 4 X (HEIGHT OF WALL (INCH)/10) (ROUNDED UP TO THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
9	24	4	DIM. "H"-2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
10	20	4	9'-0"	STR.

NOTES:

1. PROVIDE 2" x 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

LEXINGTON

DIVISION OF ENGINEERING

REINFORCEMENT DETAIL
7' NON-CIRCULAR M.H.
8' TO 10' DEPTH,
8" WALLS, 12" SLAB

STANDARD DRAWING NO. 114

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

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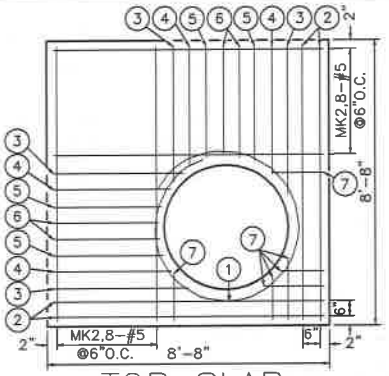
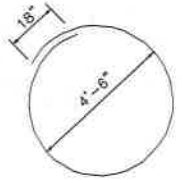


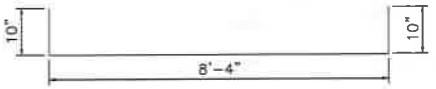
TOP SLAB
4'–0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'–10"	A
2	20	5	8'–4"	STR.
3	4	5	4'–3"	"
4	4	5	3'–9"	"
5	4	5	3'–7"	"
6	4	5	3'–6"	"
7	6	5	1'–2"	"

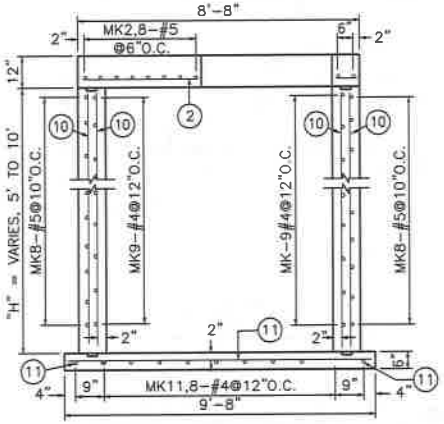
SPECIAL BAR BENDS



TYPE A



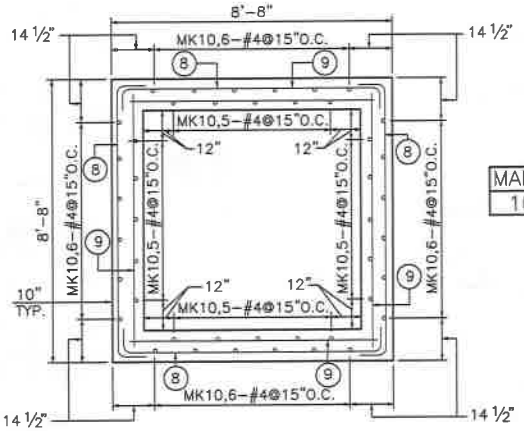
TYPE C



VERT. SECTION

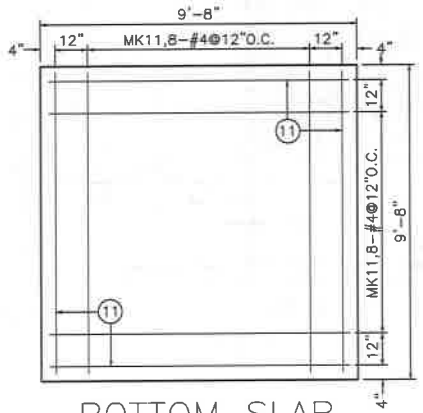
MARK	NO.	SIZE	LENGTH	TYPE
8	*1	5	10'–0"	C
9	*2	4	8'–4"	STR.

*1 4 X (WALL HEIGHT (INCH)/10)
*2 4 X (WALL HEIGHT (INCH)/12)
(ROUNDED UP TO THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
10	44	4	DIM. "H"–2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
11	20	4	9'–4"	STR.

NOTES:

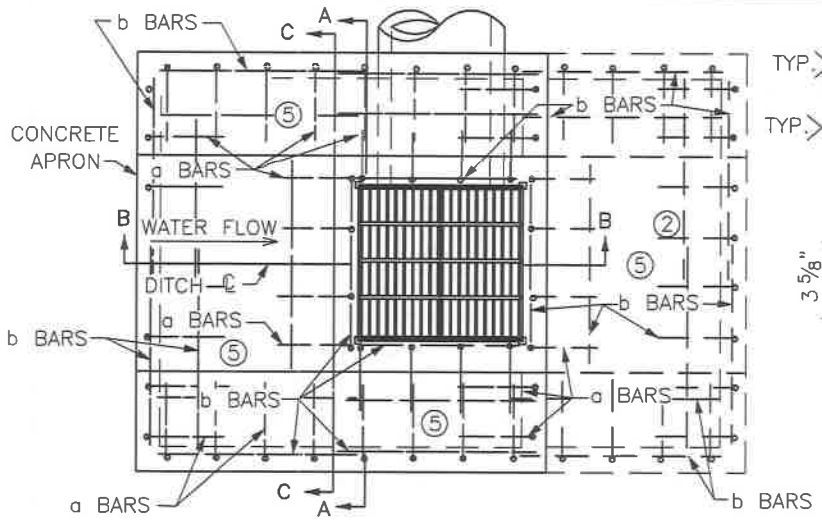
1. PROVIDE 2" x 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

LEXINGTON
DIVISION OF ENGINEERING

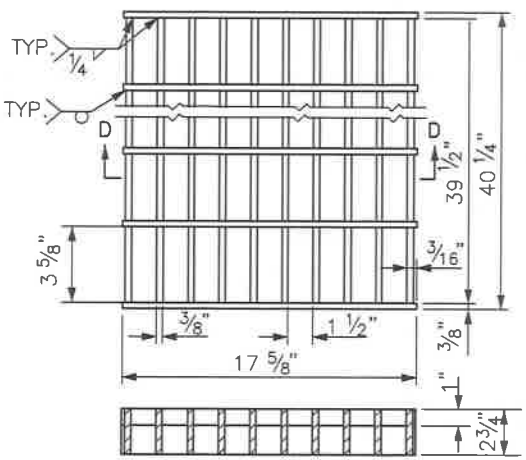
REINFORCEMENT DETAIL
7' NON–CIRCULAR M.H.
10' TO 20' DEPTH,
10" WALLS, 12" SLAB

STANDARD DRAWING NO. 115

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

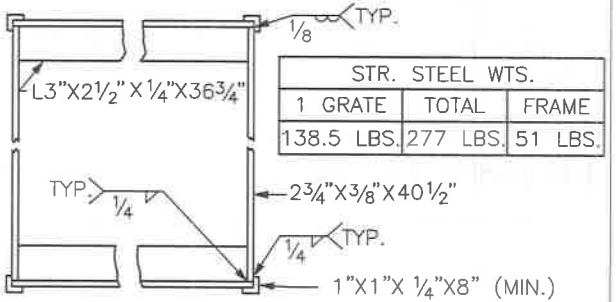


PLAN



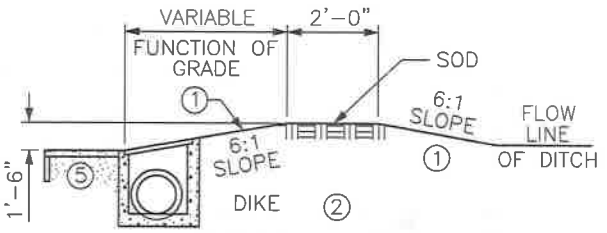
SECTION D–D

DETAIL OF GRATE
(TWO REQUIRED)

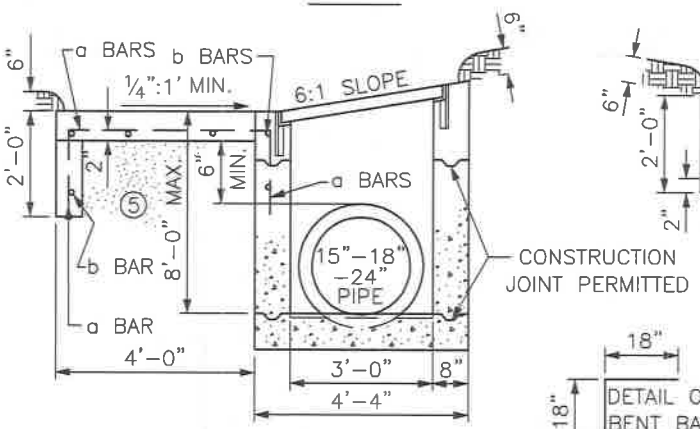


STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
138.5 LBS.	277 LBS.	51 LBS.

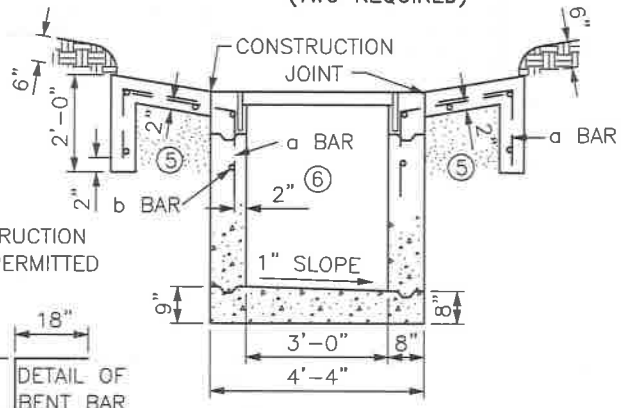
DETAIL OF FRAME



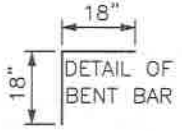
SECTION OF DIKE

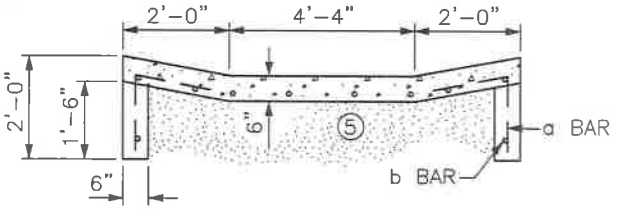


SECTION B–B



SECTION A–A





SECTION C–C

1. 6 : 1 Slopes are with reference to ditch grade.
2. When a box inlet is placed in a sag, omit the earth dike and longitudinal slope of the grate, and provide a concrete apron on each side of the inlet.
3. Rate of increase or decrease 0.36 cu. yd. per foot in height.
4. Deduct approximately 0.1 cu. yd. of concrete per pipe.
5. ⬚ Compact this volume with D.G.A. base or equivalent.
6. Steps are required for depths greater than 4' refer to Std. Dwg. 103.

APPROX. QUANTITIES

TYPE	CONCRETE 3'–9" ③ BOX	REINF. STEEL
SAG	4.4 CU. YD. ④	282 LBS.
GRADE	3.4 CU. YD. ④	192 LBS.

BILL OF REINFORCEMENT

BAR	NO.	SIZE	LENGTH	APPROX. SPACING
a	40 OR 56	#5	3'–0"	12" C TO C
b	25 OR 40	#4	4'–0"	AS SHOWN

LEXINGTON
DIVISION OF ENGINEERING

SURFACE INLET TYPE "A"

STANDARD DRAWING NO. 120

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

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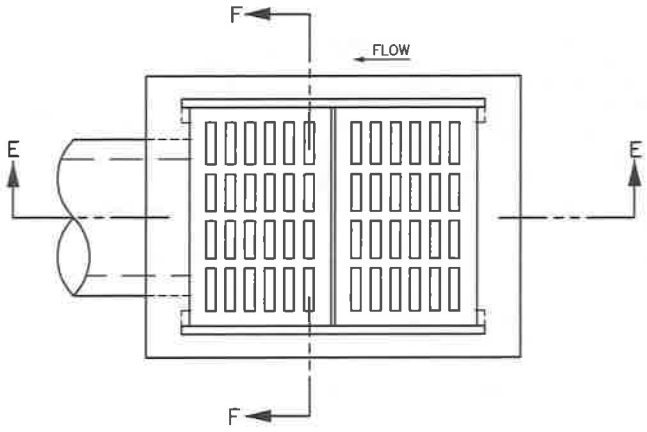
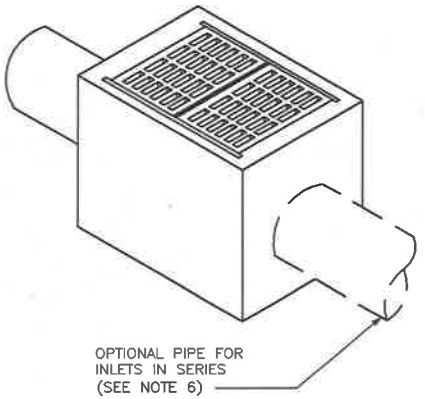


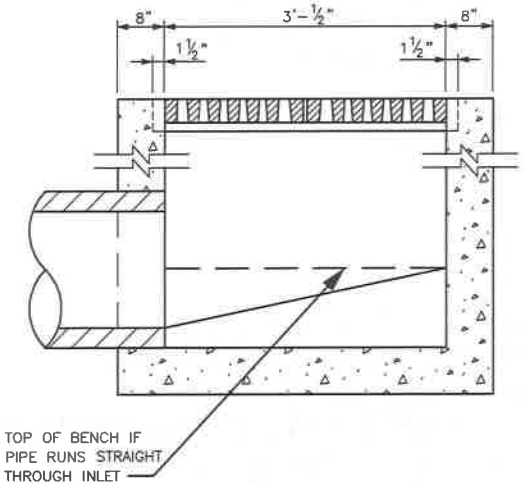
PLAN VIEW

NOTES:

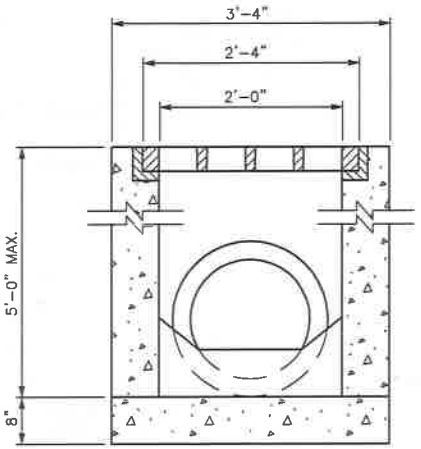
1. NO. 5 STEEL SHALL BE USED THROUGHOUT ON 12" CENTERS.
2. ALL STEEL SHALL HAVE A 2" MINIMUM CLEARANCE TO ANY CONCRETE FACE.
3. NO STEEL IS REQUIRED IN THE BOTTOM SLAB.
4. ALL VERTICAL STEEL SHALL EXTEND 4" INTO BOTTOM SLAB.
5. FOR USE IN PAVED AREAS ONLY.
6. PROVIDE MINIMUM 0.1' SLOPE THROUGH STRUCTURE FOR PIPES IN SERIES. CARRY TROUGH THROUGH. ONLY STRAIGHT THROUGH CONNECTIONS ARE ALLOWED.

ISOMETRIC VIEW

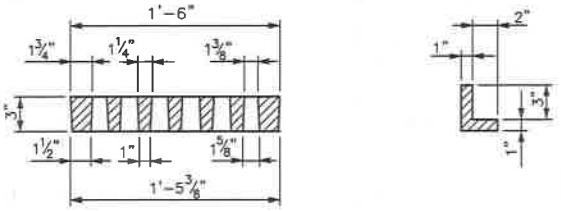




SECTION E–E



SECTION F–F



GRATE DETAILS

LEXINGTON

DIVISION OF ENGINEERING

SURFACE INLET TYPE "B"

STANDARD DRAWING NO. 121

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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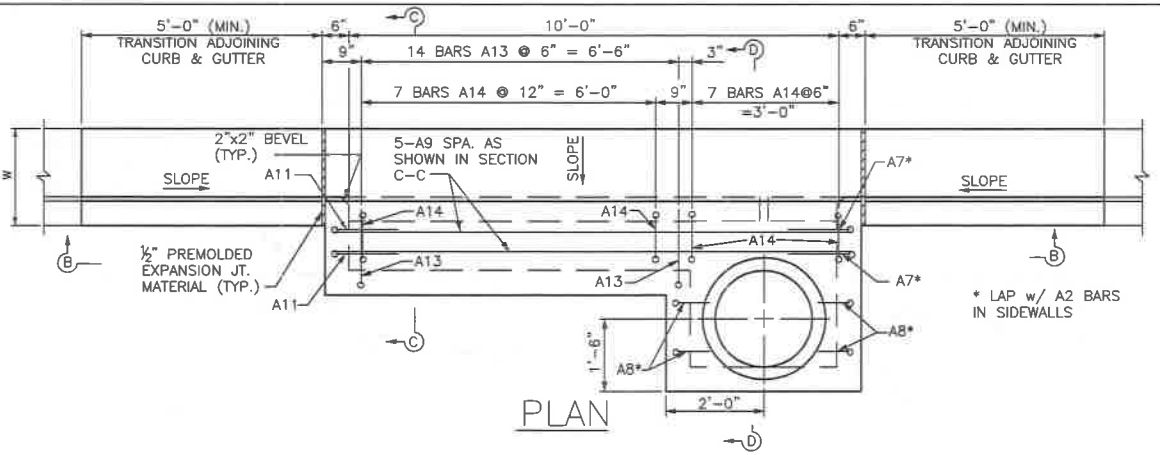
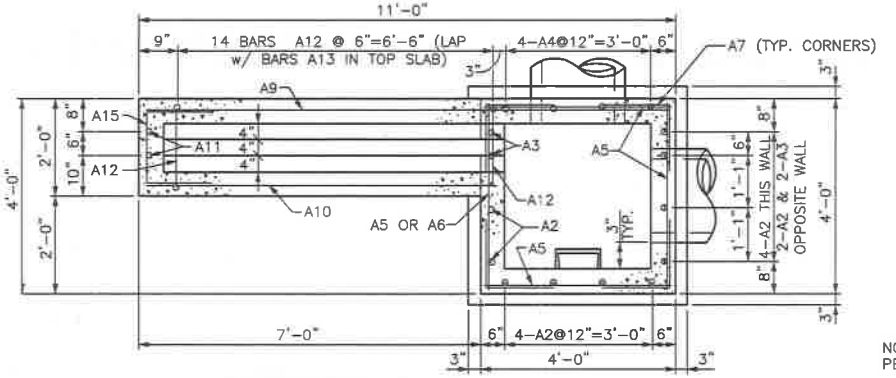
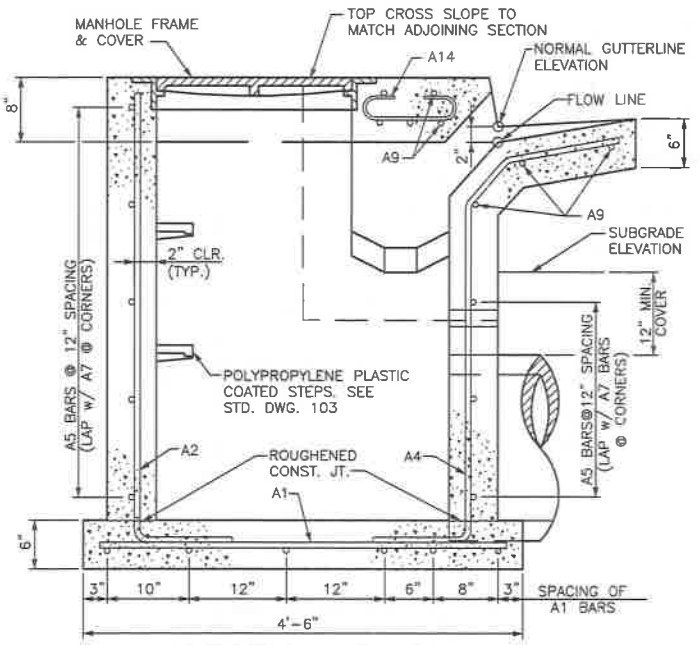
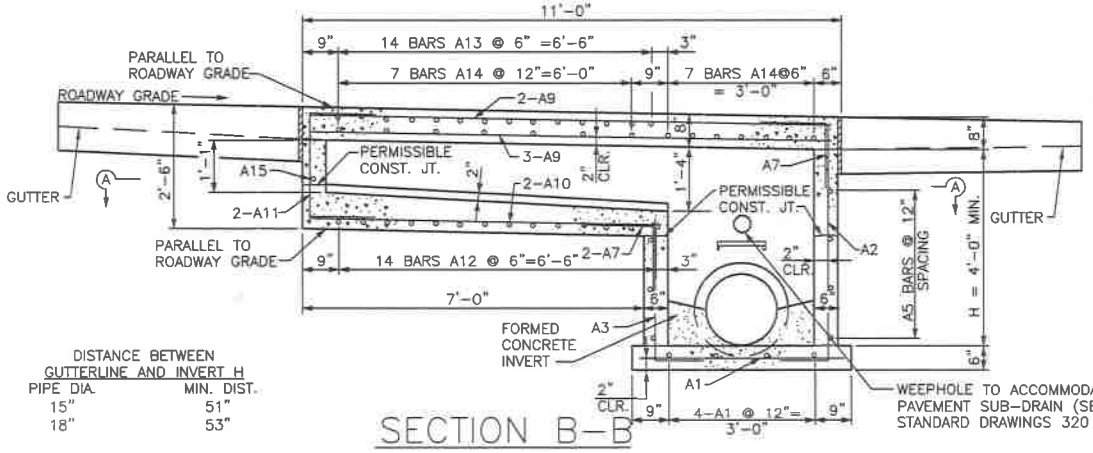


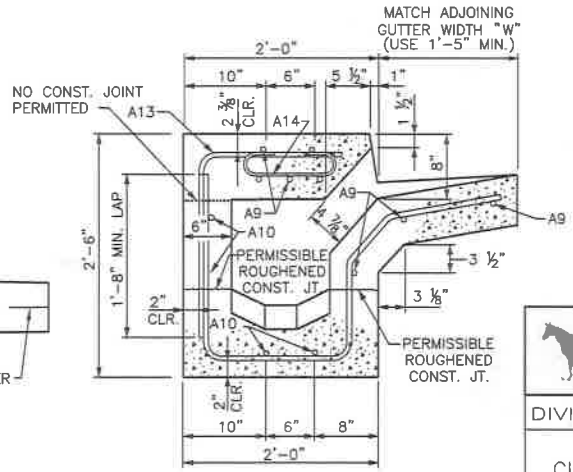






DISTANCE BETWEEN GUTTERLINE AND INVERT H

PIPE DIA.	MIN. DIST.
15"	51"
18"	53"



SEE STD. DWG 122-2 FOR BILL OF REINFORCEMENT & ADDITIONAL DETAILS

LEXINGTON

DIVISION OF ENGINEERING

CURB BOX INLET TYPE "A" 4'X4' BOX 15"-18" PIPES

STANDARD DRAWING NO. 122-1

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

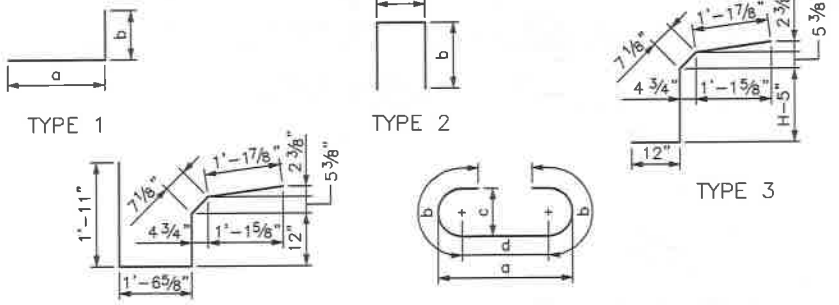
COMMISSIONER — DATE 9/22/17

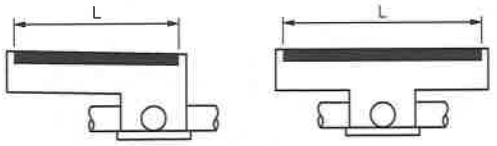
BILL OF REINFORCEMENT

MARK	TYPE	SIZE	NO.	LENGTH FT.	LENGTH IN.	LOCATION	a FT.	a IN.	b FT.	b IN.	c FT.	c IN.	d FT.	d IN.
A1	STR	#5	10	4	2	FOOTING								
A2	1	#5	10	H+(1'-10")		CHAMBER WALLS	1	0	H+10"					
A3	1	#5	2	H-4"		CHAMBER WALLS	1	0	H-(1'-4")					
A4	3	#5	4	H+(2'-4")		CHAMBER FRONT WALL								
A5	STR	#5	15*	3	8	CHAMBER WALLS								
A6	STR	#5	2	2	2	CHAMBER ABOVE THROAT								
A7	1	#5	19*	2	8	CORNERS	1	4	1	4				
A8	1	#5	4	2	1	CHAMBER WALLS & TOP	1	4	0	9				
A9	STR	#5	8	10	8	TOP SLAB & APRON								
A10	STR	#5	4	7	2	THROAT								
A11	2	#5	2	4	8	THROAT	2	1 5/8	1	4				
A12	4	#5	14	6	1	THROAT & APRON								
A13	1	#5	14	3	5	THROAT	1	11	1	6				
A14	5	#3	14	1	11	TOP SLAB	0	11 1/2	0	7	0	3	0	8 1/2
A15	2	#5	1	4	2	END THROAT	1	6	1	4				

* NO. OF BARS REQUIRED FOR H=4'-0"
ADD OR DEDUCT 4-A5 & 4-A7 FOR EACH 1'-0" INCREASE OR DECREASE IN H.

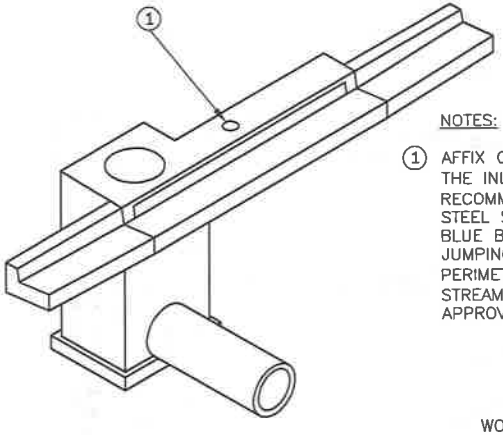
BAR TYPES





DETAIL 'A'

APPLICABLE SITUATIONS



ISOMETRIC VIEW

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI. STEEL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60. ALL EXPOSED EDGES SHALL BE BEVELED 3/4" UNLESS OTHERWISE SHOWN.
2. THIS DRAWING DEPICTS A CURB BOX INLET IN A GRADE SITUATION. FOR CURB BOX BOX IN SAG SITUATION, DETAILS SHALL BE MODIFIED AS INDICATED IN DETAIL 'A'.
3. THE STANDARD OPENING LENGTH IS 10'-0" AS DETAILED HERE. THIS LENGTH MAY BE INCREASED OR DECREASED BASED ON HYDRAULIC ANALYSIS AND APPROVAL BY THE LEXINGTON-FAYETTE COUNTY URBAN GOVERNMENT ENGINEER. MODIFICATION TO THE OPENING LENGTH WILL REQUIRE MODIFICATION OF LENGTH OF BARS A9 & A10 AND INCREASE OR DECREASE IN NUMBER OF BARS A12, A13 & A14 MAINTAINING THE SAME MAXIMUM SPACING SHOWN ON THIS DRAWING.
4. MAXIMUM "H" FOR APPLICATION OF THIS DRAWING SHALL BE 10 FEET.
5. FIELD BEND OR CUT BARS A2, A4, AND A5 AS NECESSARY WHERE PIPES PENETRATE CHAMBER WALLS.
6. FOR CURB BOX INLET IN CURVE WITH CURB RADIUS OF LESS THAN 25', LONGITUDINAL BARS A9, A10 SHALL BE SHOP FABRICATED RADIALLY.

NOTES:

(1) AFFIX CIRCULAR MARKER TO THE TOP OF THE INLET BOX, PER MANUFACTURER'S RECOMMENDATIONS: 4" DIAMETER STAINLESS STEEL STAMPED DISK WITH BAKED ENAMEL BLUE BACKGROUND. LOGO OF FISH JUMPING OVER WAVES WITH TEXT ON PERIMETER "STORM DRAIN * DRAINS TO STREAM*". ALMETEK INDUSTRIES OR APPROVED EQUAL.

WORK THIS DWG. WITH STD. DWG. 122-1

LEXINGTON

DIVISION OF ENGINEERING

CURB BOX INLET TYPE "A"
4'X4' BOX
15'-18" PIPES

STANDARD DRAWING NO. 122-2

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

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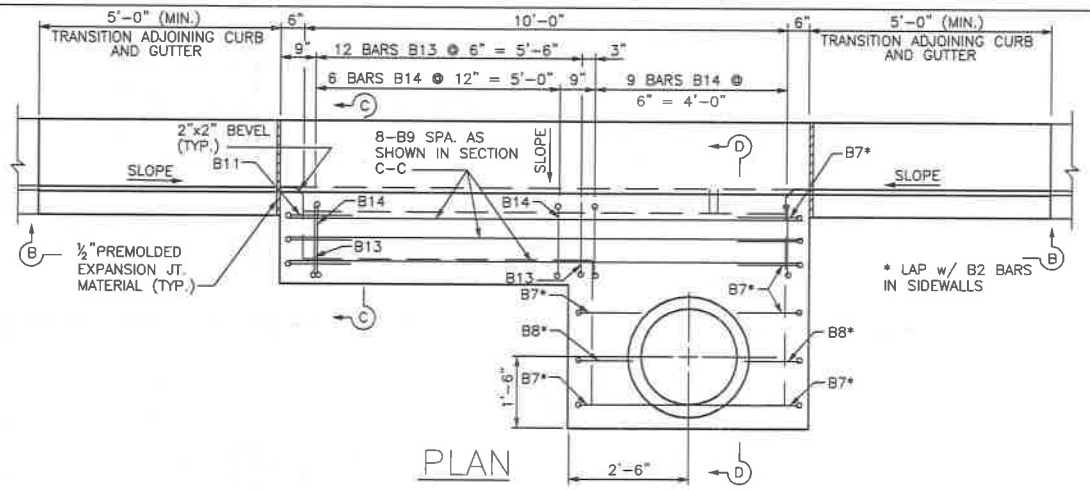

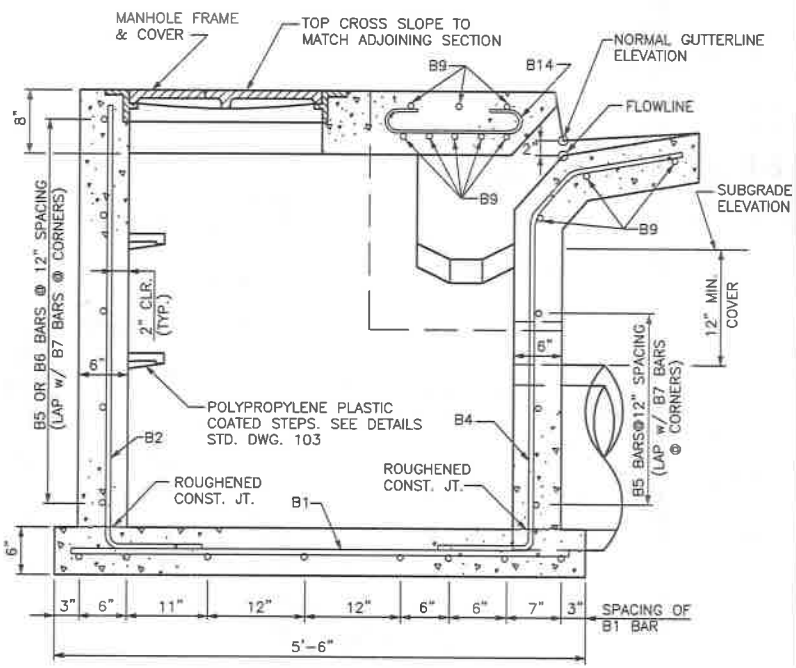

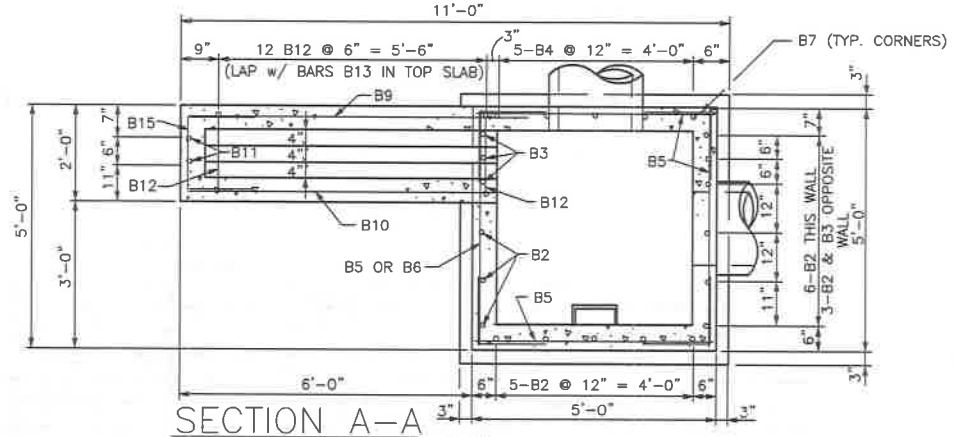

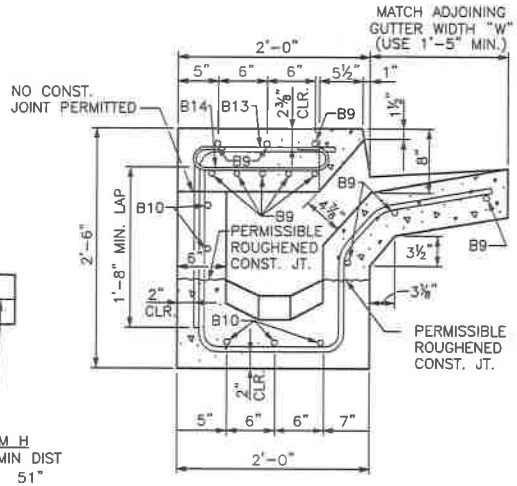

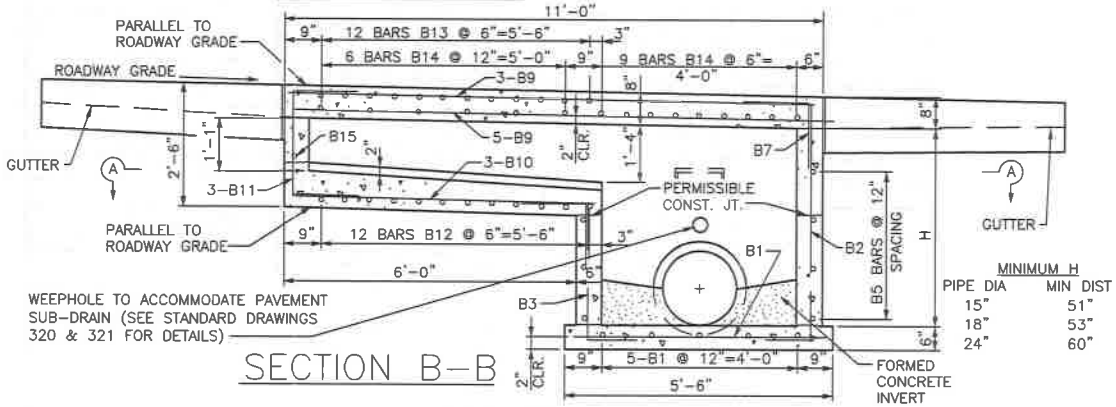

MINIMUM H

PIPE DIA	MIN DIST
15"	51"
18"	53"
24"	60"

SEE STD. DWG. 123-2 FOR BILL OF REINFORCEMENT & ADDITIONAL DETAILS.

LEXINGTON

DIVISION OF ENGINEERING

CURB BOX INLET TYPE "B"
5'X5' BOX
15"-24" PIPES

STANDARD DRAWING NO. 123-1

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

LEXINGTON – FAYETTE URBAN COUNTY GOVERNMENT

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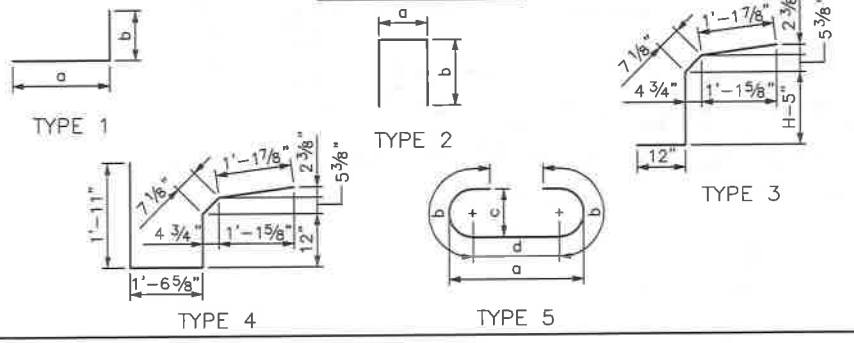
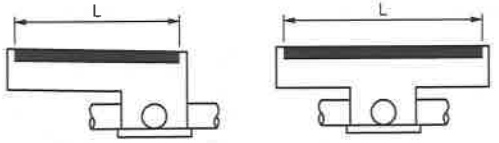
BILL OF REINFORCEMENT

MARK	TYPE	SIZE	NO.	LENGTH FT.	LENGTH IN.	LOCATION	a FT.	a IN.	b FT.	b IN.	c FT.	c IN.	d FT.	d IN.
B1	STR	#5	13	5	2	FOOTING								
B2	1	#5	14	H+(1'-10")		CHAMBER WALLS	1	0	H+10"					
B3	1	#5	3	H-4"		CHAMBER WALLS	1	0	H-(1'-4")					
B4	3	#5	5	H+(2'-4")		CHAMBER FRONT WALL								
B5	STR	#5	15*	4	8	CHAMBER WALLS								
B6	STR	#5	2	3	2	CHAMBER ABOVE THROAT								
B7	1	#5	25*	2	8	CORNERS	1	4	1	4				
B8	1	#5	2	2	6	CHAMBER WALLS & TOP	1	4	1	2				
B9	STR	#5	11	10	8	TOP SLAB & APRON								
B10	STR	#5	5	6	2	THROAT								
B11	2	#5	3	4	8	THROAT	2	1 5/8	1	4				
B12	4	#5	12	6	1	THROAT & APRON								
B13	1	#5	12	3	5	THROAT	1	11	1	6				
B14	5	#5	15	2	4	TOP SLAB	1	5	0	7	0	3	1	2
B15	2	#5	1	4	1	END THROAT	1	6	1	4				

* NO. OF BARS REQUIRED FOR H=4'-0"
ADD OR DEDUCT 4-B5 & 4-B7 FOR EACH 1'-0" INCREASE OR DECREASE IN H.

BAR TYPES

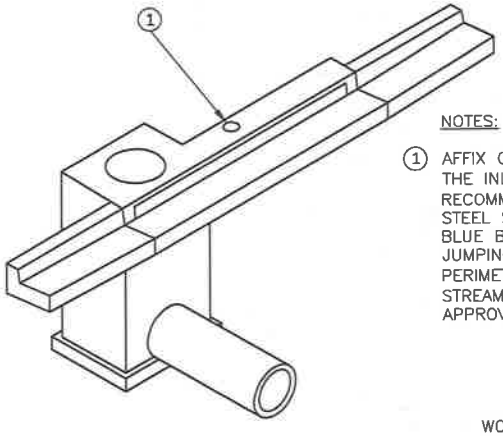




GRADE SAG

DETAIL 'A'

APPLICABLE SITUATIONS



ISOMETRIC VIEW

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI. STEEL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60. ALL EXPOSED EDGES SHALL BE BEVELED 3/4" UNLESS OTHERWISE SHOWN.
2. THIS DRAWING DEPICTS A CURB BOX INLET IN A GRADE SITUATION. FOR CURB BOX BOX IN SAG SITUATION, DETAILS SHALL BE MODIFIED AS INDICATED IN DETAIL 'A'.
3. THE STANDARD OPENING LENGTH IS 10'-0" AS DETAILED HERE. THIS LENGTH MAY BE INCREASED OR DECREASED BASED ON HYDRAULIC ANALYSIS AND APPROVAL BY THE LEXINGTON-FAYETTE COUNTY URBAN GOVERNMENT ENGINEER. MODIFICATION TO THE OPENING LENGTH WILL REQUIRE MODIFICATION OF LENGTH OF BARS B9 & B10 AND INCREASE OR DECREASE IN NUMBER OF BARS B12, B13 & B14 MAINTAINING THE SAME MAXIMUM SPACING SHOWN ON THIS DRAWING.
4. MAXIMUM "H" FOR APPLICATION OF THIS DRAWING SHALL BE 10 FEET.
5. FIELD BEND OR CUT BARS B2, B4, AND B5 AS NECESSARY WHERE PIPES PENETRATE CHAMBER WALLS.
6. FOR CURB BOX INLET IN CURVE WITH CURB RADIUS OF LESS THAN 25', LONGITUDINAL BARS B9, B10 SHALL BE SHOP FABRICATED RADIALLY.
7. 30" PIPE MAY BE APPROVED IF BOTH PIPES ARE INSTALLED ON THE SAME LINE.

NOTES:

(1) AFFIX CIRCULAR MARKER TO THE TOP OF THE INLET BOX, PER MANUFACTURER'S RECOMMENDATIONS: 4" DIAMETER STAINLESS STEEL STAMPED DISK WITH BAKED ENAMEL BLUE BACKGROUND. LOGO OF FISH JUMPING OVER WAVES WITH TEXT ON PERIMETER "STORM DRAIN * DRAINS TO STREAM*". ALMETEK INDUSTRIES OR APPROVED EQUAL.

WORK THIS DWG. WITH STD. DWG. 123-1

LEXINGTON

DIVISION OF ENGINEERING

CURB BOX INLET TYPE "B"
5'X5' BOX
15"-24" PIPES

STANDARD DRAWING NO. 123-2

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

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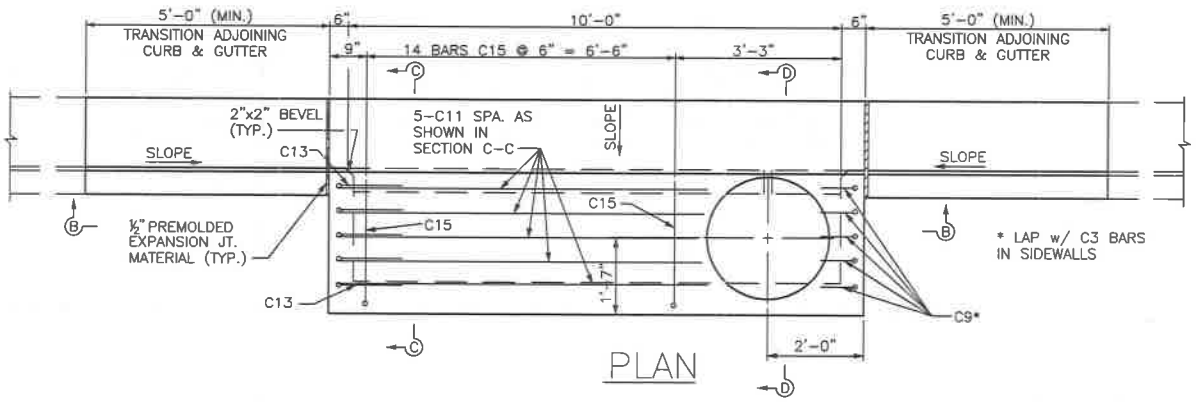
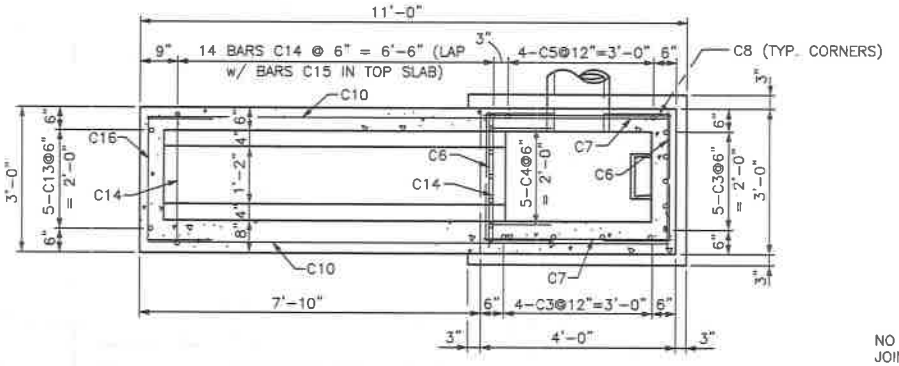
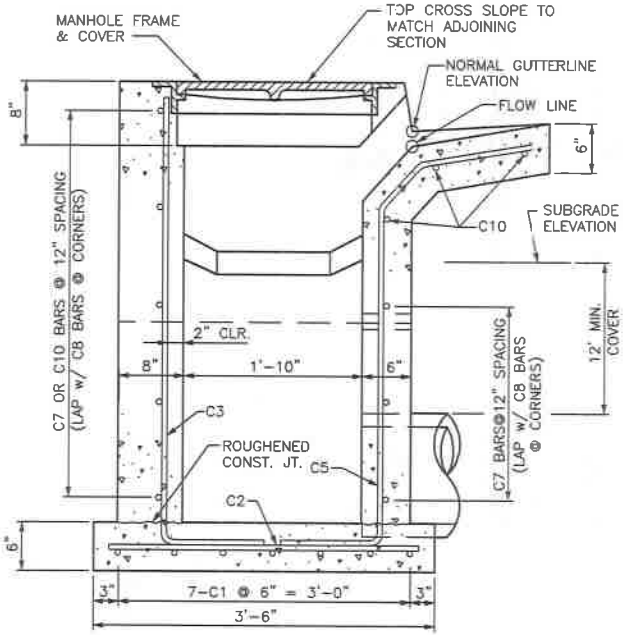


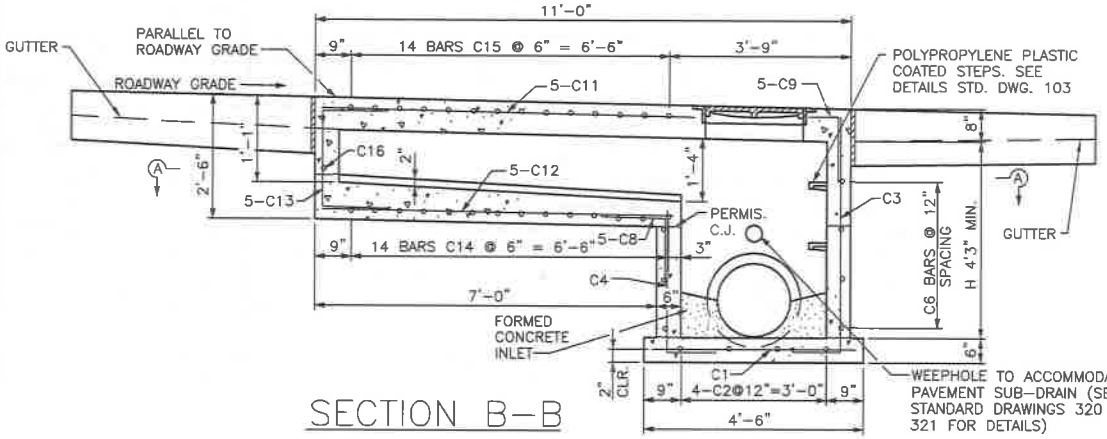
PLAN



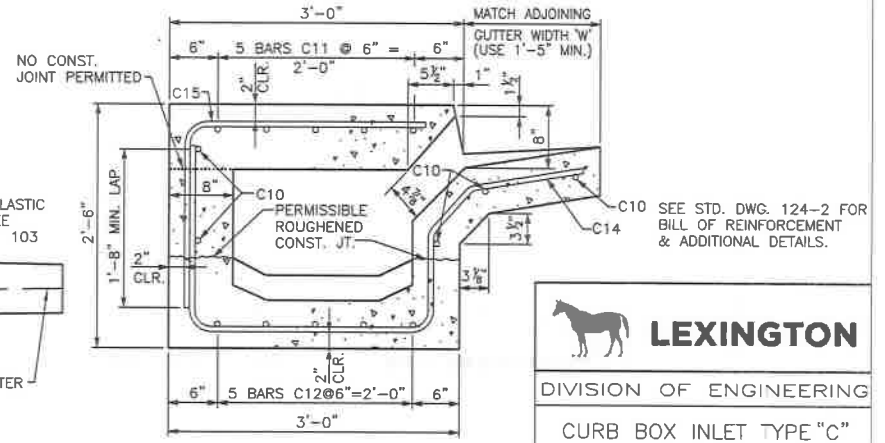
SECTION A-A



SECTION D-D



SECTION B-B



SECTION C-C

LEXINGTON

DIVISION OF ENGINEERING

CURB BOX INLET TYPE "C"
4'X3' BOX
SINGLE PIPE
15" OR LESS

STANDARD DRAWING NO. 124-1

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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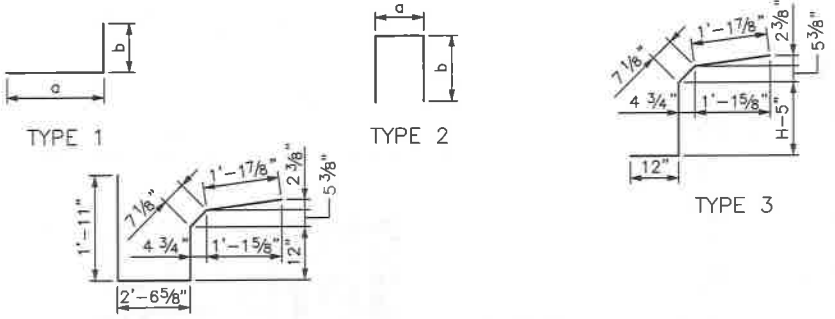
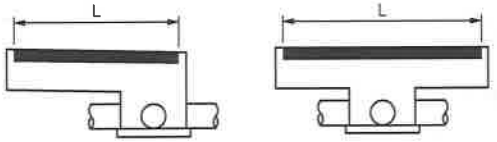
BILL OF REINFORCEMENT

MARK	TYPE	SIZE	NO.	LENGTH FT.	LENGTH IN.	LOCATION	a FT.	a IN.	b FT.	b IN.	c FT.	c IN.	d FT.	d IN.
C1	STR	#5	7	4	2	FOOTING								
C2	STR	#5	4	3	2	FOOTING								
C3	1	#5	9	H+(1'-10")		CHAMBER WALLS	1	0	H+10"					
C4	1	#5	5	H-4"		CHAMBER WALLS	1	0	H-(1'-4")					
C5	3	#5	4	H+(2'-4")		CHAMBER WALLS								
C6	STR	#5	7*	2	8	CHAMBER WALLS								
C7	STR	#5	6*	3	8	CHAMBER WALLS								
C8	1	#5	19*	2	8	CORNERS	1	4	1	4				
C9	1	#5	5	2	1	CHAMBER WALLS & TOP	1	4	0	9				
C10	STR	#5	5	10	8	THROAT & APRON								
C11	STR	#5	5	7	7	TOP SLAB								
C12	STR	#5	5	7	2	THROAT								
C13	2	#5	5	4	8	END THROAT	2	1	1	4				
C14	4	#5	14	7	1	THROAT & APRON								
C15	1	#5	14	4	5	THROAT	1	11	2	6				
C16	2	#5	1	5	1	END THROAT	2	6	1	4				

* NO. OF BARS REQUIRED FOR H=4'-0"
ADD OR DEDUCT 2-C6, 2-C7 & 4-C8 FOR EACH 1'-0" INCREASE OR DECREASE IN H.

BAR TYPES

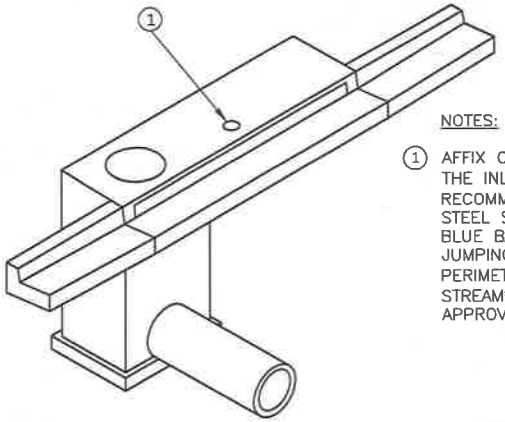




GRADE SAG

DETAIL 'A'

APPLICABLE SITUATIONS



ISOMETRIC VIEW

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI. STEEL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60. ALL EXPOSED EDGES SHALL BE BEVELED 3/4" UNLESS OTHERWISE SHOWN.
2. THIS DRAWING DEPICTS A CURB BOX INLET IN A GRADE SITUATION. FOR CURB BOX INLET IN SAG SITUATION, DETAILS SHALL BE MODIFIED AS INDICATED IN DETAIL 'A'.
3. THE STANDARD OPENING LENGTH IS 10'-0" AS DETAILED HERE. THIS LENGTH MAY BE INCREASED OR DECREASED BASED ON HYDRAULIC ANALYSIS AND APPROVAL BY THE LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT ENGINEER. MODIFICATION TO THE OPENING LENGTH WILL REQUIRE MODIFICATION OF LENGTH OF BARS C10, C11 & C12 AND INCREASE OR DECREASE IN NUMBER OF BARS C14 & C15 MAINTAINING THE SAME MAXIMUM SPACING SHOWN ON THIS DRAWING.
4. MAXIMUM "H" FOR APPLICATION OF THIS DRAWING SHALL BE 5 FEET.
5. FIELD BEND OR CUT BARS C3, C5, C6 & C7 AS NECESSARY WHERE PIPES PENETRATE CHAMBER WALLS.
6. FOR CURB BOX INLET IN CURVE WITH CURB RADIUS OF LESS THAN 25', LONGITUDINAL BARS C10, C11 & C12 SHALL BE SHOP FABRICATED RADIALLY.

NOTES:

(1) AFFIX CIRCULAR MARKER TO THE TOP OF THE INLET BOX, PER MANUFACTURER'S RECOMMENDATIONS: 4" DIAMETER STAINLESS STEEL STAMPED DISK WITH BAKED ENAMEL BLUE BACKGROUND. LOGO OF FISH JUMPING OVER WAVES WITH TEXT ON PERIMETER "STORM DRAIN * DRAINS TO STREAM*". ALMETEK INDUSTRIES OR APPROVED EQUAL.

WORK THIS DWG. WITH STD. DWG. 124-1

LEXINGTON

DIVISION OF ENGINEERING

CURB BOX INLET TYPE "C"
4'X3' BOX
SINGLE PIPE
15" OR LESS

STANDARD DRAWING NO. 124-2

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

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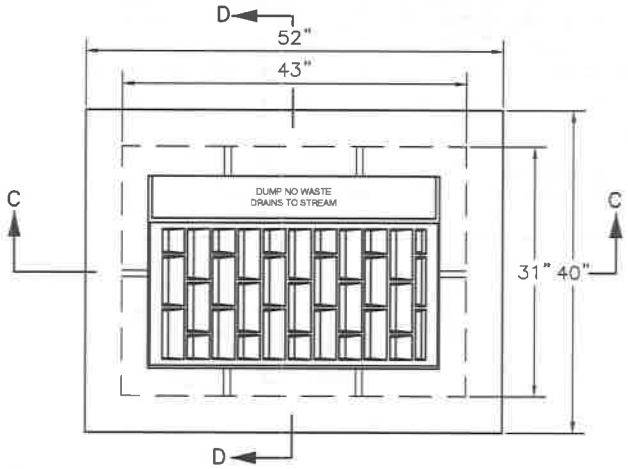
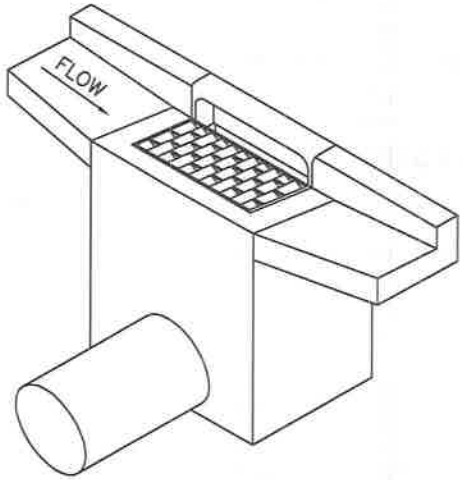


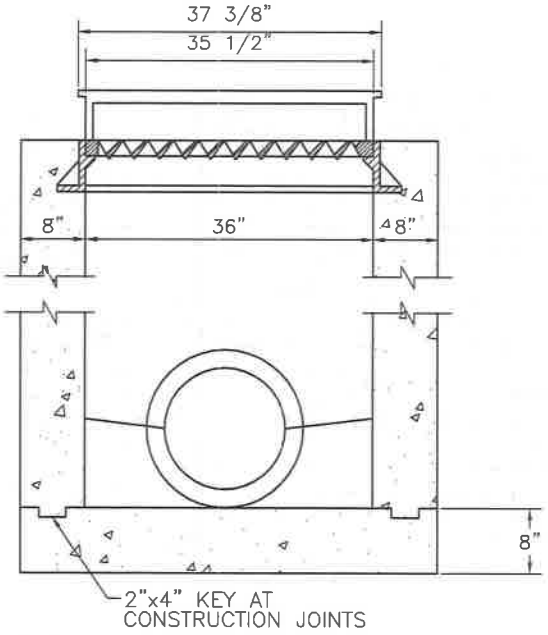
PLAN

NOTES:

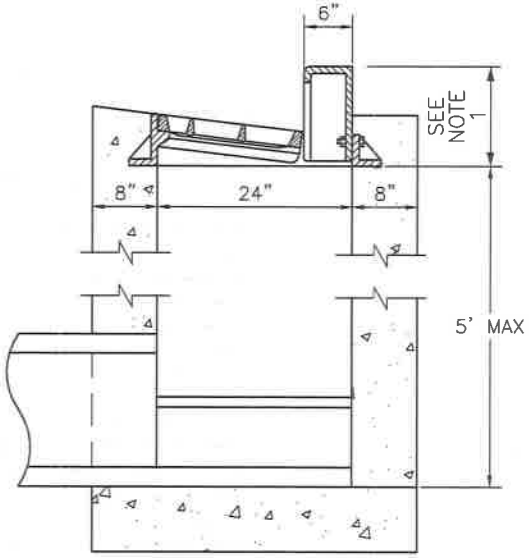
1. CURB BOX ADJUSTABLE 6" TO 9" TO MATCH TOP OF CURB.
2. NO. 5 STEEL SHALL BE USED THROUGHOUT ON 12" CENTERS. 2" CLEARANCE ON ALL EXTERIOR WALL BARS. EXTERIOR HORIZ. WALL BARS SHALL HAVE A 12" MIN. LAP AT CORNERS.
3. ALL EXPOSED FLATWORK SHALL HAVE A HAND FLOATED AND BROOMED FINISH.
4. NO STEEL IS REQUIRED IN BOTTOM SLAB.
5. ALL VERTICAL STEEL SHALL EXTEND 4" INTO BOTTOM SLAB. VERTICAL STEEL SHALL HAVE A 12" LAP INTO BOTTOM SLAB WITH 3" CLEARANCE FROM EXTERIOR BOTTOM.
6. SET BACK OF FRAME IN CONCRETE TO ANCHOR IN PLACE AFTER IT HAS BEEN ADJUSTED.
7. 18" MAX. PIPE DIAMETER.
8. EAST JORDAN IRON WORKS CATCH BASIN CURB INLET 7035 WITH TYPE M6 GRATE OR EQUIVALENT.
9. TOP OF CURB SECTION SHALL BE CAST WITH "DUMP NO WASTE DRAINS TO STREAM".



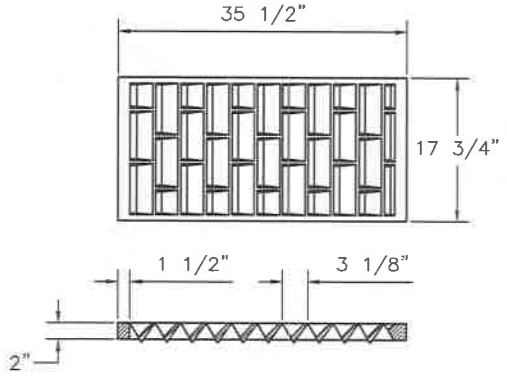
ISOMETRIC VIEW



SECTION C–C



SECTION D–D



GRATE DETAIL

LEXINGTON

DIVISION OF ENGINEERING

CURB BOX INLET
TYPE "D"

STANDARD DRAWING NO. 125

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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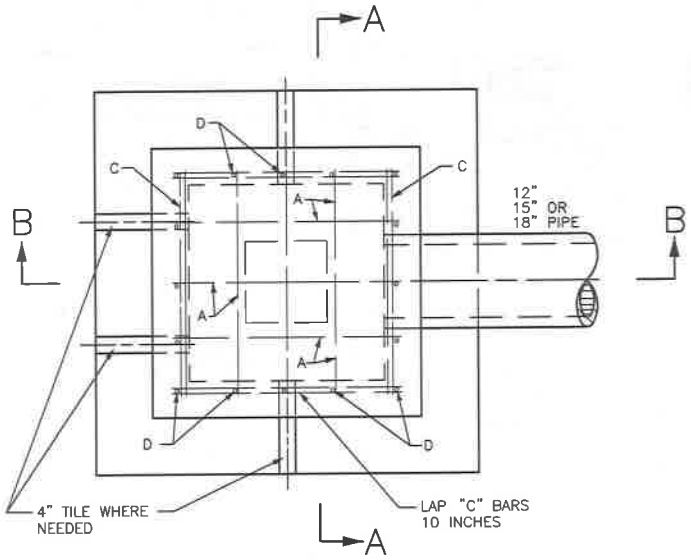


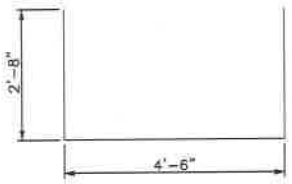
PLAN

BILL OF REINFORCEMENT

MARK	QUANTITY	SIZE	LENGTH	LOCATION	DESCRIPTION
A	10	½"Ø	4'–7"	TOP SLAB	STRAIGHT
C	6	"	9'–9"	WALL	BENT
D	16	"	3'–4"	"	STRAIGHT

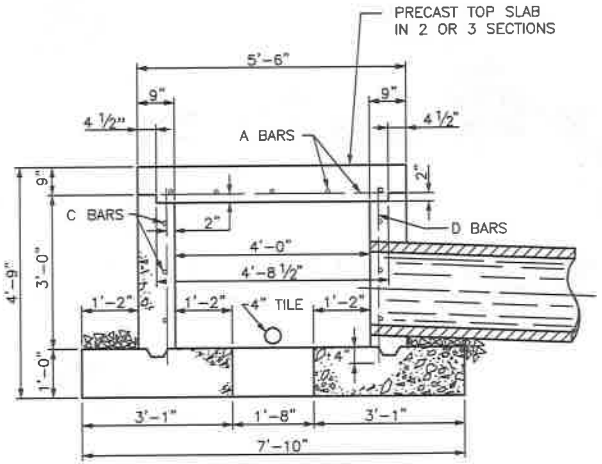
STEEL REINFORCEMENT	105 LBS.
12" CLASS "A" CONCRETE	4.61 CU. YDS.
15" CLASS "A" CONCRETE	4.59 CU. YDS.
18" CLASS "A" CONCRETE	4.58 CU. YDS.

DETAIL C–BAR

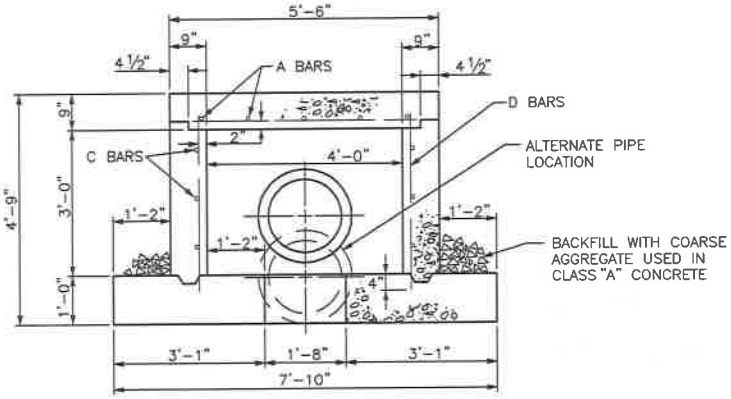


NOTES:

1. LOCATION OF OPENING MAY BE DETERMINED IN THE FIELD FOR A SIDE OR BOTTOM SPRING INLET.
2. TYPE "A" TO BE USED WHEN FILL OVER TOP IS 10' OR MORE.



SECTION B–B



SECTION A–A

LEXINGTON

DIVISION OF ENGINEERING

SPRING BOX INLET
TYPE "A"

STANDARD DRAWING NO. 126

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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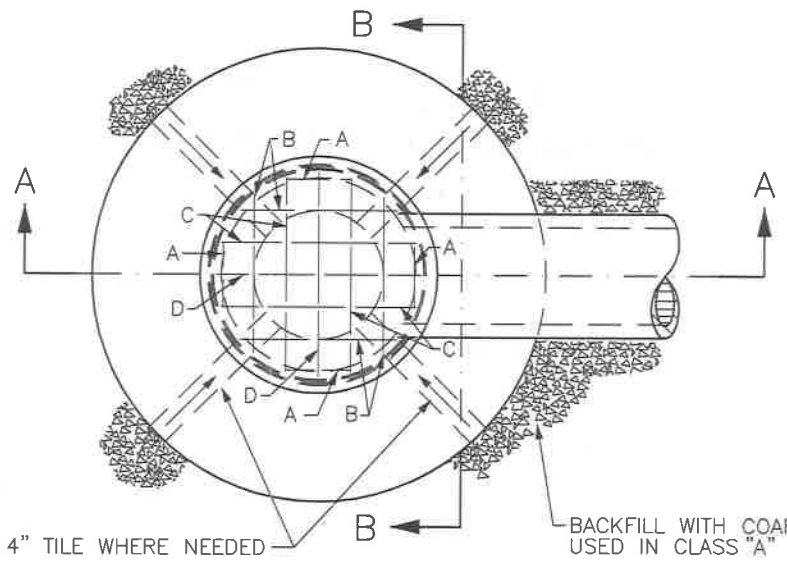
NOTES:

1. SPRING BOX INLET TYPE "B" MAY BE USED WHEN FILL OVER TOP IS LESS THAN 10'.
   ① 12", 15", OR 18" DIAMETER PIPE OUTLET (SEE PIPE SECTIONS FOR SIZE AND TYPE)
2. MORTAR AROUND PIPE TO PREVENT SEEPAGE.
3. STEEL REINFORCEMENT PLACED 6" ON CENTERS.

STEEL REINFORCEMENT 13 LBS.
CLASS "A" CONCRETE 1.54 CU. YDS.

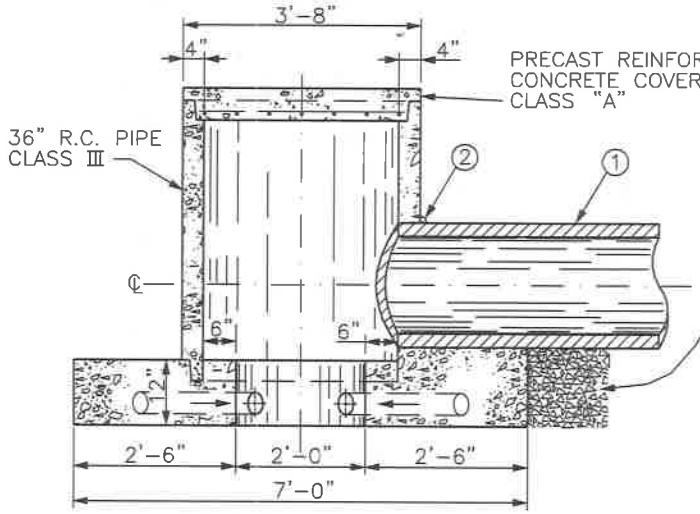


PLAN

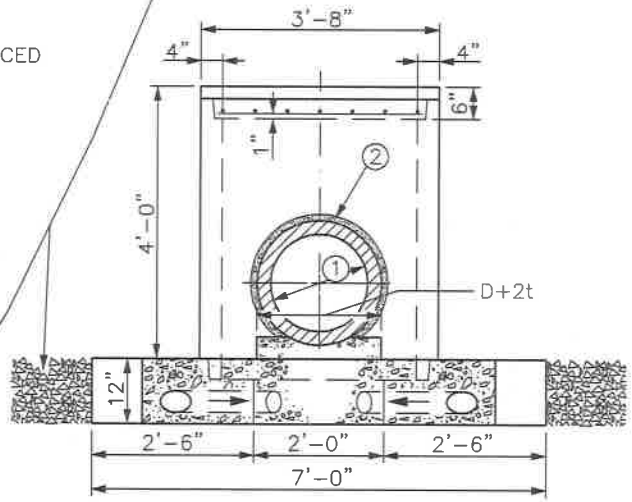
BILL OF REINFORCEMENT

MARK	QUANTITY	SIZE	LENGTH
A	4	NO.3	1'-0"
B	4	"	2'-5"
C	4	"	3'-0"
D	2	"	3'-2"

MARK	LOCATION	DESCRIPTION
A	TOP	STRAIGHT
B	"	"
C	"	"
D	"	"



SECTION A–A



SECTION B–B

LEXINGTON
DIVISION OF ENGINEERING

SPRING BOX INLET
TYPE "B"

STANDARD DRAWING NO. 127

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

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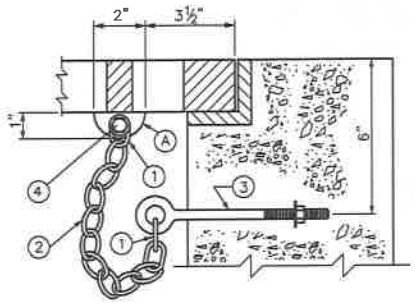
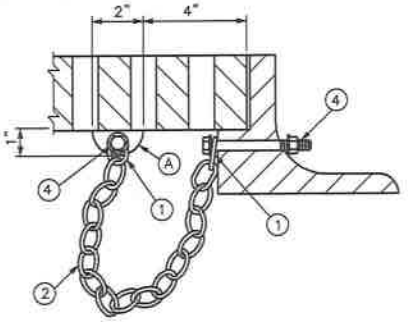


GRATE CONNECTED TO WALL

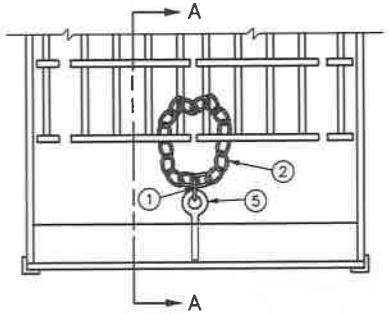


GRATE CONNECTED TO FRAME

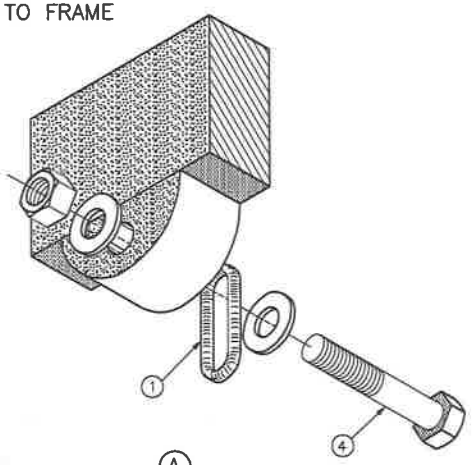
TYPICAL ILLUSTRATIONS FOR CASTINGS

NOTES:

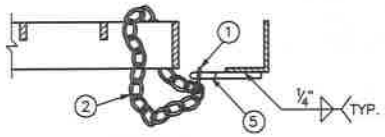
1. CHAIN SHACKLE, OR COLD SHUT OF AN APPROVED TYPE.
2. ⅜" PROOF COIL CHAIN OF SUFFICIENT LENGTH TO ALLOW REMOVAL AND DISPLACEMENT OF GRATE, 18" MIN.
3. ⅜" x 6" EYE BOLT, NUT, AND WASHER.
4. ⅜" HEX HEAD CAP SCREW (GRADE 2), NUT AND WASHERS. LENGTH DETERMINED BY THICKNESS OF FRAME OR GRATE. 7/16" DIA. HOLE FOR CAP SCREW. BATTER THREADS ON CAP SCREW TO PREVENT REMOVAL OF NUT.
5. ⅜" EYE BOLT (LENGTH DETERMINED BY THE FRAME DIMENSION).
6. ALL EYE BOLTS SHALL HAVE A CONTINUOUS OR SOLID EYE.
7. ALL HARDWARE SHALL BE GALVANIZED AND OF COMMERICAL QUALITY AND SHALL BE APPROVED BY THE ENGINEER.
8. THE COST OF THE COMPLETE SECURITY DEVICE, INSTALLED, SHALL BE INCIDENTAL TO THE COST OF THE STRUCTURE.
9. THE DESIGNS SHOWN ARE ACCEPTABLE; HOWEVER ARE SUBJECT TO CHANGE IF APPROVED IN WRITING BY THE ENGINEER.



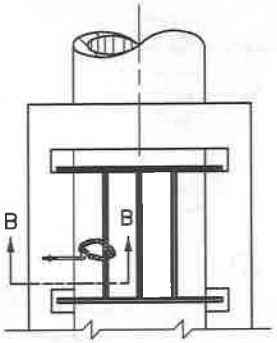
PLAN VIEW



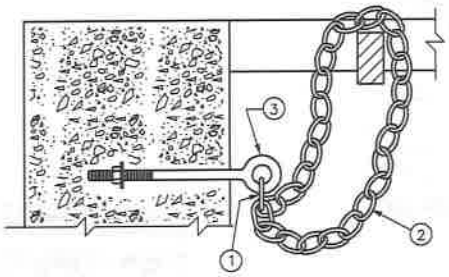
Ⓐ
LUG ON CENTER CROSS MEMBER AND BOLT ASSEMBLY (AXONOMETRIC VIEW)



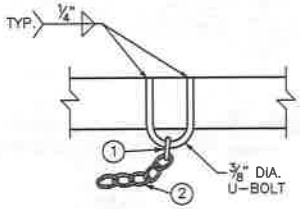
SECTION A–A
GRATE CONNECTED TO FRAME



PLAN VIEW



SECTION B–B



ALTERNATE FOR STRUCTURAL STEEL MEMBERS

GRATE CONNECTED TO WALL

TYPICAL ILLUSTRATIONS FOR STRUCTURAL STEEL UNITS

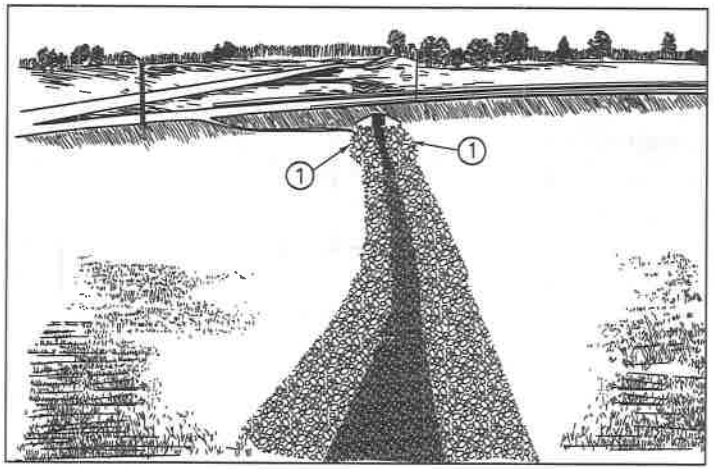
LEXINGTON — FAYETTE URBAN COUNTY GOVERNMENT

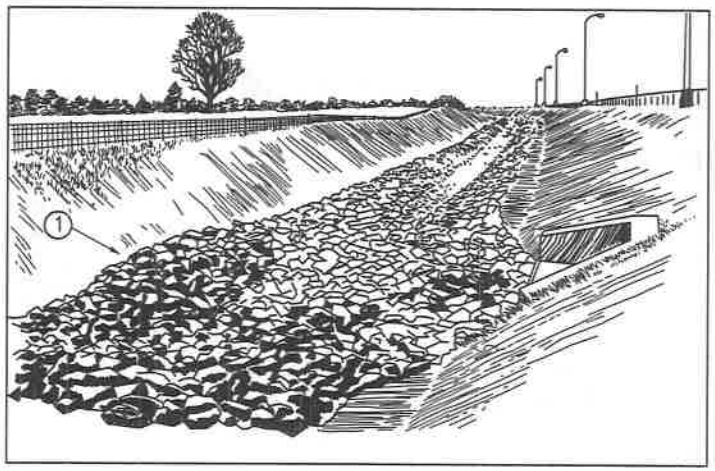
LEXINGTON
DIVISION OF ENGINEERING

SECURITY DEVICES FOR FRAMES AND GRATES

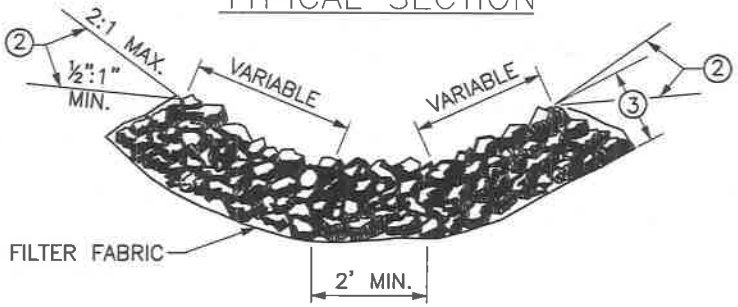
STANDARD DRAWING NO. 128

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17





TYPICAL SECTION



NOTES:

1. AGGREGATE CHANNEL LINING WILL NOT BE REQUIRED IN THE BOTTOM OF THE DITCH WHERE SOLID ROCK IS ENCOUNTERED. SIDE SLOPES SHALL BE LINED.
2. AGGREGATE ESTIMATED ON THE BASIS OF 0.50 TON/SQ. YD. PER FOOT OF DEPTH.

SHEET NOTES:

① WIDEN CHANNEL LINING AT STRUCTURES TO PREVENT EROSION.

② ALTERNATE LOCATION OF GROUNDLINE.

③ MINIMUM DEPTH OF CHANNEL LINING SHALL BE 24". LESSER DEPTHS SHALL HAVE APPROVAL FROM THE ENGINEER. STONE SHALL BE WELL GRADED SO THAT OPENINGS BETWEEN LARGER STONES ARE FILLED WITH SMALLER STONES.

SEE SHEET 130-2 FOR CHANNEL LINING MATERIAL NOTES

LEXINGTON

DIVISION OF ENGINEERING

AGGREGATE CHANNEL LINING

STANDARD DRAWING NO. 130-1

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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NOTES:

1. BEDDING MATERIAL SHOULD NOT BE SMALLER THAN KDOT NO. 2 COARSE AGGREGATE STONE. THE REQUIREMENTS FOR KDOT NO. 2 COARSE AGGREGATE STONE ARE AS FOLLOWS:

SIEVE SIZE (INCHES)	PERCENT PASSING
3 1/2	100
2 1/2	70–85
1 1/2	0–10

2. BEDDING SHOULD BE AT LEAST THREE INCHES AND SPREAD UNIFORMLY.

3. PLASTIC FILTER FABRIC MAY BE USED IN PLACE OF OR IN CONJUNCTION WITH GRAVEL FILTERS. THE FOLLOWING PARTICLE SIZE RELATIONSHIPS MUST EXIST:

   A. FOR FILTER FABRIC ADJACENT TO GRANULAR MATERIALS CONTAINING 50 PERCENT OR LESS (BY WEIGHT) OF FINE PARTICLES (LESS THAN 0.074 mm):
      1.) $\frac{\text{D (PARTICLE DIAMETER) 85 BASE (mm)}}{\text{EOS* FILTER FABRIC (mm)}} > 1$

      2.) TOTAL OPEN AREA OF FILTER IS LESS THAN 36 PERCENT.

   B. FOR FILTER FABRIC ADJACENT TO ALL OTHER SOILS:
      1.) EOS* LESS THAN U.S. STANDARD SIEVE NO. 70
      2.) TOTAL OPEN AREA OF FILTER IS LESS THAN 10 PERCENT.

4. NO FILTER FABRIC SHOULD BE USED WITH LESS THAN 4 PERCENT OPEN AREA OR AN EOS* LESS THAN U.S. STANDARD SIEVE NO. 100.

5. *EOS – EQUIVALENT OPENING SIZE TO A U.S. STANDARD SIEVE SIZE.

6. THE FOLLOWING CHART SHOWS HOW TO DETERMINE THE DIAMETER OF STONE IN RELATION TO DESIGN VELOCITY.

VELOCITY (FEET/SECOND)	STONE DIAMETER (INCHES)
4	2 1/2
6	5
8	9
10	14

SEE SHEET 130–1 FOR AGGREGATE CHANNEL LINING MATERIAL DRAWINGS

LEXINGTON

DIVISION OF ENGINEERING

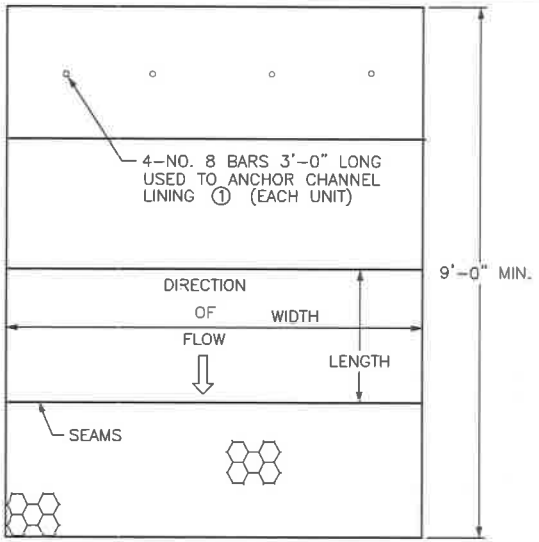
AGGREGATE CHANNEL LINING

STANDARD DRAWING NO. 130–2

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17



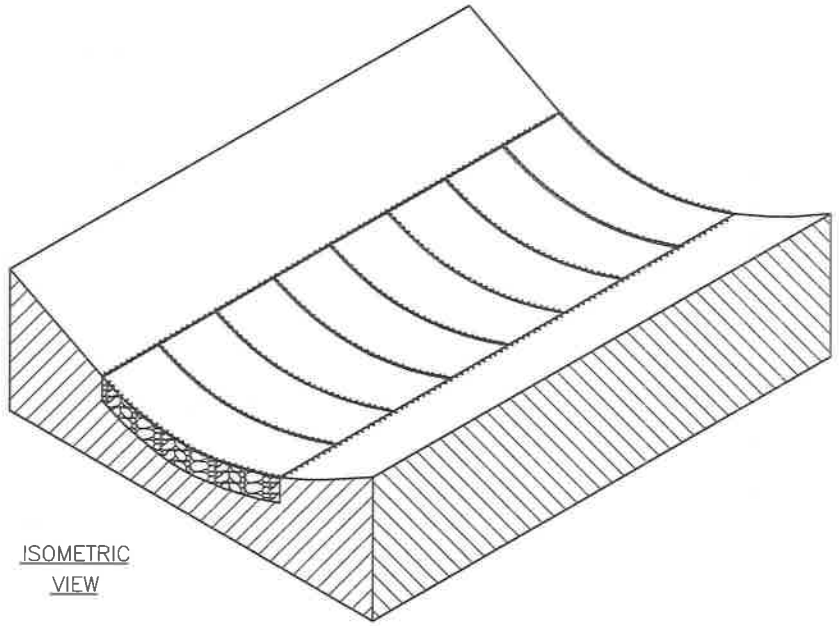
PLAN

SHEET NOTES:

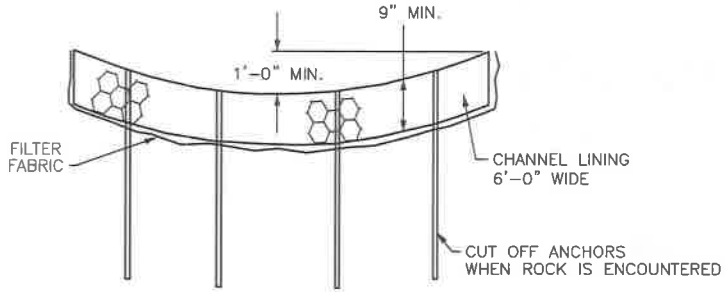
① ANCHORS REQUIRED WHEN LINING IS PLACED ON 5% GRADE OR GREATER.

NOTES:

1. SECURE THE LACING WIRE AT THE CORNER OF THE BASKET BY LOOPING AND TWISTING, CONTINUE LACING THROUGHOUT WITH DOUBLE LOOPS AT APPROXIMATELY 5 INCH INTERVALS. EACH UNIT SHALL CONSIST OF LININGS SUPPLIED IN WIDTHS OF 6'–0" AS SHOWN AND LENGTHS IN MULTIPLES OF 3'–0".
2. AGGREGATE ESTIMATED ON THE BASIS OF 0.375 TONS PER SQ. YD.
3. MATTRESS SHALL BE MANUFACTURED FROM WIRE WITH A MINIMUM TENSILE STRENGTH OF 40,000 PSI.
4. STONE SIZE PER MANUFACTURER SPECIFICATIONS.



ISOMETRIC VIEW



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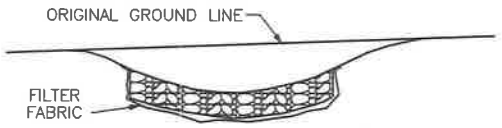


LEXINGTON

DIVISION OF ENGINEERING

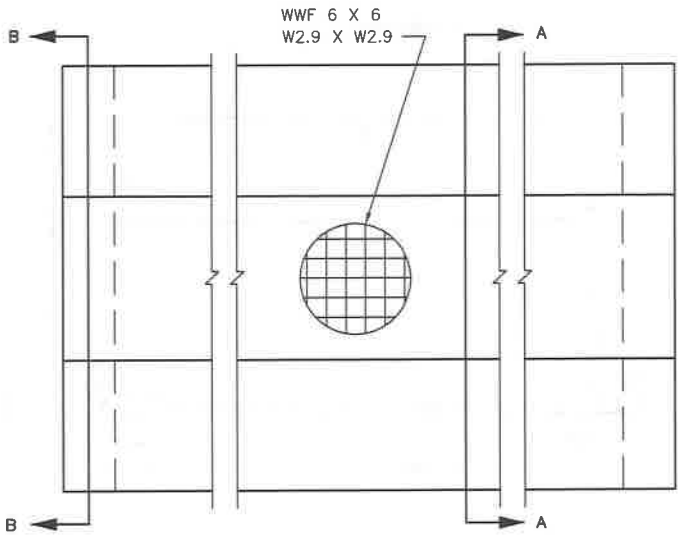
MATTRESS
CHANNEL LINING

STANDARD DRAWING NO. 131

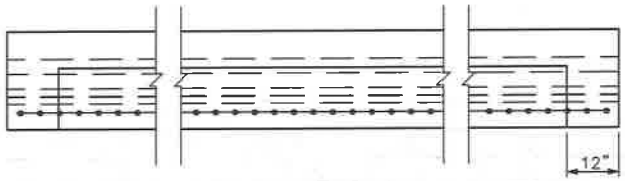
APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17



PLAN



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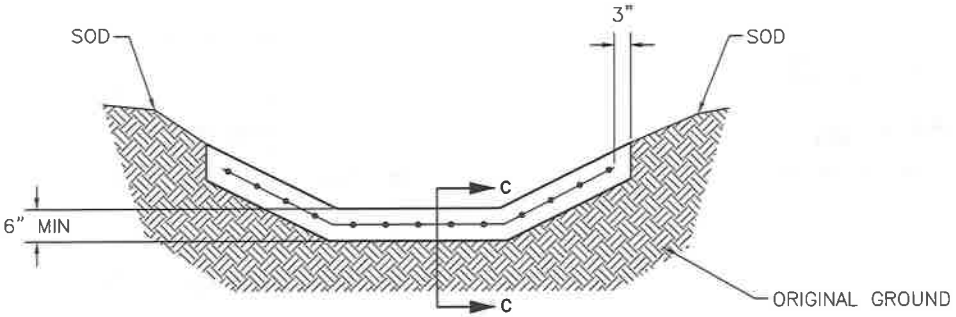
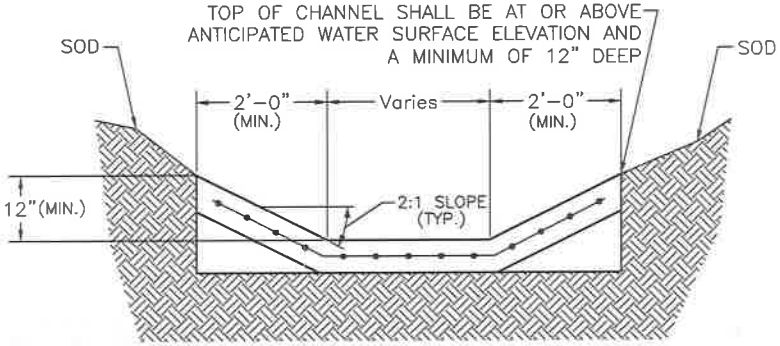
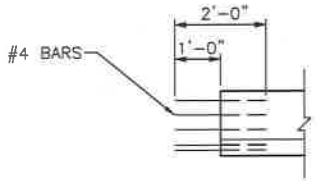


SECTION A–A



SECTION B–B



SECTION C–C
(@ CONSTRUCTION JOINT)

NOTES:

1. USE "CLASS A" CONCRETE THROUGHOUT.
2. COMPACTION, FINISHING AND CURING SHALL BE THE SAME AS REQUIRED FOR CONCRETE SIDEWALK (USE WHITE COMPOUND).
3. IF THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT IN THE POURING OF THE PAVED DITCH, NO. 4 TIE BARS SPACED 6" O.C. SHALL BE USED (SEE SECTION C–C).
4. INTERMEDIATE ANCHORS MAY BE REQUIRED BY THE ENGINEER FOR SPECIAL CASES. A SPECIAL DESIGN WILL BE REQUIRED IN THIS SITUATION.
5. SHOULD THE TERRAIN OF THE EXISTING GROUND BE SO THAT WATER WOULD DRAIN INTO THE DITCH FROM ONE SIDE ONLY, THEN SODDING WILL BE REQUIRED ON THAT ONE SIDE ONLY OF THE DITCH.
6. EXPANSION JOINTS & SEALER REQUIRED ON ENDS ABUTTING STRUCTURES AND ANCHORS ON ENDS NOT ABUTTING STRUCTURES.
7. IF FIBER REINFORCED CONCRETE IS USED THE WWF 6 x 6 MAY BE ELIMINATED.
8. DO NOT PLACE PAVED DITCH ON DISTURBED SOIL.

LEXINGTON

DIVISION OF ENGINEERING

PAVED DITCH

STANDARD DRAWING NO. 132

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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HEADWALL TYPE	DIA. OF PIPE	HEADWALL DIMENSIONS				
		A	B	C	D	E
④ STANDARD	15"	1'–8 ½"	1'–2 ½"	4'–3"	2'–9"	6'–9"
	18"	1'–9"	1'–3"	4'–6"	3'–0"	7'–6"
	21"	1'–9 ½"	1'–3 ½"	4'–9"	3'–3"	8'–3"
	24"	1'–10"	1'–4"	5'–0"	3'–6"	9'–0"
	27"	1'–10 ½"	1'–4 ½"	5'–3"	3'–9"	9'–9"
⑤ RAISED	15"	1'–8 ½"	1'–2 ½"	4'–9"	3'–3"	8'–3"
	18"	1'–9"	1'–3"	5'–0"	3'–6"	9'–0"
	21"	1'–9 ½"	1'–3 ½"	5'–3"	3'–9"	9'–9"
	24"	1'–10"	1'–4"	5'–6"	4'–0"	10'–6"
	27"	1'–10 ½"	1'–4 ½"	5'–9"	4'–3"	11'–3"

NOTES:

① HEIGHT OF FOOTER SHALL BE 18" FOR SOIL AND 12" IN ROCK.

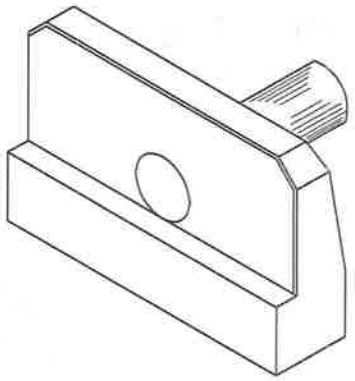
2. ALL EXPOSED EDGES TO BE CHAMFERED ¾".

3. ALL EXPOSED SURFACES TO HAVE A RUBBED FINISH.

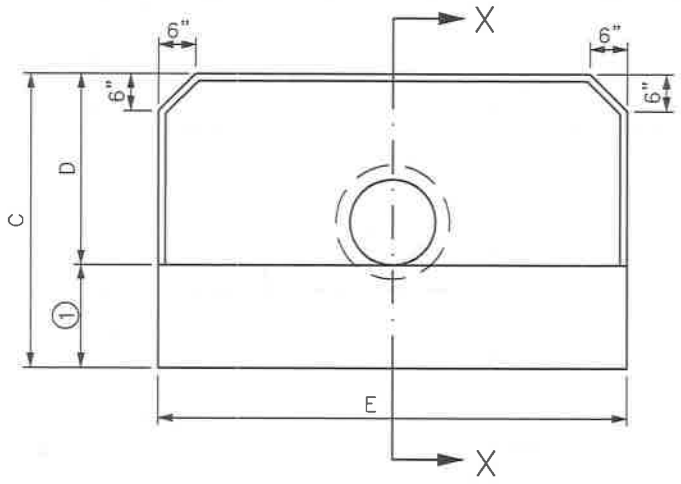
④ STANDARD HEADWALLS ARE FLUSH WITH SOIL FILL.

⑤ RAISED HEADWALLS PROTRUDE 6" ABOVE SOIL FILL.

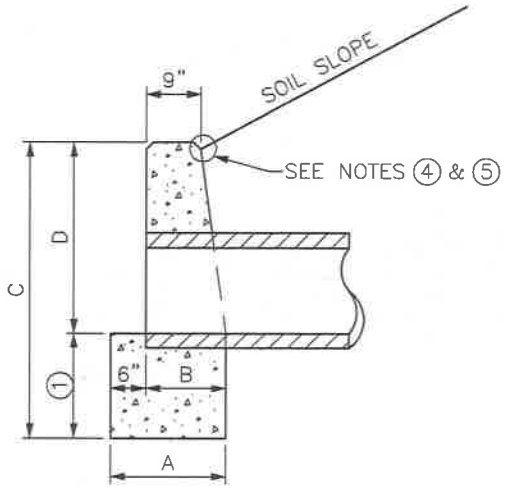
6. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "D" IS GREATER THAN 30".



ISOMETRIC VIEW



PLAN ELEVATION



SECTION X–X

LEXINGTON

DIVISION OF ENGINEERING

STRAIGHT HEADWALLS

STANDARD DRAWING NO. 150

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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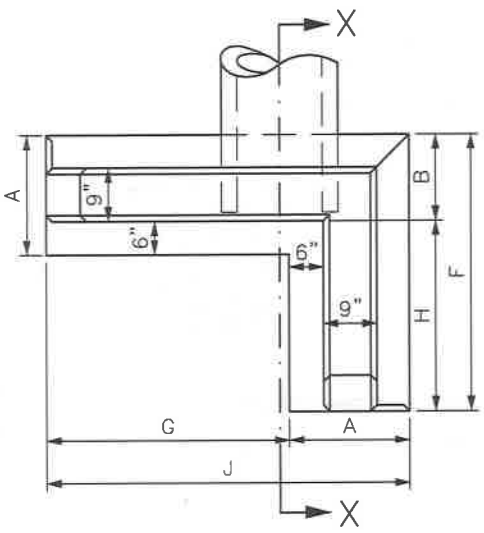
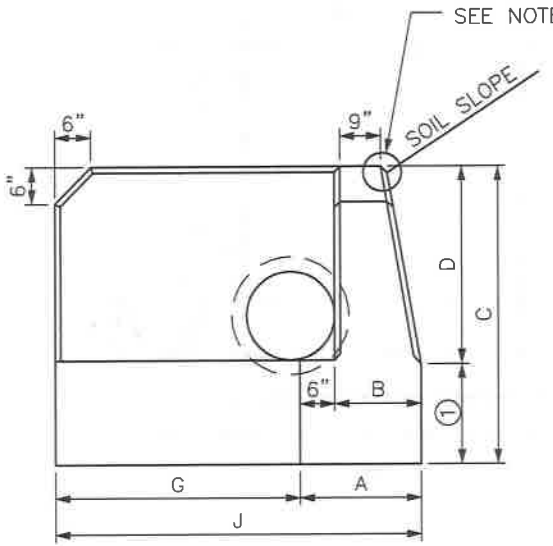
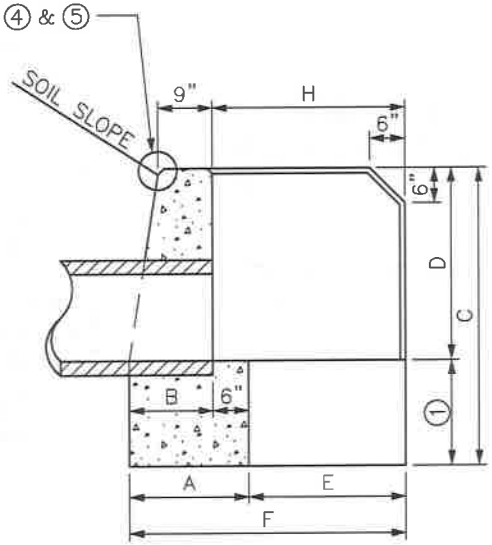


HEADWALL TYPE	DIA. OF PIPE	HEADWALL DIMENSIONS								
		A	B	C	D	E	F	G	H	J
④ STANDARD ELL	15"	1'–8 ½"	1'–2 ½"	4'–3"	2'–9"	2'–3"	3'–11 ½"	3'–6"	2'–9"	5'–2 ½"
	18"	1'–9"	1'–3"	4'–6"	3'–0"	2'–6"	4'–3"	4'–0"	3'–0"	5'–9"
	21"	1'–9 ½"	1'–3 ½"	4'–9"	3'–3"	2'–9"	4'–6 ½"	4'–6"	3'–3"	6'–3 ½"
	24"	1'–10"	1'–4"	5'–0"	3'–6"	3'–0"	4'–10"	5'–0"	3'–6"	6'–10"
	27"	1'–10 ½"	1'–4 ½"	5'–3"	3'–9"	3'–3"	5'–1 ½"	5'–6"	3'–9"	7'–4 ½"
⑤ RAISED ELL	15"	1'–8 ½"	1'–2 ½"	4'–9"	3'–3"	3'–0"	4'–8 ½"	4'–3"	3'–6"	5'–11 ½"
	18"	1'–9"	1'–3"	5'–0"	3'–6"	3'–3"	5'–0"	4'–9"	3'–9"	6'–6"
	21"	1'–9 ½"	1'–3 ½"	5'–3"	3'–9"	3'–6"	5'–3 ½"	5'–3"	4'–0"	7'–0 ½"
	24"	1'–10"	1'–4"	5'–6"	4'–0"	3'–9"	5'–7"	5'–9"	4'–3"	7'–7"
	27"	1'–10 ½"	1'–4 ½"	5'–9"	4'–3"	4'–0"	5'–10 ½"	6'–3"	4'–6"	8'–1 ½"

PLAN ELEVATION



FRONT ELEVATION



SECTION X–X

NOTES:

① HEIGHT OF FOOTER SHALL BE 18" FOR SOIL AND 12" IN ROCK.

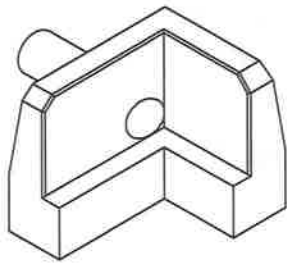
2. ALL EXPOSED EDGES TO BE CHAMFERED ¾".

3. ALL EXPOSED SURFACES TO HAVE A RUBBED FINISH.

④ STANDARD HEADWALLS ARE FLUSH WITH SOIL FILL.

⑤ RAISED HEADWALLS PROTRUDE 6" ABOVE SOIL FILL.

6. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "D" IS GREATER THAN 30".



ISOMETRIC VIEW

LEXINGTON

DIVISION OF ENGINEERING

ELL HEADWALLS

STANDARD DRAWING NO. 151

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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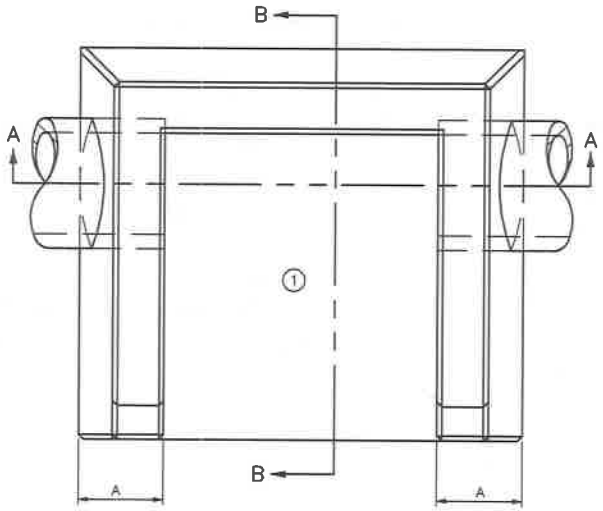


PLAN

SHEET NOTE: (1)

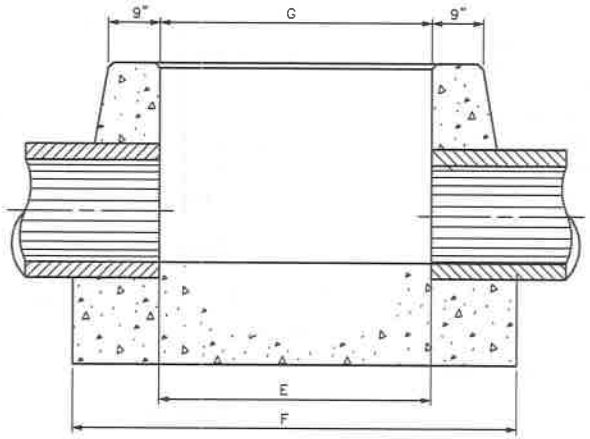
(1) SOLID CONCRETE BOTTOM REQUIRED.

NOTES:

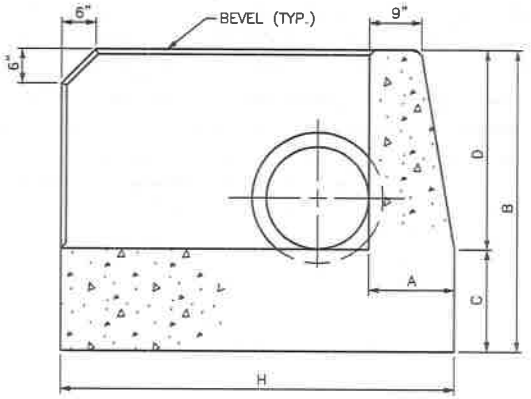
1. VOLUME DISPLACED BY BARREL OF PIPE HAS BEEN COMPUTED USING INSIDE DIAMETER OF PIPE.
2. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "D" IS GREATER THAN 30".

DIMENSIONS AND QUANTITIES

DIMENSIONS	DIAMETER OF PIPE				
	15"	18"	24"	30"	36"
A	1'-2"	1'-3"	1'-4"	1'-5"	1'-6"
B	4'-3"	4'-6"	5'-0"	5'-6"	6'-6"
C	1'-6"	1'-6"	1'-6"	1'-6"	2'-0"
D	2'-9"	3'-0"	3'-6"	4'-0"	4'-6"
E	3'-9"	4'-0"	4'-6"	4'-9"	5'-0"
F	6'-2"	6'-6"	7'-2"	7'-7"	8'-0"
G	3'-9"	4'-0"	4'-6"	4'-9"	5'-0"
H	5'-2"	5'-9"	6'-10"	7'-11"	9'-0"
C.Y. CONC. ONE HEADWALL	2.96	3.53	4.72	6.03	8.79



SECTION A–A



SECTION B–B

LEXINGTON

DIVISION OF ENGINEERING

U–TYPE HEADWALLS

STANDARD DRAWING NO. 152

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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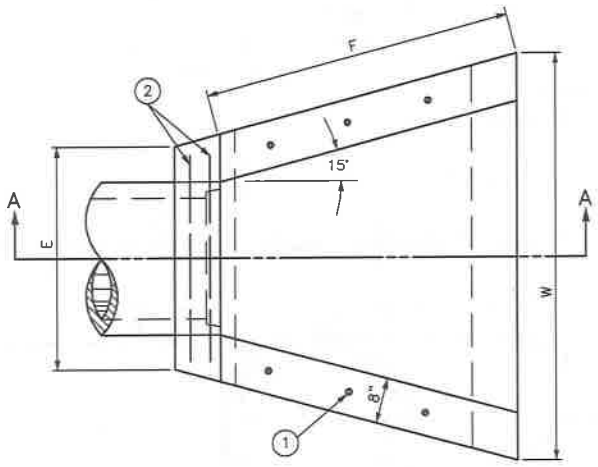


PLAN VIEW

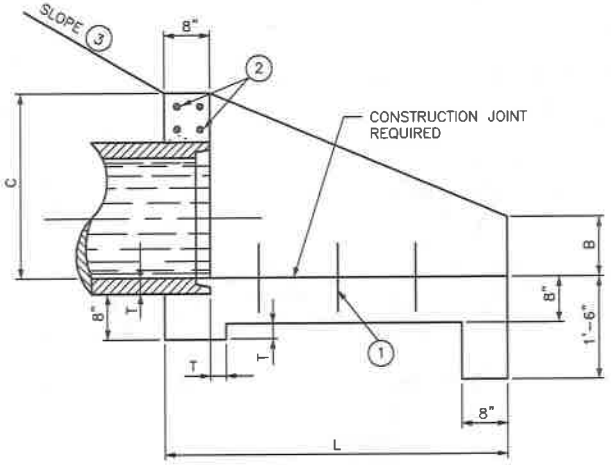
PIPE DIA.	DIMENSIONS							CLASS "A" CONC.	REINF. STEEL
	B	C	E	F	L	W	T	C.Y.	LBS.
15"	0'-7½"	2'-0"	2'-9"	3'-5 3/8"	4'-0"	4'-10 3/4"	2¼"	0.90	10
18"	0'-9"	2'-3"	3'-0"	3'-11 9/16"	4'-6"	5'-4 15/16"	2½"	0.97	11
21"	0'-10½"	2'-6"	3'-3"	4'-5 13/16"	5'-0"	5'-11 1/8"	2 3/4"	1.17	12
24"	1'-0"	2'-9"	3'-6"	5'-0"	5'-6"	6'-5 3/8"	3"	1.38	12
27"	1'-1½"	3'-0"	3'-9"	5'-6 3/16"	6'-0"	6'-11 9/16"	3 ¼"	1.62	13

SHEET NOTES:

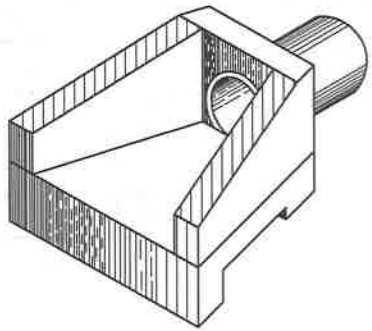
1. 6 #4 x 1'-0" DOWELS
2. 4 #4 x ("E" DIMENSION MINUS 4")
3. SLOPE SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND / OR NORMAL SLOPE VARIES FROM 2:1.

NOTES:

1. REINFORCING STEEL MINIMUM GRADE 40, EVENLY SPACED (MIN. SPACING 12" O.C.)
2. VOLUME DISPLACED BY PIPE COMPUTED USING INSIDE DIAMETER OF PIPE.
3. WING ANGLES AND / OR DIMENSIONS MAY BE ALTERED DURING CONSTRUCTION TO ACCOMMODATE FLOW OF WATER.
4. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE, BUT NOT TO EXCEED 5%. FRONT FACE OF HEADWALL SHALL REMAIN VERTICAL.
5. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "C" IS GREATER THAN 30".
6. ALL EXPOSED EDGES ARE TO HAVE ¾" CHAMFER.
7. SKEWED PIPE REQUIRES SPECIAL DESIGN.



SECTION A–A



ISOMETRIC VIEW

LEXINGTON

DIVISION OF ENGINEERING

PIPE CULVERT HEADWALLS
0° SKEW
15"–27" CIRCULAR PIPE

STANDARD DRAWING NO. 153

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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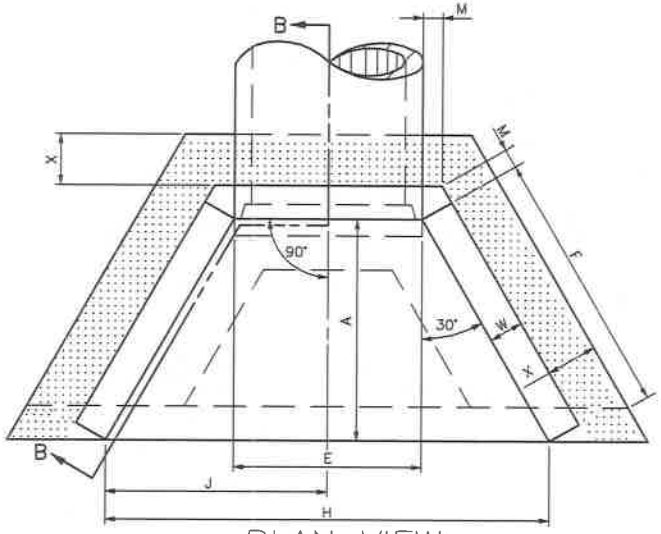
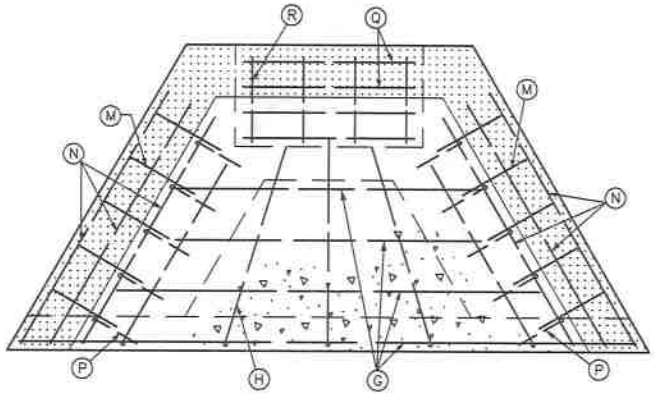
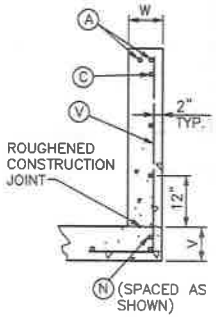


PLAN VIEW

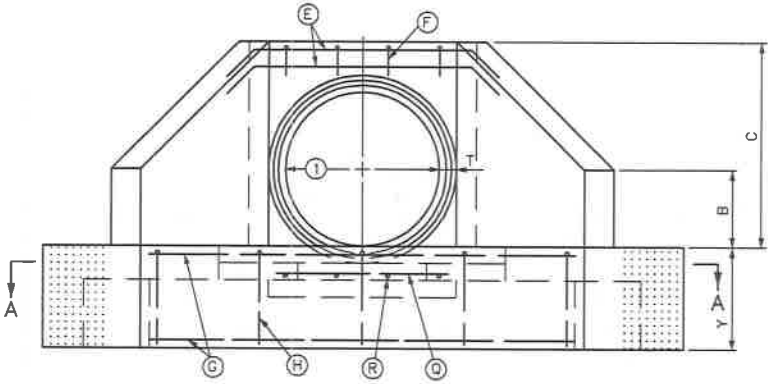


SECTION A–A

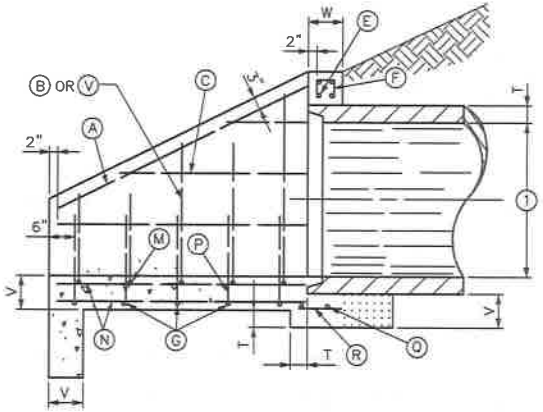


WING SECTION

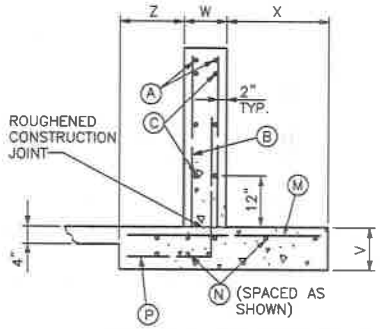
30"–60" CIRCULAR PIPE



FRONT ELEVATION



SECTION B–B



WING SECTION

66"–108" CIRCULAR PIPE

SHEET 1 OF 4

SHEET NOTE: ◯

(1) DIAMETER OF PIPE

NOTES:

1. ⋯⋯ APPLIES TO 66" DIAMETER AND GREATER. (CIRCULAR PIPE)
2. SEE SHEETS 2, 3, AND 4 OF CURRENT STD. DWG. 154 FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT.
3. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE UNLESS OTHERWISE NOTED.
4. ENCIRCLED LETTERS, ◯, INDICATE STEEL BAR LOCATIONS.
5. BARS (B), (C), (G), (P), (M), (V) ARE SPACED 1'–0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
6. BARS (B) AND (V) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
7. BARS (C) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT TOP OF EACH WING.
8. HEADWALLS LOCATED AT EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
9. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE, NOT TO EXCEED 5%.
10. FRONT OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.
11. FENCE AND / OR HANDRAIL IS REQUIRED FOR ALL HEADWALLS, SEE STD. DWG. 308.
12. ALL EXPOSED EDGES ARE TO HAVE ¾" CHAMFER.

LEXINGTON — FAYETTE URBAN COUNTY GOVERNMENT

LEXINGTON

DIVISION OF ENGINEERING

PIPE CULVERT HEADWALLS
0° SKEW
30"–108" PIPE

STANDARD DRAWING NO. 154–1

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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DIMENSION	DIAMETER OF PIPE														DIMENSION
	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"	108"	
A	3'–9"	4'–4"	4'–11"	5'–6"	6'–1"	6'–8"	7'–5"	8'–0"	8'–7"	9'–2"	9'–9"	10'–4"	10'–11"	11'–6"	A
B	1'–3"	1'–6"	1'–9"	2'–0"	2'–3"	2'–6"	2'–9"	3'–0"	3'–3"	3'–6"	3'–9"	4'–0"	4'–3"	4'–6"	B
C	3'–6"	4'–0"	4'–7"	5'–1"	5'–8"	6'–2"	7'–0"	7'–5"	8'–0"	8'–6"	9'–1"	9'–7"	10'–2"	10'–8"	C
E	3'–1"	3'–8"	4'–3"	4'–10"	5'–5"	6'–0"	6'–7"	7'–2'	7'–9"	8'–4"	8'–11"	9'–6"	10'–1"	10'–8"	E
F	4'–4"	5'–0"	5'–8"	6'–4"	7'–0"	7'–8"	8'–7"	9'–3"	9'–11"	10'–7"	11'–3"	11'–11"	12'–7"	13'–3"	F
H	7'–6"	8'–8"	10'–0"	11'–2"	12'–6"	13'–8"	15'–2"	16'–6"	17'–8"	19'–0"	20'–2"	21'–6"	22'–8"	24'–0"	H
J	3'–9"	4'–4"	5'–0"	5'–7"	6'–3"	6'–10"	7'–7"	8'–3"	8'–10"	9'–6"	10'–1"	10'–9"	11'–4"	12'–0"	J
M	0'–5"						0'–6"								M
T	0'–3.5"	0'–4.0"	0'–4.5"	0'–5.0"	0'–5.5"	0'–6.0"	0'–6.5"	0'–7.0"	0'–7.5"	0'–8.0"	0'–8.5"	0'–9.0"	0'–9.5"	0'–10.0"	T
V	0'–8"						1'–0"								V
W	0'–8"						0'–10"								W
X	–						2'–0"				2'–6"				X
Y	2'–0"						2'–6"				3'–0"				Y
Z	–						1'–3"				1'–9"				Z
CU.YDS.CONC. 2 HEADWALLS	3.36	4.30	5.35	6.53	7.82	9.22	18.76	20.95	23.25	25.67	31.48	34.31	37.25	40.32	CU.YDS.CONC. 2 HEADWALLS
LBS.STEEL 2 HEADWALLS	281	363	430	496	583	687	1320	1571	1815	2043	2451	2753	3050	3379	LBS.STEEL 2 HEADWALLS

LEXINGTON

DIVISION OF ENGINEERING

DIMENSIONS AND QUANTITIES
30"–108" HEADWALLS
CIRCULAR PIPE
0° SKEW

STANDARD DRAWING NO. 154–2

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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30"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	4	8		
C1	4	2	2	4		
C2	4	2	4	2		
E1	5	2	6	4	3	4
E2	5	2	6	8	3	8
F	4	3	1	3	0	4
G1	4	2	3	10		
G2	4	3	6	2		
H	4	4	5	1	3	5
N	4	6	4	2		
Q	4	2	2	9		
R	4	3	0	8		
V1	5	4	3	1	1	10
V2	5	4	4	1	2	10

36"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	5	5		
C1	4	2	1	7		
C2	4	2	3	8		
C3	4	2	4	10		
E1	5	2	6	11	3	11
E2	5	2	7	3	4	3
F	4	4	1	3	0	4
G1	4	3	5	0		
G2	4	3	7	4		
H	4	5	5	8	4	0
N	4	6	4	10		
Q	4	2	3	4		
R	4	4	0	8		
V1	5	4	3	4	2	1
V2	5	4	4	4	3	1
V3	5	2	5	4	4	1

42"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	6	2		
C1	4	2	2	9		
C2	4	2	4	9		
C3	4	2	5	6		
E1	5	2	7	6	4	6
E2	5	2	7	10	4	10
F	4	4	1	3	0	4
G1	4	3	6	4		
G2	4	3	8	7		

42" (CONTINUED)

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
H	4	5	6	3	4	7
N	4	6	6	6		
Q	4	2	3	11		
R	4	4	0	9		
V1	5	4	3	6	2	3
V2	5	4	4	6	3	3
V3	5	4	5	6	4	3

48"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	6	11		
C1	4	2	1	10		
C2	4	2	3	10		
C3	4	2	5	10		
C4	4	2	6	2		
E1	5	2	8	1	5	1
E2	5	2	8	5	5	5
F	4	5	1	3	0	4
G1	4	1	4	0		
G2	4	3	7	5		
G3	4	3	9	9		
H	4	6	6	10	5	2
N	4	6	6	2		
Q	4	2	4	6		
R	4	5	0	9		
V1	5	4	3	9	2	6
V2	5	4	4	9	3	6
V3	5	4	5	9	4	6

54"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	7	7		
C1	4	2	0	11		
C2	4	2	3	0		
C3	4	2	5	1		
C4	4	4	6	10		
E1	5	2	8	8	5	8
E2	5	2	9	0	6	0
F	4	6	1	3	0	4
G1	4	1	5	3		
G2	4	3	8	9		
G3	4	3	11	0		
H	4	6	7	5	5	9
N	4	6	6	10		
Q	4	2	5	1		
R	4	6	0	10		
V1	5	4	4	0	2	9

54" (CONTINUED)

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
V2	5	4	5	0	3	9
V3	5	4	6	0	4	9
V4	5	2	7	0	5	9

60"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	8	4		
C1	4	2	2	1		
C2	4	2	4	2		
C3	4	2	6	3		
C4	4	4	7	7		
E1	5	2	9	3	6	3
E2	5	2	9	7	6	7
F	4	6	1	3	0	4
G1	4	2	6	6		
G2	4	3	10	0		
G3	4	3	12	4		
H	4	7	8	0	6	4
N	4	6	7	7		
Q	4	2	5	8		
R	4	6	0	10		
V1	5	4	4	3	3	0
V2	5	4	5	3	4	0
V3	5	4	6	2	4	11
V4	5	4	7	2	5	11

66"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	9	4		
B1	5	8	2	10		
B2	5	8	3	10		
B3	5	8	4	9		
B4	5	8	5	9		
C1	4	4	1	5		
C2	4	4	3	5		
C3	4	4	5	6		
C4	4	4	7	7		
C5	4	8	8	4		
E1	5	2	11	9	6	10
E2	5	2	12	3	7	4
F	4	7	1	9	0	6
G1	4	3	8	0		
G2	4	3	11	4		
G3	4	3	13	10		
H	4	7	9	3	7	1
M	4	16	3	9		
N	4	14	8	4		

66" (CONTINUED)

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
P	5	16	5	0	3	3
Q	5	3	6	2		
R	5	7	2	7		

72"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	10	1		
B1	5	8	3	0		
B2	5	8	4	0		
B3	5	8	4	11		
B4	5	8	5	11		
B5	5	4	6	10		
C1	4	4	2	7		
C2	4	4	4	8		
C3	4	4	6	9		
C4	4	4	8	10		
C5	4	8	9	1		
E1	5	2	12	5	7	5
E2	5	2	12	11	7	11
F	4	8	1	9	0	6
G1	4	3	9	2		
G2	4	3	12	6		
G3	4	3	14	10		
H	4	9	9	10	7	8
M	4	18	3	9		
N	4	14	9	1		
P	5	18	5	3	3	6
Q	5	3	6	10		
R	5	7	2	7		

78"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	10	10		
B1	5	8	3	4		
B2	5	8	4	3		
B3	5	8	5	3		
B4	5	8	6	2		
B5	5	8	7	2		
C1	4	4	1	7		
C2	4	4	3	8		
C3	4	4	5	10		
C4	4	4	7	11		
C5	4	12	9	9		
E1	5	2	13	0	8	0
E2	5	2	13	6	8	6
F	4	8	1	9	0	6
G1	4	1	7	1		

78" (CONTINUED)

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
G2	4	3	10	6		
G3	4	3	14	0		
G4	4	3	16	4		
H	4	9	10	5	8	3
M	4	20	3	9		
N	4	14	9	9		
P	5	20	5	6	3	9
Q	5	3	7	5		
R	5	8	2	8		

84"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	11	7		
B1	5	8	3	6		
B2	5	8	4	6		
B3	5	8	5	5		
B4	5	8	6	5		
B5	5	8	7	4		
B6	5	4	8	4		
C1	4	4	2	10		
C2	4	4	4	11		
C3	4	4	7	0		
C4	4	4	9	1		
C5	4	12	10	5		
E1	5	2	13	7	8	7
E2	5	2	14	2	9	2
F	4	9	1	9	0	6
G1	4	1	9	6		
G2	4	3	11	10		
G3	4	3	15	2		
G4	4	3	17	6		
H	4	9	11	0	8	10
M	4	22	3	9		
N	4	14	10	5		
P	5	22	5	9	4	0
Q	5	3	8	0		
R	5	9	2	8		

90"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	12	3		
B1	5	8	3	10		
B2	5	8	4	9		
B3	5	8	5	9		
B4	5	8	6	8		
B5	5	8	7	7		
B6	5	4	8	6		
C1	4	4	1	11		
C2	4	4	4	0		
C3	4	4	6	1		
C4	4	4	8	3		
C5	4	4	10	4		
C6	4	12	11	1		
E1	5	2	14	2	9	2
E2	5	2	14	8	9	8
F	4	9	1	9	0	6
G1	4	2	9	6		
G2	4	3	13	0		
G3	4	3	16	5		
G4	4	3	18	9		
H	4	10	12	1	9	5
M	4	22	4	9		
N	4	16	11	1		
P	6	22	6	6	4	3
Q	5	4	8	7		
R	5	9	3	3		

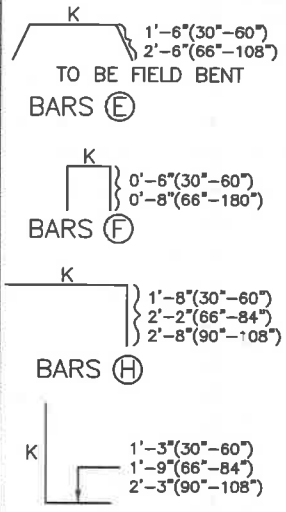
NOTES:

① NUMBER OF BARS IN ONE HEADWALL.

2. DIMENSIONS ARE OUT TO OUT OF BARS.

3. ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES



LEXINGTON

DIVISION OF ENGINEERING

BILL OF REINFORCEMENT
30"–90" DIAMETER
CIRCULAR PIPE HEADWALLS
0° SKEW

STANDARD DRAWING NO. 154-3

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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MARK	SIZE	NO	LGTH		K	
		①	FT	IN	FT	IN
96"						
A	5	4	13	0		
B_1	5	8	4	1		
B_2	5	8	5	0		
B_3	5	8	5	11		
B_4	5	8	6	10		
B_5	5	8	7	10		
B_6	5	8	8	9		
C_1	4	4	3	0		
C_2	4	4	5	2		
C_3	4	4	7	3		
C_4	4	4	9	5		
C_5	4	4	11	7		
C_6	4	12	11	9		
E_1	5	2	14	9	9	9
E_2	5	2	15	3	10	3
F	4	10	1	9	0	6
G_1	4	3	10	9		
G_2	4	3	14	3		
G_3	4	3	17	9		
G_4	4	3	20	0		
H	4	10	12	8	10	0
M	4	24	4	9		
N	4	16	11	9		
P	6	24	6	9	4	6
Q	5	4	9	2		
R	5	10	3	3		

MARK	SIZE	NO	LGTH		K	
		①	FT	IN	FT	IN
102"						
A	5	4	13	9		
B_1	5	8	4	4		
B_2	5	8	5	3		
B_3	5	8	6	2		
B_4	5	8	7	2		
B_5	5	8	8	1		
B_6	5	8	9	0		
B_7	5	4	9	11		
C_1	4	4	2	0		
C_2	4	4	4	2		
C_3	4	4	6	4		
C_4	4	4	8	6		
C_5	4	4	10	7		
C_6	4	16	12	5		
E_1	5	2	15	4	10	4
E_2	5	2	15	10	10	10
F	4	10	1	9	0	6
G_1	4	3	12	1		
G_2	4	3	15	8		
G_3	4	3	19	2		
G_4	4	3	21	7		
H	4	11	13	3	10	7
M	4	26	4	9		
N	4	16	12	5		
P	7	26	7	0	4	9
Q	5	4	9	9		
R	5	10	3	4		

MARK	SIZE	NO	LGTH		K	
		①	FT	IN	FT	IN
108"						
A	5	4	14	6		
B_1	5	8	4	7		
B_2	5	8	5	6		
B_3	5	8	6	5		
B_4	5	8	7	4		
B_5	5	8	8	3		
B_6	5	8	9	3		
B_7	5	8	10	2		
C_1	4	4	3	3		
C_2	4	4	5	5		
C_3	4	4	7	7		
C_4	4	4	9	8		
C_5	4	4	11	10		
C_6	4	16	13	1		
E_1	5	2	15	10	10	10
E_2	5	2	16	5	11	5
F	4	11	1	9	0	6
G_1	4	1	9	10		
G_2	4	3	13	4		
G_3	4	3	16	10		
G_4	4	3	20	3		
G_5	4	3	22	7		
H	4	11	13	10	11	2
M	4	28	4	9		
N	4	16	13	1		
P	7	28	7	3	5	0
Q	5	4	10	4		
R	5	11	3	4		

MARK	SIZE	NO	LGTH		K	
		①	FT	IN	FT	IN

MARK	SIZE	NO	LGTH		K	
		①	FT	IN	FT	IN

MARK	SIZE	NO	LGTH		K	
		①	FT	IN	FT	IN

MARK	SIZE	NO	LGTH		K	
		①	FT	IN	FT	IN

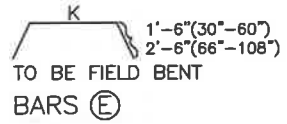
NOTES:

① NUMBER OF BARS IN ONE HEADWALL.

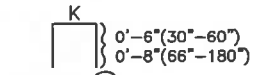
2. DIMENSIONS ARE OUT TO OUT OF BARS.

3. ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

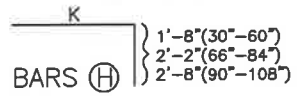
BENT BAR SHAPES



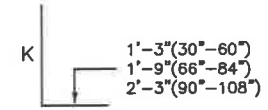
TO BE FIELD BENT
BARS Ⓔ



BARS Ⓕ



BARS Ⓗ



BARS Ⓟ AND Ⓥ

SHEET 4 OF 4

LEXINGTON

DIVISION OF ENGINEERING

BILL OF REINFORCEMENT
96"-108" DIAMETER
CIRCULAR PIPE HEADWALLS
0° SKEW

STANDARD DRAWING NO. 154-4

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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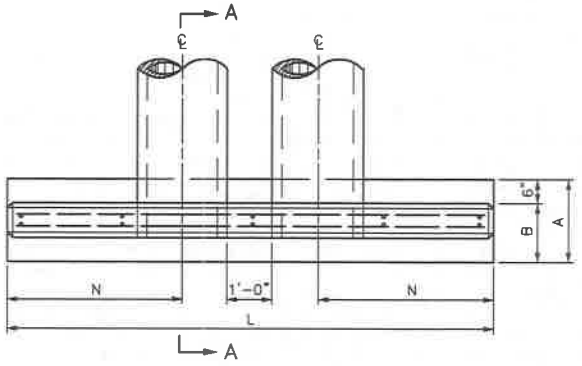
DIMENSIONS AND QUANTITIES

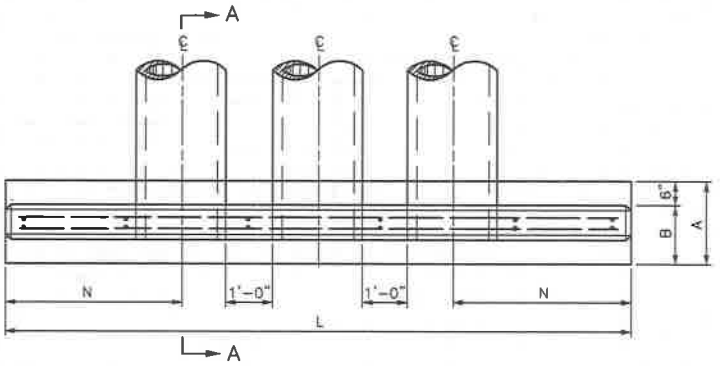
HEADWALL TYPE	PIPE DIA.	A	B	C	E	L	M	N	CU. YD. CONC. 2 HDWLS
STANDARD DOUBLE LINE	18"	1'-9"	1'-3"	4'-6"	3'-0"	10'-5"	10 ¾"	3'-9"	4.18
	24"	1'-10"	1'-4"	5'-0"	3'-6"	12'-6'		4'-6"	5.65
STANDARD TRIPLE LINE	18"	1'-9"	1'-3"	4'-6"	3'-0"	13'-4"		3'-9"	4.87
	24"	1'-10"	1'-4"	5'-0"	3'-6"	16'-0"		4'-6"	6.68
RAISED DOUBLE LINE	18"	1'-9"	1'-3"	5'-0"	3'-6"	11'-11"		4'-6"	5.28
	24"	1'-10"	1'-4"	5'-6"	4'-0"	14'-0"		5'-3"	7.43
RAISED TRIPLE LINE	18"	1'-9"	1'-3"	5'-0"	4'-0"	14'-10"		4'-5"	6.76
	24"	1'-10"	1'-4"	5'-6"	4'-6"	17'-6"		5'-3"	8.83

NOTES:

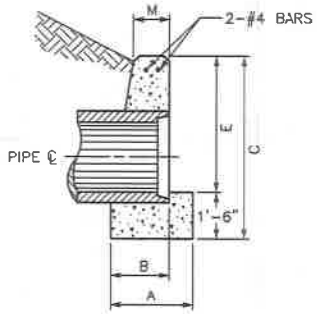
1. ALL VOLUMES ARE IN CUBIC YARDS FOR TWO HEADWALLS; VOLUME DISPLACED BY BARREL OF PIPE HAS BEEN COMPUTED USING INSIDE DIAMETER OF PIPE. NO DEDUCTION HAS BEEN MADE FOR BEVELED EDGES.
2. WHERE HEADWALLS ARE LOCATED AT THE EDGE OF THE SHOULDER, THE TOP OF THE HEADWALLS SHALL BE PARALLEL TO THE EDGE OF SHOULDER.
3. WHERE A RAISED HEADWALL IS USED ON THE OUTLET END OF THE PIPE, THE TOPS OF BOTH WALLS SHALL BE AT THE SAME ELEVATION.
4. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "E" IS GREATER THAN 30".



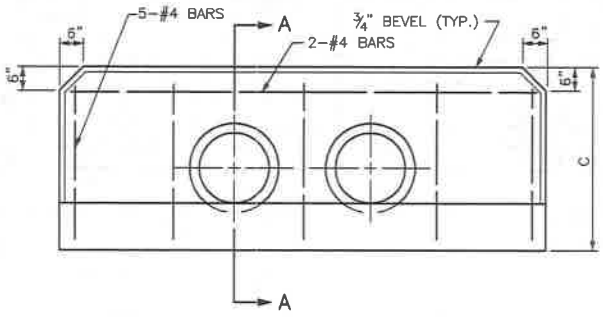
PLAN



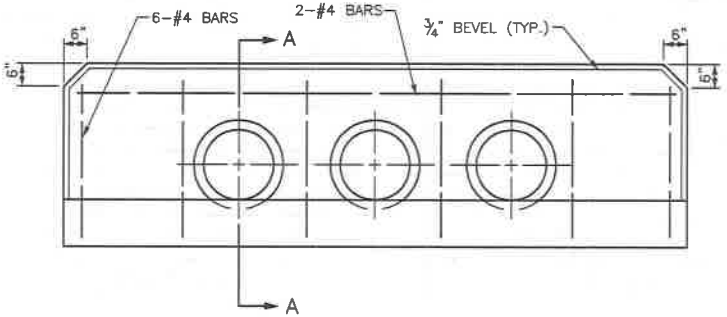
PLAN



SECTION A-A



ELEVATION



ELEVATION

LEXINGTON

DIVISION OF ENGINEERING

18"-24" DOUBLE & TRIPLE PIPE CULVERT HEADWALLS AT 0° SKEW

STANDARD DRAWING NO. 158

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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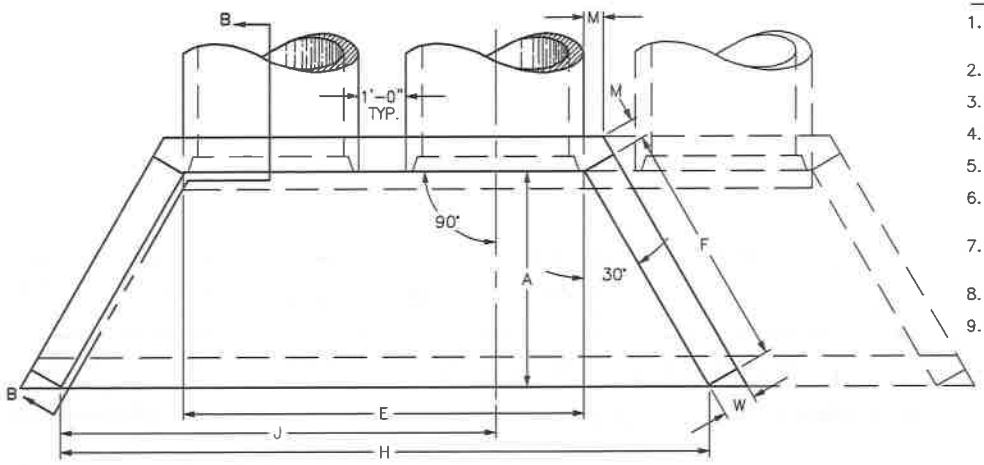
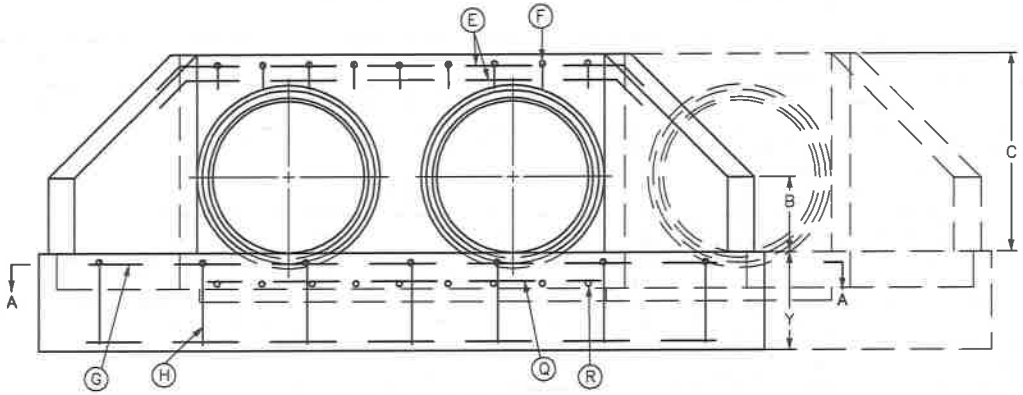
NOTES:

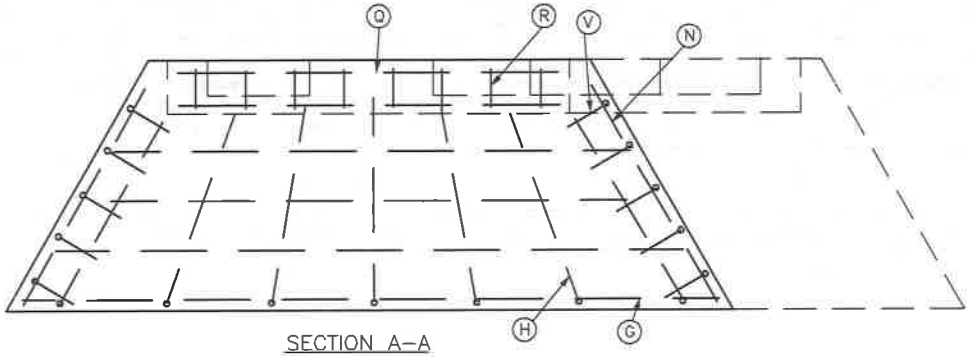
1. SEE SHEETS 2 AND 3 OF CURRENT STD. DWG. 159 FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT.
2. ENCIRCLED LETTERS, Ⓐ, INDICATE STEEL BAR LOCATIONS.
3. BARS Ⓒ, Ⓖ, Ⓥ ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
4. BARS Ⓥ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
5. BARS Ⓒ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
6. HEADWALLS LOCATED AT THE EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
7. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE AND ENDS OF WINGS SHALL REMAIN VERTICAL.
8. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
9. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "C" IS GREATER THAN 30". SEE STD. DWG. 308.



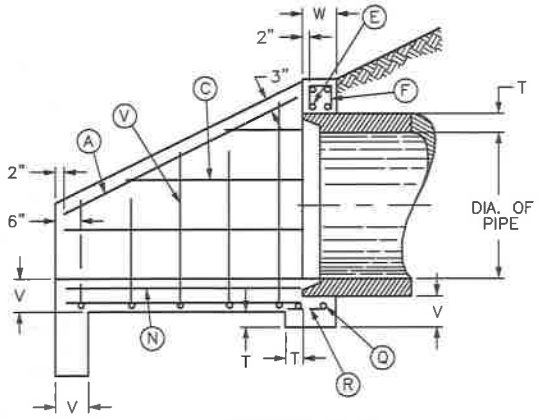
PLAN VIEW



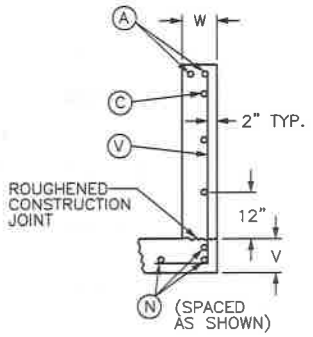
FRONT ELEVATION



SECTION A–A



SECTION B–B



WING SECTION

SHEET 1 OF 3

LEXINGTON

DIVISION OF ENGINEERING

DOUBLE & TRIPLE PIPE CULVERT HEADWALLS 0° SKEW

STANDARD DRAWING NO. 159–1

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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DIMENSIONS FOR MULTIPLE PIPE HEADWALLS – 0° SKEW

DIMENSION	DOUBLE				TRIPLE				DIMENSION
	30"	36"	42"	48"	30"	36"	42"	48"	
A	3'–9"	4'–4"	4'–11"	5'–6"	3'–9"	4'–4"	4'–11"	5'–6"	A
B	1'–3"	1'–6"	1'–9"	2'–0"	1'–3"	1'–6"	1'–9"	2'–0"	B
C	3'–6"	4'–0"	4'–7"	5'–1"	3'–6"	4'–0"	4'–7"	5'–1"	C
E	7'–2"	8'–4"	9'–6"	10'–8"	11'–3"	13'–0"	14'–9"	16'–6"	E
F	4'–4"	5'–0"	5'–8"	6'–4"	4'–4"	5'–0"	5'–8"	6'–4"	F
H	11'–6"	13'–4"	15'–2"	17'–0"	15'–6"	18'–0"	20'–6"	22'–10"	H
J	–	–	–	–	7'–9"	9'–0"	10'–3"	11'–5"	J
M	0'–5"				0'–5"				M
T	0'–3.5"	0'–4"	0'–4.5"	0'–5"	0'–3.5"	0'–4"	0'–4.5"	0'–5"	T
V	0'–8"				0'–8"				V
W	0'–8"				0'–8"				W
Y	2'–0"				2'–0"				Y
CLASS "A" CONC. CU. YDS. 2 HEADWALLS	4.91	6.22	7.75	9.38	6.49	8.20	10.19	12.30	CLASS "A" CONC. CU. YDS. 2 HEADWALLS
LBS. STEEL 2 HEADWALLS	379	480	561	660	475	594	702	797	LBS. STEEL 2 HEADWALLS

LEXINGTON

DIVISION OF ENGINEERING

DIMENSIONS AND QUANTITIES
30"–48"
DOUBLE & TRIPLE
HEADWALLS–CIRCULAR PIPE
0° SKEW

STANDARD DRAWING NO. 159–2

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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DOUBLE 30"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	4	8		
C1	4	2	2	4		
C2	4	2	4	2		
E1	5	2	10	6	7	6
E2	5	2	10	8	7	8
F	4	8	1	3	0	4
G1	4	2	7	8		
G2	4	3	10	0		
H	4	6	5	1	3	5
N	4	6	4	2		
Q	4	2	7	1		
R	4	8	0	8		
V1	5	4	3	1	1	10
V2	5	4	4	1	2	10

42"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	6	2		
C1	4	2	2	9		
C2	4	2	4	9		
C3	4	2	5	6		
E1	5	2	12	10	9	10
E2	5	2	13	0	10	0
F	4	10	1	3	0	4
G1	4	3	11	5		
G2	4	3	13	9		
H	4	7	6	3	4	7
N	4	6	5	6		
Q	4	2	9	2		
R	4	10	0	9		
V1	5	4	3	6	2	3
V2	5	4	4	6	3	3
V3	5	4	5	6	4	3

TRIPLE 30"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	4	8		
C1	4	2	2	4		
C2	4	2	4	2		
E1	5	2	14	7	11	7
E2	5	2	14	9	11	9
F	4	12	1	3	0	4
G1	4	2	11	10		
G2	4	3	14	1		
H	4	8	5	1	3	5
N	4	6	4	2		
Q	4	2	11	1		
R	4	12	0	8		
V1	5	4	3	1	1	10
V2	5	4	4	1	2	10

42"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	6	2		
C1	4	2	2	9		
C2	4	2	4	9		
C3	4	2	5	6		
E1	5	2	18	1	15	1
E2	5	2	18	3	15	3
F	4	15	1	3	0	4
G1	4	3	16	8		
G2	4	3	19	1		
H	4	10	6	3	4	7
N	4	6	5	6		
Q	4	2	14	5		
R	4	15	0	9		
V1	5	4	3	6	2	3
V2	5	4	4	6	3	3
V3	5	4	5	6	4	3

36"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	5	5		
C1	4	2	1	7		
C2	4	2	3	8		
C3	4	2	4	10		
E1	5	2	11	8	8	8
E2	5	2	11	10	8	10
F	4	9	1	3	0	4
G1	4	3	9	7		
G2	4	3	12	0		
H	4	7	5	8	4	0
N	4	6	4	10		
Q	4	2	8	2		
R	4	9	0	8		
V1	5	4	3	4	2	1
V2	5	4	4	4	3	1
V3	5	2	5	4	4	1

48"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	6	11		
C1	4	2	1	10		
C2	4	2	3	10		
C3	4	2	5	10		
C4	4	2	6	2		
E1	5	2	14	0	11	0
E2	5	2	14	2	11	2
F	4	11	1	3	0	4
G1	4	1	11	0		
G2	4	3	13	3		
G3	4	3	15	7		
H	4	9	16	10	5	2
N	4	6	6	2		
Q	4	2	10	4		
R	4	11	0	9		
V1	5	4	3	9	2	6
V2	5	4	4	9	3	6
V3	5	4	5	9	4	6

36"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	5	5		
C1	4	2	1	7		
C2	4	2	3	8		
C3	4	2	4	10		
E1	5	2	16	4	13	4
E2	5	2	16	6	13	6
F	4	13	1	3	0	4
G1	4	3	14	4		
G2	4	3	16	8		
H	4	9	5	8	4	0
N	4	6	4	10		
Q	4	2	12	8		
R	4	13	0	8		
V1	5	4	3	4	2	1
V2	5	4	4	4	3	1
V3	5	2	5	4	4	1

48"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	6	11		
C1	4	2	1	10		
C2	4	2	3	10		
C3	4	2	5	10		
C4	4	2	6	2		
E1	5	2	19	10	16	10
E2	5	2	20	0	17	10
F	4	17	1	3	0	4
G1	4	1	16	9		
G2	4	3	19	0		
G3	4	3	21	5		
H	4	12	6	11	5	3
N	4	6	6	2		
Q	4	6	16	2		
R	4	17	0	9		
V1	5	4	3	9	2	6
V2	5	4	4	9	3	6
V3	5	4	5	9	4	6

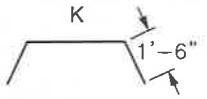
NOTES:

① NUMBER OF BARS IN ONE HEADWALL.

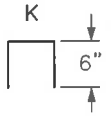
2. DIMENSIONS ARE OUT TO OUT OF BARS.
3. ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES

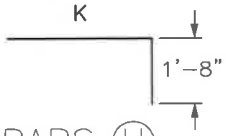
TO BE FIELD BENT



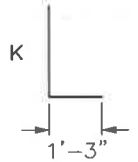
BARS (E)



BARS (F)



BARS (H)



BARS (V)

SHEET 3 OF 3

LEXINGTON

DIVISION OF ENGINEERING

BILL OF REINFORCEMENT
30"-48" DOUBLE & TRIPLE
HEADWALLS-CIRCULAR PIPE
0° SKEW

STANDARD DRAWING NO: 159-3

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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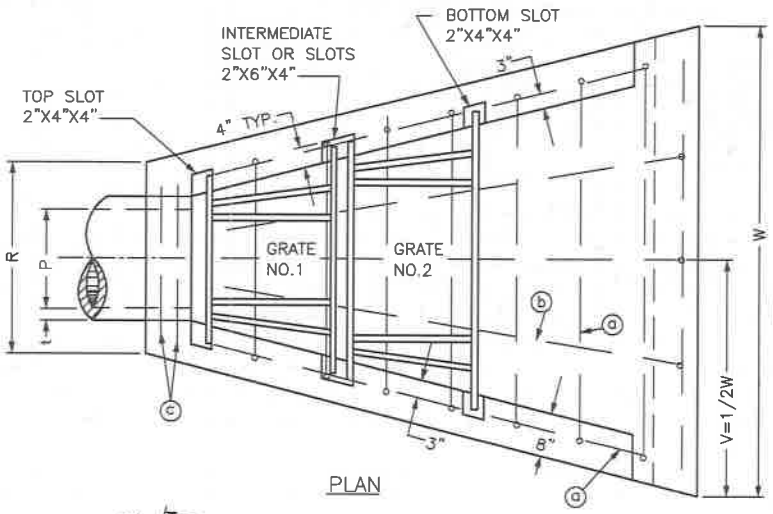
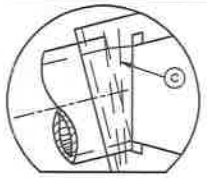
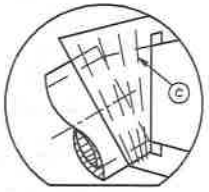


PLAN

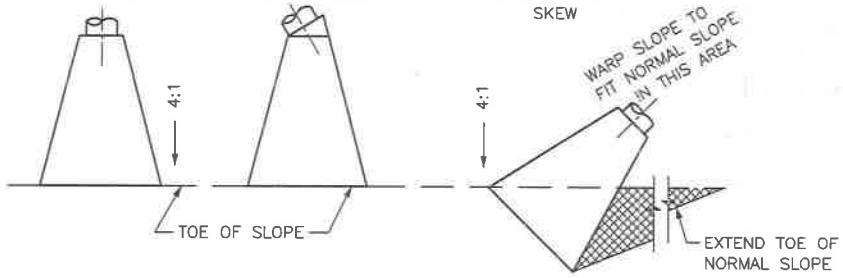


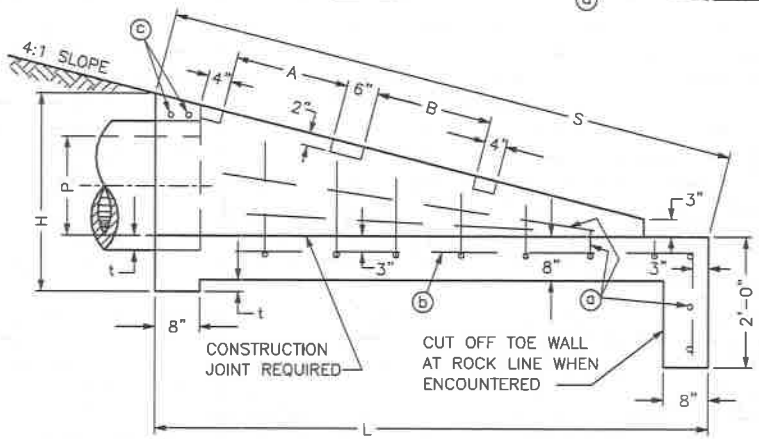
15° SKEW



30° SKEW

PLAN VIEW OF STRUCTURE LOCATIONS





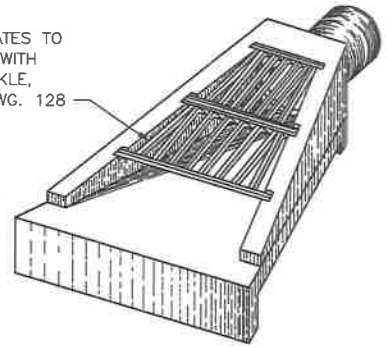
ELEVATION

NOTES:

1. THE MINIMUM REQUIREMENT FOR REINFORCING STEEL SHALL BE GRADE 40. FIELD BENDING WILL BE PERMITTED.

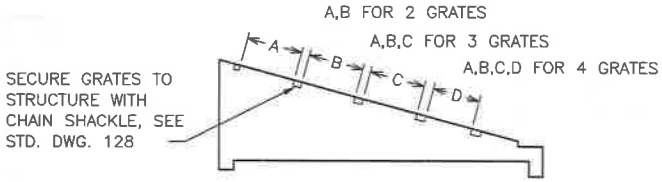
② ONE ADDITIONAL ⓒ BAR WILL BE REQUIRED FOR EACH 15° SKEW.

3. t IS CONCRETE PIPE WALL THICKNESS.



18"–24"
TRIMETRIC VIEW

DETAIL SHOWING LOCATION
OF SLOTS FOR GRATES



SEE STD. DWG. 163 FOR GRATE DETAILS.

DIMENSIONS

P	H	L	S	R	V	W	A	B	C	D
18"	3'–0"	8'–6"	8'–9 1/8"	2'–11 1/2"	3'–7 1/2"	7'–3"	1'–9"	1'–9"	–	–
24"	3'–7"	10'–8"	11'–0"	3'–6 1/2"	4'–5 1/2"	8'–11"	2'–9"	2'–9"	–	–
30"	4'–2"	12'–10"	13'–2 3/4"	4'–1 1/2"	5'–3 1/2"	10'–7"	2'–9"	2'–9"	1'–9"	–
36"	4'–9"	15'–0"	15'–5 1/2"	4'–8 1/2"	6'–1 1/2"	12'–3"	2'–9"	2'–9"	1'–9"	1'–9"

NO. OF GRATES REQ'D	
2'	3'
2	–
–	2
1	2
2	2

NO. 4 REINFORCEMENT BARS NUMBER–LENGTH AND WEIGHT				CLASS "A" CONC.
ⓐ	ⓑ	② ⓒ	LBS.	CU.YD.
14 AT 6'–5"	3 AT 8'–6"	2 AT 2'–8"	81	1.8
16 AT 8'–0"	3 AT 10'–6"	2 AT 3'–3"	111	2.7
18 AT 9'–7"	3 AT 12'–9"	2 AT 3'–10"	146	3.8
20 AT 11'–4"	3 AT 15'–0"	2 AT 4'–5"	187	5.1

LEXINGTON

DIVISION OF ENGINEERING

SLOPED AND FLARED
BOX INLET–OUTLET
18"–24"–30"–36"
ALL SKEWS

STANDARD DRAWING NO. 162

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE

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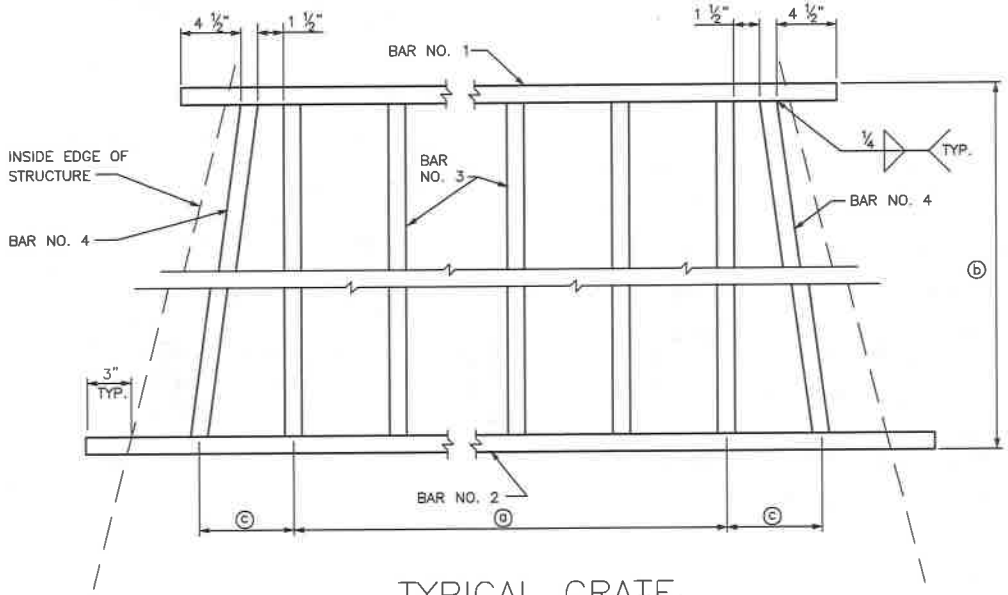
BOX INLET–OUTLET SIZE	GRATE NO.	GRATE SIZE	BAR NO. 1 LENGTH	BAR NO. 2 LENGTH	BAR NO. 3 NO. BARS	BAR NO. 3 LENGTH	BAR NO. 4 LENGTH	LBS. STRUCTURAL STEEL EACH GRATE	LBS. STRUCTURAL STEEL TOTAL
18"	1	2'–0"	2'–6 ½"	3'–5 ¾"	4	1'–10"	1'–10 ¼"	116	272
	2	2'–0"	3'–7 ⅝"	4'–6 ⅞"	6	1'–10"	1'–10 ¼"	156	
24"	1	3'–0"	3'–1 ½"	4'–6 ⅝"	5	2'–10"	2'–10 ⅜"	187	454
	2	3'–0"	4'–8 ½"	6'–1 ⅝"	8	2'–10"	2'–10 ⅜"	267	
30"	1	3'–0"	3'–8 ½"	5'–1 ½"	6	2'–10"	2'–10 ⅜"	215	796
	2	3'–0"	5'–3 ½"	6'–8 ⅝"	9	2'–10"	2'–10 ⅜"	294	
	3	2'–0"	6'–10 ½"	7'–9 ¾"	13	1'–10"	1'–10 ¼"	287	
36"	1	3'–0"	4'–3 ½"	5'–8 ½"	7	2'–10"	2'–10 ⅜"	242	1218
	2	3'–0"	5'–10 ½"	7'–3 ⅝"	10	2'–10"	2'–10 ⅜"	321	
	3	2'–0"	7'–5 ½"	8'–4 ¾"	14	1'–10"	1'–10 ¼"	308	
	4	2'–0"	8'–6 ¾"	9'–5 ⅞"	16	1'–10"	1'–10 ¼"	347	



TYPICAL GRATE

NOTES:

ⓐ EQUALLY SPACE BARS NO. 3.

ⓑ SIZE OF GRATE EITHER 2'–0" OR 3'–0".

ⓒ 5 ½" FOR 2'–0" GRATE, 7" FOR 3'–0" GRATE.

1. ALL COMPONENTS ARE 1" x 2" STRUCTURAL STEEL BARS.
2. SEE STD. DWG. 162.
3. SECURE GRATE TO STRUCTURE WITH CHAIN SHACKLE, SEE STD. DWG. 128.

LEXINGTON

DIVISION OF ENGINEERING

GRATES FOR SLOPED AND FLARED BOX INLET–OUTLET

STANDARD DRAWING NO. 163

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE

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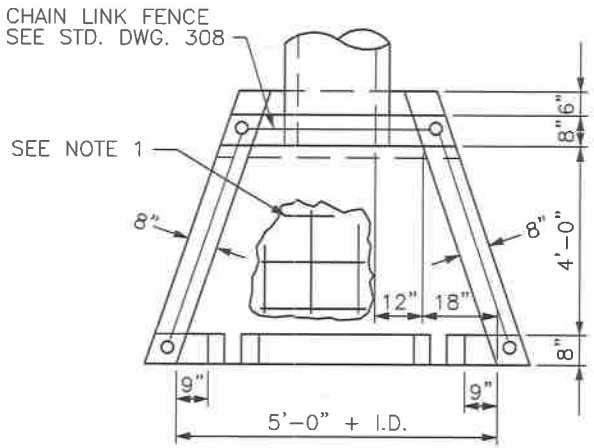
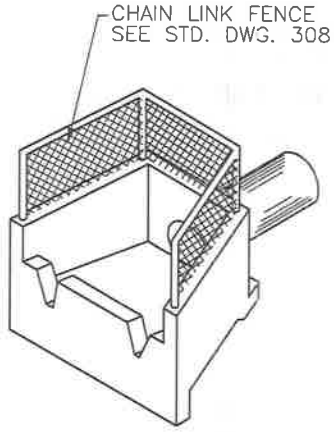
NOTES:

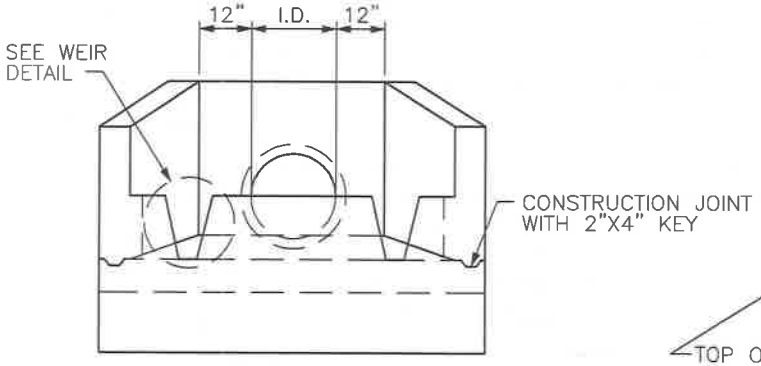
1. NO. 5 STEEL BARS TO BE USED THROUGHOUT ON 12" CENTERS.
2. HEIGHT OF WALL SHALL BE DETERMINED BY THE AMOUNT OF FILL BEHIND PIPE. TOP OF WALL SHALL BE 18" ABOVE TOP O.D. OF PIPE.
3. TOP OF END SILL SHALL BE LEVEL WITH CENTERLINE OF PIPE.
4. CHANNEL LINING TO BE WIDTH OF END SILL, 18" MINIMUM THICKNESS, AND COMPOSED OF CLASS III CHANNEL LINING.
5. ALL VERTICAL OR SLOPED EXPOSED SURFACES SHALL HAVE A RUBBED FINISH.
6. ALL EXPOSED FLAT WORK TO HAVE A HAND FLOATED AND BROOMED FINISH.
7. ALL EXPOSED EDGES SHALL HAVE A ¾" CHAMFER.
8. ALL STEEL SHALL HAVE 2" MINIMUM CLEARANCE TO THE CONCRETE FACE ON THE BACKFILL SIDE OF THE WALLS.
9. FENCES REQUIRED ON HEADWALLS.



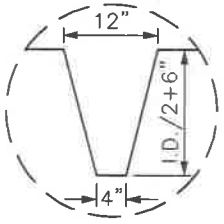
PLAN ELEVATION



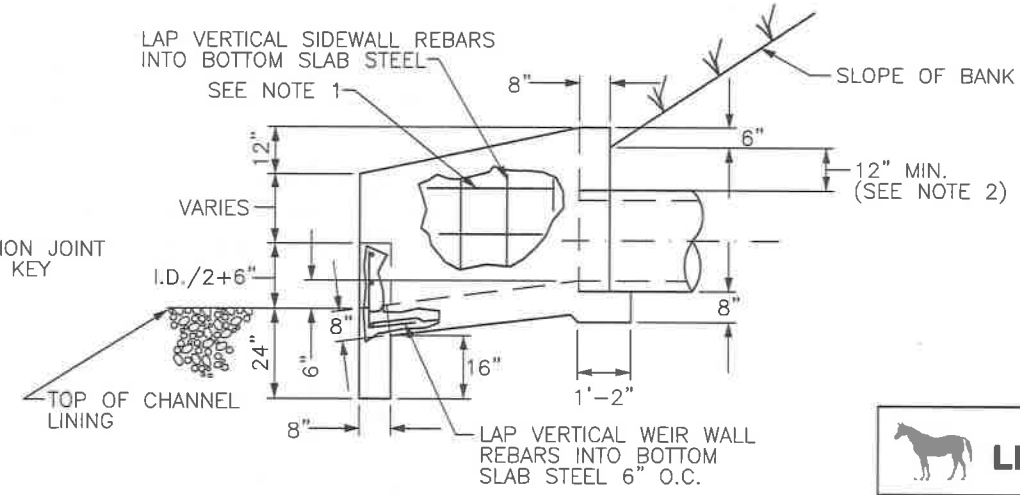
ISOMETRIC VIEW



FRONT ELEVATION



WEIR DETAIL



SIDE ELEVATION

LEXINGTON

DIVISION OF ENGINEERING

IMPACT STILLING BASIN
15"–24" PIPES

STANDARD DRAWING NO. 164

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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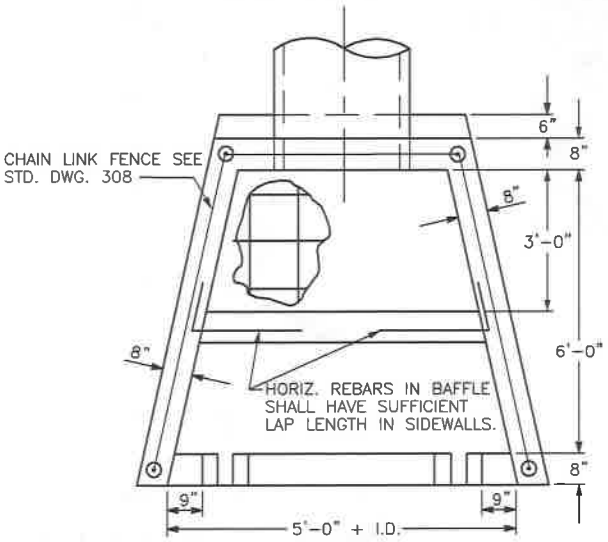
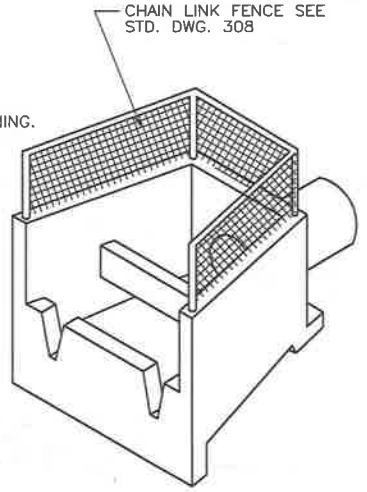


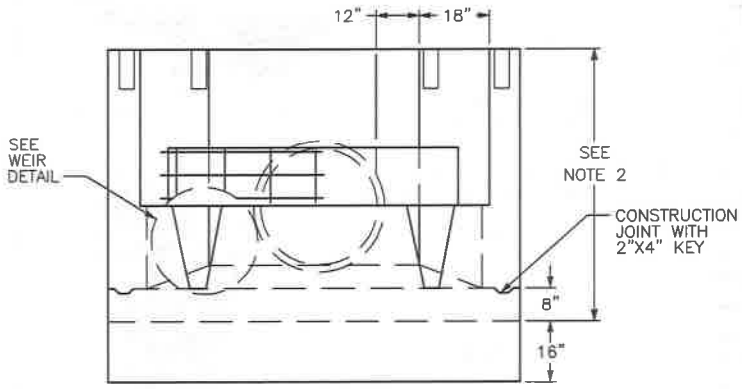
PLAN ELEVATION

NOTES:

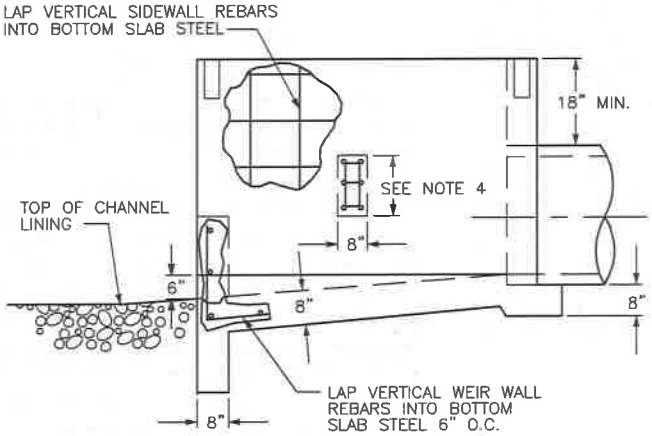
1. NO. 5 STEEL BARS SHALL BE USED THROUGHOUT ON 12" CENTERS EXCEPT ON BAFFLE WHERE HORIZONTAL AND VERTICAL STEEL WILL BE ON 6" CENTERS.
2. HEIGHT OF WALL SHALL BE DETERMINED BY THE AMOUNT OF FILL BEHIND PIPE. TOP OF WALL SHALL BE 18" ABOVE TOP O.D. OF PIPE.
3. TOP OF END SILL SHALL BE LEVEL WITH CENTERLINE OF PIPE.
4. TOP OF BAFFLE SHALL BE LEVEL WITH CROWN OF PIPE, AND THE BOTTOM SHALL BE LEVEL WITH CENTERLINE OF PIPE.
5. CHANNEL LINING TO BE 2 TIMES THE WIDTH OF THE END SILL AND EXTEND A MINIMUM OF 4' BEYOND THE STILLING BASIN WITH AN 18" MINIMUM THICKNESS AND COMPOSED OF CLASS III CHANNEL LINING.
6. CHANNEL LINE SPILL SLOPES BEYOND SIDES OF HEADWALL WITH CLASS III CHANNEL LINING. CHANNEL LINING SHALL EXTEND 4' IN WIDTH ON SLOPES AT WINGWALL AND TO DOWNSTREAM END OF CHANNEL.
7. ALL VERTICAL OR SLOPED EXPOSED SURFACES SHALL HAVE A RUBBED FINISH.
8. ALL EXPOSED FLATWORK SHALL HAVE A HANDFLOATED AND BROOMED FINISH.
9. ALL EXPOSED EDGES SHALL HAVE A ¾" CHAMFER.
10. ALL STEEL SHALL HAVE A 2" MINIMUM CLEARANCE TO THE CONCRETE FACE ON THE BACKFILL SIDE OF THE STRUCTURE.
11. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN THE VERTICAL FACE IS GREATER THAN 30".
12. ALL LARGER PIPES SHALL HAVE A SPECIAL DESIGN STILLING BASIN.
13. ALL LONGITUDINAL REINFORCING BARS IN BAFFLE SHALL HAVE SUFFICIENT ANCHORAGE LENGTH IN SIDEWALLS.



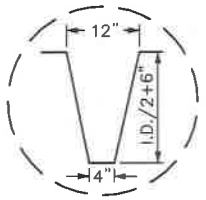
ISOMETRIC VIEW



FRONT ELEVATION



SIDE ELEVATION



WEIR DETAIL

LEXINGTON

DIVISION OF ENGINEERING

IMPACT STILLING BASIN
27"–48" PIPES

STANDARD DRAWING NO. 165

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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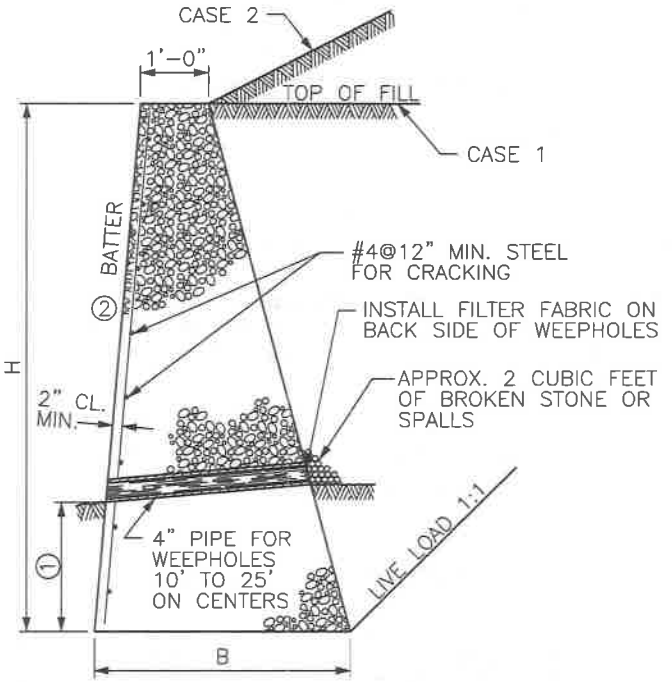


RETAINING WALL

H	B	END AREA SQ. FT.	VOLUME C.Y./L.F.
CASE 1 OR 2			
2'-6"	1'-3"	2.8125	0.1042
3'-0"	1'-6"	3.7500	0.1389
3'-6"	1'-9"	4.8125	0.1782
4'-0"	2'-0"	6.0000	0.2222
4'-6"	2'-3"	7.3125	0.2708
5'-0"	2'-6"	8.7500	0.3241
5'-6"	2'-9"	10.3125	0.3819
6'-0"	3'-0"	12.0000	0.4444
6'-6"	3'-3"	13.8125	0.5116
7'-0"	3'-6"	15.7500	0.5833
7'-6"	3'-9"	17.8125	0.6597
8'-0"	4'-0"	20.0000	0.7407
8'-6"	4'-3"	22.3125	0.8264
9'-0"	4'-6"	24.7500	0.9167
9'-6"	4'-9"	27.3125	1.0116
CASE 1			
10'-0"	5'-0"	30.0000	1.1111
10'-6"	5'-3"	32.8125	1.2153
11'-0"	5'-6"	35.7500	1.3241
11'-6"	5'-9"	38.8125	1.4375
12'-0"	6'-0"	42.0000	1.5556
CASE 2			
10'-0"	6'-0"	35.0000	1.2963
10'-6"	6'-3"	38.0625	1.4097
11'-0"	6'-6"	41.2500	1.5278
11'-6"	6'-9"	44.5625	1.6505
12'-0"	7'-0"	48.0000	1.7778

NOTES:

1. THE RETAINING WALL DEPICTED ON THIS DRAWING SHALL BE USED WHEN THE HEIGHT ("H" DIMENSION) OF THE WALL IS 2'-6" TO 12'-0" PROVIDED THE FILL COMPLIES WITH THE FOLLOWING CONDITIONS:
   CASE 1 – TOP OF FILL IS LEVEL WITH TOP OF WALL.
   CASE 2 – WALL IS SURCHARGED WITH DEAD LOAD FILL SLOPES OF 2:1 OR LESS.
2. AREAS AND VOLUMES HAVE BEEN COMPUTED WITHOUT DEDUCTING FOR BEVELED EDGES OR PIPE DRAINS. WHEN A RETAINING WALL VARIES IN HEIGHT, THE PRISMOIDAL FORMULA SHALL BE USED IN COMPUTING VOLUMES.
3. GRAVITY TYPE RETAINING WALLS SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE.
4. TRANSVERSE EXPANSION JOINTS 1/2 INCH IN WIDTH SHALL BE PLACED AT INTERVALS OF NOT OVER 30 FEET THROUGHOUT THE LENGTH OF RETAINING WALLS AND EXPANSION JOINT MATERIAL SHALL BE PLACED THEREIN. ALL EXPOSED EDGES SHALL BE BEVELED 3/4 INCH. THE WALLS SHALL NOT BE SURCHARGED EXCEPT IN SPECIAL CASES WHEREIN SPECIAL DRAWINGS WILL BE FURNISHED.

SHEET NOTES: Ⓞ

SPECIAL DESIGNS SHALL BE REQUIRED WHEN ANY ONE OF THE FOLLOWING CONDITIONS EXIST:

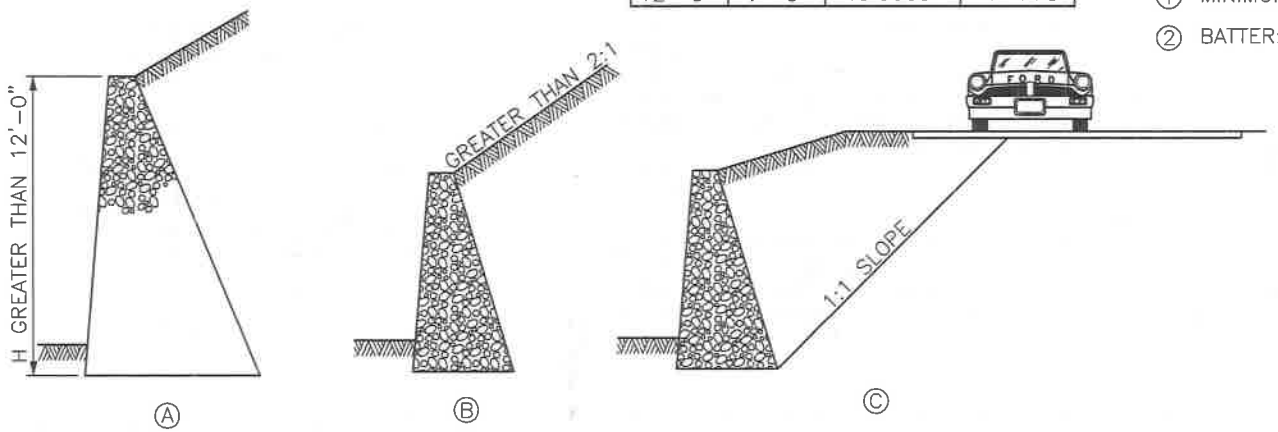
Ⓐ WALL HEIGHT IS GREATER THAN 12'-0" (CASE 1 OR CASE 2 FILL).

Ⓑ WALL IS SURCHARGED WITH DEAD LOAD FILL SLOPES GREATER THAN 2:1.

Ⓒ WALL IS SURCHARGED WITH A LIVE LOAD WITHIN THE LIMITS OF A 1:1 SLOPE EXTENDING FROM THE BASE OF THE WALL.

① MINIMUM VALUE FOR FIRM SOIL IS 2'-0".

② BATTER: H=3'-0" TO LESS THAN 5'-0" (VERTICAL)
H=5'-0" TO LESS THAN 10'-0" (1":1')
H=10'-0" TO 12'-0" (2":1')



SPECIAL DESIGNS REQUIRED

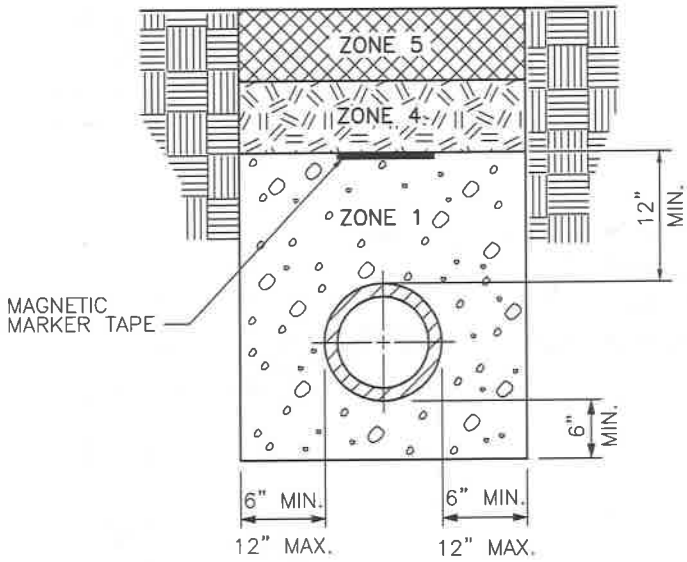
LEXINGTON – FAYETTE URBAN COUNTY GOVERNMENT

LEXINGTON
DIVISION OF ENGINEERING

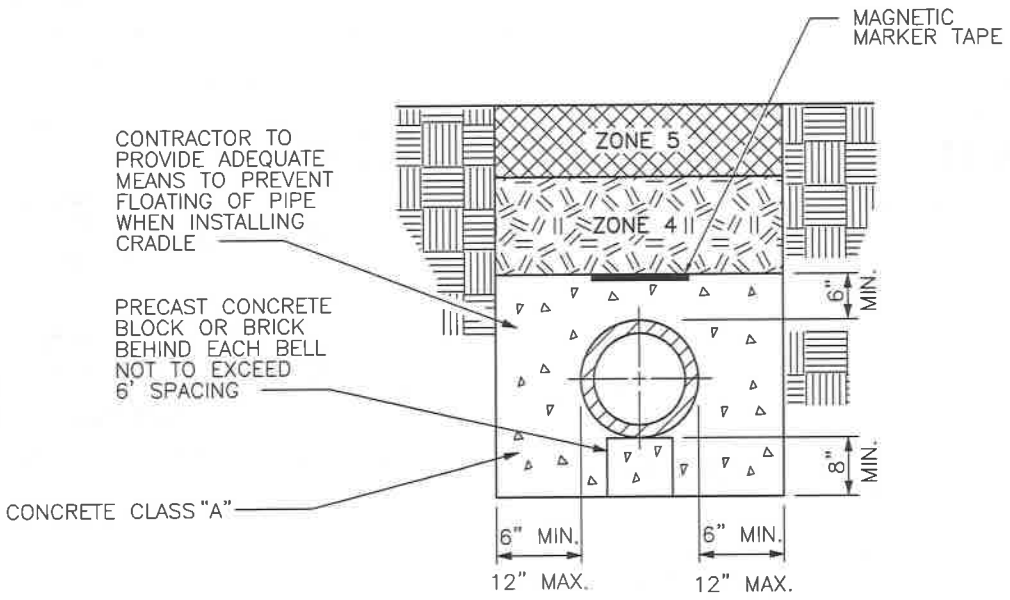
RETAINING WALL
GRAVITY TYPE

STANDARD DRAWING NO. 180

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17



PIPE LAID IN ROCK OR SOIL TRENCH



STANDARD CONCRETE ENCASEMENT (NOTE: AS REQUIRED BY DESIGN)

PIPE BACKFILL DESCRIPTIONS	
ZONE 1	NO. 9 STONE
ZONE 2	NO. 9 OR NO. 57 STONE
ZONE 3	COMPACTED DGA
ZONE 4	CONSOLIDATED SOIL, (NO ROCK GREATER THAN 6" DIAMETER) NO. 9, OR NO. 57 STONE
ZONE 5	12" MAX. TOPSOIL, NO ROCK ALLOWED

NOTES:

1. COVER, UP TO AND INCLUDING ZONE 4 SHALL BE ESTABLISHED BEFORE TRENCH EXCAVATION.
2. ALL SANITARY SEWER LINES CONSTRUCTED FROM NON-METALLIC MATERIALS SHALL HAVE MAGNETIC MARKER TAPE INSTALLED IN THE TRENCH ABOVE THE SANITARY SEWER LINE.
3. MAGNETIC MARKER TAPE FOR SANITARY SEWER ONLY.
4. **ZONE 4 MATERIAL SHALL BE COMPACTED IN LIFTS IN ORDER TO ACHEIVE 95% STANDARD PROCTOR DENSITY.**

LEXINGTON

DIVISION OF ENGINEERING

TRENCHING, LAYING, BACKFILLING AND BEDDING OUTSIDE R/W LIMITS

STANDARD DRAWING NO. 200

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE

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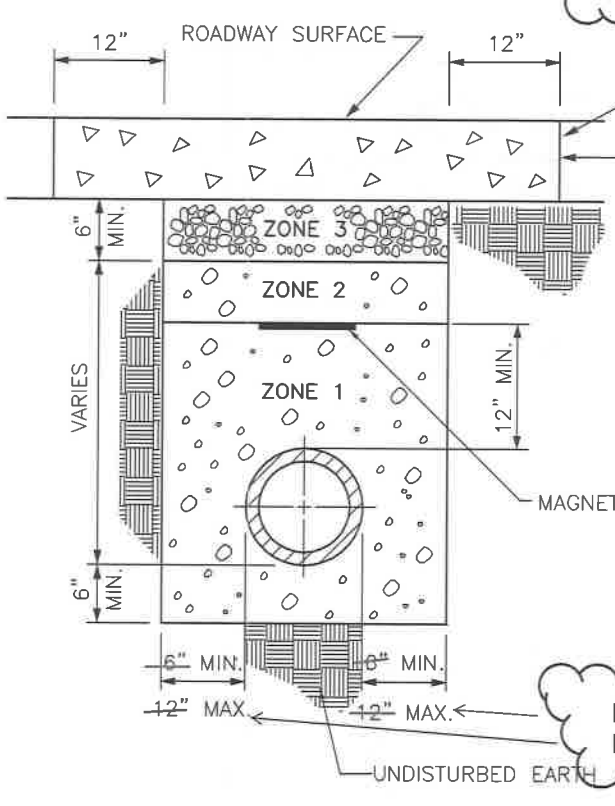
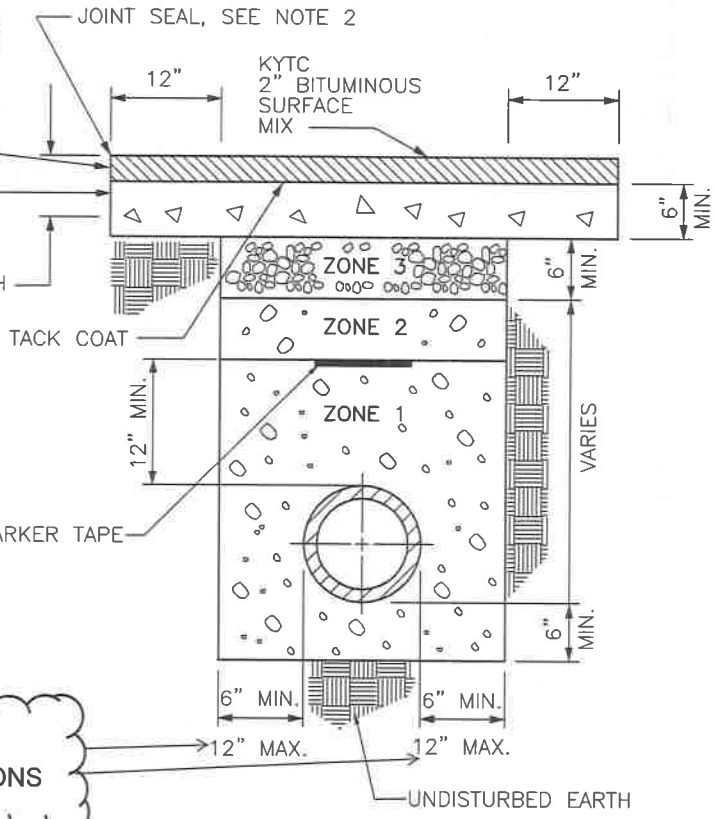
CONCRETE PAVEMENT

#9 CRUSHED LIMESTONE IN ZONE 3 IS ACCEPTABLE ALTERNATIVE TO DGA



BITUMINOUS PAVEMENT



PIPE ENVELOPE PER PIPE MANUFACTURER'S RECOMMENDATIONS

PIPE BACKFILL DESCRIPTIONS	
ZONE 1	NO. 9 STONE
ZONE 2	NO. 9 OR NO. 57 STONE
ZONE 3	COMPACTED DGA
ZONE 4	CONSOLIDATED SOIL, (NO ROCK GREATER THAN 6" DIAMETER), NO. 9, OR NO. 57 STONE
ZONE 5	12" MAX. TOPSOIL, NO ROCK ALLOWED

NOTES:

1. REPLACE CONCRETE PAVEMENT WITH NEW CONCRETE PAVEMENT, 6"MINIMUM OR EXISTING THICKNESS, WHICHEVER IS GREATER.
2. SEAL PERIMETER OF CUT PAVEMENT WITH CRACK SEALANT THAT MEETS ASTM D6690, TYPE 2.
3. MAGNETIC MARKER TAPE FOR SANITARY SEWER ONLY.

FORCE MAIN SEWERS OR WHERE A GRAVITY SEWER IS BETWEEN MANHOLES WHERE ONE OR BOTH MANHOLES IS BURIED

LEXINGTON

DIVISION OF ENGINEERING

TRENCHING, LAYING, BACKFILLING AND BEDDING UNDER STREET PAVEMENT

STANDARD DRAWING NO. 201–1

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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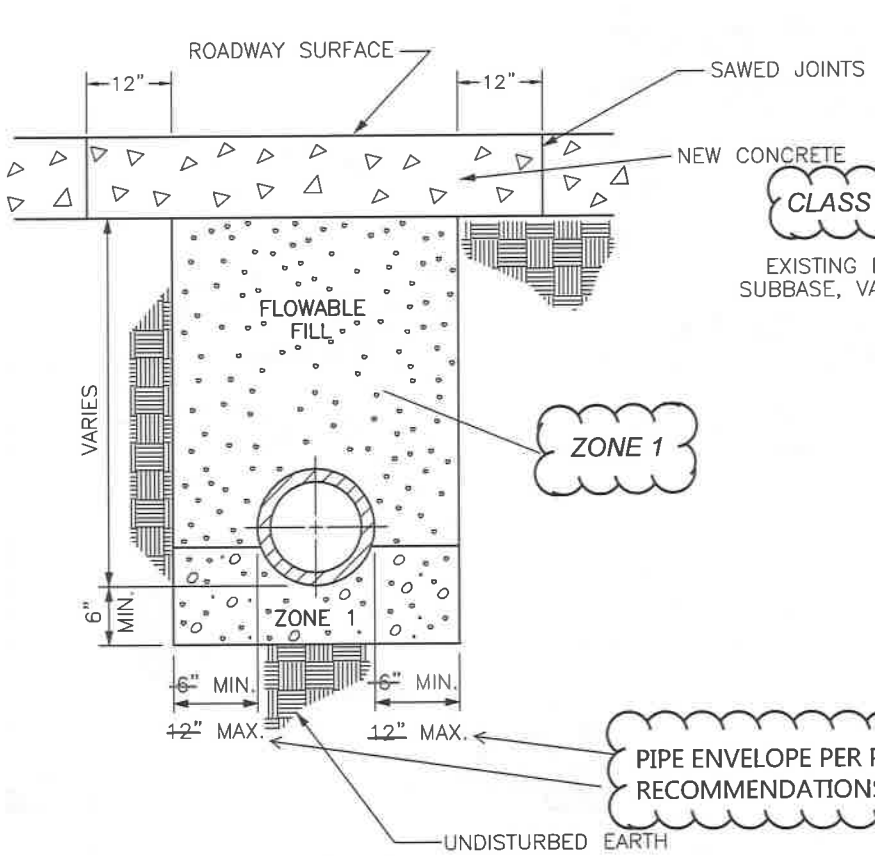
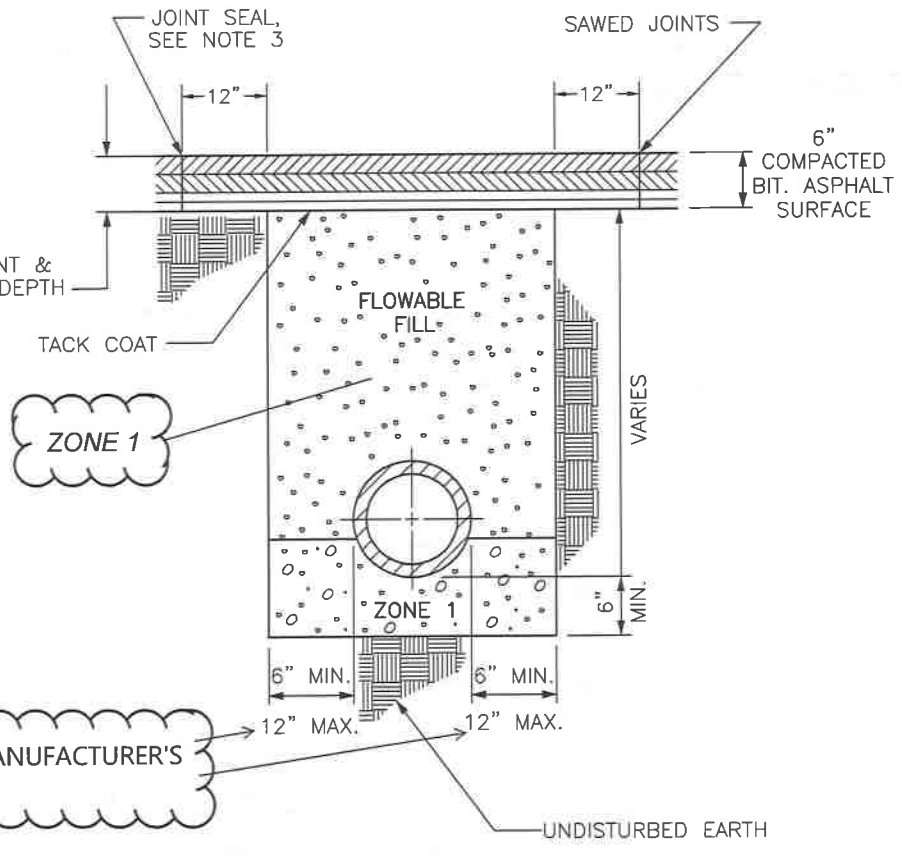
CONCRETE PAVEMENT



BITUMINOUS PAVEMENT



PIPE BACKFILL DESCRIPTIONS	
ZONE 1	NO. 9 STONE
ZONE 2	NO. 9 OR NO. 57 STONE
ZONE 3	COMPACTED DGA
ZONE 4	CONSOLIDATED SOIL, (NO ROCK GREATER THAN 6" DIAMETER), NO. 9, OR NO. 57 STONE
ZONE 5	12" MAX. TOPSOIL, NO ROCK ALLOWED

NOTES:

1. FLOWABLE FILL PER KYTC SPECIFICATION 601.03.03 FROM STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION CURRENT EDITION.
2. REPLACE CONCRETE PAVEMENT WITH NEW CONCRETE PAVEMENT, 6" MINIMUM OR EXISTING THICKNESS, WHICHEVER IS GREATER.
3. SEAL PERIMETER OF CUT PAVEMENT WITH CRACK SEALANT THAT MEETS ASTM D6690, TYPE 2.

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DIVISION OF ENGINEERING

TRENCHING, LAYING, BACKFILLING, AND BEDDING UNDER STREET PAVEMENT USING FLOWABLE FILL

STANDARD DRAWING NO. 201-2

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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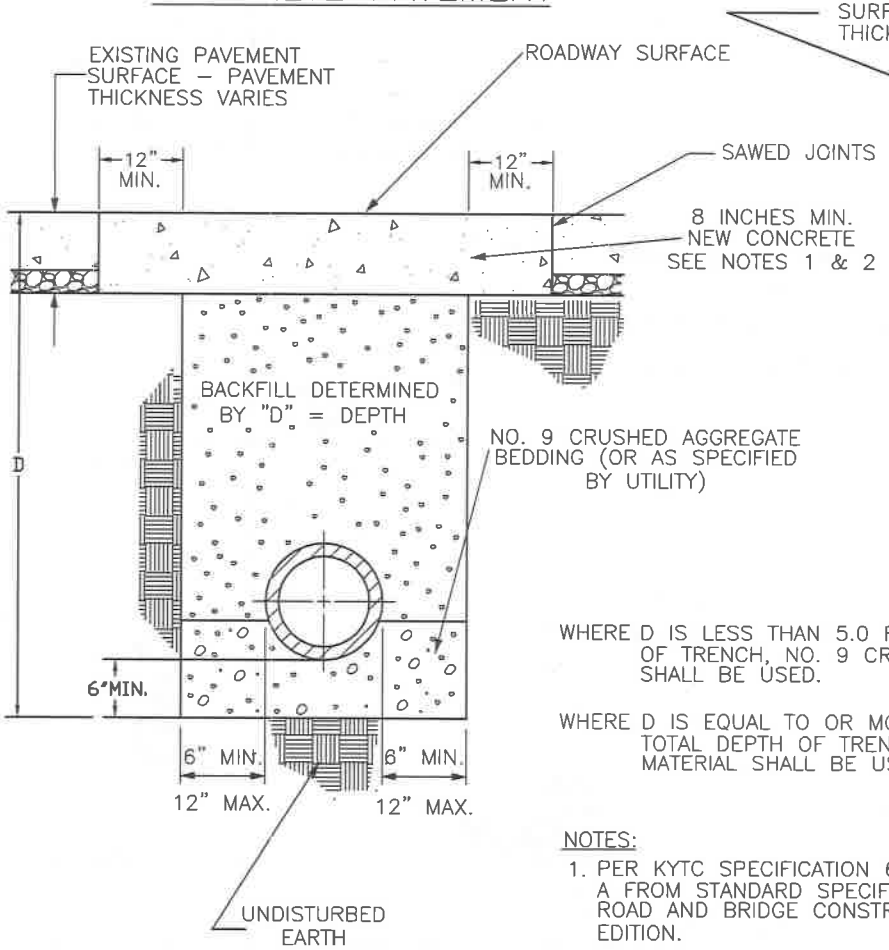
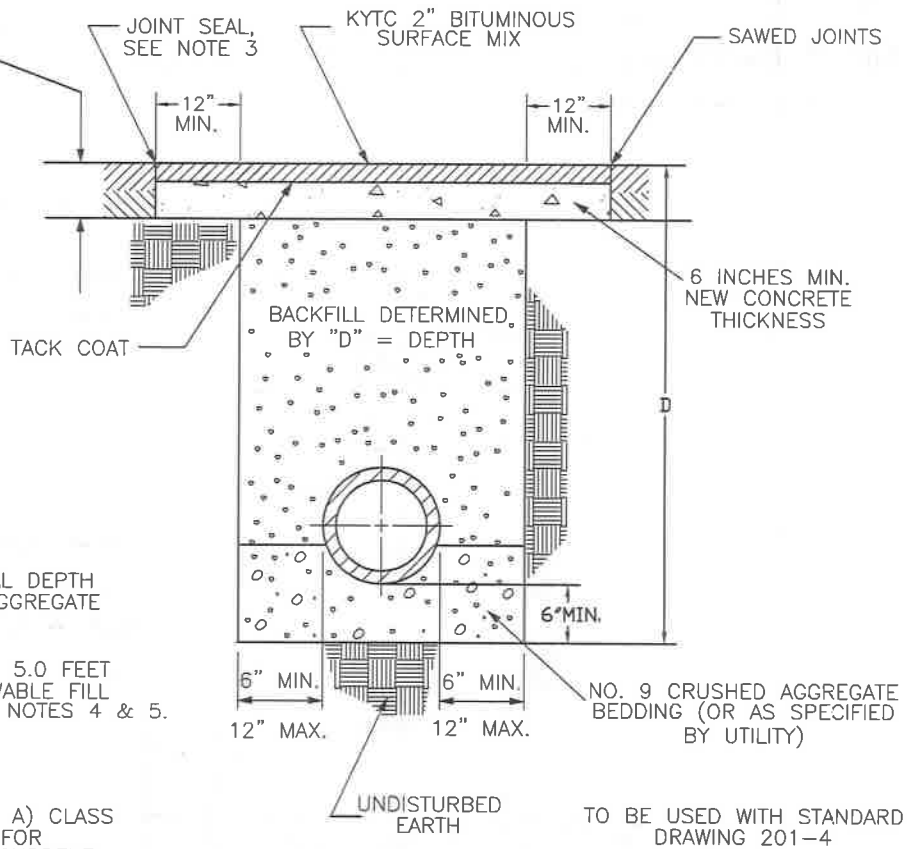
CONCRETE PAVEMENT



EXISTING PAVEMENT SURFACE – PAVEMENT THICKNESS VARIES

BITUMINOUS PAVEMENT



WHERE D IS LESS THAN 5.0 FEET TOTAL DEPTH OF TRENCH, NO. 9 CRUSHED AGGREGATE SHALL BE USED.

WHERE D IS EQUAL TO OR MORE THAN 5.0 FEET TOTAL DEPTH OF TRENCH, FLOWABLE FILL MATERIAL SHALL BE USED. SEE NOTES 4 & 5.

NOTES:

1. PER KYTC SPECIFICATION 601.03.03 A) CLASS A FROM STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.
2. REPLACE CONCRETE PAVEMENT WITH NEW CONCRETE PAVEMENT.
3. SEAL PERIMETER OF CUT PAVEMENT WITH CRACK SEALANT THAT MEETS ASTM D6690, TYPE 2.
4. FLOWABLE FILL TO BE PROPORTIONED PER KYTC SPECIFICATION 601.03.03 B) 5) FROM STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.
5. UTILITY DESIGNERS AND CONTRACTORS SHALL ACCOUNT FOR AND PROVIDE ANY SUITABLE MEANS TO PREVENT PIPE/CONDUIT FLOATATION.

TO BE USED WITH STANDARD DRAWING 201–4

LEXINGTON

DIVISION OF ENGINEERING

UTILITY TRENCH RESTORATION BENEATH EXISTING PAVED ROADS (SECTION VIEW)

STANDARD DRAWING NO. 201–3

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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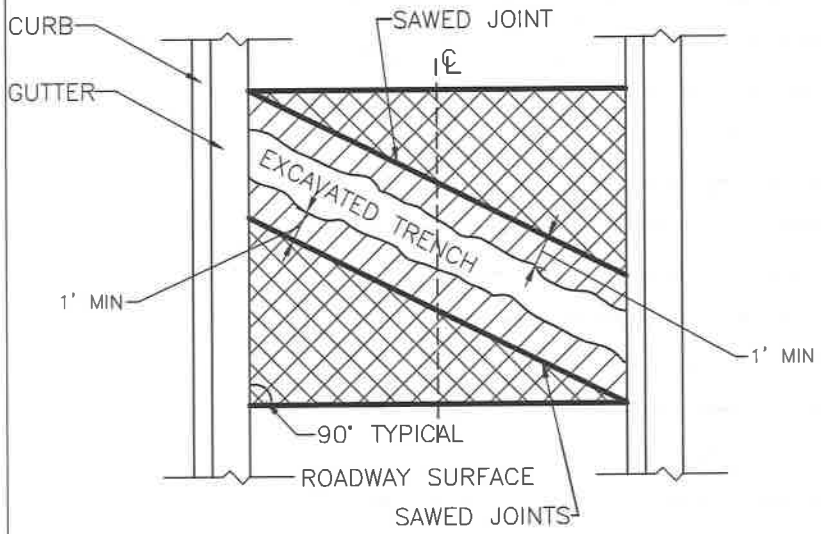
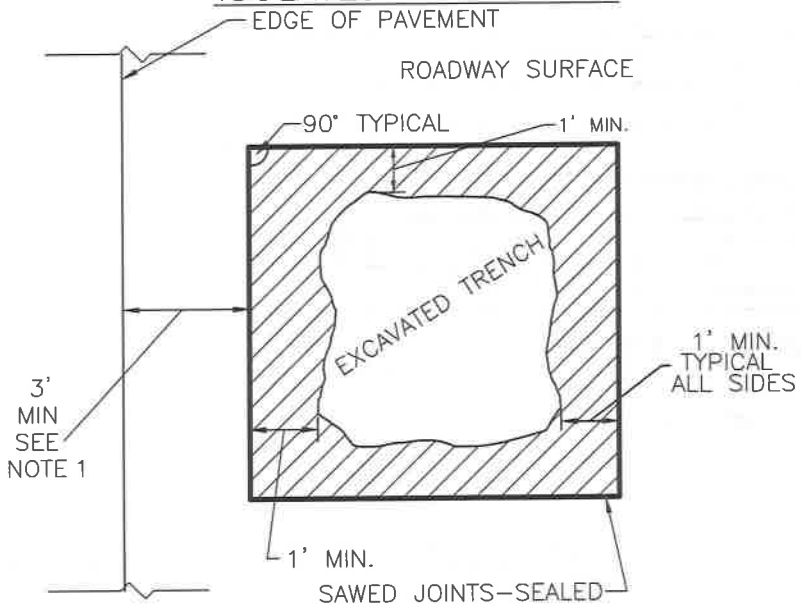
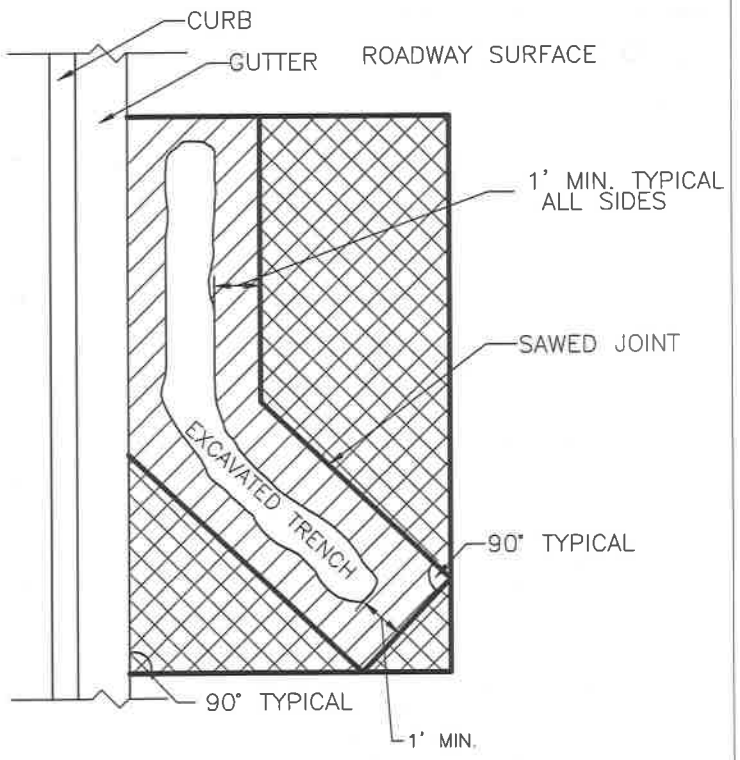
TRANSVERSE EXCAVATION



ISOLATED EXCAVATION



LONGITUDINAL EXCAVATION – ADJACENT TO CURB OR GUTTER



NOTES:

1. WHEN LESS THAN 3', THEN THE PAVEMENT SHALL BE REMOVED TO THE EDGE OF PAVEMENT AND REPLACED PER STANDARD DRAWING 201–3.
2. STREET CUT SHALL BE ORIENTED EITHER PARALLEL OR PERPENDICULAR TO CURB OR GUTTER.
3. ALL SAWED JOINTS SHALL PRODUCE NEAT CUTS WITH SQUARED EDGES.

AREA SHALL BE EXCAVATED TO 8" BELOW ROADWAY SURFACE, THEN REPLACED PER STANDARD DRAWING 201–3.

AREA SHALL BE MILLED 2" AND REPLACED WITH 2" BITUMINOUS SURFACE MIX.

TO BE USED WITH STANDARD DRAWING, 201–3

LEXINGTON

DIVISION OF ENGINEERING

UTILITY TRENCH RESTORATION BENEATH EXISTING PAVED ROADS (PLAN VIEW)

STANDARD DRAWING NO. 201–4

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE

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TABLE OF:

MAXIMUM ALLOWABLE FILL HEIGHTS

(LIVE LOAD NOT INCLUDED)

DIAMETER (INCHES)	DUCTILE IRON PIPE	POLYVINYL CHLORIDE (PVC) PIPE	
	CLASS 50 *	SDR-35	SDR-26 HEAVY WALL
	MAXIMUM DEPTH OF COVER (FEET)	MAXIMUM DEPTH OF COVER (FEET)	MAXIMUM DEPTH OF COVER (FEET)
4	–	–	–
6	20	15	–
8	20	15	–
10	20	15	–
12	20	15	–
14	20	–	–
15	–	15	–
16	20	–	–
18	20	–	20
20	18	–	–
21	–	–	20
24	17	–	20
27	–	–	20
30	14	–	–
36	14	–	–
42	13	–	–
48	13	–	–

* LIGHTEST CLASS OF DUCTILE IRON PIPE

NOTES:

1. DEPTH IS BASED ON LAYING CONDITION UTILIZING NO. 9 STONE ENCASING PIPE FROM 6" MINIMUM BELOW PIPE TO A PLANE, LEVEL WITH THE TOP OF THE PIPE AND 6" TO 12" NO. 9 STONE TO EDGE OF TRENCH.
2. WEIGHT OF SOIL AND ROCK COVER MIX IS ASSUMED TO BE APPROXIMATELY 120 LB./CU. FT.
3. DUCTILE IRON PIPE HAS FLEXIBLE LINING.
4. DESIGN ENGINEERS SHOULD USE THIS STANDARD DRAWING FOR GENERAL GUIDELINES AND SHOULD CHECK THEIR DESIGN FOR SAFE, NON-DESTRUCTIVE FILL HEIGHTS FOR ACTUAL BRAND OF PIPE PROPOSED.
5. SPECIAL TRENCHING DETAILS AND PROCEDURES SHOULD BE USED WHERE FILL DEPTHS ARE HIGHER THAN THOSE SHOWN IN TABLE.
6. INSTALLATIONS REQUIRING A DEPTH GREATER THAN 20', MUST BE APPROVED BY THE ENGINEER.

LEXINGTON

DIVISION OF ENGINEERING

SANITARY SEWER PIPE: TYPES & MAXIMUM ALLOWABLE FILL HEIGHTS

STANDARD DRAWING NO. 204

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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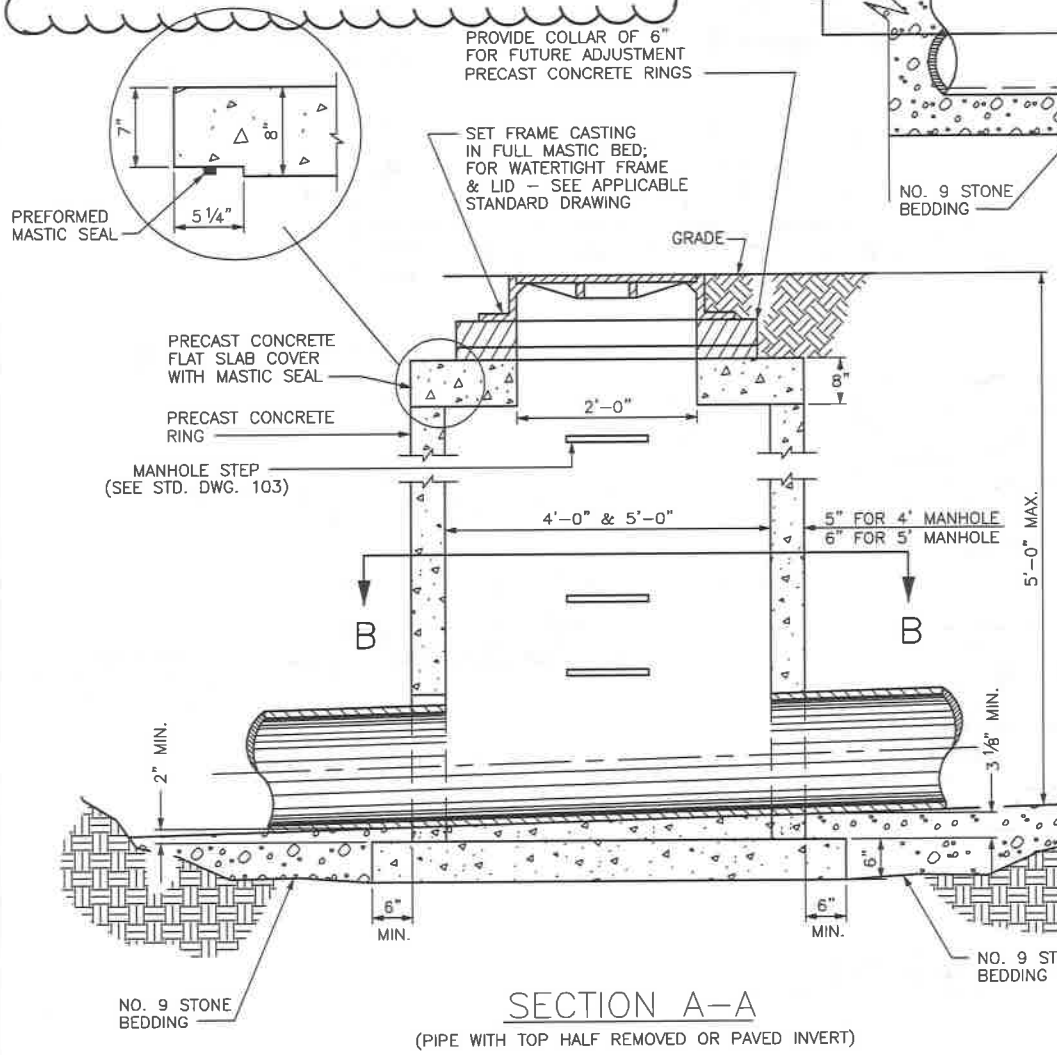
NOTES CONTINUED

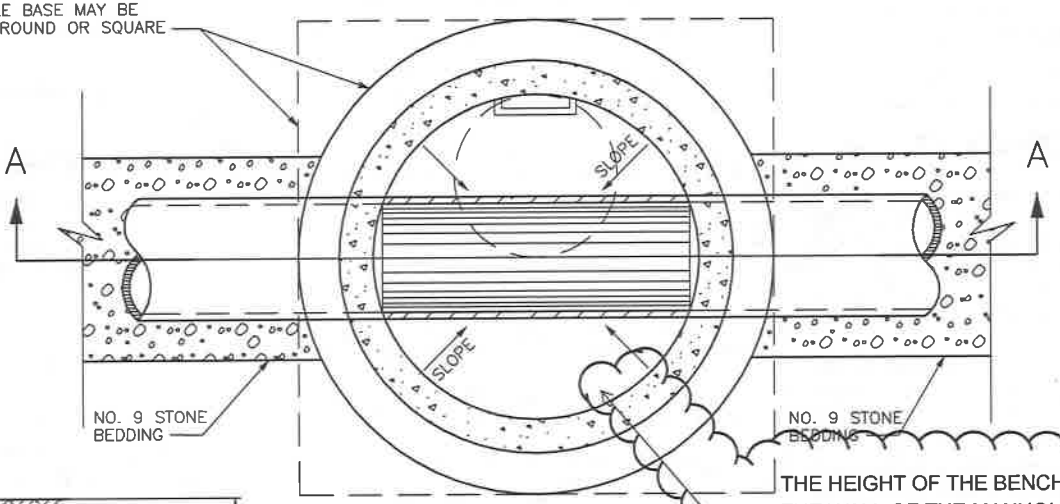
9. MANHOLES GREATER THAN 5' DIAMETER SHALL BE SIZED BY THE ENGINEER IN ACCORDANCE WITH STANDARD DRAWING NO. 217

10. FOR ALL MANHOLES, THE JOINTS BETWEEN BARREL SECTIONS SHALL BE A MINIMUM OF ONE FOOT FROM THE CROWN OF THE LARGEST PIPE PENETRATION.



SECTION A–A

(PIPE WITH TOP HALF REMOVED OR PAVED INVERT)



SECTION B–B

THE HEIGHT OF THE BENCH AT THE WALL OF THE MANHOLE MUST MATCH THE CROWN OF THE LARGEST PIPE.

NOTES:

1. ALL BARREL JOINTS BETWEEN BASE AND BARREL, BETWEEN BARREL AND TOP, BETWEEN TOP AND ADJUSTING RINGS, BETWEEN ADJUSTING RINGS AND FRAME SHALL HAVE ONE OUTER MASTIC SEAL AND AN INNER SEAL OF NONSHRINK GROUT.
2. COAT OUTSIDE OF ADJUSTING RINGS WITH SEMI–FIBRATED ASPHALT DAMPROOFING COMPOUND APPLIED BY BRUSH OR SPRAY.
3. WATER STOPS SHOULD BE PROVIDED FOR INLETS AND OUTLETS OF EVERY MANHOLE, DESIGNED FOR TYPE OF PIPE USED AND WITH EXPANSIVE GROUT. SEE STD. DWG. 213 FOR WATER STOP DETAIL.
4. MANHOLES MUST PASS VACUUM TEST PER ASTM C–1244 PRIOR TO ACCEPTANCE.

5. MANHOLES SHALL HAVE MONOLITHIC BASES.

6. MANHOLES SHALL BE MANUFACTURED WITH XYPEX PER SPECIFICATION SECTION 02608.

7. MANHOLE SHALL HAVE CONCRETE ADMIXTURE, CONSHIELD AT LOCATIONS SHOWN ON DRAWINGS AND AS SPECIFIED IN SPECIFICATION SECTION 02608.

8. MANHOLES LOCATED IN 100-YEAR FLOODPLAIN SHALL INCLUDE ANTI-FLOTATION COLLAR PER SPECIFICATION SECTION 02608.

LEXINGTON

DIVISION OF ENGINEERING

TYPICAL PRECAST CONCRETE SHALLOW MANHOLE FOR PIPES 24" AND LARGER

STANDARD DRAWING NO. 210

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

LEXINGTON – FAYETTE URBAN COUNTY GOVERNMENT

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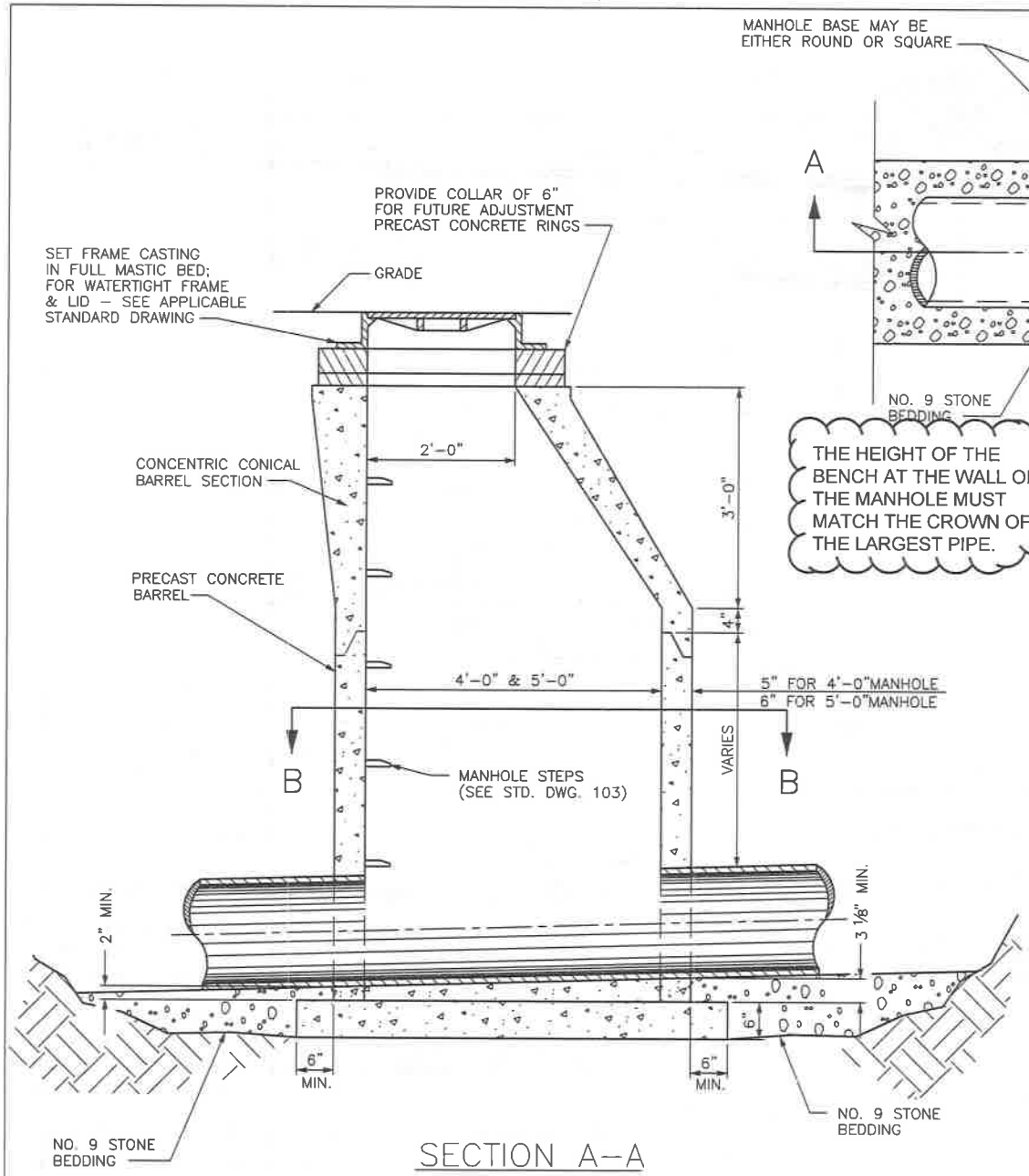
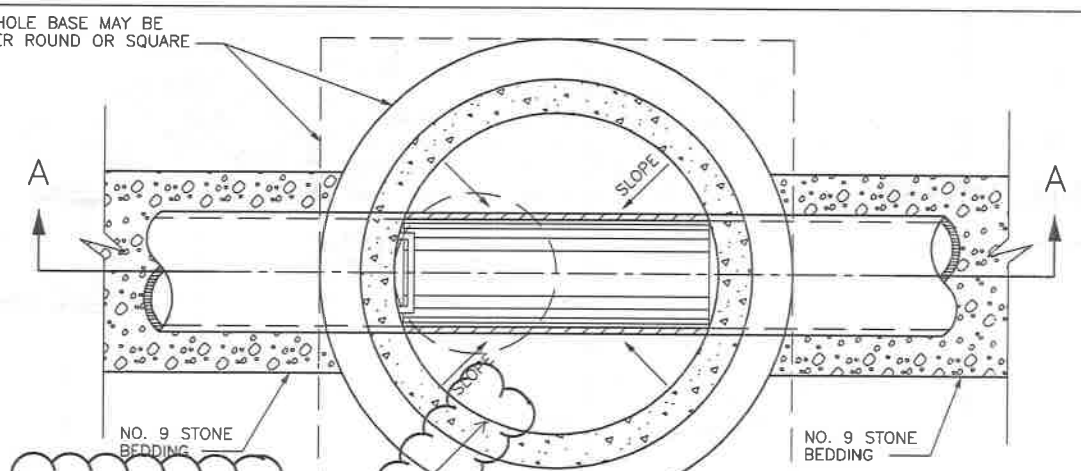


SECTION A–A



SECTION B–B

THE HEIGHT OF THE BENCH AT THE WALL OF THE MANHOLE MUST MATCH THE CROWN OF THE LARGEST PIPE.

NOTES:

1. ALL BARREL JOINTS BETWEEN BASE AND BARREL, BETWEEN BARREL AND TOP, BETWEEN TOP AND ADJUSTING RINGS, BETWEEN ADJUSTING RINGS AND FRAME SHALL HAVE ONE OUTER MASTIC SEAL AND AN INNER SEAL OF NONSHRINK GROUT.
2. COAT OUTSIDE OF ADJUSTING RINGS WITH SEMI–FIBRATED ASPHALT DAMPROOFING COMPOUND APPLIED BY BRUSH OR SPRAY.
3. WATER STOPS SHOULD BE PROVIDED FOR INLETS AND OUTLETS OF EVERY MANHOLE, DESIGNED FOR TYPE OF PIPE USED AND WITH EXPANSIVE GROUT. SEE STD. DWG. 213 FOR WATER STOP DETAIL.
4. NO REINFORCEMENT NEEDED IN BOTTOM SLAB AT DEPTHS UP TO 12'. AT DEPTHS GREATER THAN 12' REINFORCE WITH NO. 4 BARS – 12" C–C.
5. A DIFFERENCE OF FLOW ELEVATION MORE THAN 24" REQUIRES AN OUTSIDE DROP. (SEE STD. DWG. 212)
6. MANHOLE STEPS SHALL BE ALIGNED WITH STRAIGHT SIDE OF CONCENTRIC CONE SECTION, AND ALIGNED OVER THE OUTLET PIPE.
7. PIPES SHALL NOT ENTER THE CONE SECTION.
8. MANHOLES MUST PASS VACUUM TEST PER ASTM C–1244 PRIOR TO ACCEPTANCE.

9. MANHOLES SHALL HAVE MONOLITHIC BASES.

10. MANHOLE SHALL BE MANUFACTURED WITH XYPEX PER SPECIFICATIONS SECTION 02608.

11. MANHOLE SHALL HAE CONCRETE ADMIXTURE, CONSHIELD AT LOCATIONS SHOWN ON DRAWINGS AND AS SPECIFIED IN SPECIFICATION SECTION 02608.

12. MANHOLES LOCATED IN 100-YEAR FLOODPLAIN SHALL INCLUDE ANTI-FLOTATION COLLAR PER SPECIFICATION SECTION 02608.

LEXINGTON

DIVISION OF ENGINEERING

TYPICAL STANDARD PRECAST CONCRETE MANHOLE FOR PIPES UP TO 24"

STANDARD DRAWING NO. 211

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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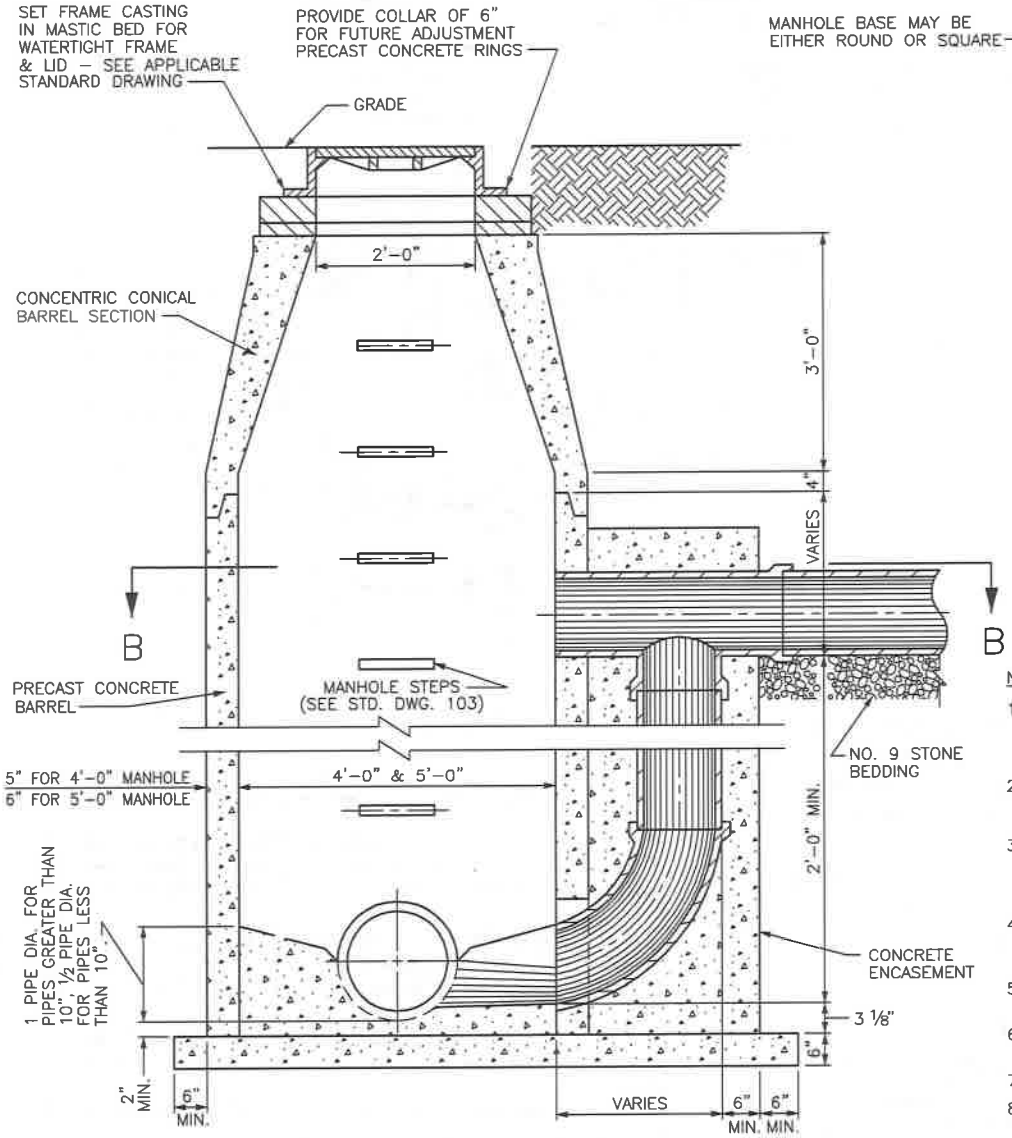
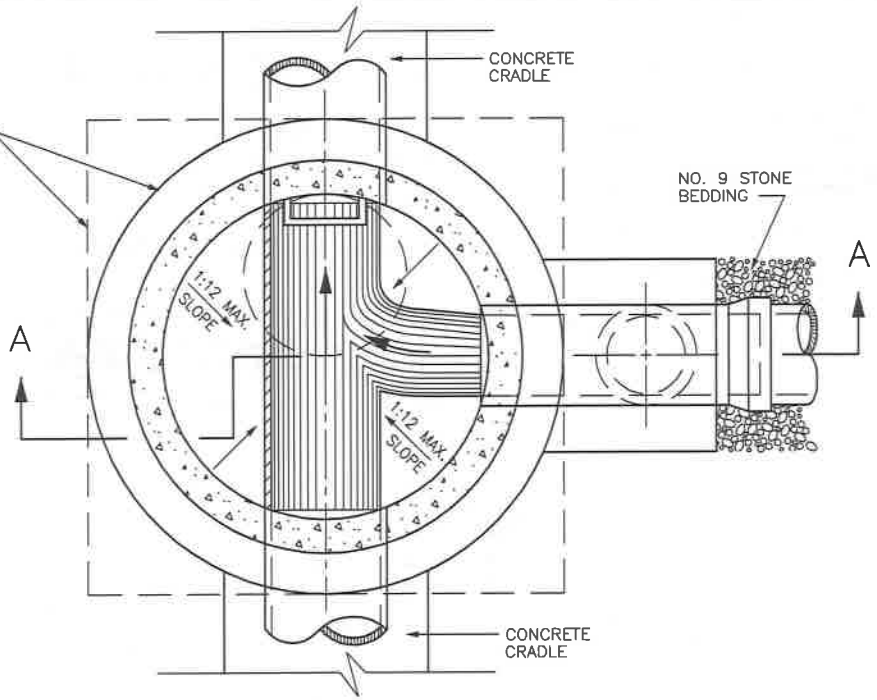


SECTION A–A



SECTION B–B

NOTES:

1. ALL BARREL JOINTS BETWEEN BASE AND BARREL, BETWEEN BARREL AND TOP, BETWEEN TOP AND ADJUSTING RINGS, BETWEEN ADJUSTING RINGS AND FRAME SHALL HAVE ONE OUTER MASTIC SEAL AND AN INNER SEAL OF NONSHRINK GROUT.
2. COAT OUTSIDE OF ADJUSTING RINGS WITH SEMI–FIBRATED ASPHALT DAMPROOFING COMPOUND APPLIED BY BRUSH OR SPRAY.
3. WATER STOPS SHOULD BE PROVIDED FOR INLETS AND OUTLETS OF EVERY MANHOLE, DESIGNED FOR TYPE OF PIPE USED AND WITH EXPANSIVE GROUT. SEE STD. DWG. 213 APPLICABLE FOR WATER STOP DETAIL.
4. NO REINFORCEMENT NEEDED IN BOTTOM SLAB AT DEPTHS UP TO 12'. AT DEPTHS GREATER THAN 12' REINFORCE WITH NO. 4 BARS – 12" C–C.
5. PROVIDE A MINIMUM FALL OF 0.1 FOOT FROM DROP TO MANHOLE OUTLET.
6. MANHOLES SHALL PASS VACUUM TEST PER ASTM C–1244 PRIOR TO ACCEPTANCE.
7. PIPE SHALL NOT ENTER CONE SECTION.
8. MANHOLE STEPS SHALL BE ALIGNED WITH STRAIGHT SIDE OF CONCENTRIC CONE SECTION, AND ALIGNED OVER OUT–LET PIPE.
9. DO NOT USE IN CASES WHERE THE DROP IS 2'–0" OR LESS.

LEXINGTON

DIVISION OF ENGINEERING

TYPICAL PRECAST CONCRETE DROP MANHOLE FOR PIPES UP TO 36"

STANDARD DRAWING NO. 212

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

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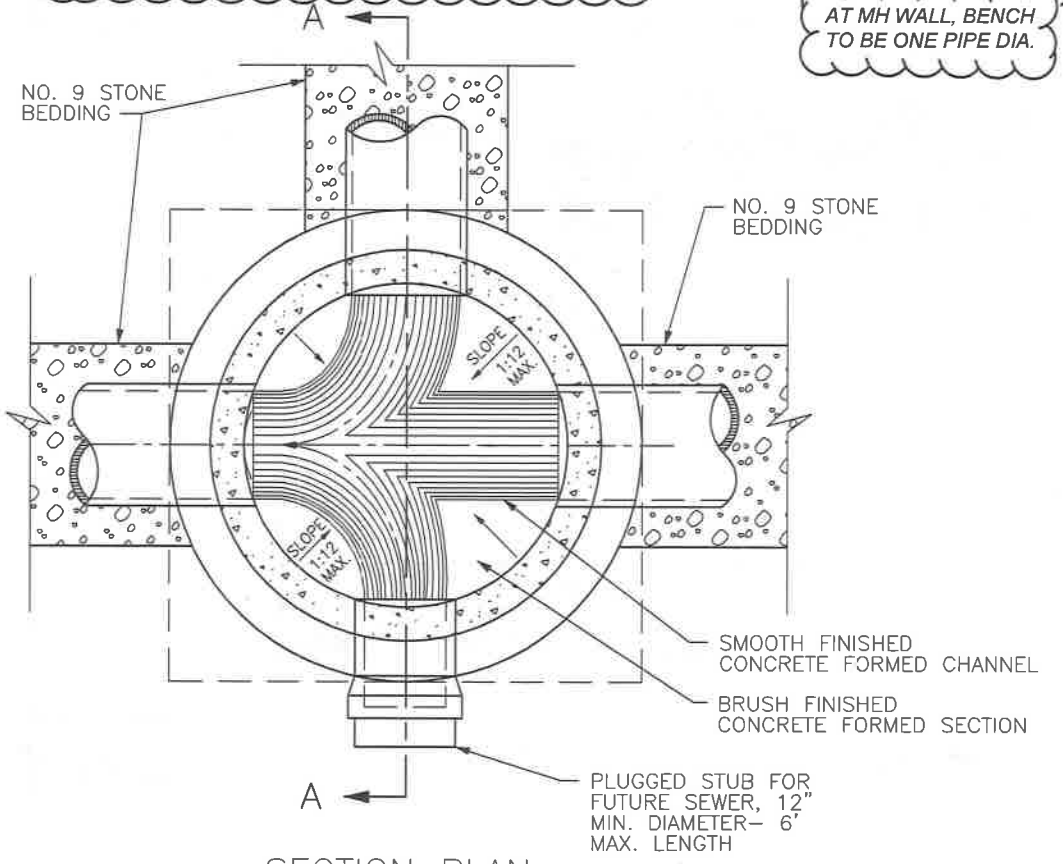
1. *MANHOLES SHALL HAVE MONOLITHIC BASES.*

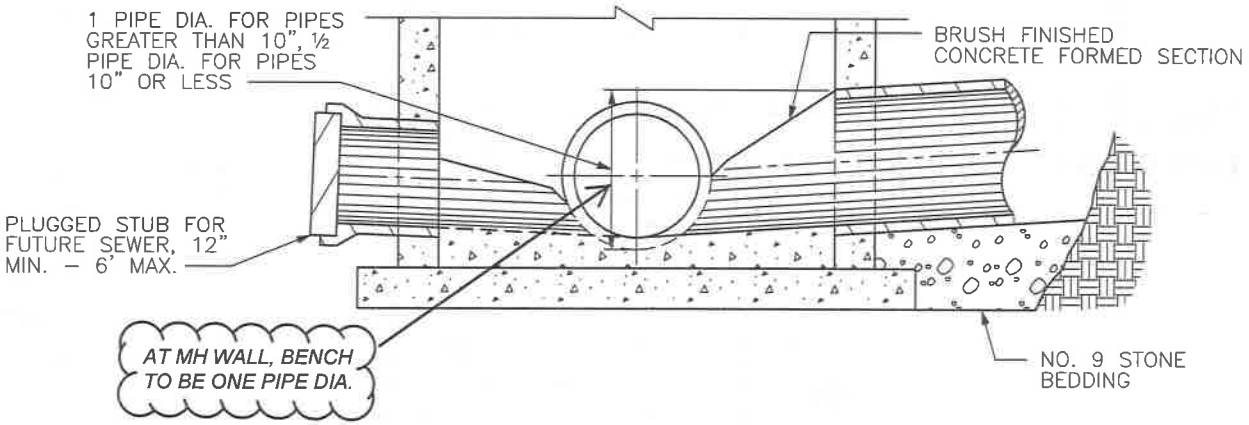
2. *MANHOLES SHALL BE MANUFACTURED WITH XYPEX PER SPECIFICATIONS SECTION 02608.*

3. *MANHOLE SHALL HAVE CONCRETE ADMIXTURE, CONSHIELD AT LOCATIONS SHOWN ON DRAWINGS AND AS SPECIFIED IN SPECIFICATION SECTION 02608.*

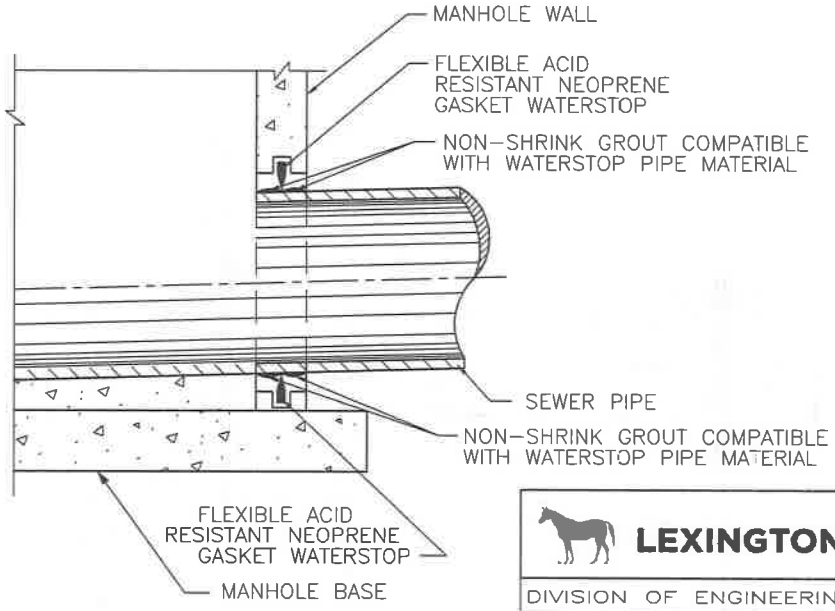
4. *MANHOLES LOCATED IN 100-YEAR FLOODPLAIN SHALL INCLUDE ANTI-FLOTATION COLLAR PER SPECIFICATION SECTION 02608.*



SECTION PLAN



SECTION A–A



WATER STOP DETAIL

NOTE:
MANHOLES SHALL PASS VACUUM TEST PER ASTM C–1244 PRIOR TO ACCEPTANCE.

LEXINGTON

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STANDARD MANHOLE JUNCTION AND WATER STOP DETAILS

STANDARD DRAWING NO. 213

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

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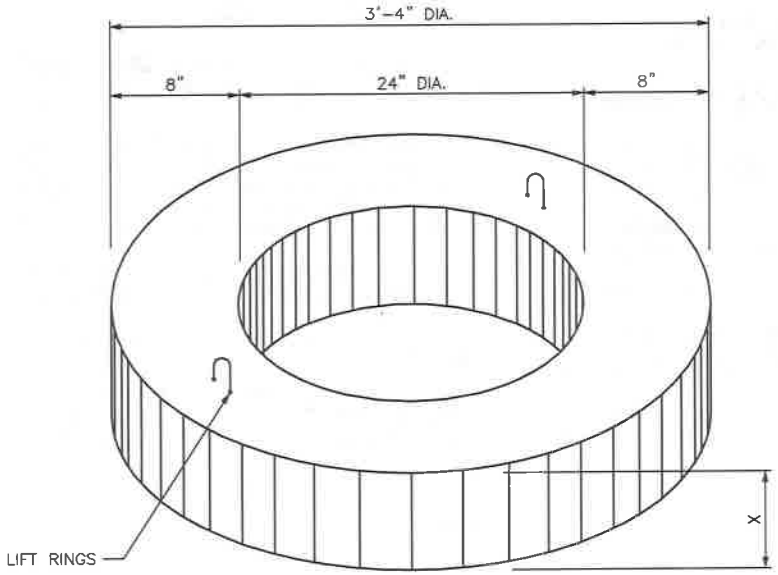
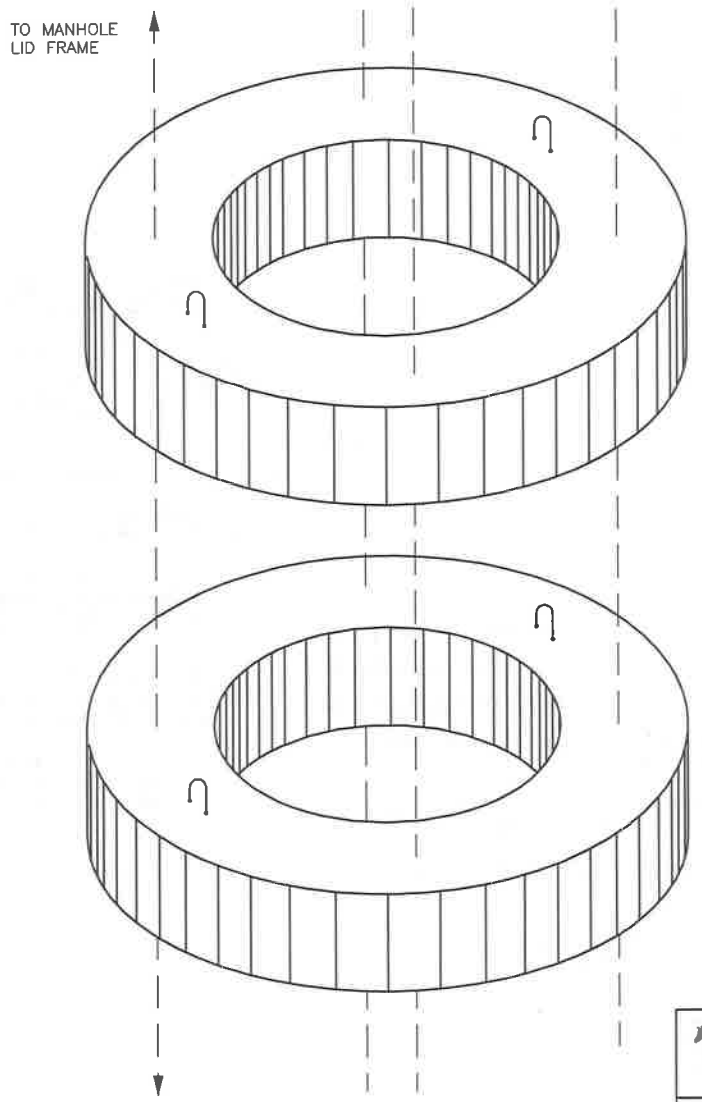
NOTES:

1. LIFT RINGS TO BE CUT BEFORE ADDING THE NEXT RING OR TOP.
2. COAT OUTSIDE AND IN BETWEEN ADJUSTING RINGS WITH SEMI-FIBRATED ASPHALT DAMPROOFING COMPOUND APPLIED BY BRUSH OR SPRAY.
3. GRADE RINGS WITH NON-PARALLEL SURFACES MAY BE USED TO ADJUST CASTING TO SLOPED SURFACE.
4. CONCRETE: CLASS "A" 3500 PSI AT 28 DAYS, AND IN ACCORDANCE WITH ASTM C-478, OR APPROVED EQUAL.
5. NO MORE THAN 2 GRADE RINGS MAY BE USED AT ONE LOCATION AND THE MAXIMUM HEIGHT OF ALL RINGS USED SHALL NOT EXCEED 12 INCHES.
6. APPLY MASTIC BETWEEN ALL JOINTS.



GRADE RING WIDTH CHART

X	WEIGHT LBS.
2"	140
3"	210
4"	279
6"	419
8"	560
12"	730



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SEWER MANHOLE ADJUSTMENT GRADE RINGS

STANDARD DRAWING NO. 214

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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GENERAL NOTES

1. SHALLOW MANHOLE TYPE CONSTRUCTION SHOWN ON STD. DWG. 210 MAY BE USED FOR ALL MANHOLES UP TO 5' IN DEPTH.
2. ALL DIMENSIONS ARE BASED ON SIZE OF LARGEST PIPE IN MANHOLE.
3. MANHOLES FOR PIPE LARGER THAN 36" SHALL BE SPECIALLY DESIGNED.
4. BOTTOM SLAB OF MANHOLES SHALL BE SPECIALLY DESIGNED WITH REGARD TO AREA, THICKNESS, AND REINFORCING IN SITUATIONS WHERE HIGH WATER TABLE OR UNSTABLE SOIL CONDITIONS EXIST.
5. MANHOLE STEPS SHALL BE INSTALLED IN A VERTICAL LINE AND SHALL COMPLY WITH OSHA STANDARDS IN ALL RESPECTS.
6. ALL FLOORS OF MANHOLES SHALL SLOPE AT LEAST 1" PER FT. FROM WALL TO CHANNELS AND SHALL HAVE SMOOTH FLOAT AND BRUSH FINISH.
7. CHANNEL SURFACE OF MANHOLES FROM INLET TO OUTLET SHALL HAVE SMOOTH FLOAT FINISH.
8. ELEVATIONS OF PIPES IN MANHOLES SHALL BE SUCH THAT THE TOP OF ALL INFLUENT PIPES WILL BE AT AN EL-EVATION EQUAL TO OR GREATER THAN THE TOP OF THE EFFLUENT PIPE.
9. A MINIMUM FALL OF 0.10 FOOT SHALL BE PROVIDED.
10. BASE OF MANHOLES GREATER THAN 12' DEEP TO BE REINFORCED WITH NO. 4 BARS AT 12" BOTH WAYS.
11. ~~ASPHALT DAMPROOFING COMPOUND IS REQUIRED ON PRECAST MANHOLES IN WET AREAS OR OTHERWISE AS DIRECTED BY THE ENGINEER.~~ *DOES NOT APPLY*
12. LEAKS IN MANHOLES OBSERVED DURING CONSTRUCTION OR INSPECTION SHALL BE CORRECTED IMMEDIATELY.
13. MANHOLES SHALL PASS VACUUM TEST PER ASTM C-1244 PRIOR TO ACCEPTANCE.
14. ALL INLETS, INCLUDING LATERALS, MUST HAVE FLOW CHANNELS.
15. NEW CONNECTIONS TO EXISTING SANITARY SEWER MANHOLES MUST REPLACE EXISTING BRICK MANHOLES OR DAMAGED MANHOLES AT NO EXPENSE TO THE LFUCG.
16. FIELD POURED BASES (DOGHOUSE MANHOLES) SHALL ONLY BE ALLOWED WITH PRIOR APPROVAL OF THE LFUCG.

SPECIFICATIONS

1. CASTINGS SHALL BE ASTM A-48, CLASS 35.
2. CONCRETE FOR MANHOLES, CRADLE ENCASEMENT, ETC. SHOWN IN THESE DETAILS SHALL BE CLASS "A".
3. CONCRETE MANHOLE BARREL CONSTRUCTION SHALL CONFORM TO ASTM C-478 OR ITS LATEST REVISION.

LEXINGTON

DIVISION OF ENGINEERING

MANHOLE SIZE STANDARDS AND GENERAL NOTES FOR DEEP MANHOLES

STANDARD DRAWING NO. 216

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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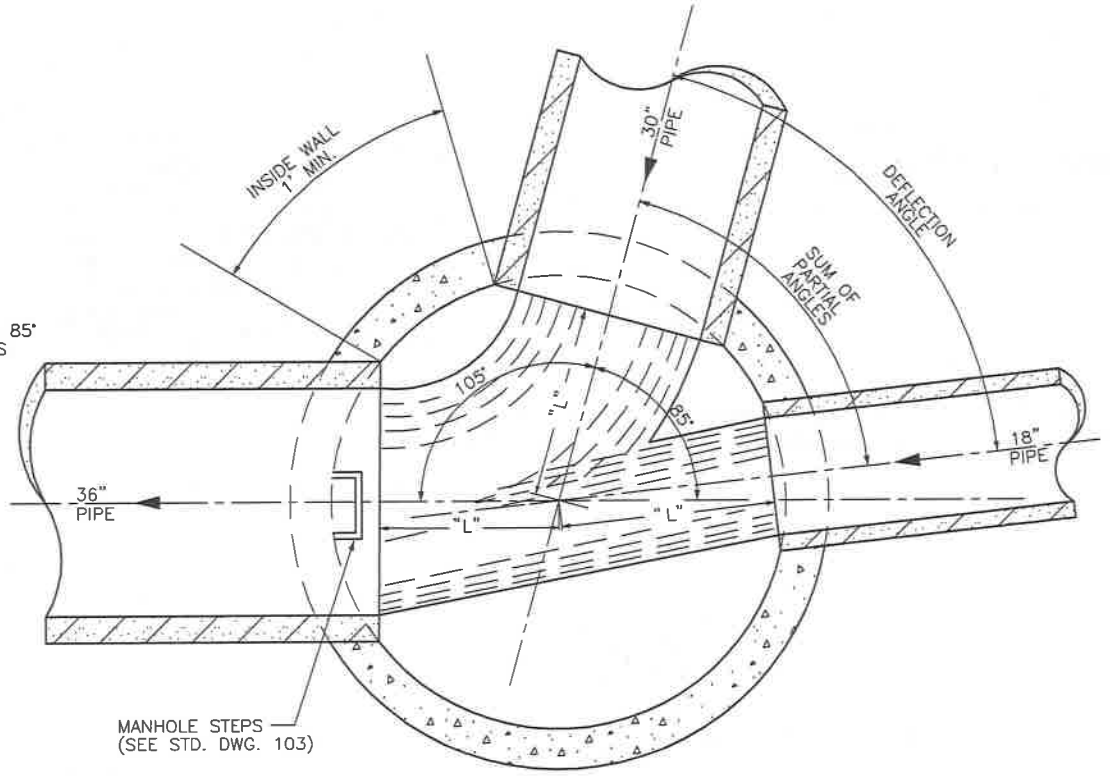
CIRCULAR MANHOLE NOTES:

1. THE ANGLE BETWEEN ANY TWO PIPES (e.g. ANGLE "Y" OR "Z") MUST BE GREATER THAN THE SUM OF THE PARTIAL ANGLES. REFER TO SEPARATE STANDARD DRAWINGS FOR TABLE OF MINIMUM PARTIAL ANGLES. ANGLES SMALLER THAN LISTED ON TABLE SHALL REQUIRE LARGER MANHOLE SELECTION.
2. THE MAXIMUM DEFLECTION ANGLE BETWEEN ANY INCOMING PIPE AND THE CENTERLINE EXTENSION OF THE DISCHARGE PIPE SHALL BE NO MORE THAN 90° FOR PIPES UP TO 24" IN DIAMETER. THE MAXIMUM DEFLECTION ANGLE FOR 27" TO 36" PIPES SHALL BE 75°.

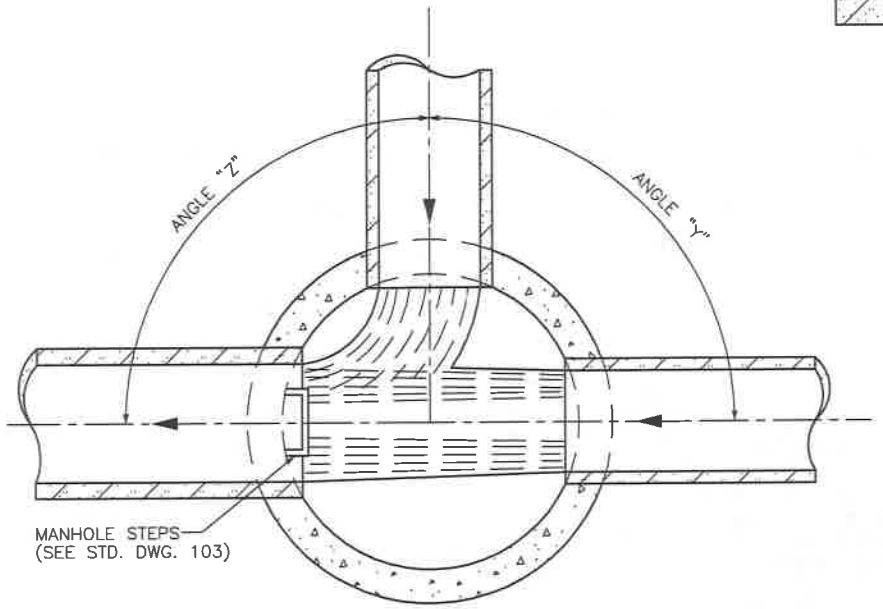
EXAMPLE FOR SANITARY MANHOLE SIZE SELECTION:

FOR MANHOLE SHOWN AT RIGHT, THE ANGLE BETWEEN THE 18" AND 30" PIPES IS 85° AND THE ANGLE BETWEEN THE 30" AND 36" PIPES IS 105°. THE TABLE INDICATES THAT FOR A 5'–0" DIAMETER MANHOLE THE MINIMUM PARTIAL ANGLE FOR AN 18" PIPE IS 34° AND FOR A 30" PIPE IS 50°. THE SUM OF THE PARTIAL ANGLES IS 84°, THIS SUM IS LESS THAN THE 85° THEREFORE, A 5'–0" MANHOLE DIAMETER IS ACCEPTABLE.

FOR MANHOLES WITH PIPE(S) GREATER THAN 30" THE MANHOLE SHALL BE SIZED BY THE ENGINEER BASED ON THE INTENT OF THESE CRITERIA.



PLAN SECTION



PLAN SECTION

TABLE OF MINIMUM PARTIAL ANGLES FOR SANITARY MANHOLES

PIPE SIZE	MANHOLE SIZE			
	4'–0"		5'–0"	
	P. ANGLE	L. DIST.	P. ANGLE	L. DIST.
15"	38°	1'–10"	30°	2'–3"
18"	43°	1'–8"	34°	2'–3"
24"	53°	1'–6"	39°	2'–2"
27"	–	–	45°	2'–0"
30"	–	–	50°	1'–11"

LEXINGTON

DIVISION OF ENGINEERING

DEFLECTION ANGLE CRITERIA FOR SANITARY MANHOLES

STANDARD DRAWING NO. 217

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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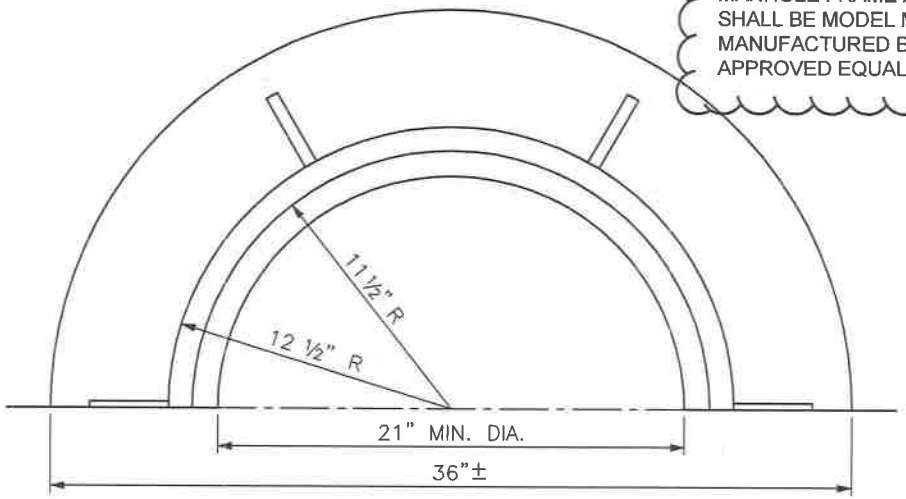
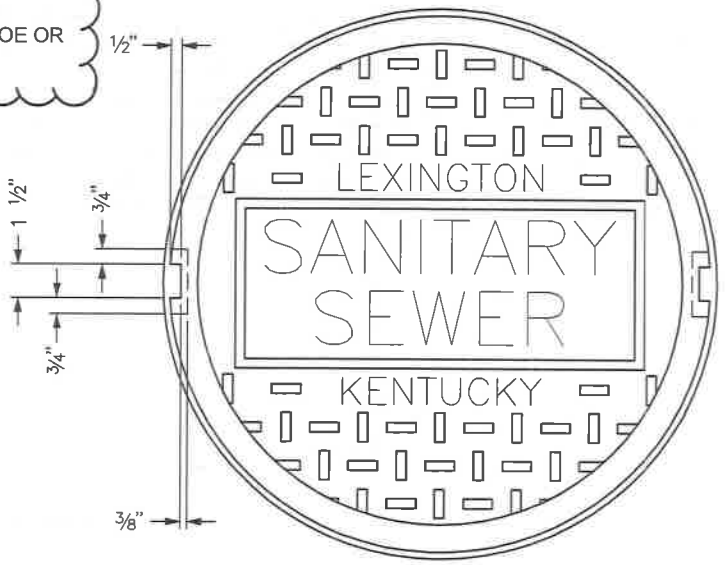
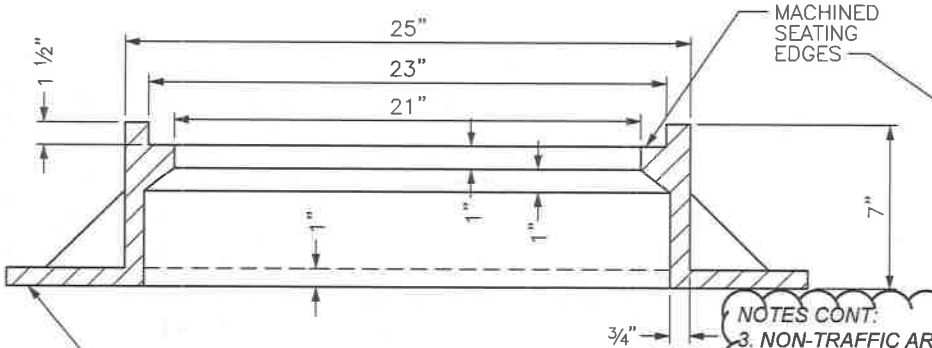
MANHOLE FRAME AND LID SHALL BE MODEL MC-350 MANUFACTURED BY JY HOE OR APPROVED EQUAL.

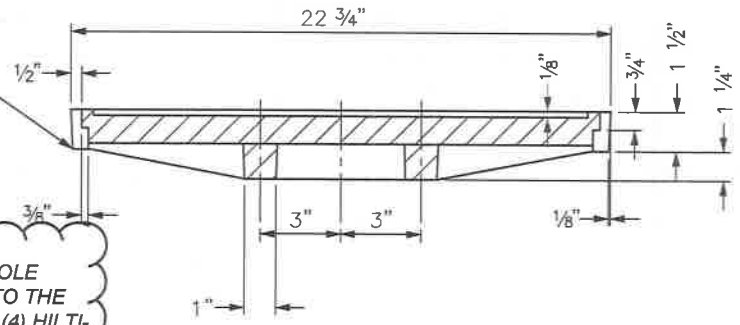






SET FRAME CASTING IN FULL MORTAR BED, FOR WATERTIGHT MANHOLE FRAME AND LID – SEE APPLICABLE STANDARD DRAWING

FRAME DETAIL



COVER DETAIL

NOTES:
1. MANHOLE FRAME & LID ASSEMBLEY SHALL BE TRAFFIC H-20 RATED, HAVE A MINUMUM WIEGHT OF 125 LBS, AND A TOTAL MINIMUM FRAME AND LID WEIGHT OF 305 LBS, WITH ALL STEEL IN ACCORDANCE WITH ASTM A-48 CLASS 35 SPEC.

2. FRAME SHALL BE SET IN BEAD OF BUTYL MASTIC SEALANT WITH MORTAR AROUND AND COVERING THE FRAME.

NOTES CONT:
3. NON-TRAFFIC AREA MANHOLE FRAMES SHALL BE BOLTED TO THE MANHOLE CONE WITH FOUR (4) HILTI-TYPE S.S. ANCHOR BOLTS IN ACCORDANCE WITH SPECIFICATION SECTION 02608.

NOTE:

MANHOLE FRAME & LID ASSEMBLY SHALL HAVE A MINIMUM LID WEIGHT OF 120 LBS. AND A TOTAL MINIMUM FRAME & LID WEIGHT OF 305 LBS. WITH ALL STEEL IN ACCORDANCE WITH ASTM A–48 CLASS 35 SPEC.

LEXINGTON

DIVISION OF ENGINEERING

STANDARD CIRCULAR MANHOLE FRAME & COVER

STANDARD DRAWING NO. 220

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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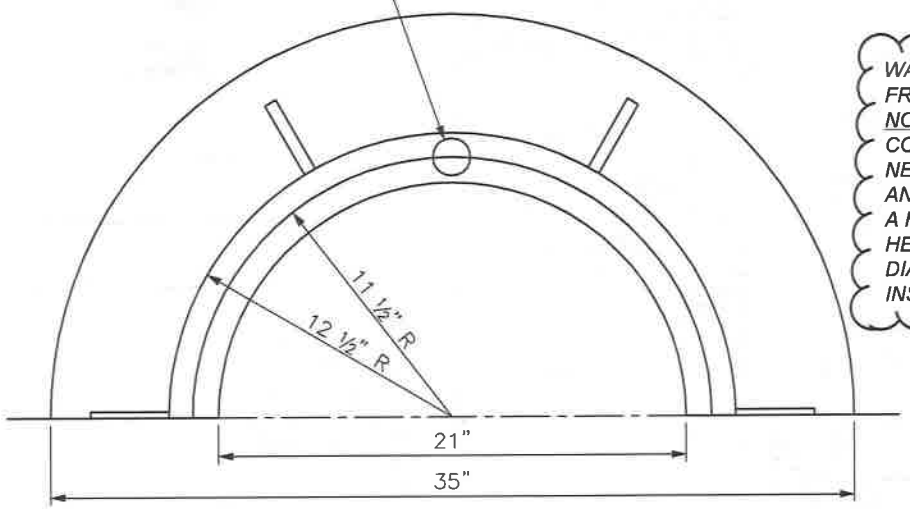
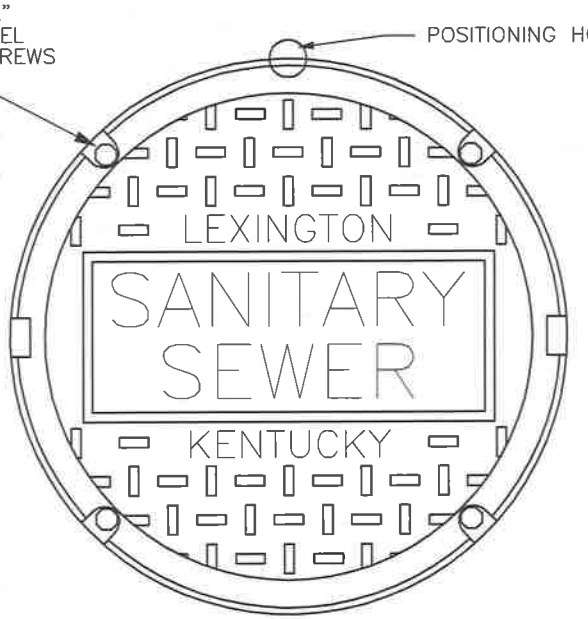
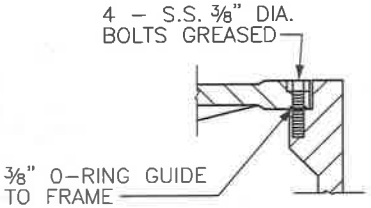
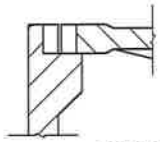


WATERTIGHT MANHOLE FRAMES AND COVERS SHALL NOT BE BOLT DOWN TYPE. COVERS SHALL HAVE NEOPRENE T-GASKET SEAL AND CONCEALED PICKHOLE. A HIGH DENSITY ETHYLENE HEXENE-1 COPOLYMER DIAPHRAGM SHALL BE INSTALLED UNDER COVER.



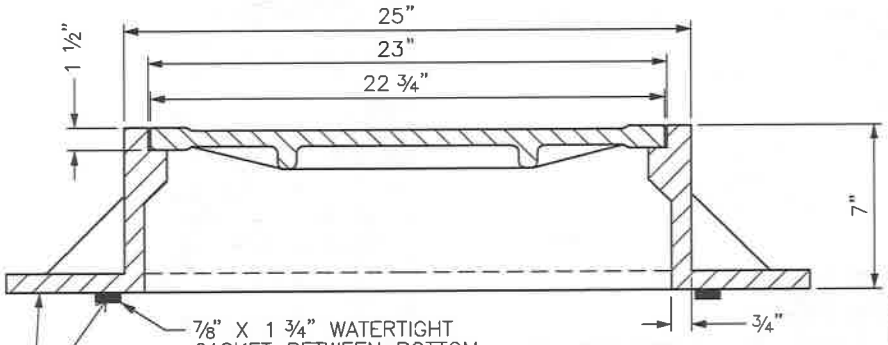


WATERTIGHT DETAIL



POSITIONING HOLE

COVER DETAIL



1' BEAD BUTYL MASTIC SEALANT ROPE

FRAME DETAIL

MANHOLE FRAME AND LID SHALL BE MODEL MC-350 MANUFACTURED BY JR HOE OR APPROVED EQUAL.

NOTE:

MANHOLE FRAME & LID ASSEMBLY SHALL BE NEENAH #R–1916–D OR APPROVED EQUAL, HAVE A MINIMUM LID WEIGHT OF 150 LBS. AND A TOTAL MINIMUM FRAME & LID WEIGHT OF 335 LBS. WITH ALL STEEL IN ACCORDANCE WITH ASTM A–48 CLASS 35 SPEC. OR HIGHER.

FRAME SHALL BE SET IN BEAD OF BUTYL MASTIC SEALANT, WITH MORTAR AROUND AND COVERING THE FRAME.

LEXINGTON

DIVISION OF ENGINEERING

STANDARD WATERTIGHT MANHOLE FRAME & COVER

STANDARD DRAWING NO.	222
APPROVAL: URBAN COUNTY ENGINEER	DATE 9/22/17
COMMISSIONER	DATE 9/22/17

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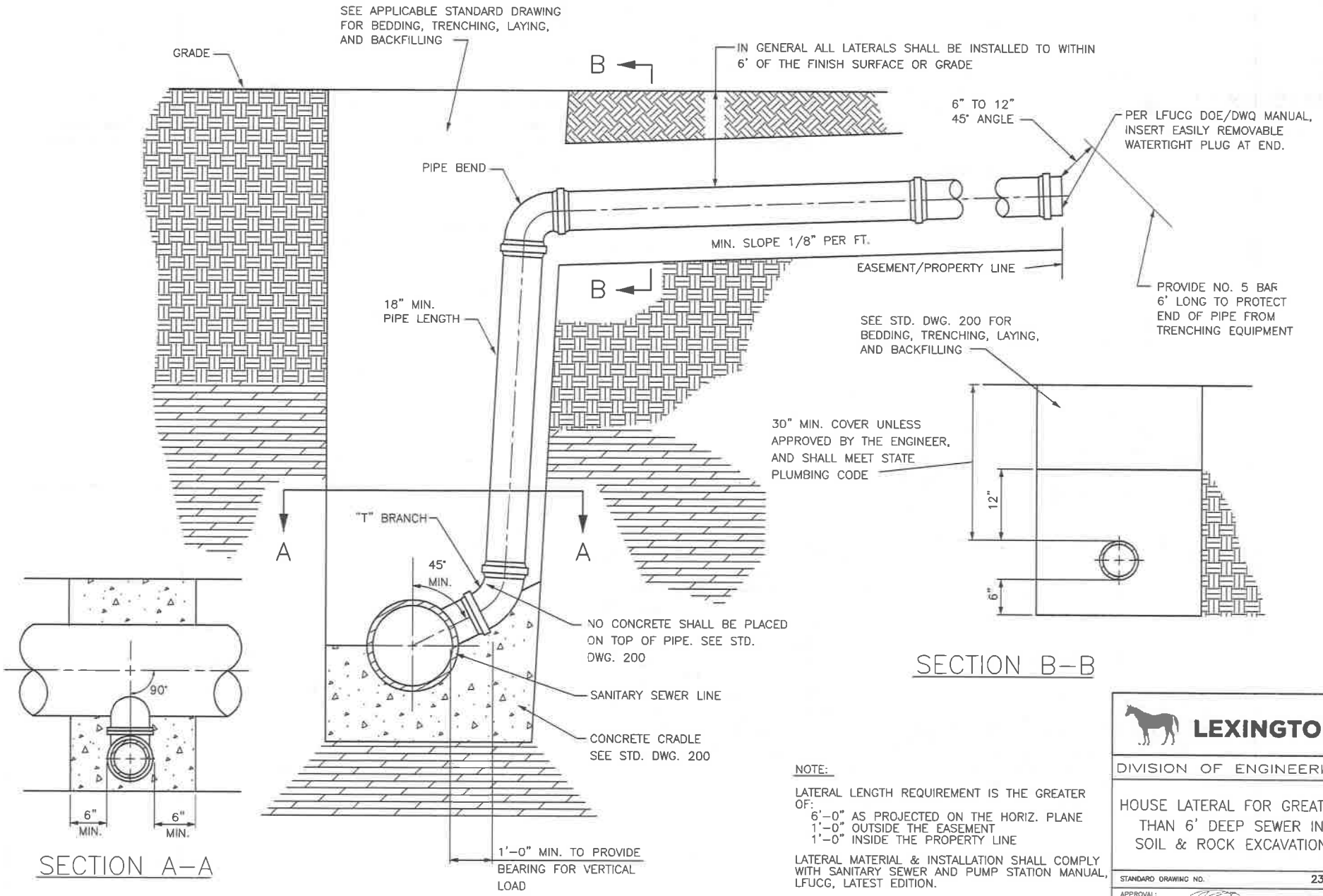

SECTION A–A

SECTION B–B

NOTE:

LATERAL LENGTH REQUIREMENT IS THE GREATER OF:
- 6'–0" AS PROJECTED ON THE HORIZ. PLANE
- 1'–0" OUTSIDE THE EASEMENT
- 1'–0" INSIDE THE PROPERTY LINE

LATERAL MATERIAL & INSTALLATION SHALL COMPLY WITH SANITARY SEWER AND PUMP STATION MANUAL, LFUCG, LATEST EDITION.

LEXINGTON

DIVISION OF ENGINEERING

HOUSE LATERAL FOR GREATER THAN 6' DEEP SEWER IN SOIL & ROCK EXCAVATION

STANDARD DRAWING NO. 230

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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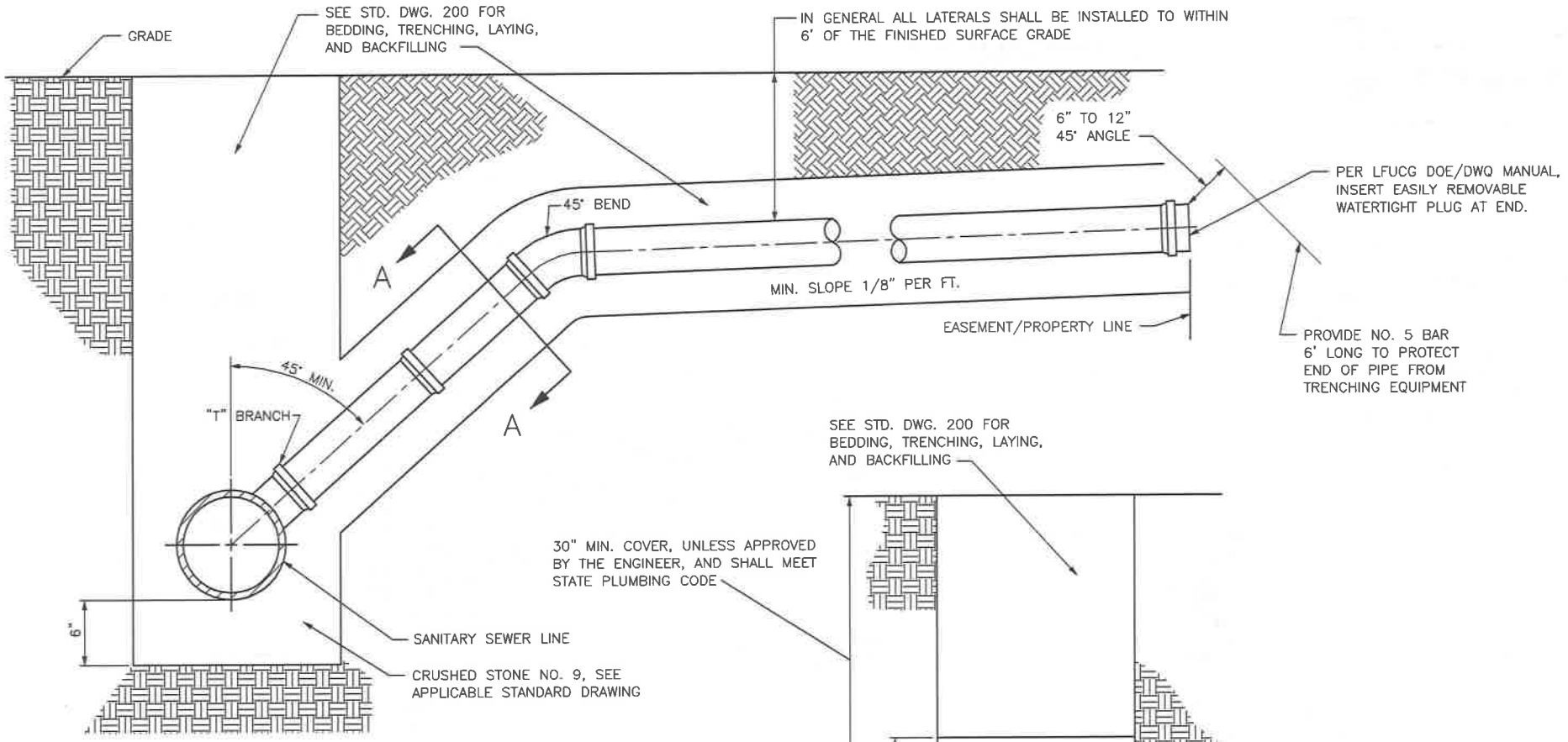

SECTION A–A

NOTE:

LATERAL LENGTH REQUIREMENT IS THE GREATER OF:
- 6'–0" AS PROJECTED ON THE HORIZ. PLANE
- 1'–0" OUTSIDE THE EASEMENT
- 1'–0" INSIDE THE PROPERTY LINE

LATERAL MATERIAL & INSTALLATION SHALL COMPLY WITH SANITARY SEWER AND PUMP STATION MANUAL, LFUCG, LATEST EDITION.

LEXINGTON

DIVISION OF ENGINEERING

HOUSE LATERAL FOR GREATER THAN 6' DEEP SEWER IN SOIL

STANDARD DRAWING NO. 231

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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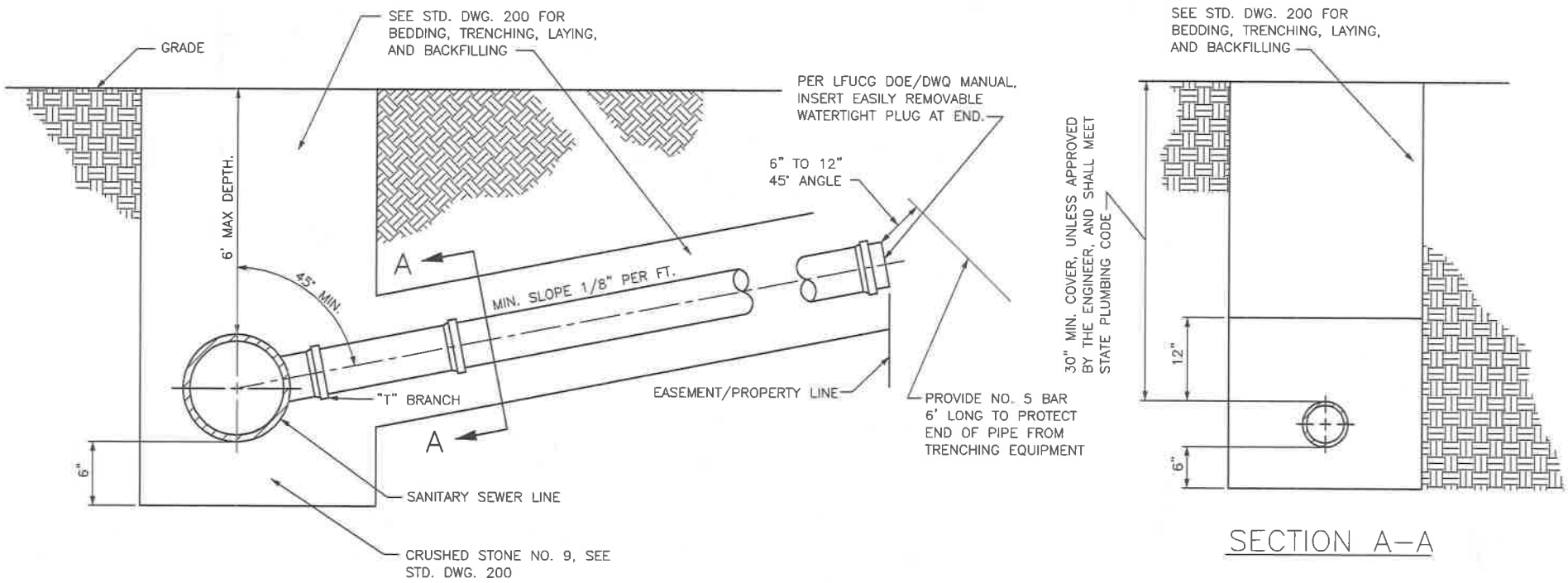


SECTION A–A

NOTE:

LATERAL LENGTH REQUIREMENT IS THE GREATER OF:
- 6'–0" AS PROJECTED ON THE HORIZ. PLANE
- 1'–0" OUTSIDE THE EASEMENT
- 1'–0" INSIDE THE PROPERTY LINE

LATERAL MATERIAL & INSTALLATION SHALL COMPLY WITH SANITARY SEWER AND PUMP STATION MANUAL, LFUCG, LATEST EDITION.

LEXINGTON

DIVISION OF ENGINEERING

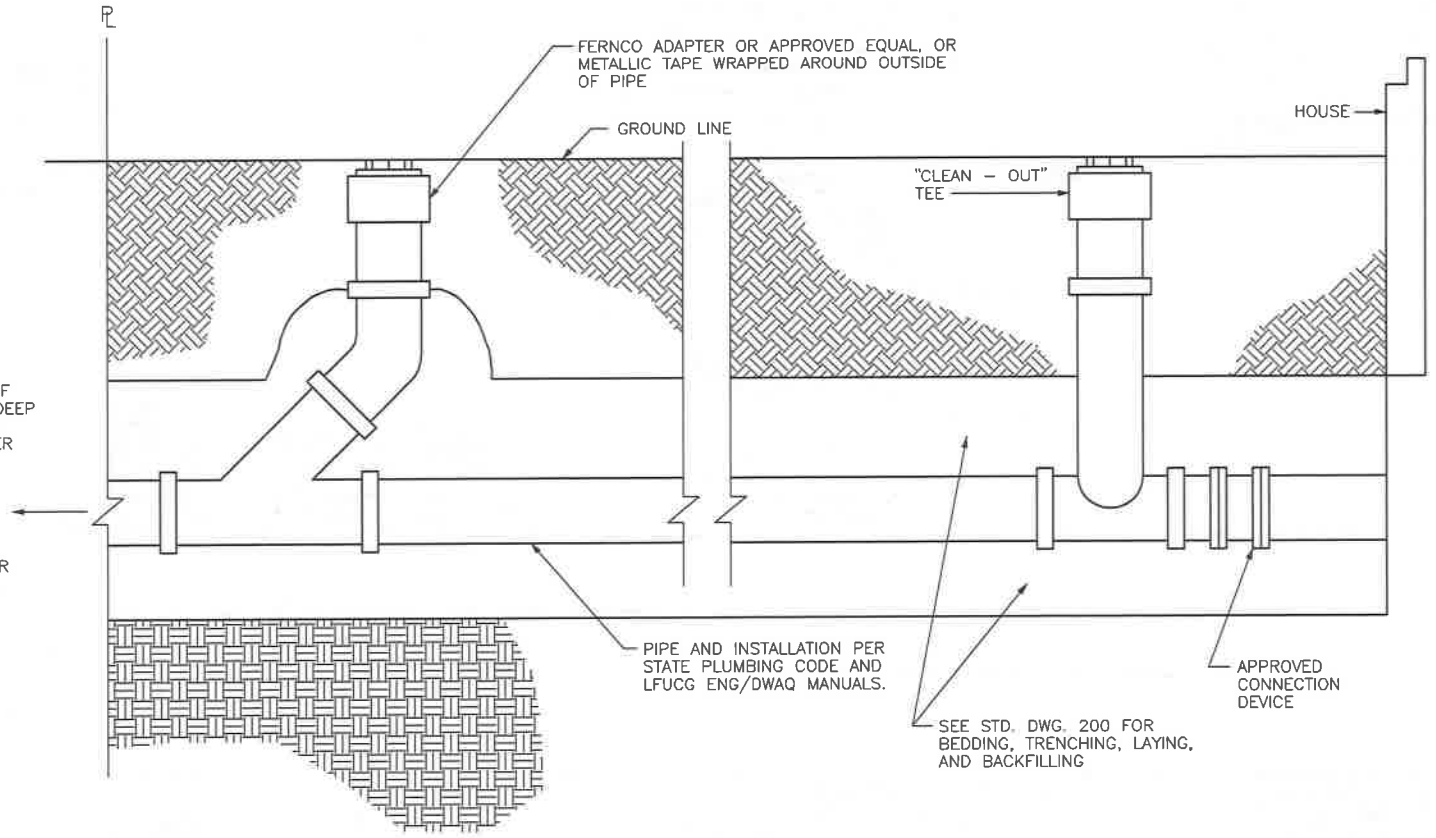
HOUSE LATERAL FOR SHALLOW SEWER IN SOIL OR ROCK

STANDARD DRAWING NO. 232

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17



NOTE:

SEWER PIPE FROM HOUSE TO THE LONG SWEEP "L" MUST BE IN ACCORDANCE WITH STATE PLUMBING CODE AND LFUCG ENG/DWAG MANUALS.

LEXINGTON

DIVISION OF ENGINEERING

LATERAL CLEANOUT IN NON–PAVED AREAS AND YARDS

STANDARD DRAWING NO. 233

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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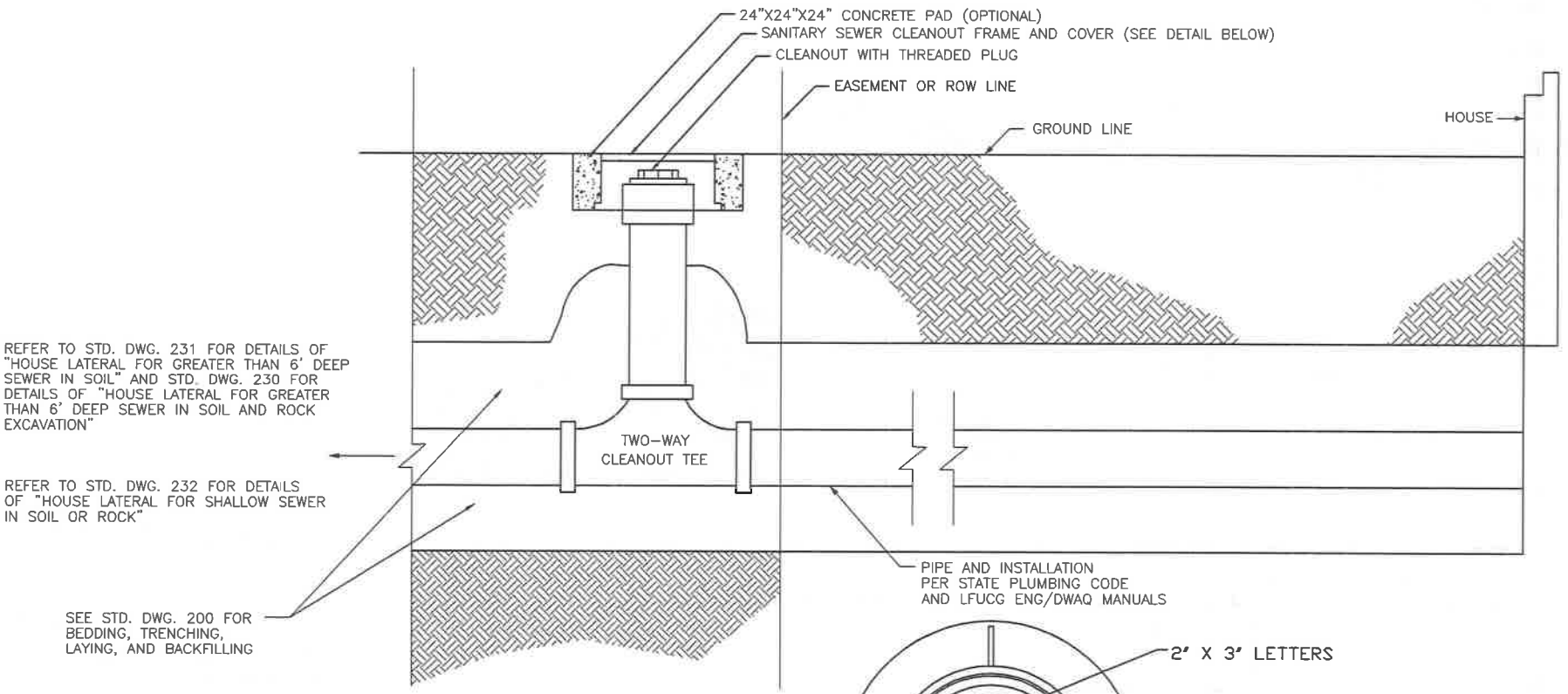
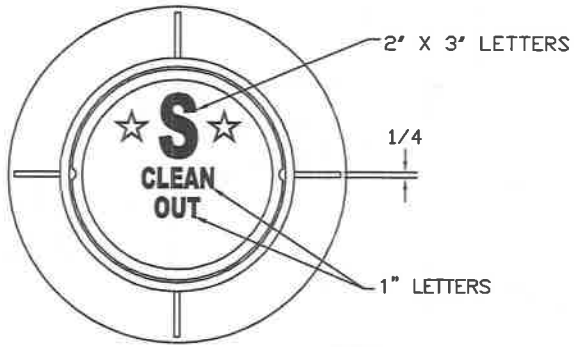
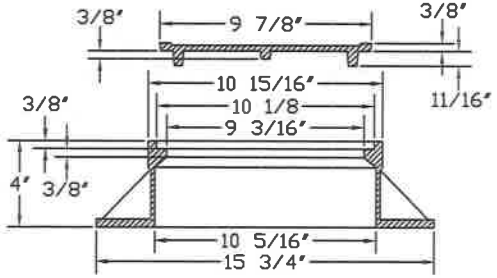






NOTES:

SEWER PIPE FROM HOUSE TO CLEANOUT MUST BE IN ACCORDANCE WITH STATE PLUMBING CODE AND LFUCG ENG/DWAQ MANUALS.

TWO-WAY CLEANOUT TEE IS TO BE INSTALLED BY THE PLUMBER AND OR CONTRACTOR PRIOR TO CONNECTION OF THE LATERAL TO PUBLIC SANITARY SEWER LINE.

CLEANOUT TO BE INSTALLED AT THE END OF PUBLICLY MAINTAINED SEWER. POINT TO BE DETERMINED BY THE DIVISION OF ENGINEERING.

LEXINGTON

DIVISION OF ENGINEERING

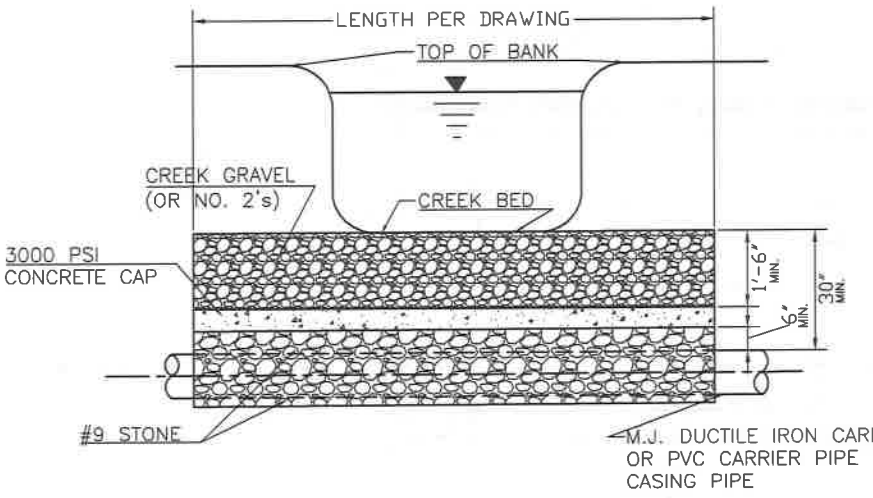
RIGHT OF WAY OR EASEMENT
LATERAL CLEANOUT
IN NON-PAVED
AREAS AND YARDS

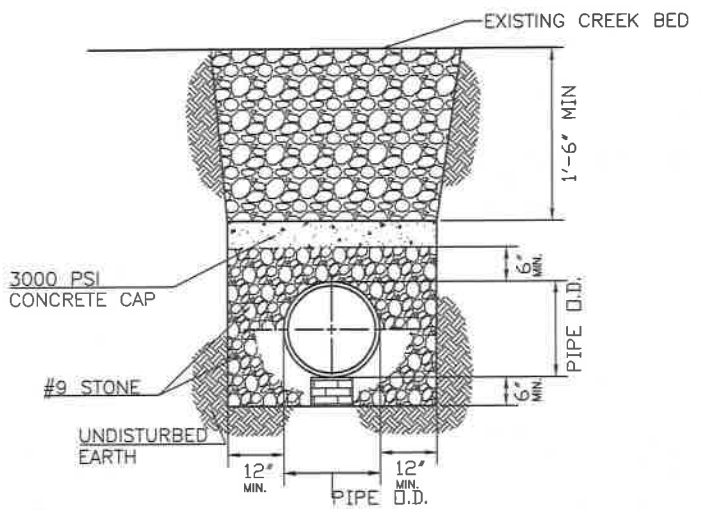
STANDARD DRAWING NO. 234

APPROVAL:

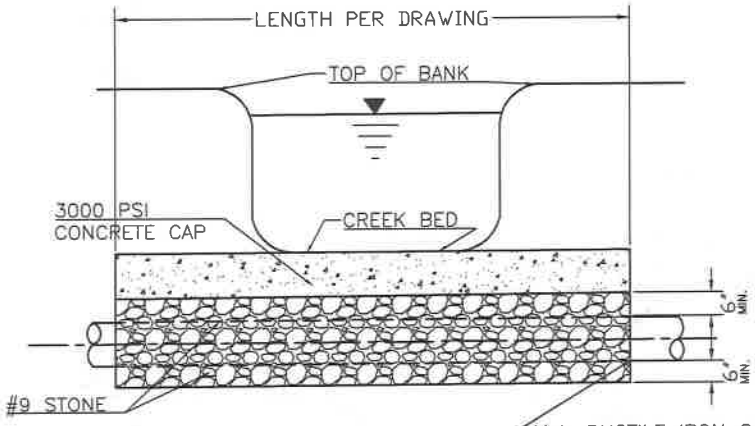
URBAN COUNTY ENGINEER — DATE 9/22/17

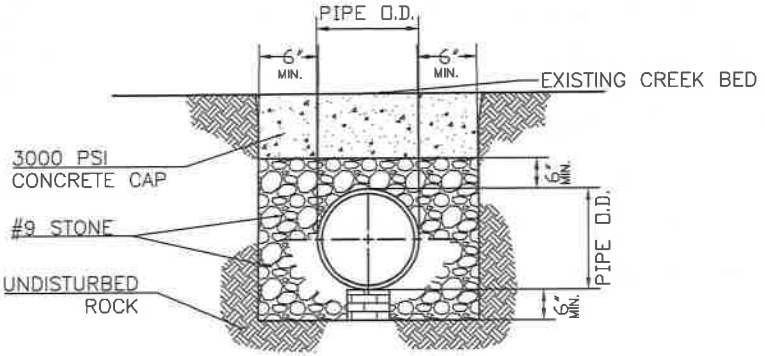
COMMISSIONER — DATE 9/22/17





CREEK CROSSING DETAIL FOR SOIL CREEKBED





CREEK CROSSING DETAIL FOR ROCK CREEKBED

NOTES:

1. A WATERSTOP SHALL BE PROVIDED ON THE UPSTREAM SIDE OF THE DOWNSTREAM MANHOLE.
2. PIPE TO BE DUCTILE IRON WHEN DEPTH OF COVER IS LESS THAN 4'.
3. SPECIAL DESIGN REQUIRED WHEN COVER IS 30" OR LESS.
4. CONTRACTOR SHALL USE THE CREEK CROSSING DETAIL THAT CORRESPONDS TO THE CHANNEL BED ENCOUNTERED.

CONCRETE CAP SHALL BE PLACED ACROSS CHANNEL BED AND EXTEND 10 FT. MIN. INTO EACH CHANNEL BANK, MEASURED FROM BOTTOM OF BANK.

SAWCUT EDGE OF TRENCH (4" MIN. DEPTH) TO PREVENT FRACTURING OF SURFACE BEDROCK BEYOND TRENCH EXCAVATION (TYP. EACH SIDE).

WHILE CROSSING THE CREEK WITH EQUIPMENT, PROVIDE NECESSARY MEANS TO PREVENT FRACTURING OF BEDROCK OUTSIDE THE TRENCH, BY USING GRAVEL, SWAMP MATS, OR OTHER APPROVED METHOD.

LEXINGTON

DIVISION OF ENGINEERING

SANITARY SEWER STREAM CROSSING AND STREAM BED RESTORATION DETAIL

STANDARD DRAWING NO. 240

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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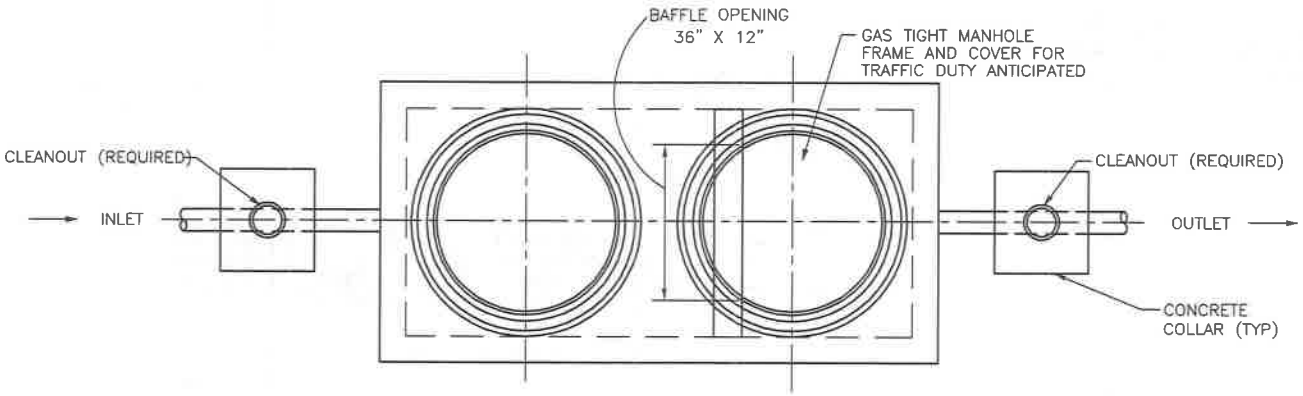
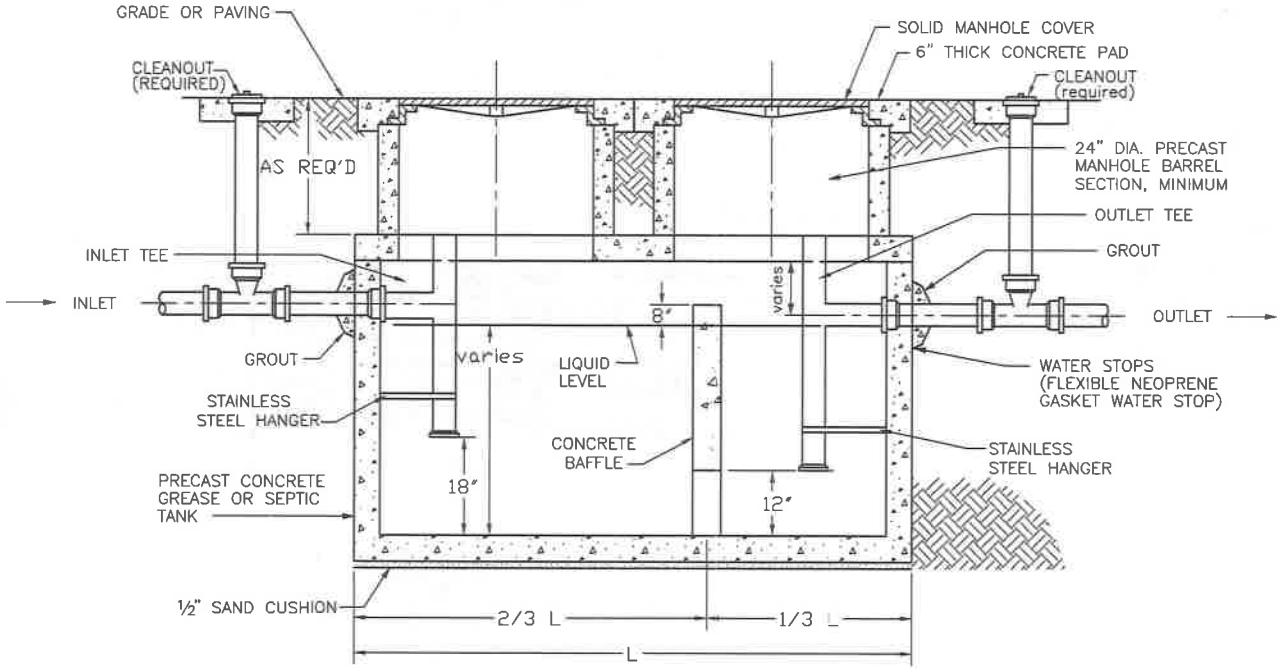


TOP VIEW



SECTION

GENERAL NOTES:

1. THIS STRUCTURE IS TO BE ACCESSIBLE FOR MAINTENANCE OR INSPECTION WITH COVERS AND CLEANOUTS BROUGHT TO GRADE.
2. DESIGN CRITERIA SHALL BE HS-20 LOADING.
3. FLOW TO THE INTERCEPTOR SHALL EXCLUDE SANITARY SEWAGE AND SURFACE DRAINAGE.
4. DESIGN AND CAPACITY OF GREASE INTERCEPTOR TO BE CERTIFIED BY ENGINEER IN ACCORD WITH KENTUCKY STATE PLUMBING CODE AND REVIEWED FOR CAPACITY BY THE DIVISION OF WATER QUALITY PRIOR TO CONSTRUCTION.
5. MULTIPLE COMPARTMENT INTERCEPTORS ARE ACCEPTABLE.
6. THE MINIMUM CAPACITY OF INTERCEPTORS IS 1000 GALLONS.
7. PIPE CLEANOUT TEE SHALL BE THE SAME SIZE AS THE PIPE AND BE WITHIN 6' OF THE GREASE INTERCEPTOR ON THE OUTLET LINE. THE INLET LINE CLEANOUT IS OPTIONAL.
8. MANUFACTURER WILL PROVIDE GREASE TRAP WITH TWO(2) ACCESS POINTS AS SHOWN. PLUMBING CONTRACTOR TO INSTALL FIXTURES AS SHOWN.
9. DIAMETER OF PIPE IN GREASE INTERCEPTOR SHALL BE THE SAME DIAMETER AS THE INLET LATERAL PIPE.

LEXINGTON

DIVISION OF ENGINEERING

GREASE INTERCEPTOR
TYPICAL
CONFIGURATION

STANDARD DRAWING NO.	250
APPROVAL: URBAN COUNTY ENGINEER	DATE 9/22/17
COMMISSIONER	DATE 9/22/17

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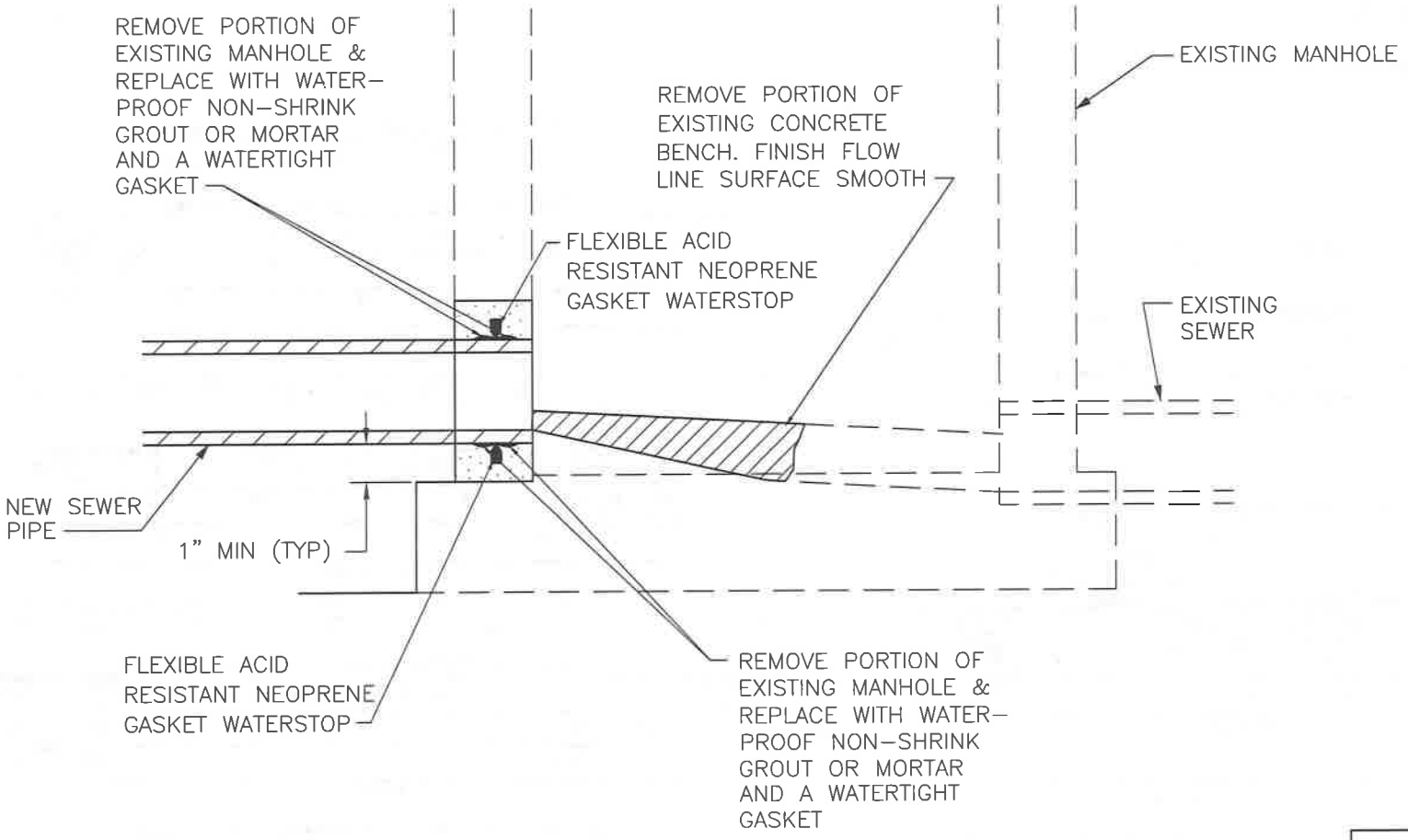

ALL HOLES CUT INTO SEWER MANHOLES SHALL BE CORE DRILLED.

SEWER CONNECTION TO EXISTING MANHOLE

LEXINGTON

DIVISION OF ENGINEERING

SEWER CONNECTION TO EXISTING CONCRETE MANHOLE

STANDARD DRAWING NO.	260
APPROVAL: URBAN COUNTY ENGINEER	DATE 9/22/17
COMMISSIONER	DATE 9/22/17

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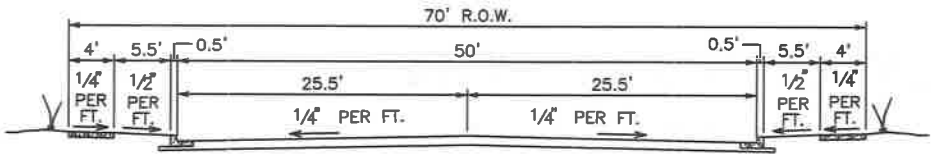
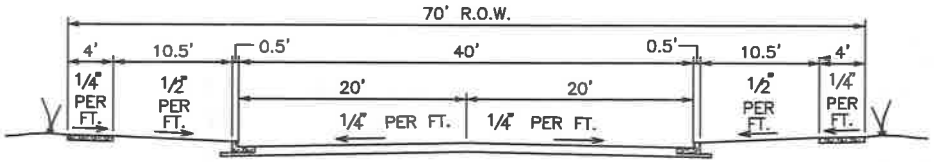
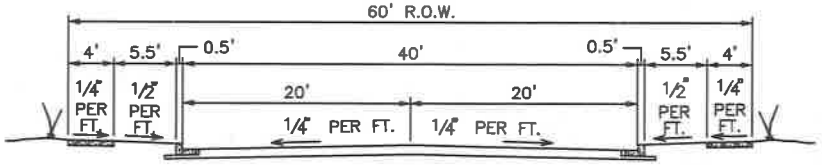


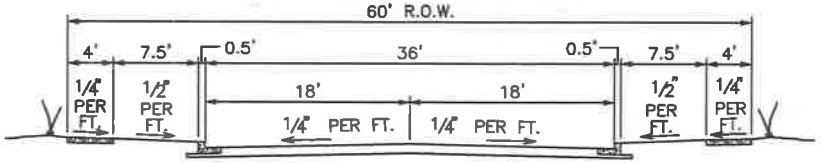
NON-RESIDENTIAL COLLECTOR



NON-RESIDENTIAL OR INDUSTRIAL COLLECTOR

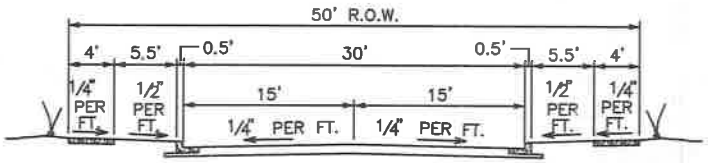


RESIDENTIAL COLLECTOR AND INDUSTRIAL LOCAL

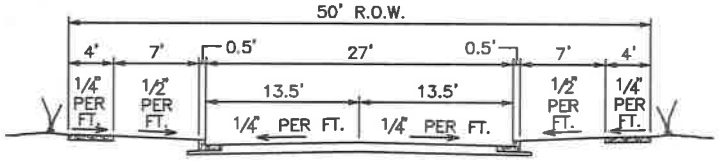


RESIDENTIAL COLLECTOR

(OBSOLETE) – USED TO COMPLETE EXISTING STREETS

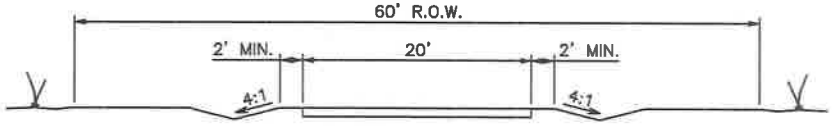


RESIDENTIAL CONTINUING LOCAL OR COMMERCIAL SERVICE



RESIDENTIAL CUL-DE-SAC AND CONTINUING LOCAL

(SEE NOTE 3)



RURAL LOCAL

NOTES:

1. SLOPES AND DRAINAGE DITCHES OUTSIDE THE R.O.W. SHALL BE APPROVED BY THE ENGINEER.
2. THE APPLICATIONS AND USES OF THE ABOVE TYPICAL SECTIONS SHALL BE IN ACCORDANCE WITH THE L.F.U.C.G. LAND SUBDIVISION REGULATIONS, ARTICLE 6.
3. PARKING RESTRICTED TO ONE SIDE OF ROADWAY.

PENDING LAND SUBDIVISION REGULATIONS UPDATE

LEXINGTON – FAYETTE URBAN COUNTY GOVERNMENT

LEXINGTON

DIVISION OF ENGINEERING

TYPICAL STREET SECTIONS

STANDARD DRAWING NO. 300

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/20/17

COMMISSIONER — DATE 9/20/17

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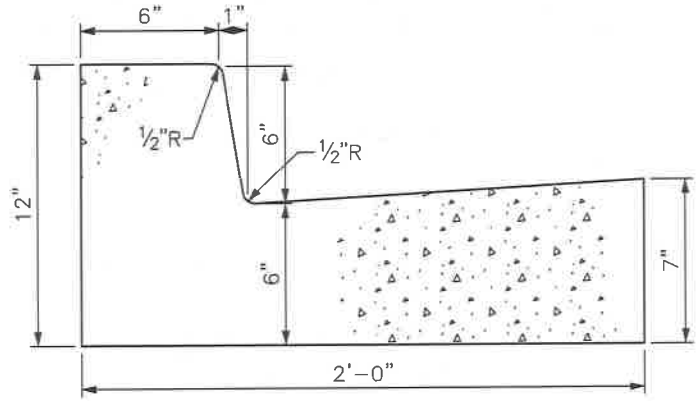

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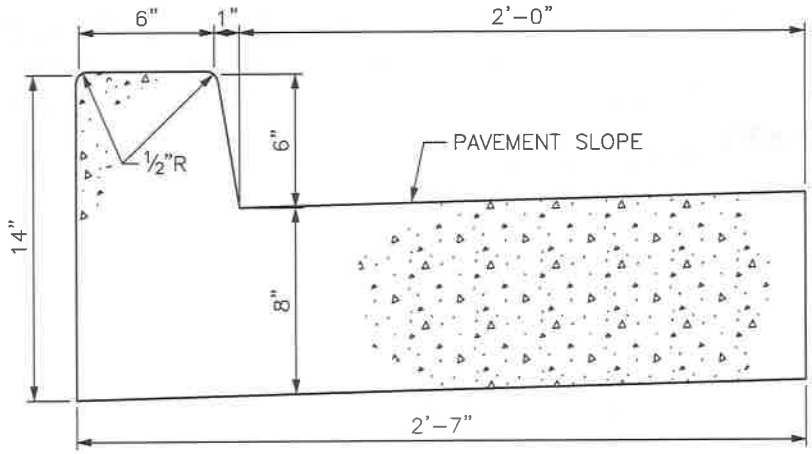
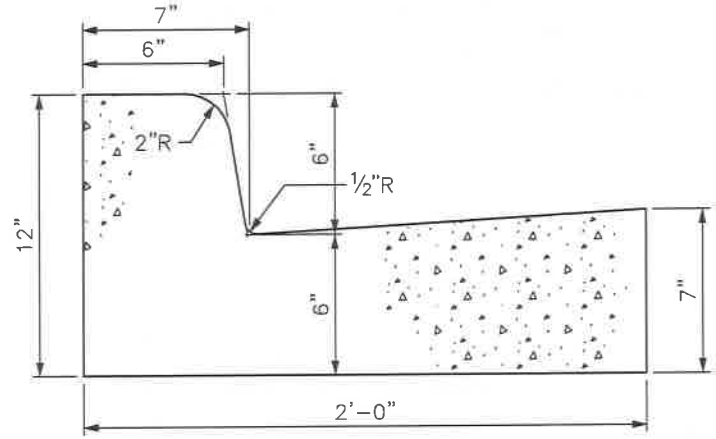


TYPE 2



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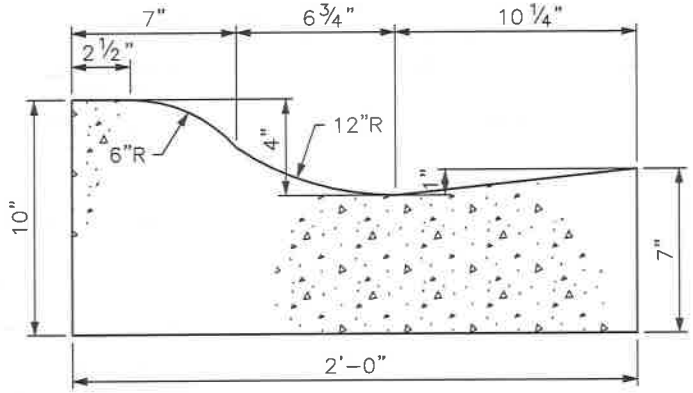


TYPE 4

(RESIDENTIAL LOCAL STREETS ONLY)

NOTES:

1. CONCRETE SHALL BE KDOT CLASS "A".
2. SAWED CONTRACTION JOINTS SHALL BE CONSTRUCTED EVERY 20 FEET, WITH A MIN. DEPTH OF 3", IN ACCORDANCE WITH KDOT STANDARD SPECIFICATION.
3. FULL DEPTH EXPANSION JOINTS SHALL BE CONSTRUCTED AT ALL BREAKS IN ALIGNMENT, AT CONTACT WITH NEW OR EXISTING CONCRETE, AT ALL DRAINAGE INLETS, AT THE BEGINING AND ENDING POINTS OF CURVES, AND NOT TO EXCEED 200' MAXIMUM SPACING FOR SLIP FORM APPLICATION AND 30' MAXIMUM SPACING FOR HAND PLACED.
4. ALL CONCRETE SHALL BE CURED WITH WHITE PIGMENTED MEMBRANE FORMING COMPOUND (AASHTO M 148, TYPE 2).

LEXINGTON

DIVISION OF ENGINEERING

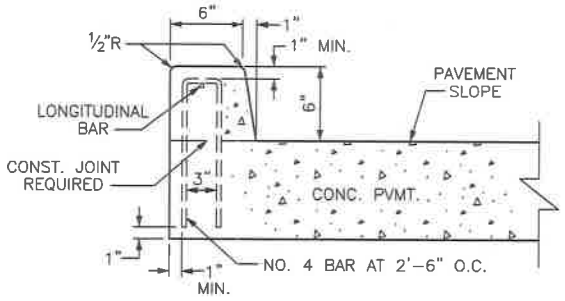
CURB & GUTTER

STANDARD DRAWING NO. 301

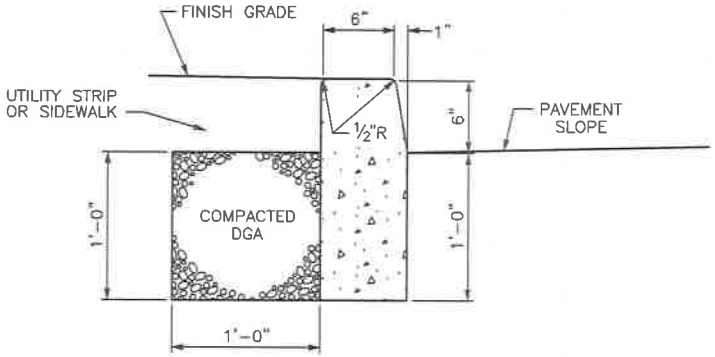
APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

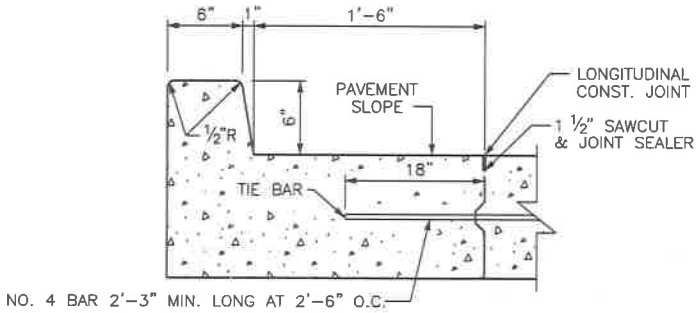
COMMISSIONER — DATE 9/22/17



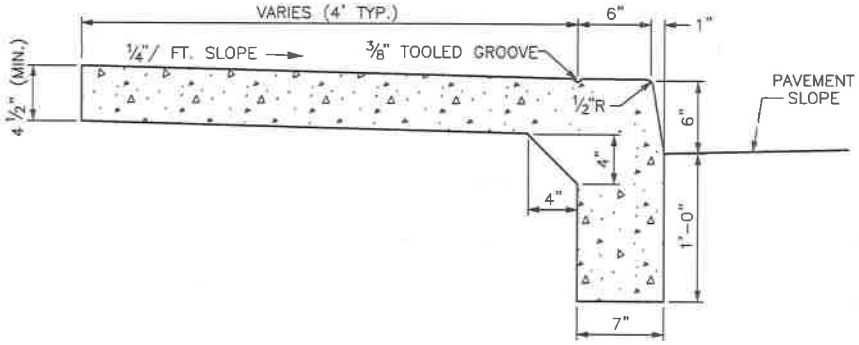
INTEGRAL CURB, TYPE 1



HEADER CURB



INTEGRAL CURB, TYPE 2



MONOLITHIC CURB AND SIDEWALK

NOTES:

1. CONCRETE SHALL BE KDOT CLASS "A".
2. SAWED CONTRACTION JOINTS SHALL BE CONSTRUCTED EVERY 20 FEET, 3" MINIMUM DEPTH.
3. THE CONTRACTOR HAS THE OPTION OF CONSTRUCTING THE STANDARD INTEGRAL CURB AS DETAILED IN EITHER TYPE 1 OR 2. IF TYPE 2 IS CHOSEN A LONGITUDINAL CONSTRUCTION JOINT SHALL BE REQUIRED AND THE REMAINING PAVEMENT AND CURB SHALL BE CONSTRUCTED MONOLITHIC WITHOUT A HORIZONTAL CONSTRUCTION JOINT AND ACCOMPANYING REINFORCING STEEL (TYPE 1).
4. FULL DEPTH EXPANSION JOINTS SHALL BE CONSTRUCTED AT ALL BREAKS IN ALIGNMENT, AT ALL DRAINAGE INLETS AND AT THE BEGINNING AND ENDING POINTS OF CURVES.
5. ALL CONCRETE, EXCEPT BONDING SURFACES, SHALL BE CURED WITH WHITE PIGMENTED MEMBRANE FORMING COMPOUND (AASHTO M 148, TYPE 2).

LEXINGTON

DIVISION OF ENGINEERING

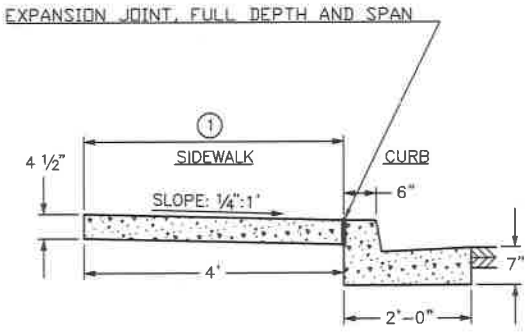
INTEGRAL CURB, HEADER CURB, MONOLITHIC CURB & SIDEWALK

STANDARD DRAWING NO. 302

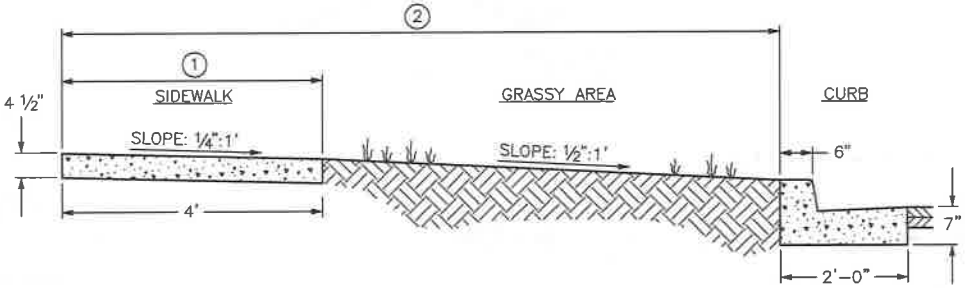
APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17



SIDEWALK/CURB AND GUTTER



SIDEWALK/CURB AND GUTTER WITH GRASS UTILITY STRIP

NOTES:

1. CONCRETE SIDEWALKS AND WALKWAYS SHALL BE CONSTRUCTED ON A THOROUGHLY COMPACTED SUB-GRADE AND SHALL BE FOUR AND ONE HALF (4 ½) INCHES IN THICKNESS AND A MINIMUM WIDTH OF FOUR (4) FEET. CONCRETE SHALL MEET THE REQUIREMENTS FOR CLASS "A" AND SHALL BE COATED WITH WHITE PIGMENTED CURING COMPOUND TYPE 2, ALL AS SPECIFIED IN KYTC SPECIFICATION, SECTION 823.02.

2. FULL DEPTH EXPANSION JOINTS SHALL BE PLACED AT CONTACT WITH NEW OR EXISTING CONCRETE, EXISTING CONCRETE, AT ABUTTING RIGID STRUCTURES OR FEATURES SUCH AS BUILDINGS, DRIVEWAYS, UTILITY POLES FIRE HYDRANTS, ECT. AND NOT TO EXCEED 200' MAXIMUM SPACING FOR SLIP FORM APPLICATION AND 32' FOR HAND PLACED. EXPANSION MATERIAL SHALL BE 1/2" ASPHALTIC MATERIAL OR APPROVED EQUAL MEETING KYTC 807.04.03.

3. CONTROL JOINTS SHALL BE PLACED AT INTERVALS EQUILAVENT TO THE SIDEWALK WIDTH, WITH A DEPTH OF 1/4 THE SIDEWALK THICKNESS.

4. THE SIDEWALKS SHALL BE PLACED ADJACENT TO THE STREET RIGHT-OF-WAY LINE. SLOPE TOWARD CURB SHALL BE ONE QUARTER (¼) OF AN INCH TO THE FOOT. CONSTRUCTION IN EXISTING NEIGHBORHOODS SHALL REQUIRE THE CONTRACTOR TO MATCH EXISTING GRADE AND SIDEWALK WIDTH UNLESS SPECIFIED OTHERWISE BY THE DIVISION OF ENGINEERING.

5. SIDEWALK REPAIR FOR ANY CUTS MADE FOR UTILITY WORK REPLACEMENT SHALL BE FULL PANEL MATCHING THE ORIGINAL DIMENSIONS.

SHEET NOTES:

(1) NORMAL SIDEWALK WIDTH SHALL BE 4' UNLESS CHANGE IS AUTHORIZED BY URBAN COUNTY ENGINEER'S OFFICE.

(2) DISTANCE WILL VARY WITH ROAD CROSS-SECTION.

LEXINGTON

DIVISION OF ENGINEERING

SIDEWALK CONSTRUCTION SPECIFICATIONS

STANDARD DRAWING NO.	303
APPROVAL: URBAN COUNTY ENGINEER	DATE 9/22/17
COMMISSIONER	DATE 9/22/17

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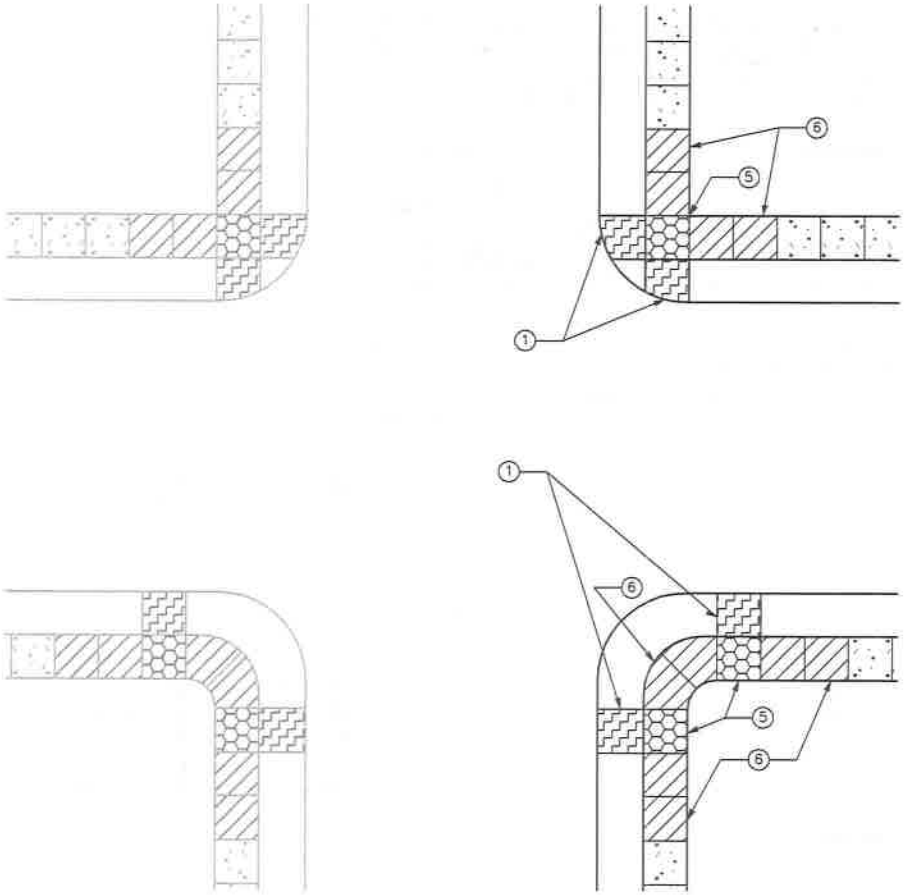


PLAN VIEW

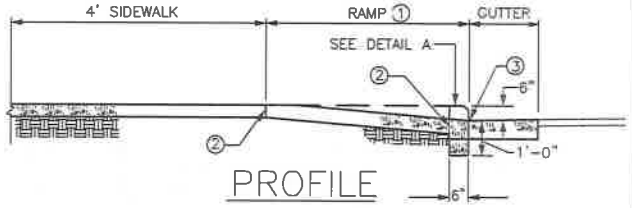
NORMAL TREATMENT FOR ARTERIALS
AND SIGNALIZED INTERSECTIONS

NOTES:

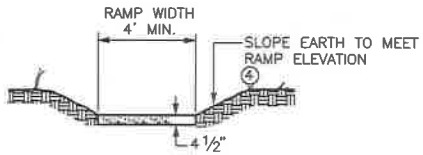
1. INLET LOCATIONS WILL VARY, DEPENDENT ON CROSSWALK AND RAMP LOCATION.
2. THE RAMP SHALL BE CONSTRUCTED OF CLASS A" CONCRETE. AND SHALL UTILIZE CAST IN PLACE REPLACEABLE TACTILE WARNING TILE, SUCH AS ADA SOLUTIONS, INC., ACCESS TILE TACTILE SYSTEMS, ARMOR–TILE HERCULITE OR APPROVED EQUAL. TILE COLOR SHALL BE FEDERAL YELLOW.
3. THE NORMAL GUTTER LINE SHOULD BE MAINTAINED THROUGH THE RAMP.
4. RAMPS SHOULD BE LOCATED WITHIN MARKED LIMITS OF CROSSWALKS.
5. WHERE NO CURB EXISTS, STREET EDGE SHALL BE SAW CUT, OR AS DIRECTED BY L.F.U.C.G. ENGINEER.
6. MAXIMUM CROSS SLOPE OF SIDEWALK 1/4": 1'.
7. SIDEWALK REPAIR FOR ANY CUTS MADE FOR UTILITY WORK REPLACEMENT SHALL BE FULL PANEL MATCHING THE ORIGINAL DIMENSIONS.

SHEET NOTES:

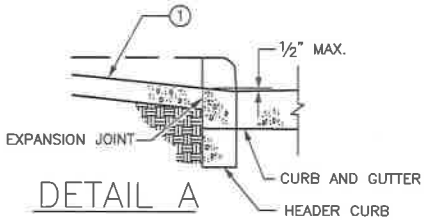
1. MAXIMUM RAMP SLOPE 1":1'.
2. ½" EXPANSION JOINT AT BACK OF CURBLINE AND SIDEWALK LINE, FULL DEPTH.
3. NO BUMP PERMITTED.
4. SLOPE VARIES UNIFORMLY TO A MAXIMUM OF 1":1' AT GUTTER LINE.
5. MAXIMUM CROSS SLOPE OF LANDING 1/4": 1' IN ALL DIRECTIONS.
6. MAXIMUM LONGITUDINAL SLOPE 1/2": 1', OR ALONG THE CENTERLINE GRADE OF THE ADJACENT ROADWAY.



PROFILE



CROSS SECTION



DETAIL A

LEXINGTON

DIVISION OF ENGINEERING

SIDEWALK
RAMP

STANDARD DRAWING NO. 304

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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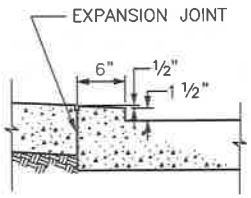
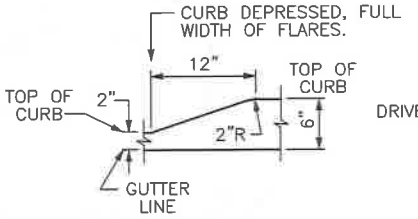
MAXIMUM ALLOWABLE APRON AND DRIVEWAY WIDTHS

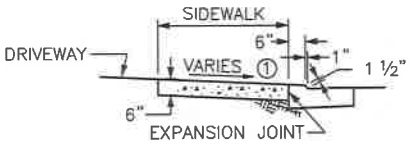
CLASSIFICATION	DRIVEWAY	APRON
SINGLE RESIDENTIAL	12'	18'
DOUBLE OR JOINT RESIDENTIAL	20'	26'



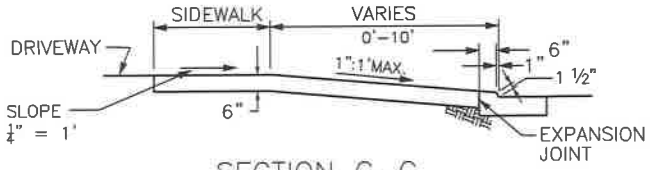
SECTION A–A



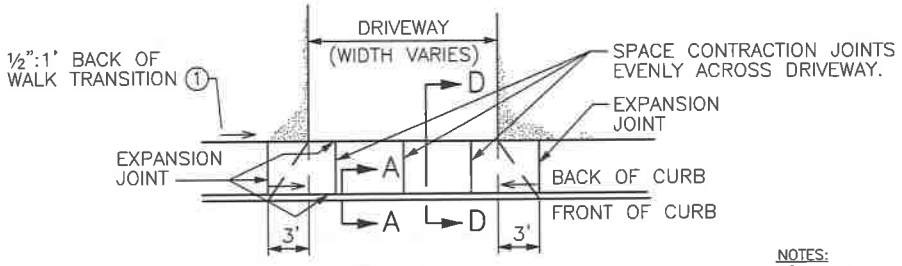
SECTION B–B



SECTION D–D



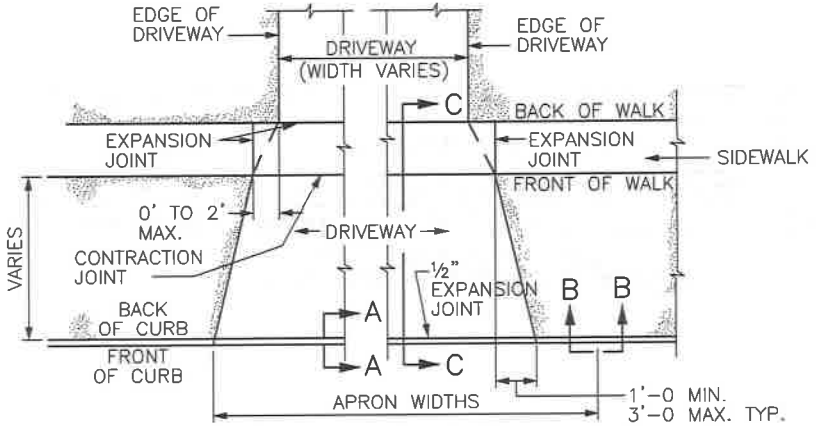
SECTION C–C



ENTRANCE WITHOUT UTILITY STRIP

STREET WITH PARKING LANE

STREET WITHOUT PARKING LANE



ENTRANCE WITH UTILITY STRIP

NOTE:
FOR USE WITH 6" HEADER CURB OR 6" CURB AND GUTTER

BASED ON UTILITY STRIP WITH ½":1' CROSS SLOPE

UTILITY STRIP WIDTH	DROP BACK OF 4' SIDEWALK	SIDEWALK SLOPE	SLOPE ON APRON
0'	1 ½"	7.29%	N/A
2'	1 ½"	5.21%	8.33%
4'	1 ½"	3.12%	8.33%
5'	1 ½"	2.08%	8.33%
6'	1"	2.08%	8.33%
8'	0"	2.08%	8.33%
10'	0"	2.08%	7.50%

BASED ON UTILITY STRIP WITH ¼":1' CROSS SLOPE

UTILITY STRIP WIDTH	DROP BACK OF 4' SIDEWALK	SIDEWALK SLOPE	SLOPE ON APRON
0'	1 ½"	7.29%	N/A
2'	1 ½"	4.17%	8.33%
3'	1 ½"	2.60%	8.33%
4'	1"	2.08%	8.33%
6'	0"	2.08%	7.64%
8'	0"	2.08%	6.25%
10'	0"	2.08%	5.42%

NOTES:

① DROP BACK OF SIDEWALK GRADE 1 ½" OVER 3' TO PROVIDE A MAXIMUM SLOPE OF 1":1'.

2. PROVIDE A SAWED JOINT ALONG CENTER LINE OF APRON.
3. MAXIMUM DROP AT BACK OF SIDEWALK SHALL NOT EXCEED 1 ½".
4. MAXIMUM CROSS SLOPE ON SIDEWALK SHALL NOT EXCEED ¼" = 1'
5. MAXIMUM SLOPE ON APRON SHALL NOT EXCEED 1":1' (8.3%).
6. ENTIRE APRON FROM BACK OF CURB TO BACK OF SIDEWALK SHALL BE CONSTRUCTED WITH A SINGLE POUR.
7. ALL EXPANSION JOINTS SHALL BE FULL DEPTH.

LEXINGTON

DIVISION OF ENGINEERING

RESIDENTIAL ENTRANCE DETAILS

STANDARD DRAWING NO. 307–1

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/26/17

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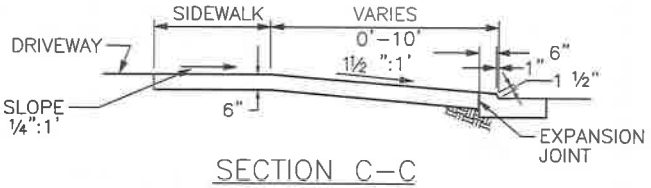
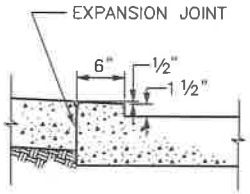
MAXIMUM ALLOWABLE APRON AND DRIVEWAY WIDTHS

CLASSIFICATION	DRIVEWAY	STANDARD APRON	ALTERNATE APRON
NON-RESIDENTIAL	30'	5' STRAIGHT FLARE=40' CURB CUT	10' RADIAL FLARE=50' CURB CUT
COMMERCIAL LOADING	30'	15' STRAIGHT FLARE=60' CURB CUT	20' RADIAL FLARE=70' CURB CUT
INDUSTRIAL	40'	20' STRAIGHT FLARE=80' CURB CUT	25' RADIAL FLARE=90' CURB CUT

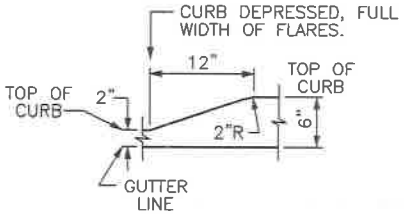


SECTION C-C

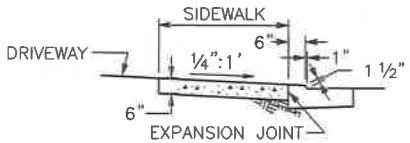
FRONT OF SIDEWALK ELEVATION DETERMINED BY ADDING ½ ": 1' ACROSS UTILITY STRIP FROM TOP OF CURB. IF COMING OFF 1½ " LIP ADD ANOTHER 4½ " TO DETERMINE ELEVATION AT FRONT OF SIDEWALK.



SECTION A-A



SECTION B-B



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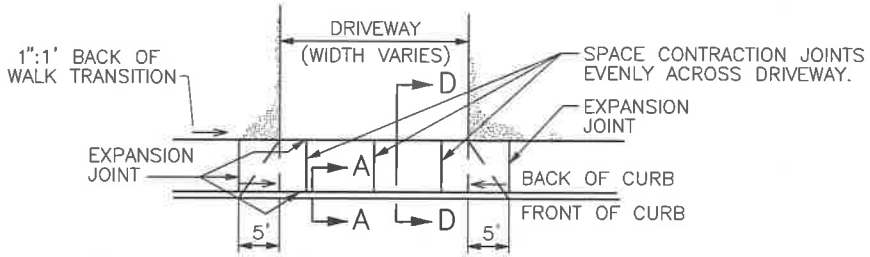
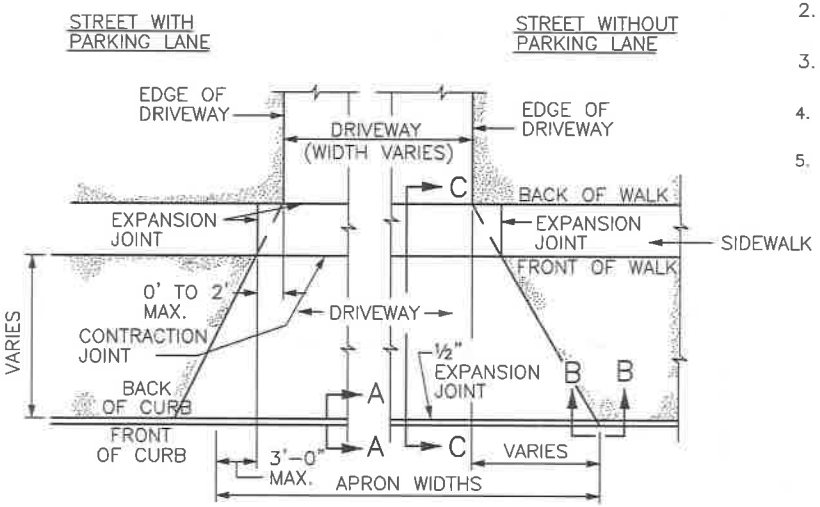


ENTRANCE WITHOUT UTILITY STRIP



ENTRANCE WITH UTILITY STRIP

NOTES:

1. PROVIDE A SAWED JOINT ALONG CENTER LINE OF APRON.
2. MAXIMUM CROSS SLOPE ON SIDEWALK SHALL NOT EXCEED ¼ ":1'
3. MAXIMUM SLOPE ON APRON SHALL NOT EXCEED 1½ ":1'.
4. NO CATCH BASINS WILL BE PUT IN APRONS.
5. ALL EXPANSION JOINTS SHALL BE FULL DEPTH.

LEXINGTON

DIVISION OF ENGINEERING

COMMERCIAL ENTRANCE DETAILS

STANDARD DRAWING NO. 307-2

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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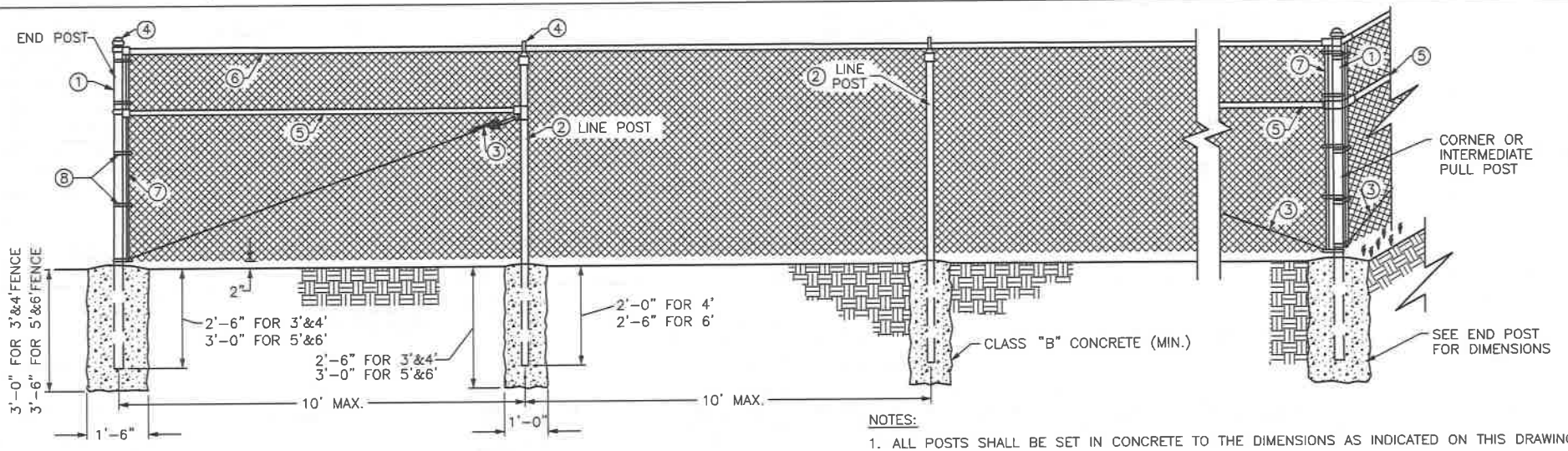
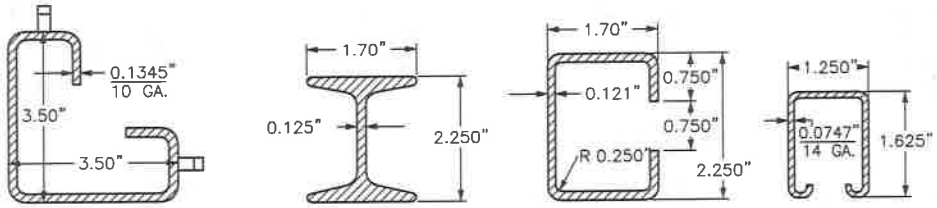




TERMINAL POST & CORNER POST

LINE POST H-COLUMN

LINE POST HEAVY "C" ROLL FORM

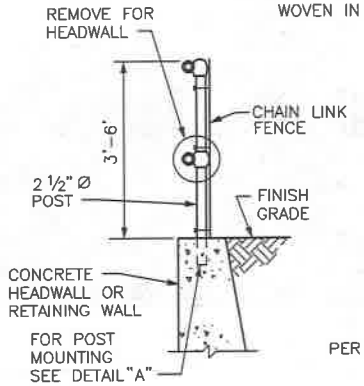
TOP & BRACE RAIL

NOTES:

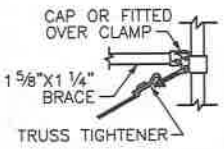
1. ALL POSTS SHALL BE SET IN CONCRETE TO THE DIMENSIONS AS INDICATED ON THIS DRAWING.
2. 3' HIGH FENCE SHALL HAVE 3' FABRIC HEIGHT. 4' HIGH FENCE SHALL HAVE 4' FABRIC HEIGHT. 5' HIGH FENCE SHALL HAVE 5' FABRIC HEIGHT. 6' HIGH FENCE SHALL HAVE 6' FABRIC HEIGHT.
3. BRACE BANDS SHALL BE 7/8"X 1/8" GALVANIZED STEEL 5/16"X1 1/4" CARRIAGE BOLT.
4. POST CAPS AND SOCKET TYPE BRACE END CONNECTIONS SHALL BE GALVANIZED MALLEABLE IRON OR OTHER TYPE AS APPROVED BY THE ENGINEER. THEY SHALL BE DESIGNED IN A MANNER TO EXCLUDE MOISTURE FROM INSIDE POSTS AND RAILS.
5. O.D. DEPICTED FOR TUBULAR POSTS IS NOMINAL–ASTM A–120 SHALL GOVERN.
6. STRUCTURAL SHAPES SHALL CONFORM TO STD. SPEC. 816.07.01 EXCEPT YIELD SHALL BE A MIN. 45,000 P.S.I.
7. INDISCRIMINATE MIXING OF POSTS WILL NOT BE PERMITTED.
8. CHAIN LINK FENCE FABRIC SHALL BE 0.148 INCH NOMINAL DIAMETER (NO. 9 GAGE) WIRE WOVEN IN 2 INCH MESH.

LEGEND–(ALTERNATES)

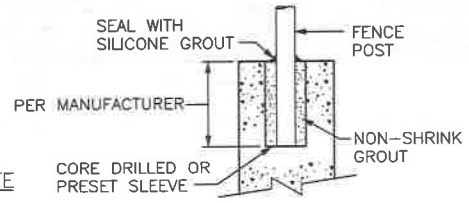
	TUBULAR	ROLL FORMED
①	2 1/2" O.D. @ 3.65#/L.F.	3.5"X3.5" @ 5.14#/L.F.
②	2" O.D. @ 2.72#/L.F.	2.250" H–COL.@ 3.26#/L.F. OR 2.250" C–COL.@ 2.64#/L.F.
③	3/8" Ø TRUSS ROD & TIGHTENER	0.375"Ø TRUSS ROD & TIGHTENER
④	APPROVED CAPS	NOT REQUIRED
⑤	1 5/8" BRACE @ 2.27#/L.F.	1.250"X1.625" @ 1.35#/L.F.
⑥	1 5/8" O.D. @ 2.27#/L.F.	1.250"X1.625" @ 1.35#/L.F.
⑦	3/16"X3/4" FLAT STRETCHER BAR	NOT REQUIRED
⑧	BRACE BAND & TENSION BAND	NOT REQUIRED



CHAIN LINK FENCE MOUNTED TO CONCRETE HEADWALL OR RETAINING WALL



BRACE & TRUSS CONNECTION



DETAIL "A"

LEXINGTON

DIVISION OF ENGINEERING

CHAIN LINK FENCE
3'–6'

STANDARD DRAWING NO. 308

APPROVAL:

URBAN COUNTY ENGINEER — DATE 4/20/17

COMMISSIONER — DATE 9/22/17

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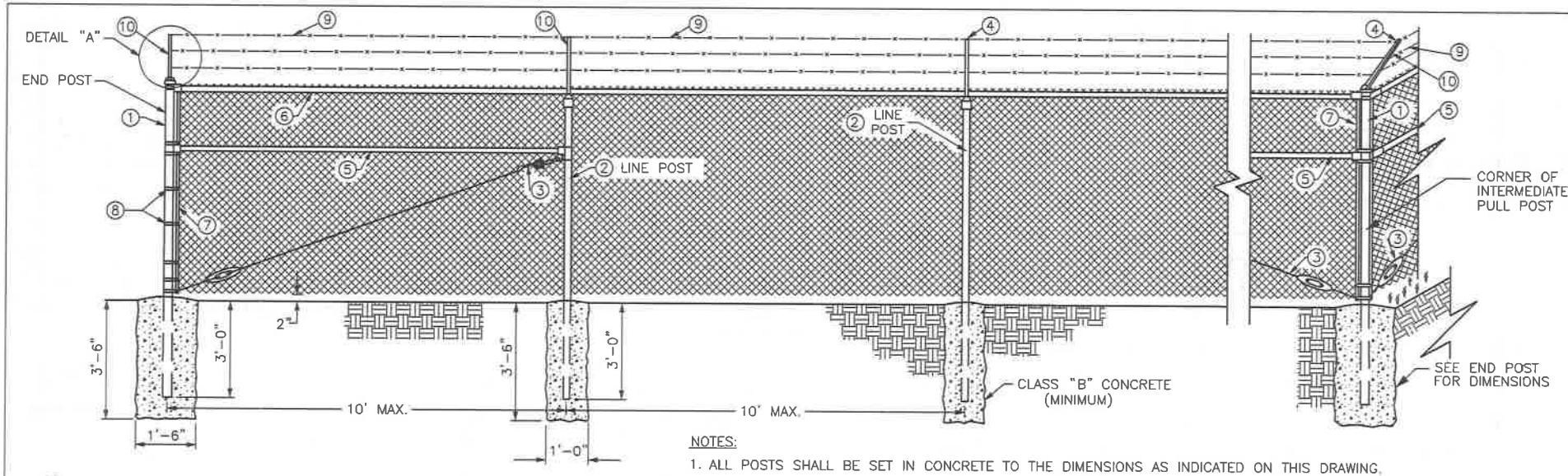
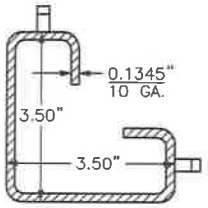
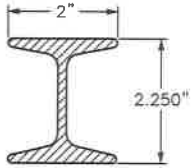
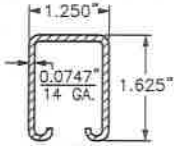




TERMINAL POST & CORNER POST



LINE POST



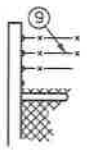
TOP & BRACE RAIL

LEGEND–(ALTERNATES)

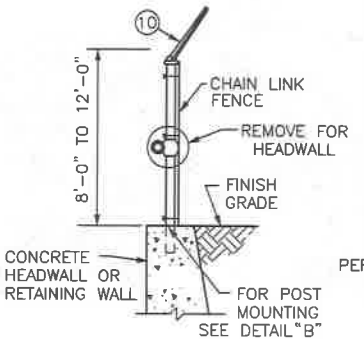
	TUBULAR	ROLL FORMED
①	2 ½" O.D. @ 3.65#/L.F.	3.5"X3.5" @ 5.14#/L.F.
②	2" O.D. @ 2.72#/L.F.	2.250" H–COL. @ 3.26#/L.F. OR 2.250" C–COL. @ 2.64#/L.F.
③	⅜" Ø TRUSS ROD & TIGHTENER	0.375" Ø TRUSS ROD & TIGHTENER
④	APPROVED CAPS	NOT REQUIRED
⑤	1 ⅝" BRACE @ 2.27#/L.F.	1.250"X1.625" @ 1.35#/L.F.
⑥	1 ⅝" O.D. @ 2.27#/L.F.	1.250"X1.625" @ 1.35#/L.F.
⑦	3/16"X ¾" FLAT STRETCHER BAR	NOT REQUIRED
⑧	BRACE BAND & TENSION BAND	NOT REQUIRED
⑨	BARBED WIRE	BARBED WIRE
⑩	BARBED WIRE ARMS	BARBED WIRE ARMS

NOTES:

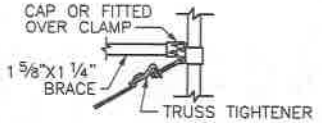
1. ALL POSTS SHALL BE SET IN CONCRETE TO THE DIMENSIONS AS INDICATED ON THIS DRAWING.
2. A 1 ⅝" O.D. AT 2.27 LB. PER L.F. OR 1 ¼"X1 ⅝" ROLL FORMED SECTION AT 1.35 LB. PER L.F. BOTTOM RAIL SHALL BE REQUIRED AROUND ALL UTILITY INSTALLATIONS AND AT OTHER LOCATIONS DESIGNATED BY THE ENGINEER.
3. 8' HIGH FENCE SHALL HAVE 7' FABRIC HEIGHT. 9' HIGH FENCE SHALL HAVE 8' FABRIC HEIGHT. 10' HIGH FENCE SHALL 9' FABRIC HEIGHT. 11' HIGH FENCE SHALL HAVE 10' FABRIC HEIGHT. 12' HIGH FENCE SHALL HAVE 11' FABRIC HEIGHT.
4. BRACE BAND SHALL BE ⅞"X 1/8" GALVANIZED STEEL WITH 5/16"X1 ¼" CARRIAGE BOLTS. POST CAPS AND SOCKET TYPE BRACE END CONNECTION SHALL BE GALVANIZED MALLEABLE IRON OR OTHER TYPE AS APPROVED BY THE ENGINEER. THEY SHALL BE DESIGNED IN A MANNER TO EXCLUDE MOISTURE FROM INSIDE POSTS AND RAILS.
5. O.D. DEPICTED FOR TUBULAR POSTS IS NOMINAL – ASTM A–120 SHALL GOVERN.
6. CHAIN LINK FENCE FABRIC SHALL BE 0.148 INCH NOMINAL DIAMETER (NO.9 GAGE) WIRE WOVEN IN 2 INCH MESH.



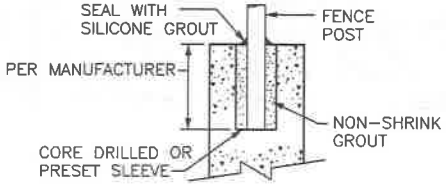
DETAIL "A" ROLL FORMED



CHAIN LINK FENCE MOUNTED TO CONCRETE HEADWALL OR



BRACE & TRUSS CONNECTION



DETAIL "B"

LEXINGTON

DIVISION OF ENGINEERING

CHAIN LINK FENCE
8'–12'

STANDARD DRAWING NO. 309

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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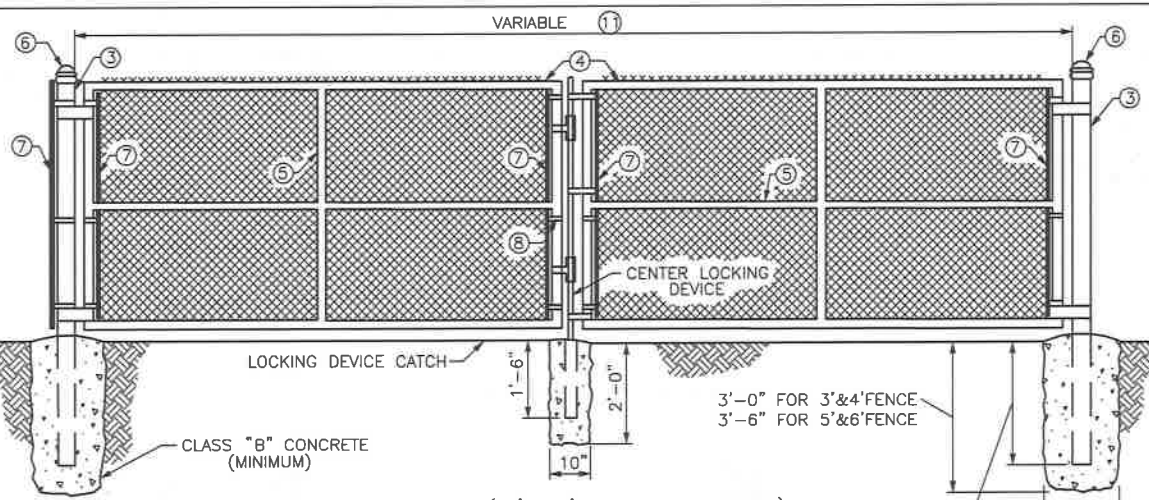
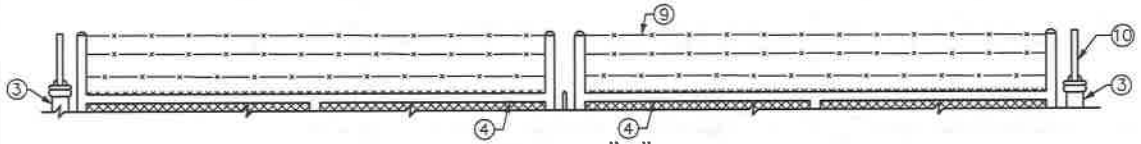
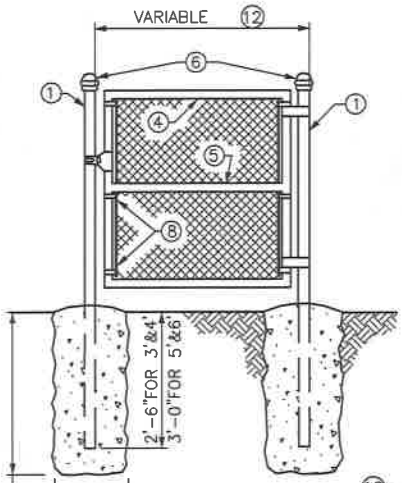


VEHICULAR GATE (3'–6' HIGH FENCE)

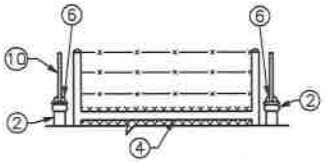


DETAIL "B"



PEDESTRIAN GATE (3'–6' HIGH FENCE)

HINGE DETAIL



DETAIL " A"

NOTES:

1. ALL POSTS SHALL BE SET IN CONCRETE TO THE DIMENSIONS AS INDICATED ON THIS DRAWING.
2. VEHICULAR AND PEDESTRIAN GATES SHALL HAVE HEAVY PRESSED STEEL CORNERS SECURELY RIVETED OR SHALL BE MACHINE NOTCHED, AND ELECTRICALLY WELDED SO AS TO BE RIGID AND WATER TIGHT; AND EQUIPPED WITH PADLOCKING DEVICE AND GROUND STOP.
3. ALL WELDED JOINTS SHALL BE CLEANED AND PAINTED WITH TWO (2) COATS OF ALUMINUM PAINT.
4. 3' HIGH GATES SHALL HAVE 3' FABRIC HEIGHT. 4' HIGH GATES SHALL HAVE 4' FABRIC HEIGHT. 5' HIGH GATES SHALL HAVE 5' FABRIC HEIGHT. 6' HIGH GATES SHALL HAVE 6' FABRIC HEIGHT. 8' HIGH GATES SHALL HAVE 7' FABRIC HEIGHT. 9' HIGH GATES SHALL HAVE 8' FABRIC HEIGHT. 10' HIGH GATES SHALL HAVE 9' FABRIC HEIGHT. 11' HIGH GATES SHALL HAVE 10' FABRIC HEIGHT. 12' HIGH GATES SHALL HAVE 11' FABRIC HEIGHT.
5. SEE DETAIL "A" FOR BARBED WIRE INSTALLATION ON 8' TO 12' HIGH PEDESTRIAN GATES.
6. SEE DETAIL "B" FOR BARBED WIRE INSTALLATION ON 8' TO 12' HIGH VEHICULAR GATES.
7. THE CONTRACTOR IS NOT TO ORDER GATES UNTIL THEIR NECESSITY AND LOCATION HAVE BEEN CERTIFIED BY THE ENGINEER.
8. O.D. DEPICTED FOR TUBULAR POSTS IS NOMINAL – ASTM A-120 SHALL GOVERN.
9. CHAIN LINK FENCE FABRIC SHALL BE 0.148 INCH NOMINAL DIAMETER (NO.9 GAGE) WIRE WOVEN 2 INCH MESH.

LEGEND – (ALTERNATES)

	TUBULAR	ROLL FORMED
(1)	END POST 2½" O.D. @ 3.65#L.F.	3½"X3½" @ 5.14#/L.F.
(2)	END POST 3" O.D. @ 3.65#/L.F.	3½"X3½" @ 5.14#/L.F.
(3)	4" O.D. @ 9.1#/L.F. GATE POST	NO ALTERNATE
(4)	2" O.D. @ 2.72#/L.F. GATE FRAME	NO ALTERNATE
(5)	1⅝" O.D. @ 2.27#/L.F.	NO ALTERNATE
(6)	APPROVED CAPS	NOT REQUIRED
(7)	3/16"X⅝" FLAT STRETCHER BAR	NOT REQUIRED
(8)	BRACE BAND & TENSION BAND	NOT REQUIRED
(9)	BARBED WIRE	BARBED WIRE
(10)	BARBED WIRE ARMS	BARBED WIRE ARMS

(11) 6' TO 13' WIDTH FOR SINGLE GATE OR 12' TO 26' WIDTH FOR DOUBLE GATE.

(12) 4' TO 6' WIDTH

LEXINGTON

DIVISION OF ENGINEERING

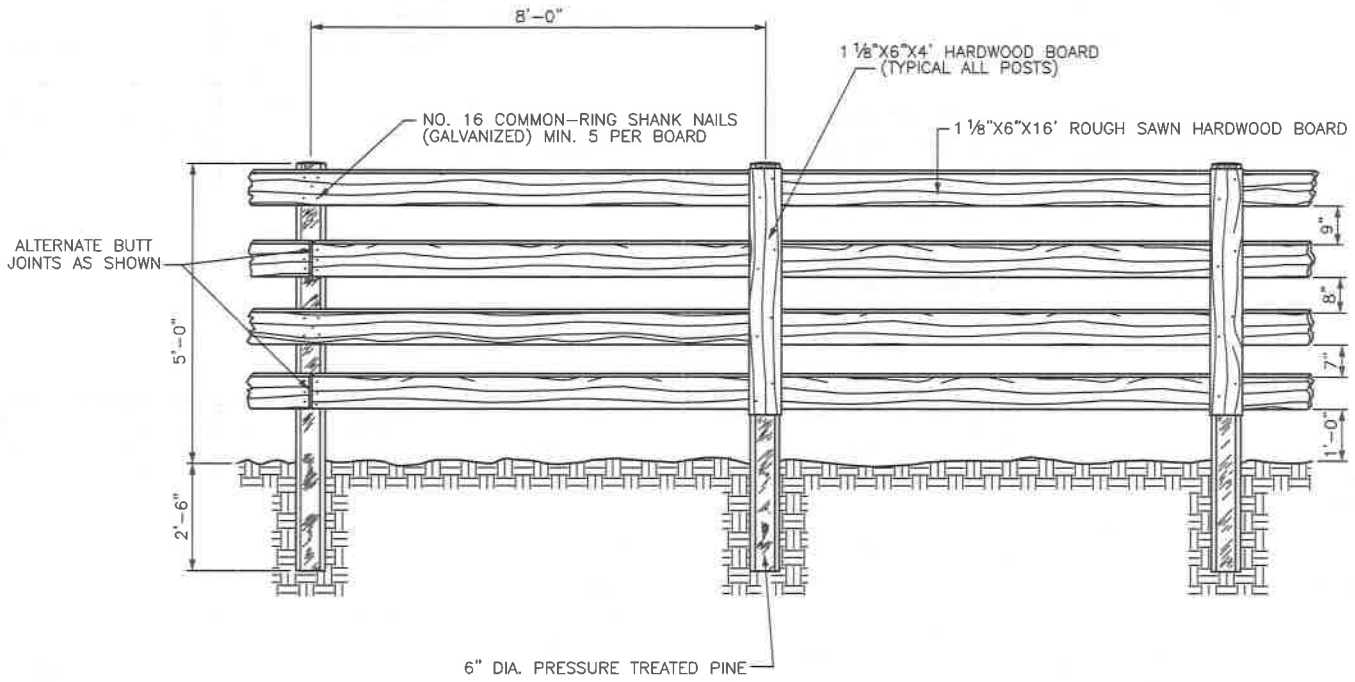
CHAIN LINK GATE

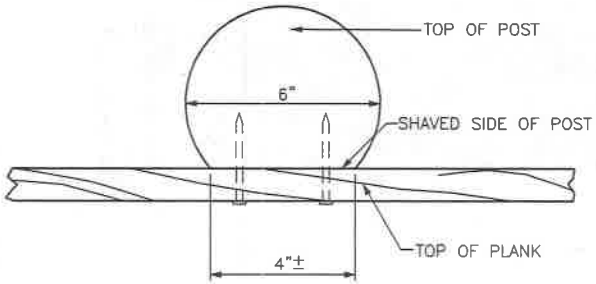
STANDARD DRAWING NO. 310

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17





NOTES:

1. POSTS ARE TO BE DRIVEN 2'-6" INTO GROUND AND TOPS CUT AT AN ANGLE TO DRAIN WATER.
2. FENCE SHALL BE PAINTED BLACK OR WHITE WITH PAINT AND APPLICATION RATE AS APPROVED BY THE ENGINEER.
3. HARDWOODS APPROVED ARE RED OAK, WHITE OAK, AND POPLAR.

LEXINGTON

DIVISION OF ENGINEERING

PLANK FENCE

STANDARD DRAWING NO.	311	
APPROVAL:		9/22/17
URBAN COUNTY ENGINEER		DATE
COMMISSIONER		9/22/17 DATE

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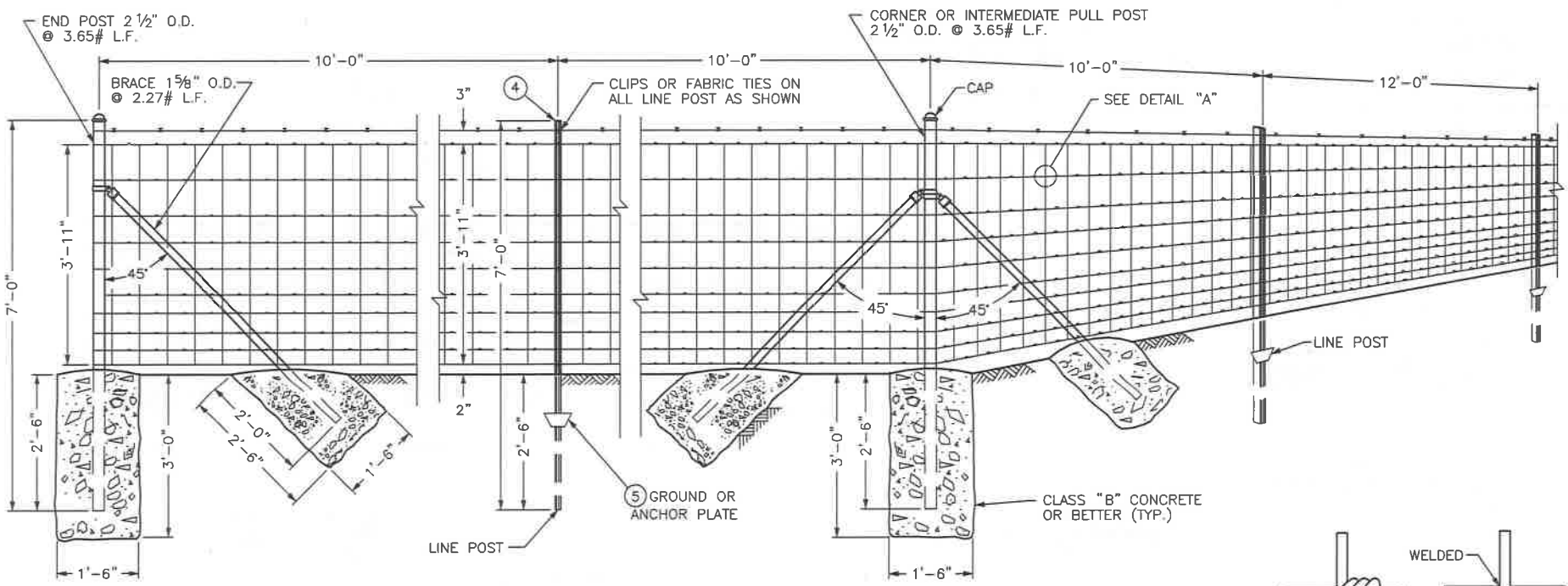
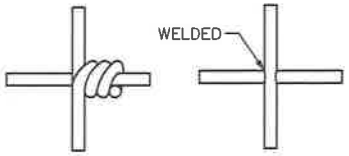


RIGHT-OF-WAY FENCE

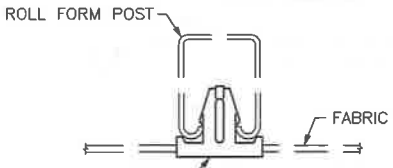
NOTES:

1. WOVEN-WIRE USED FABRIC IN RIGHT-OF-WAY FENCE SHALL BE EITHER ALUMINUM-COATED STEEL NO. 1047-6-9 OR ZINC-COATED STEEL NO. 1047-6-9.
2. ALL FENCE FITTINGS SHALL COMPLY WITH ASTM F 626.
3. O.D. DEPICTED FOR TUBULAR POSTS IS NOMINAL – ASTM F 1083 SHALL GOVERN.
4. STUDDED "T" POST AT 1.33 LBS. PER FOOT.
   – OR –
   ROLL FORM POST AT 1.35 LBS. PER FOOT. (SEE DETAIL)
5. NOT REQUIRED FOR ROLL FORM POST.

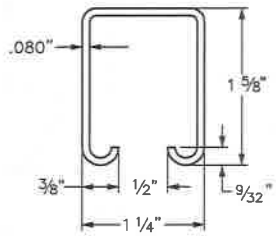


ALTERNATE METHODS OF SECURING VERTICAL STAY WIRE TO THE HORIZONTAL WIRE OF THE FABRIC.

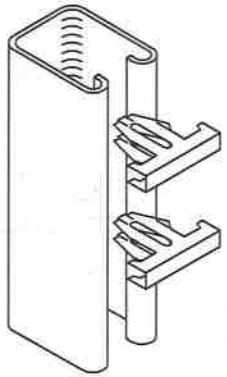
DETAIL " A"



PLAN VIEW OF CLIP INSTALLED IN ROLL FORM POST



PLAN VIEW OF ROLL FORM POST



ISOMETRIC EXPLODED VIEW OF ROLL FORM POST AND CLIPS

CLIPS SHALL BE SPRING STEEL ALUMINUM – FINISHED

LEXINGTON

DIVISION OF ENGINEERING

WOVEN WIRE
RIGHT-OF-WAY FENCE
TYPE 1

STANDARD DRAWING NO. 312

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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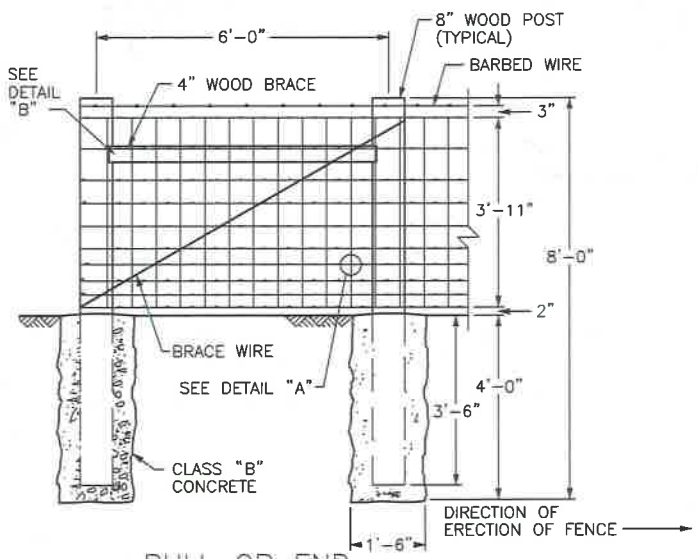
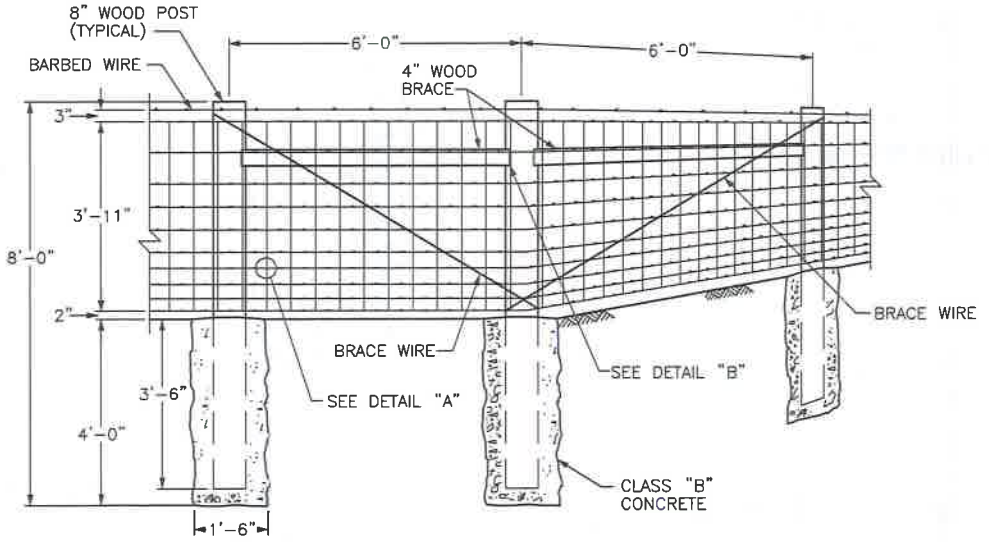
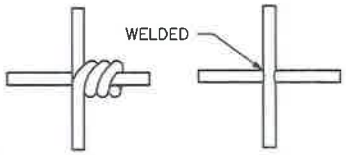


PULL OR END POST ASSEMBLY

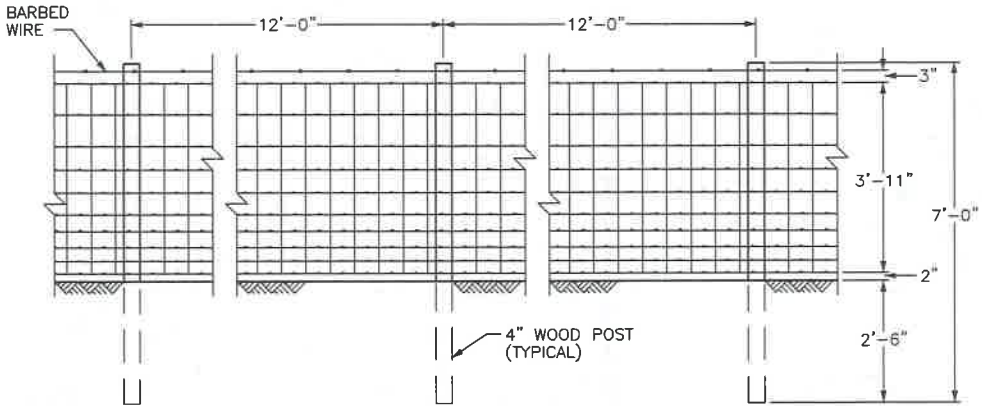


CORNER POST ASSEMBLY

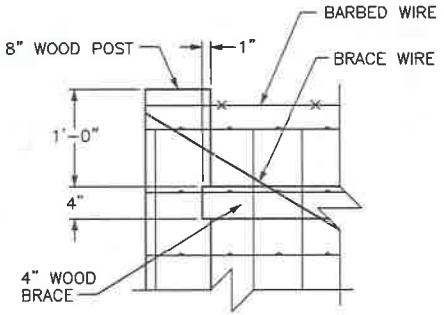


ALTERNATE METHODS OF SECURING VERTICAL STAY WIRE TO THE HORIZONTAL WIRE OF THE FABRIC.

DETAIL " A"



LINE POST



DETAIL " B"

NOTES:

1. ON INTERMEDIATE PULL POST ASSEMBLIES, BRACE WIRES SHALL BE REQUIRED FOR BOTH DIRECTIONS.
2. WOVEN-WIRE FABRIC USED IN RIGHT-OF-WAY FENCE SHALL BE EITHER ALUMINUM-COATED STEEL NO. 1047-6-9 OR ZINC-COATED STEEL NO. 1047-6-9.

LEXINGTON

DIVISION OF ENGINEERING

WOVEN WIRE RIGHT-OF-WAY FENCE TYPE 2

STANDARD DRAWING NO. 313

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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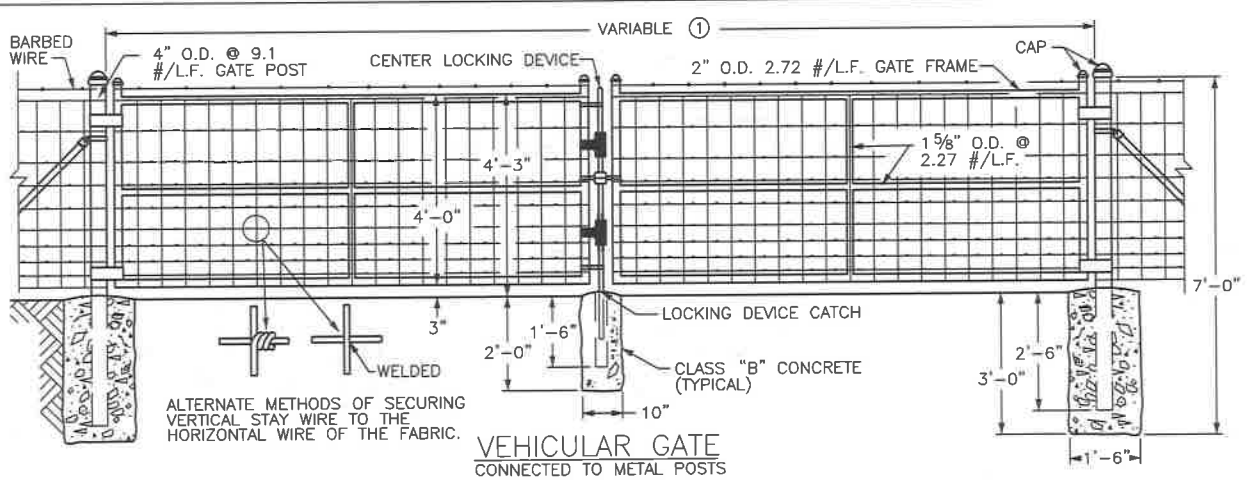
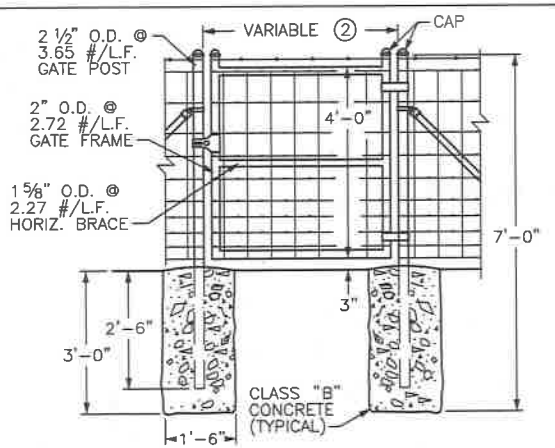
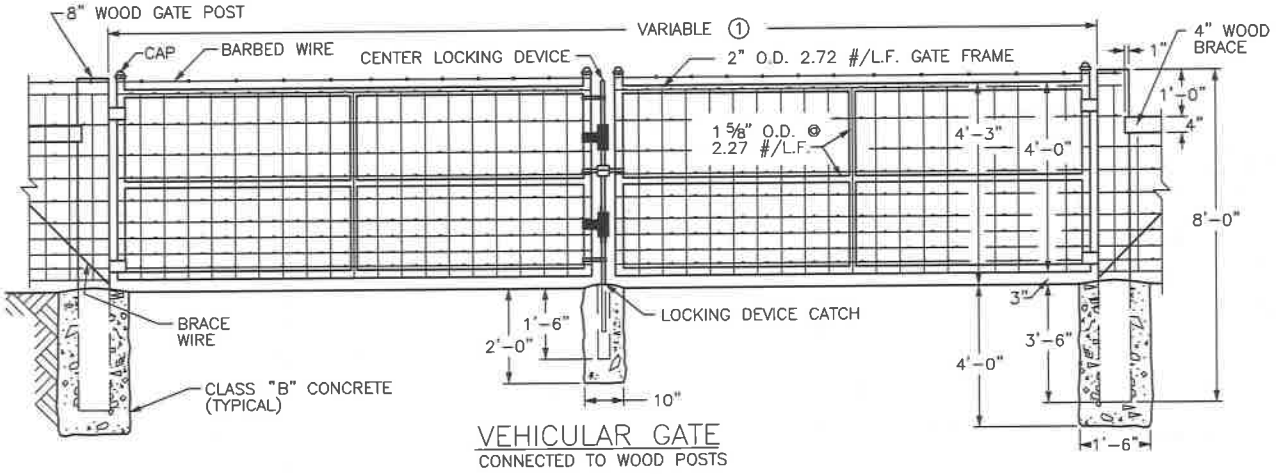


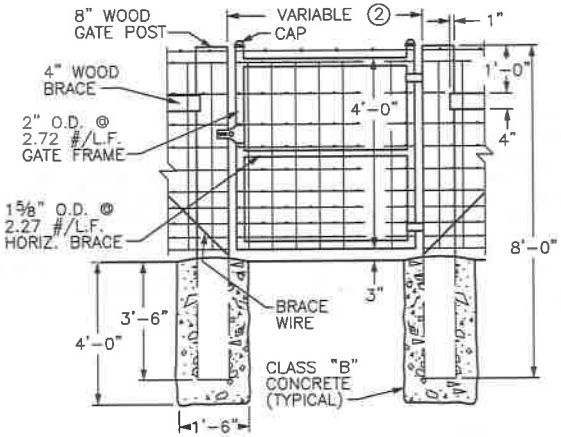
VEHICULAR GATE
CONNECTED TO METAL POSTS



PEDESTRIAN GATE
CONNECTED TO METAL POSTS



VEHICULAR GATE
CONNECTED TO WOOD POSTS



PEDESTRIAN GATE
CONNECTED TO WOOD POSTS

NOTES:

BASIS OF PAYMENT:

THE CONTRACT UNIT PRICE FOR WOVEN WIRE GATES SHALL BE:

① FEET WIDE SINGLE VEHICULAR WOVEN WIRE GATE

① FEET WIDE DOUBLE VEHICULAR WOVEN WIRE GATE

② FEET WIDE PEDESTRIAN WOVEN WIRE GATE

① – ② AS SHOWN ON PLANS

CONSTRUCTION REQUIREMENTS:

FABRIC TIE WIRES SHALL BE SPACED 12 INCHES ON CENTERS. THE CONTRACTOR IS NOT TO ORDER GATES UNTIL THEIR NECESSITY AND LOCATION HAVE BEEN CERTIFIED BY THE ENGINEER.

MATERIALS:

WOVEN-WIRE FABRIC USED IN THE GATES SHALL EITHER BE ALUMINUM-COATED STEEL NO. 1047-6-9 OR ZINC-COATED STEEL NO. 1047-6-9.

O.D. DEPICTED FOR TUBULAR POSTS IS NOMINAL – ASTM F 1083 SHALL GOVERN.

GATES SHALL HAVE HEAVY PRESSED STEEL CORNERS SECURELY RIVETED OR SHALL BE MACHINE NOTCHED AND ELECTRICALLY WELDED SO AS TO BE RIGID AND WATER TIGHT. ALL WELDED JOINTS SHALL BE CLEANED AND PAINTED WITH TWO (2) COATS OF ALUMINUM PAINT.

GENERAL:

① 6' TO 13' WIDTH FOR SINGLE GATE AND 12' TO 26' WIDTH FOR DOUBLE GATE.

② 4' TO 6' WIDTH

LEXINGTON

DIVISION OF ENGINEERING

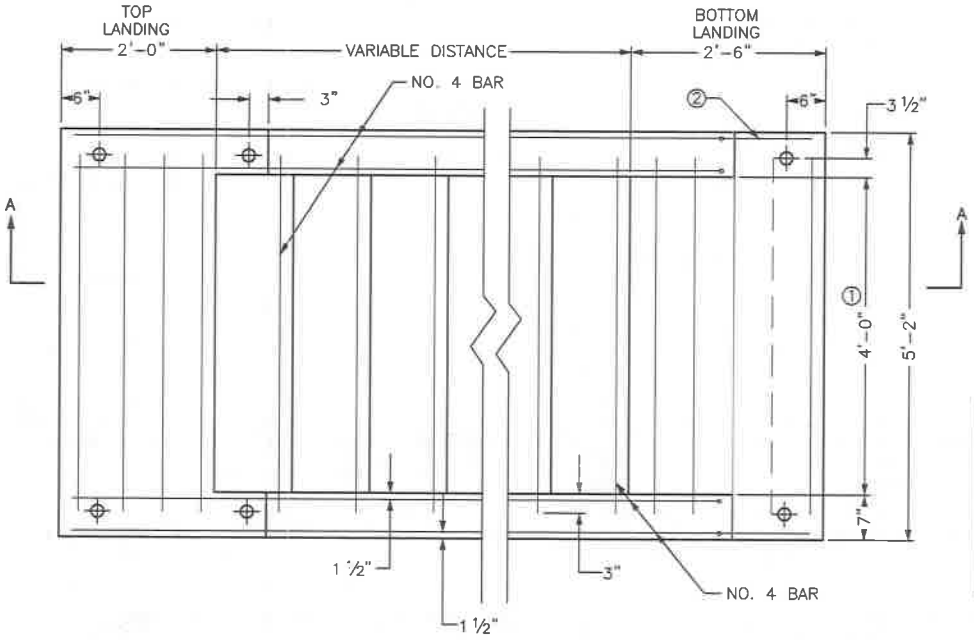
WOVEN WIRE GATES

STANDARD DRAWING NO. 314

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE



PLAN

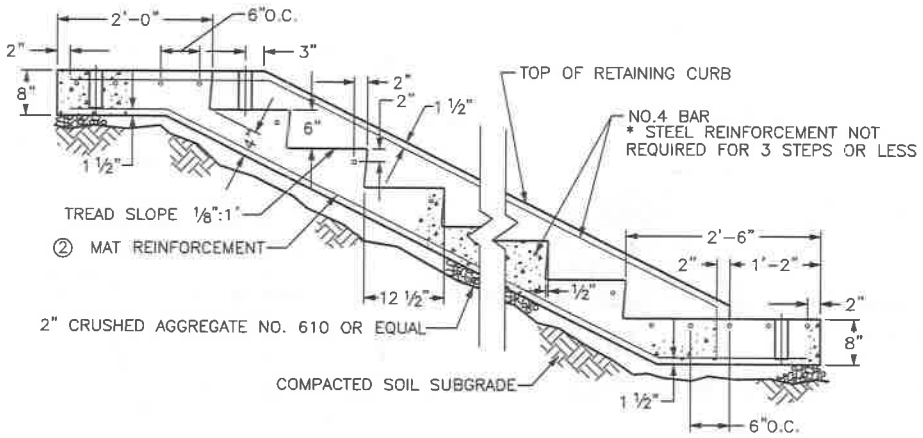
NOTES:

1. MAT REINFORCEMENT ②
   NO. 4 REINFORCEMENT BARS, LONG. BARS 6"O.C. AND TRANSV. BARS 12"O.C., MIN. GRADE 40, OR WELDED WIRE FABRIC–6X6–W4XW4, 58 LBS./100 SQ. FT.
2. NO. 4 REINFORCEMENT BARS ADDITIONALLY AS SHOWN.
3. ROUND ALL EXPOSED EDGES AND CORNERS ¼" R.
4. MAT REINFORCEMENT IN BOTTOM OF THE STEPS SHALL BE WIRE FABRIC OR BAR MAT ②.
5. HANDRAIL SHALL BE REQUIRED WITH THREE OR MORE STEPS.

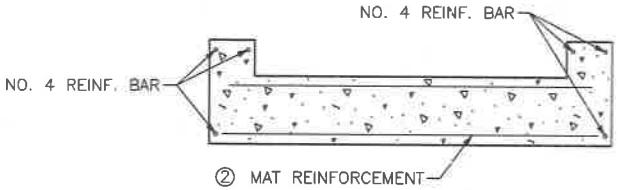
TABLE OF QUANTITIES

SLOPE	LOCATION	ADDITIONAL NO. 4 BAR REINF. (LBS)		MAT REINFORCEMENT WIRE FABRIC(SQ.FT.)		MAT REINFORCEMENT BAR MAT (LBS)		CU. YDS. CLASS "A" CONCRETE	
		4' WIDTH	①	4' WIDTH	①	4' WIDTH	②	4' WIDTH	①
2:1	BOTTOM LANDING	23.547	3.340	11.776	2.375	27.388	5.177	0.337	0.059
	INTERMEDIATE STEP	8.015	1.336	5.991	1.208	12.191	2.283	0.16	0.025
	TOP LANDING	22.483	3.340	9.504	1.917	20.708	3.897	0.265	0.051
1½:1	BOTTOM LANDING	23.603	3.340	12.602	2.542	28.613	5.400	0.36	0.062
	INTERMEDIATE STEP	7.431	1.336	5.268	1.063	11.119	2.098	0.17	0.027
	TOP LANDING	22.545	3.340	9.710	1.958	21.014	3.952	0.281	0.054

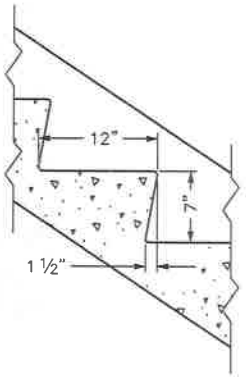
① APPROXIMATE QUANTITY TO ADD FOR EACH ADDITIONAL FOOT OF WIDTH OVER 4'–0".



SECTION A–A 2:1 SLOPE



STEP CROSS SECTION



STEP DETAIL FOR 1 ½:1 SLOPE

LEXINGTON

DIVISION OF ENGINEERING

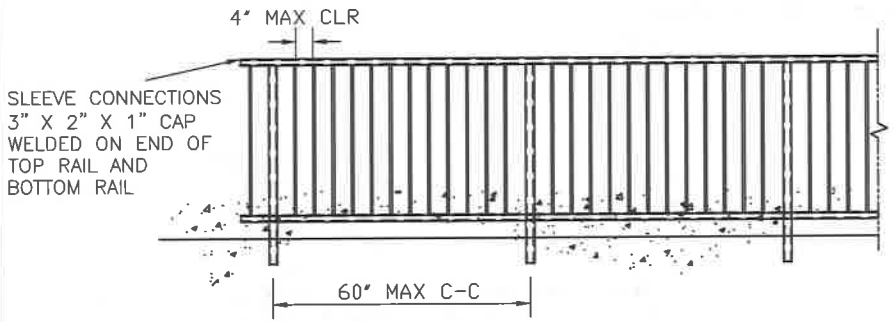
CONCRETE STEPS

STANDARD DRAWING NO. 315

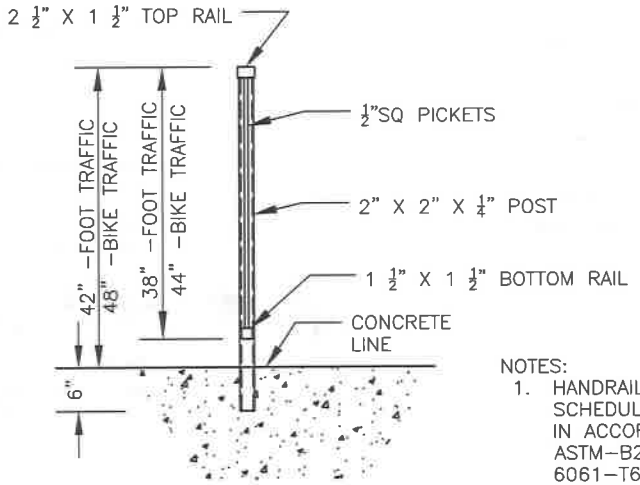
APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17



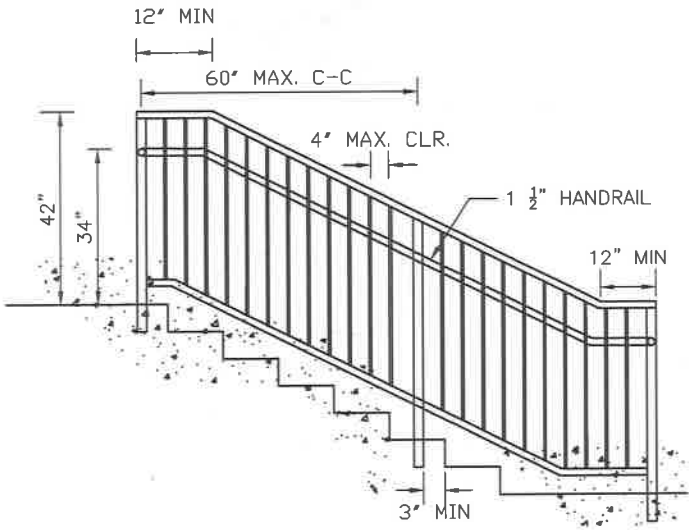
TOP RAIL FOR RETAINING WALLS



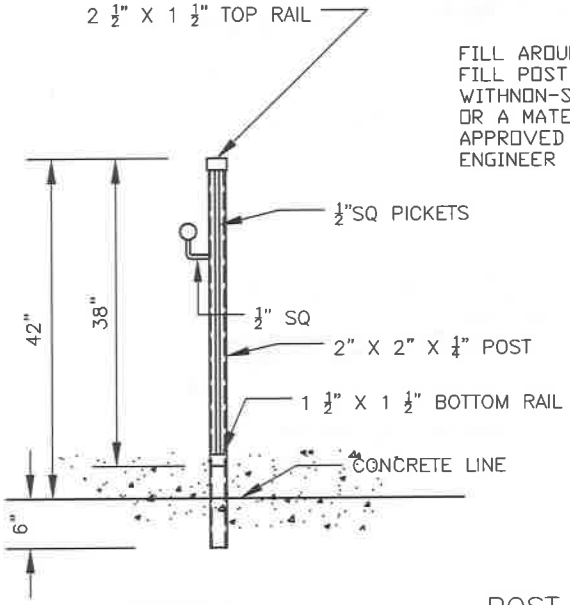
SECTION

NOTES:

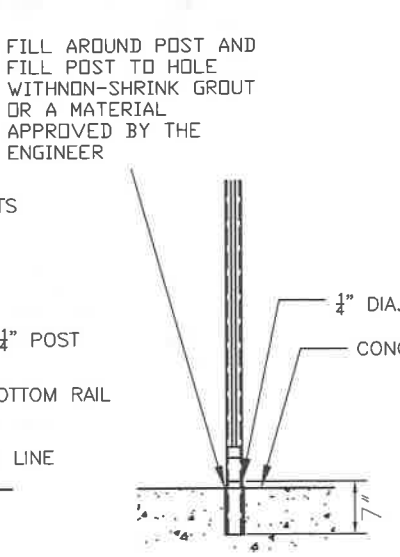
1. HANDRAILS SHALL BE DN 40 SCHEDULE 40 ALUMINUM PIPE IN ACCORDANCE WITH ASTM–B221 OR B210 ALLOY 6061–T6.
2. SQUARE BARS SHALL BE DN 40 SCHEDULE ALUMINUM IN ACCORDANCE WITH ASTM –B221 OR B210 ALLOY 6061–T6.
3. ALL METAL TO BE POWDER COATED BLACK IN ACCORDANCE WITH AAMA 2605.
4. GROUT POSTS TO CONCRETE – SEE POST SETTINGS DETAIL THIS SHEET.
5. ANCHOR POSTS IN CORED OR FORMED HOLES.
6. ALUMINUM SURFACES, SUCH AS EXPOSED ENDS, IN CONTACT WITH CONCRETE, GROUT, OR DISSIMILAR METALS SHALL BE PROTECTED WITH A COAT OF BITUMINOUS PAINT.



HANDRAIL FOR STEPS



SECTION



POST SETTING DETAIL

LEXINGTON

DIVISION OF ENGINEERING

TOP RAIL FOR RETAINING WALLS HANDRAIL FOR STEPS

STANDARD DRAWING NO. 316

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE

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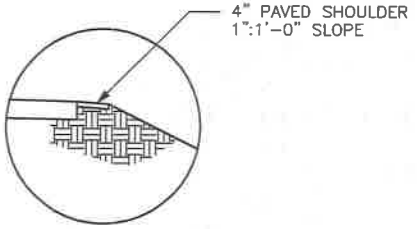
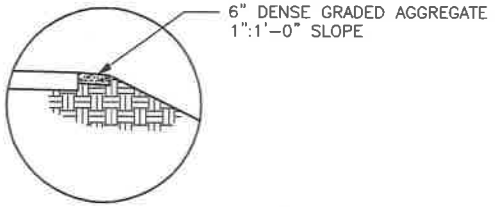
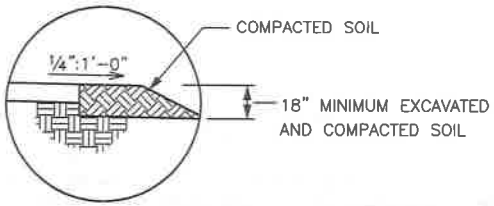


DETAIL "A"



DETAIL "B"



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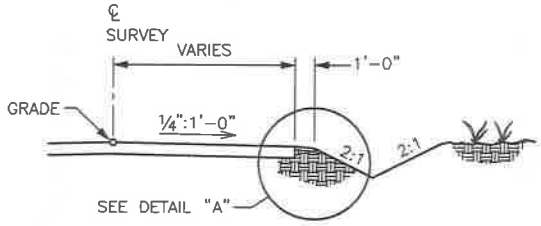
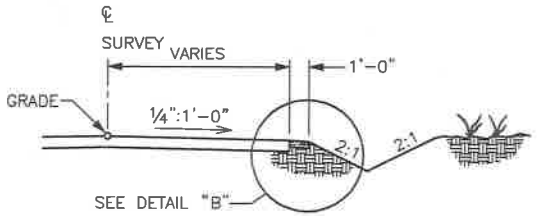
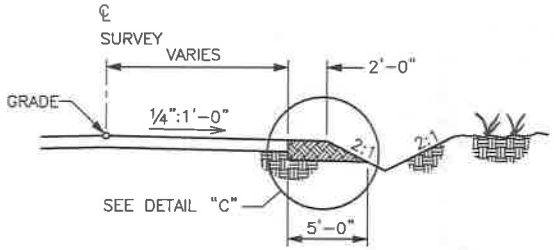


PAVED SHOULDER



ROCK SHOULDER



SOIL SHOULDER

NOTES:

1. SLOPES AND DRAINAGE DITCHES OUTSIDE THE R/W SHALL BE APPROVED BY THE ENGINEER.
2. DRAINAGE DITCH SIDE SLOPES SHALL BE 2:1 MAXIMUM.

LEXINGTON

DIVISION OF ENGINEERING

COUNTY ROAD
TYPICAL SHOULDER SECTIONS
(MINIMUM REQUIREMENTS)

STANDARD DRAWING NO. 317

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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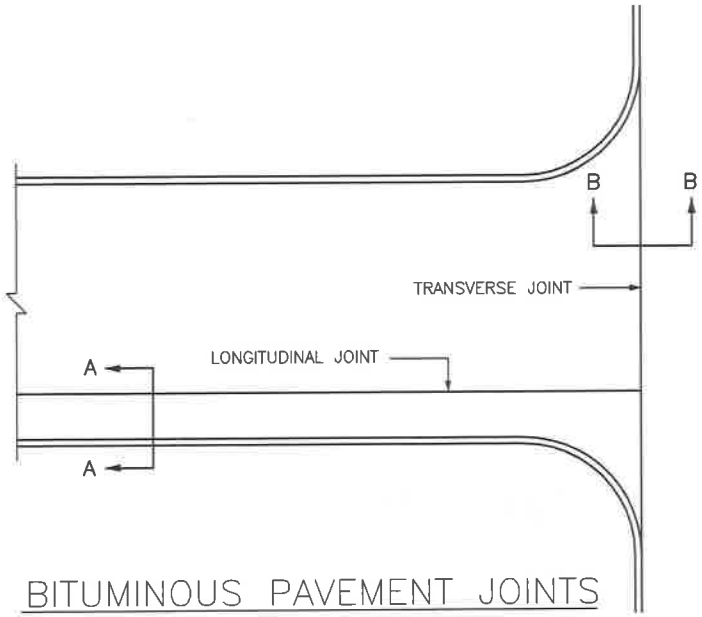
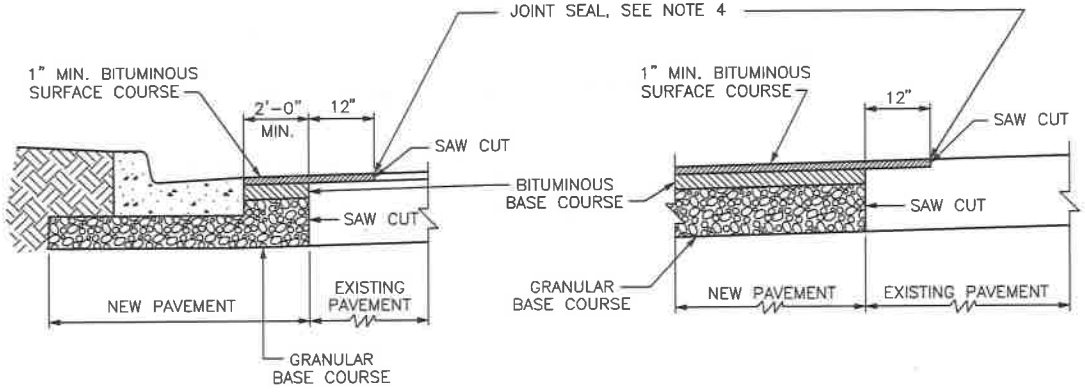


BITUMINOUS PAVEMENT JOINTS

NOTES:

1. ALL SAW-CUTS SHALL BE NEAT AND STRAIGHT.
2. IMMEDIATELY BEFORE LAYING NEW BITUMINOUS COURSES, ALL SAW CUT EDGES SHALL BE CLEANED OF DUST AND DEBRIS AND SPRAYED WITH A BITUMINOUS TACK COAT.
3. EDGE KEY SHALL NOT BE REQUIRED IF BOTH EXISTING AND NEW PAVEMENT ARE TO RECEIVE AN OVERLAY AS PART OF THIS CONTRACT.
4. SEAL PERIMETER OF CUT PAVEMENT WITH CRACK SEALANT THAT MEETS ASTM D6690, TYPE 2.



SECTION A-A
LONGITUDINAL EDGE KEY

SECTION B-B
TRANSVERSE EDGE KEY

LEXINGTON

DIVISION OF ENGINEERING

EDGE KEY

STANDARD DRAWING NO. 318

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE

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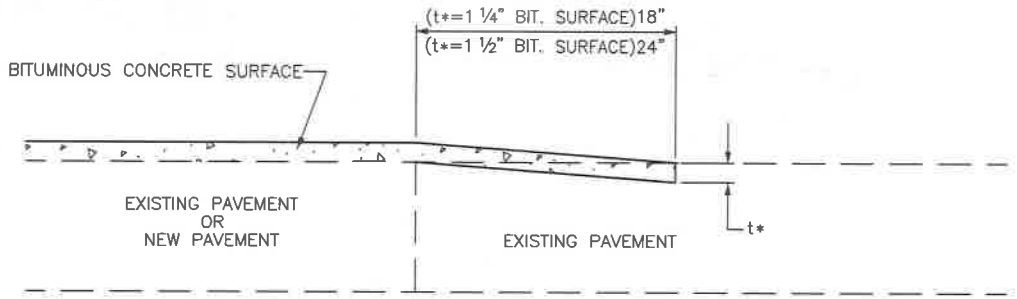

EDGE KEY

LEXINGTON

DIVISION OF ENGINEERING

TYPICAL EDGE KEY
FOR
MINIMUM OVERLAYS,
SHORT PROJECTS,
LOW SPEED

STANDARD DRAWING NO. 319

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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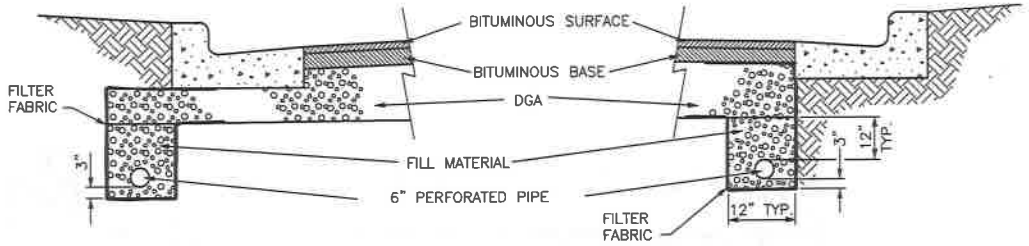
TYPICAL SECTION

CASE 1

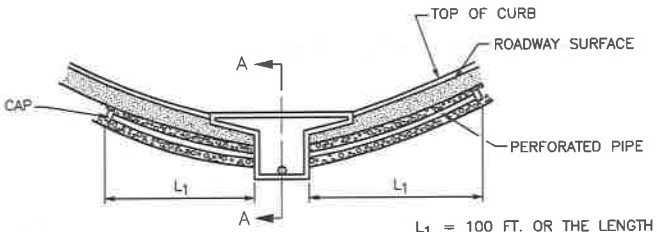


CASE 2

NOTES:

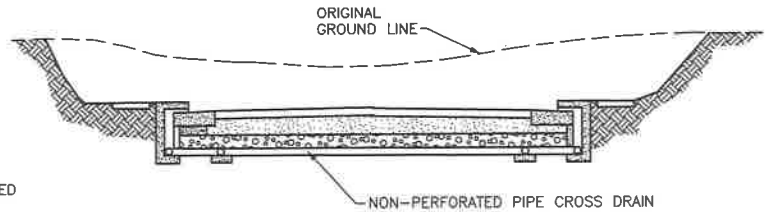
1. SUBGRADE DRAINAGE, AS DEPICTED, IS INTENDED FOR USE WITH THE SURFACING PHASE OF CONSTRUCTION, AND SHALL BE INSTALLED ONLY AFTER THE SUBGRADE HAS BEEN COMPLETED, AND PRIOR TO CONSTRUCTING PAVING MATERIALS.
2. THE CAP SHALL BE A STANDARD MANUFACTURED ITEM FURNISHED BY THE PIPE SUPPLIER.
3. TERMINATE PERFORATED PIPE IN CATCH BASIN AT AN ELEVATION WHICH PROVIDES POSITIVE DRAINAGE (MAY REQUIRE ADDITIONAL OPENING IN CATCH BASIN WALL).
4. BACKFILL TO CONSIST OF NO. 78, 8, 9M COARSE AGGREGATE OR NATURAL SAND. THE FILL MATERIAL SHALL BE THOROUGHLY COMPACTED IN LAYERS NOT EXCEEDING 6 INCHES LOOSE MEASUREMENT.
5. CONNECTIONS TO DRAINAGE STRUCTURES AND PIPE TERMINI SHALL BE NON-PERFORATED PIPE MEETING THE REQUIREMENTS OF THE PERFORATED PIPE EXCEPT FOR PERFORATIONS.
6. ALL RAISED NON-PAVED MEDIANS SHALL HAVE SUBGRADE DRAINAGE ASSOCIATED WITH CURB AND GUTTER.

TYPICAL SUBGRADE DRAINAGE LOCATIONS

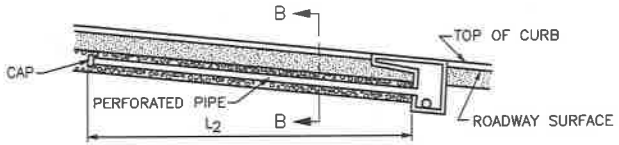


SAG VERTICAL CURVE

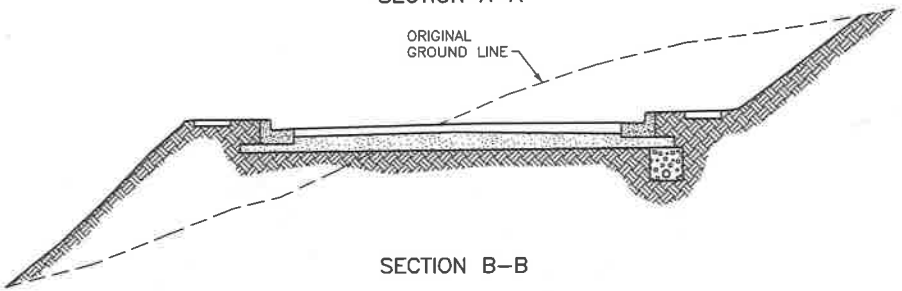
L_1 = 100 FT. OR THE LENGTH REQUIRED TO REACH THE 1% SLOPE POINT, WHICHEVER IS LARGER.



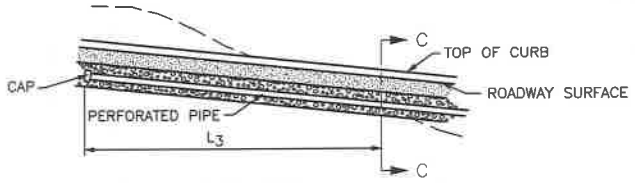
SECTION A-A



HILLSIDE L_2 = 100 FT. OR THE LENGTH TO THE CREST OF THE HILL, WHICHEVER IS LARGER.

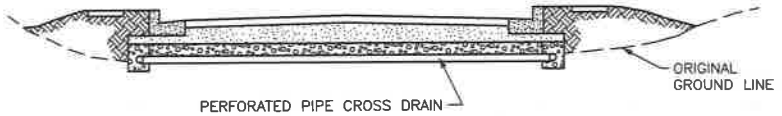


SECTION B-B



CUT TO FILL

L_3 = 100 FT. OR THE LENGTH REQUIRED TO REACH THE CREST OF THE HILL, WHICHEVER IS LARGER.



SECTION C-C

LEXINGTON

DIVISION OF ENGINEERING

PERFORATED PIPE SUBGRADE DRAINAGE ALONG ROADWAY

STANDARD DRAWING NO. 320-1

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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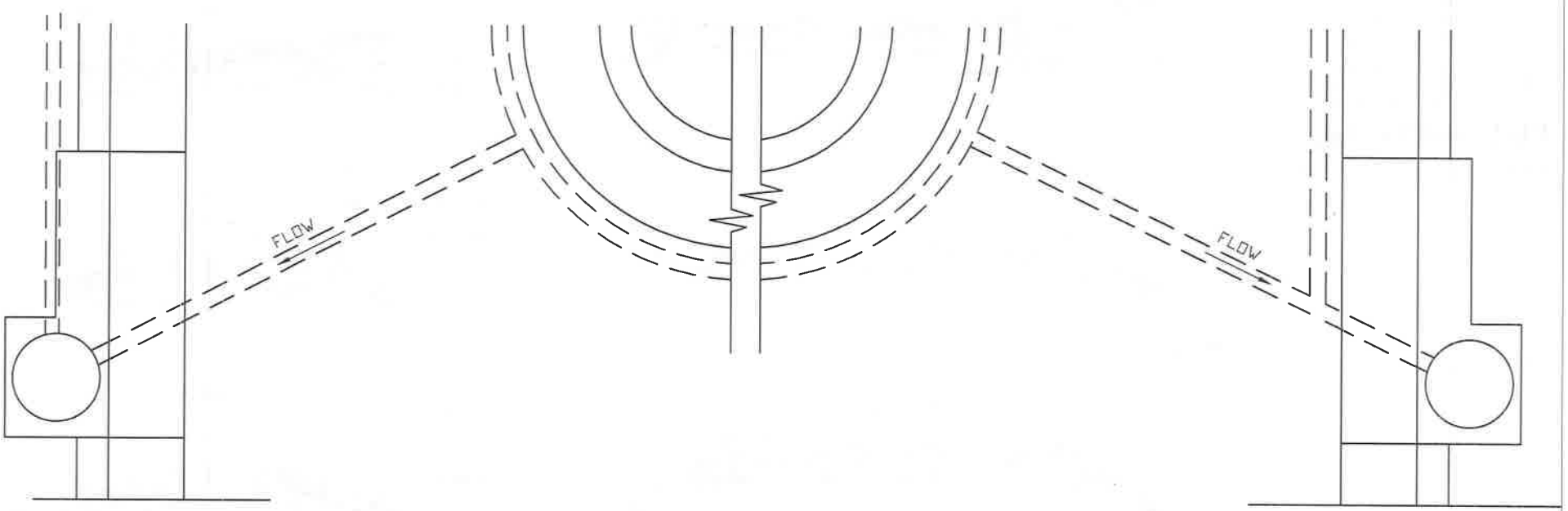
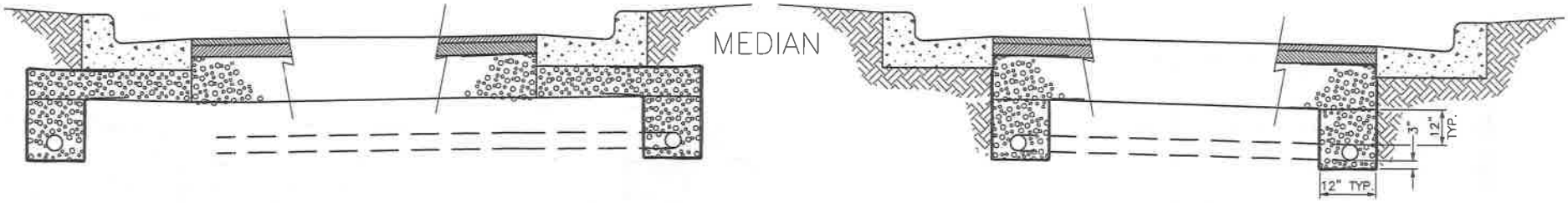


CURB ON PAVEMENT

CURB ON SOIL



TYPICAL SECTION

1. For installation of perforated pipe see Detail Sheet #320
2. Perforated pipe shall completely surround all islands
3. For islands greater than 50" long or wide, perforated pipe surrounding island and leading to the curb inlet shall be 6" diameter.

LEXINGTON

DIVISION OF ENGINEERING

PERFORATED PIPE
SUBGRADE DRAINAGE
FOR RAISED
NON–PAVED MEDIANS

STANDARD DRAWING NO. 320–2

APPROVAL:

URBAN COUNTY ENGINEER — DATE 9/22/17

COMMISSIONER — DATE 9/22/17

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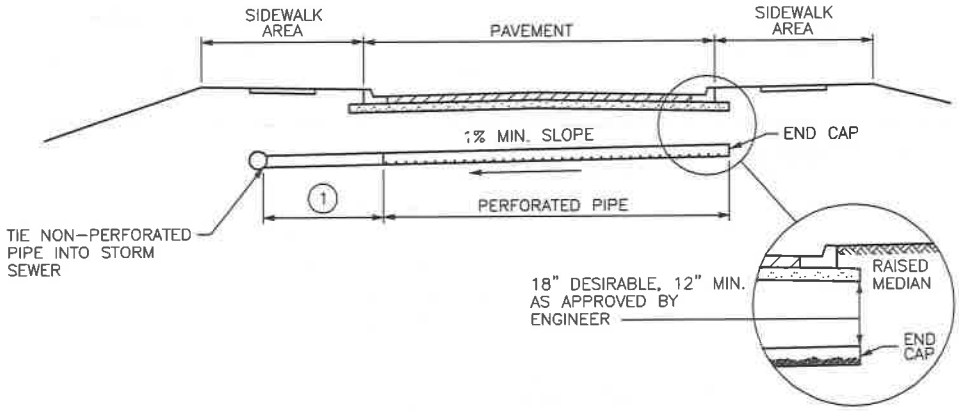
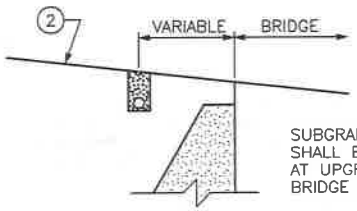


NOTES:

1. SUBGRADE DRAINAGE, AS DEPICTED, IS INTENDED FOR USE WITH THE ROADWAY CONSTRUCTION PHASE AND SHALL BE INSTALLED ONLY AFTER THE SUBGRADE HAS BEEN COMPLETED, AND PRIOR TO PLACING PAVING MATERIALS.
2. SUBGRADE DRAINAGE WILL NOT BE REQUIRED WHEN:
   A. AGGREGATE SUBGRADE OR NATURAL BANK GRAVEL IS SPECIFIED.
   B. POROUS OR FREE DRAINING SUBGRADES ARE EVIDENT.
   C. DIRECTED BY THE LFUCG ENGINEER.
3. THE END CAP SHALL BE A STANDARD MANUFACTURED ITEM FURNISHED BY THE PIPE SUPPLIER.
4. FLOW SHALL BE DIRECTED TOWARD THE FILL SIDE OF THE ROADWAY WHEN POSSIBLE.
5. IF ROCK IS ENCOUNTERED WITHIN 24" OF SUBGRADE, PERFORATED PIPE IS REQUIRED THE FULL LENGTH OF ROCK. POSITIVE OUTLET IS REQUIRED.
6. A MIN. OF 100' OF PERFORATED PIPE IS REQUIRED UPHILL FROM BASINS ON GRADE AND 100' OF PERFORATED PIPE IS REQUIRED EACH WAY FROM SAG BASINS.

SAG VERTICAL CURVES

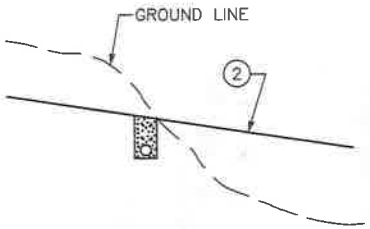


SUBGRADE DRAINAGE SHALL BE INSTALLED AT UPGRADE END OF BRIDGE ONLY

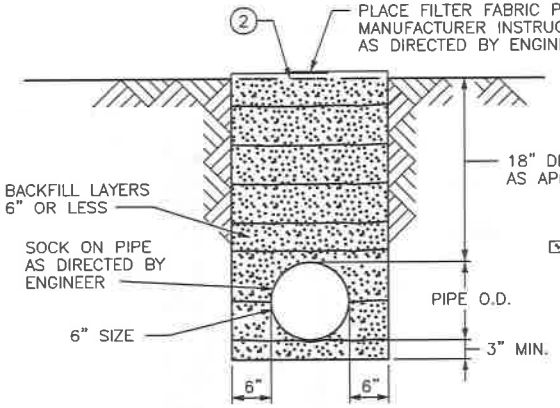
BRIDGES

(1) APPROXIMATELY 8 TO 12 FEET OF PIPE AT THE OUTLET SHALL BE NON-PERFORATED PIPE MEETING THE REQUIREMENTS OF THE PERFORATED PIPE, EXCEPT FOR PERFORATIONS.

(2) SUBGRADE ELEVATION



CUT TO FILL



TRENCH DETAIL

— NO. 78, 8, OR 9M COARSE AGGREGATE. THE FILL MATERIAL SHALL BE THOROUGHLY COMPACTED IN LAYERS NOT EXCEEDING 6 INCHES LOOSE MEASUREMENT.

TYPICAL SUBGRADE DRAINAGE LOCATIONS

LEXINGTON — FAYETTE URBAN COUNTY GOVERNMENT

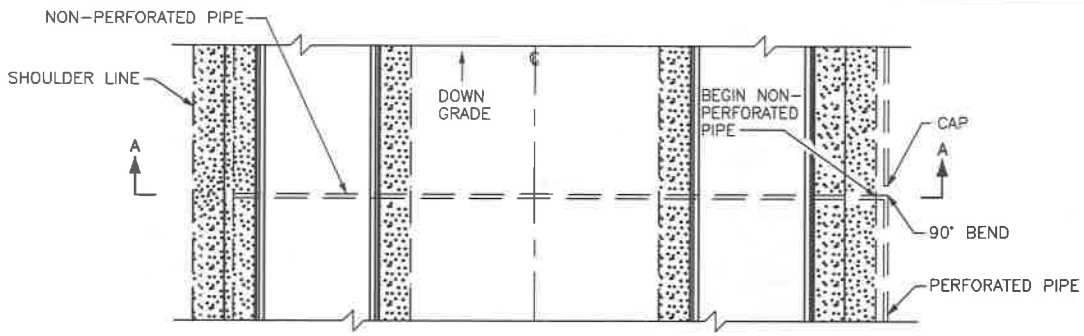
LEXINGTON
DIVISION OF ENGINEERING

PERFORATED PIPE FOR SUBGRADE DRAINAGE

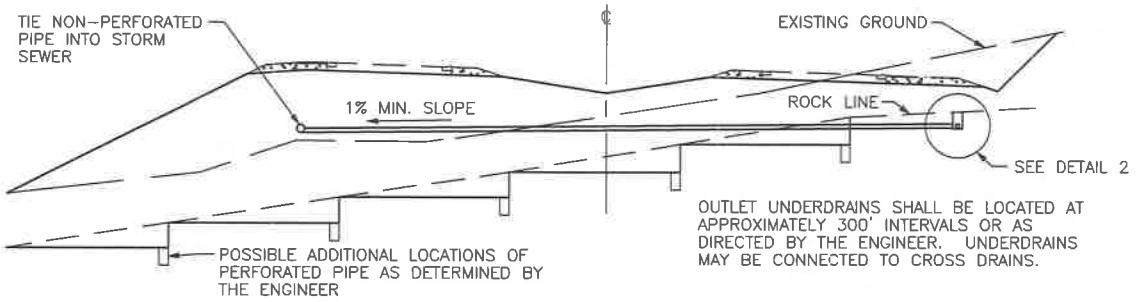
STANDARD DRAWING NO. 321

APPROVAL:
URBAN COUNTY ENGINEER — DATE 9/22/17
COMMISSIONER — DATE 9/22/17

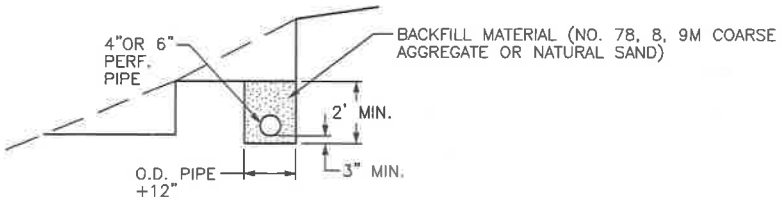
G:\ENGDATA\Standard Drawings 2017\SD322.dwg, 9/20/2017 9:45:44 AM, AutoCAD PDF (Web and Mobile).pc3



PLAN VIEW



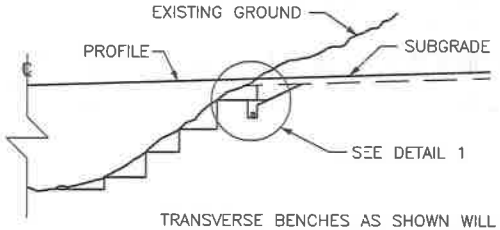
SECTION A–A



DETAIL 2

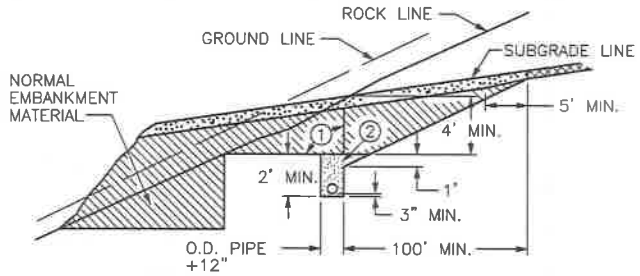
DETAIL FOR LONGITUDINAL UNDERDRAINS

DETAIL FOR TRANSVERSE UNDERDRAIN CUT TO FILL CONDITION



TRANSVERSE BENCHES AS SHOWN WILL BE REQUIRED WHERE PROPOSED GRADE INTERSECTS EXISTING GROUND.

1. UNDERDRAINS WILL BE REQUIRED ON UPGRADE BENCH. THIS PERFORATED PIPE UNDERDRAIN SHOULD BE PLACED IN ROCK OR SHALE FORMATIONS IF POSSIBLE. EXACT LOCATIONS TO BE DETERMINED BE THE ENGINEER ON CONSTRUCTION.
2. BENCHING AND UNDERDRAIN SHALL BE REQUIRED AT ALL TRANSITIONS FROM ROCK CUTS TO FILL WHETHER OR NOT UNDERDRAIN IS REQUIRED.
3. IF ROCK IS ENCOUNTERED WITHIN 24" OF SUBGRADE, PERFORATED PIPE IS REQUIRED THE FULL LENGTH OF ROCK. POSITIVE OUTLET IS REQUIRED.



DETAIL 1

SHEET NOTES: ○

① LIMITS OF FIRST BENCH.

② BACKFILL MATERIAL

NOTE:

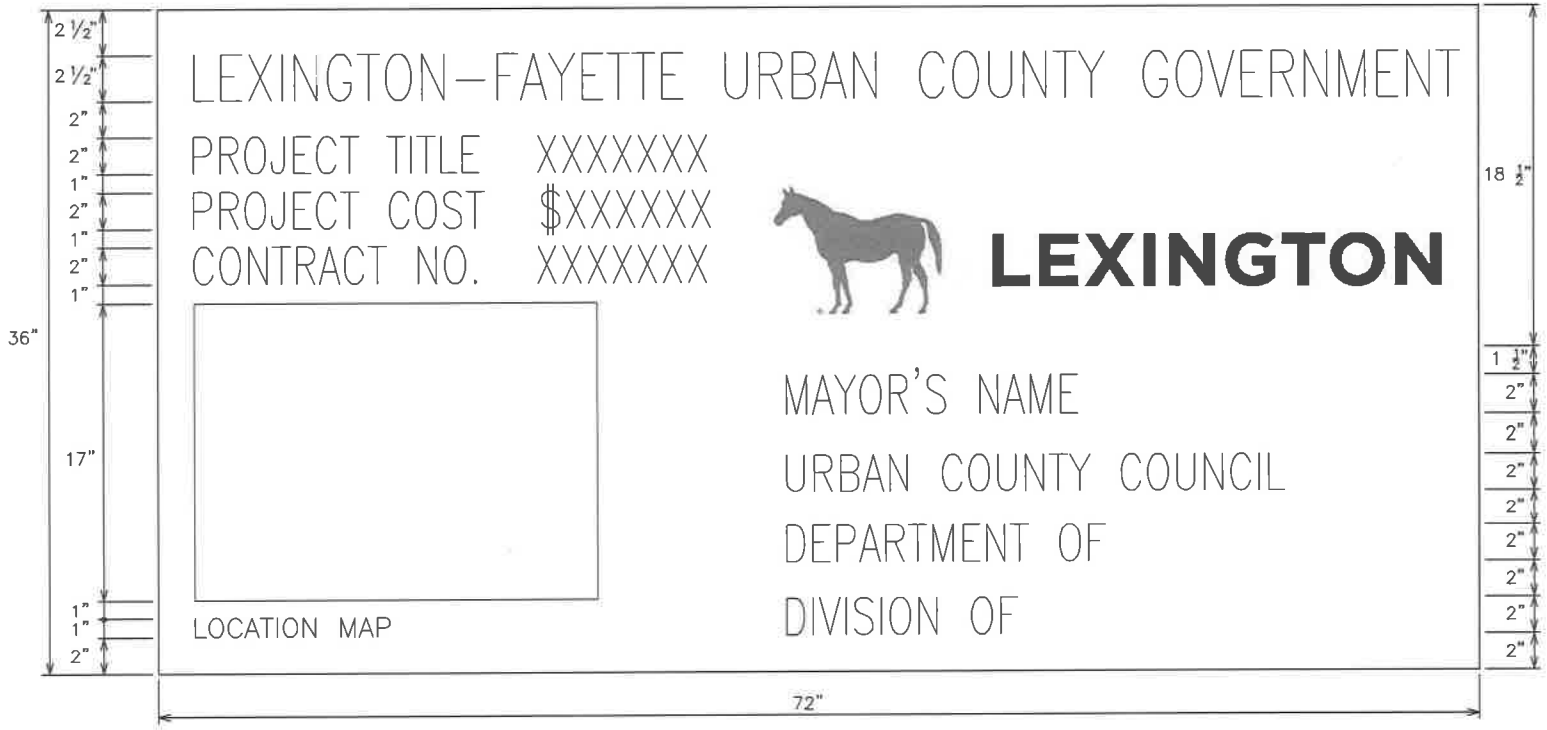
1. ALL PERFORATED AND NON-PERFORATED PIPE SHALL COMPLY WITH ASTM & KDOT SPECIFICATIONS.

LEXINGTON

DIVISION OF ENGINEERING

PERFORATED PIPE UNDERDRAINS

STANDARD DRAWING NO.	322
APPROVAL: URBAN COUNTY ENGINEER	9/22/17 DATE
COMMISSIONER	9/22/17 DATE



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

LEXINGTON

DIVISION OF ENGINEERING

PUBLIC IMPROVEMENT SIGN

STANDARD DRAWING NO. 323

APPROVAL: _____ 9/22/17
URBAN COUNTY ENGINEER DATE

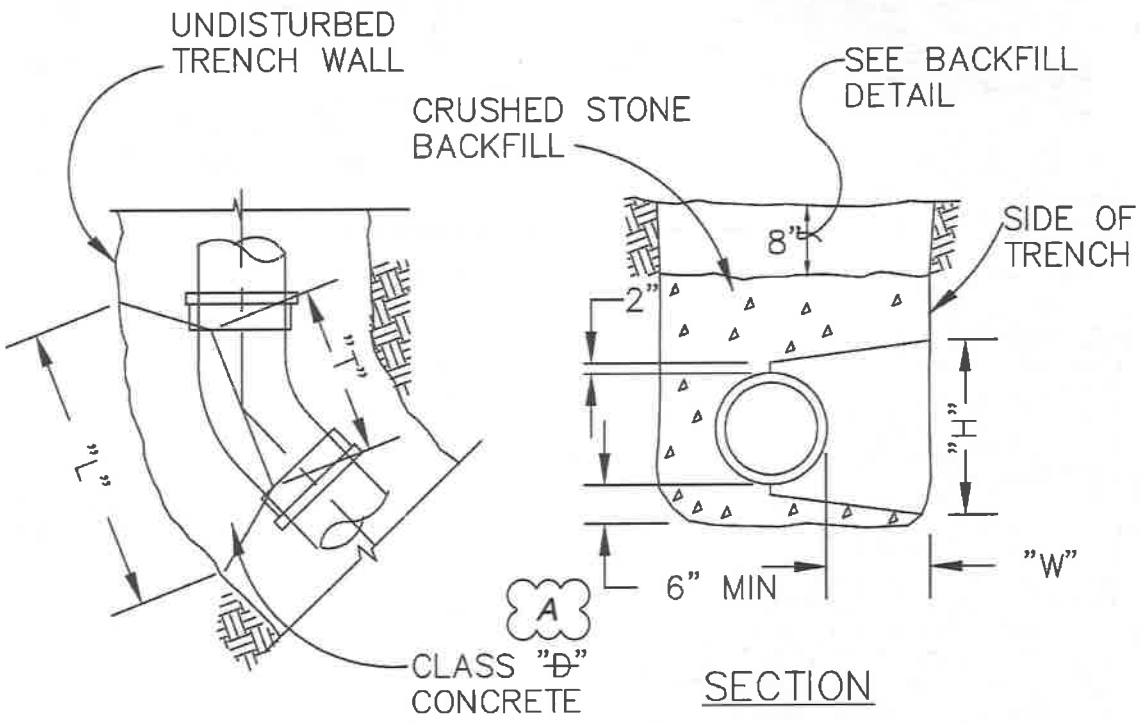
_____ 9/22/17
COMMISSIONER DATE

APPENDIX B

LFUCG SANITARY SEWER & PUMPING STATION STANDARD DRAWINGS 2009

Excerpt from:
LFUCG Sanitary Sewer and Pump Station Manual, Appendix B - Drawings

* ALL PIPE AND FITTINGS TO BE BLOCKED SHALL BE WRAPPED TO PREVENT PERMANENT ENCASEMENT OF JOINTS.



PLAN

SECTION

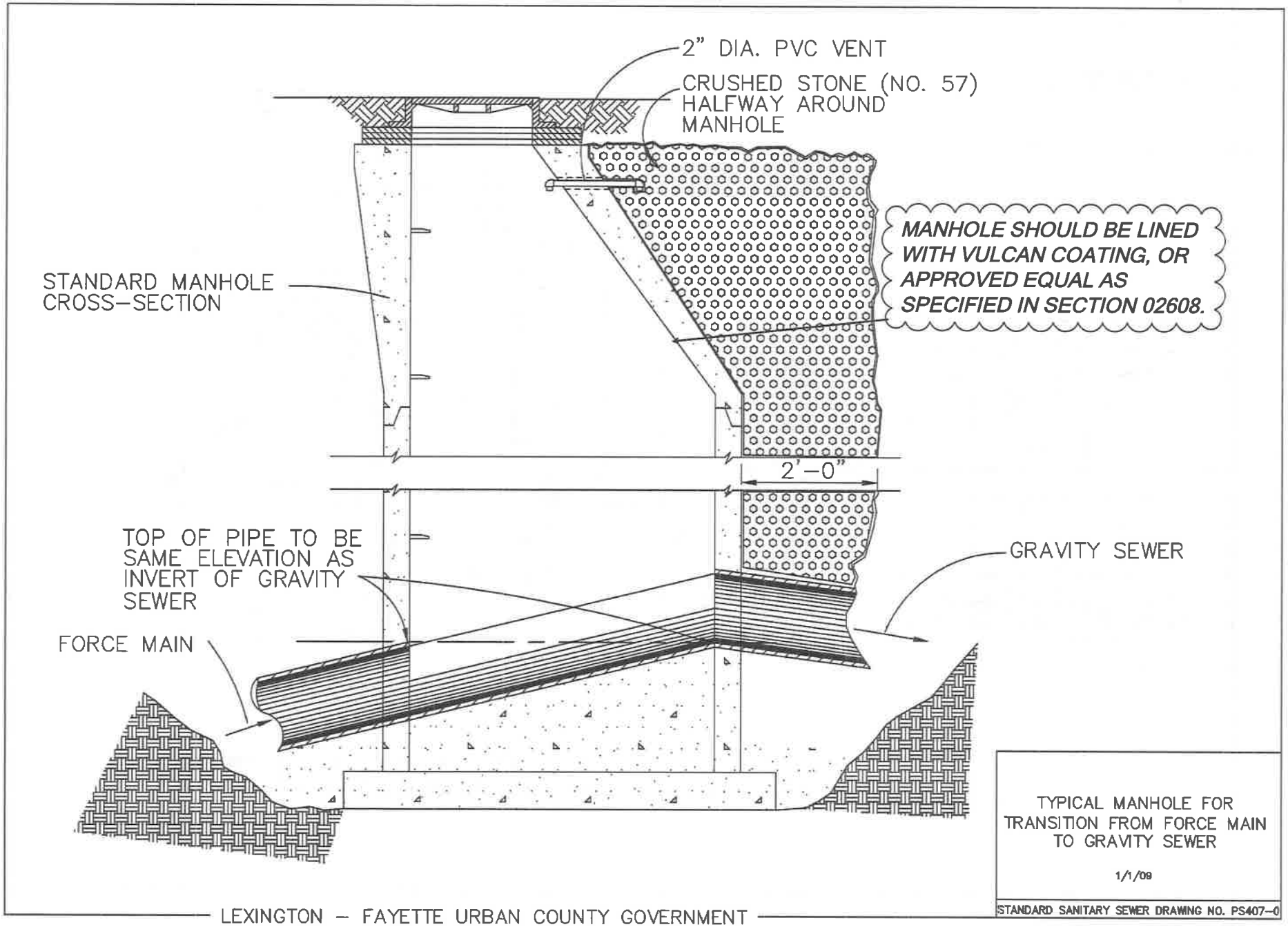
45° BEND					
SIZE D	4"	6"	8"	10"	12"
W	8"	8"	10"	12"	12"
L	14"	18"	20"	22"	27"
H	14"	16"	18"	20"	24"
T	13"	15"	16"	18"	18"

90° BEND					
SIZE D	4"	6"	8"	10"	12"
W	8"	8"	10"	12"	12"
L	14"	24"	30"	35"	40"
H	14"	16"	18"	24"	30"
T	13"	16"	18"	20"	22"

HORIZ. & VERT. BENDS & CONCRETE BACKING

1/1/09

STANDARD SANITARY SEWER DRAWING NO. PS406-0

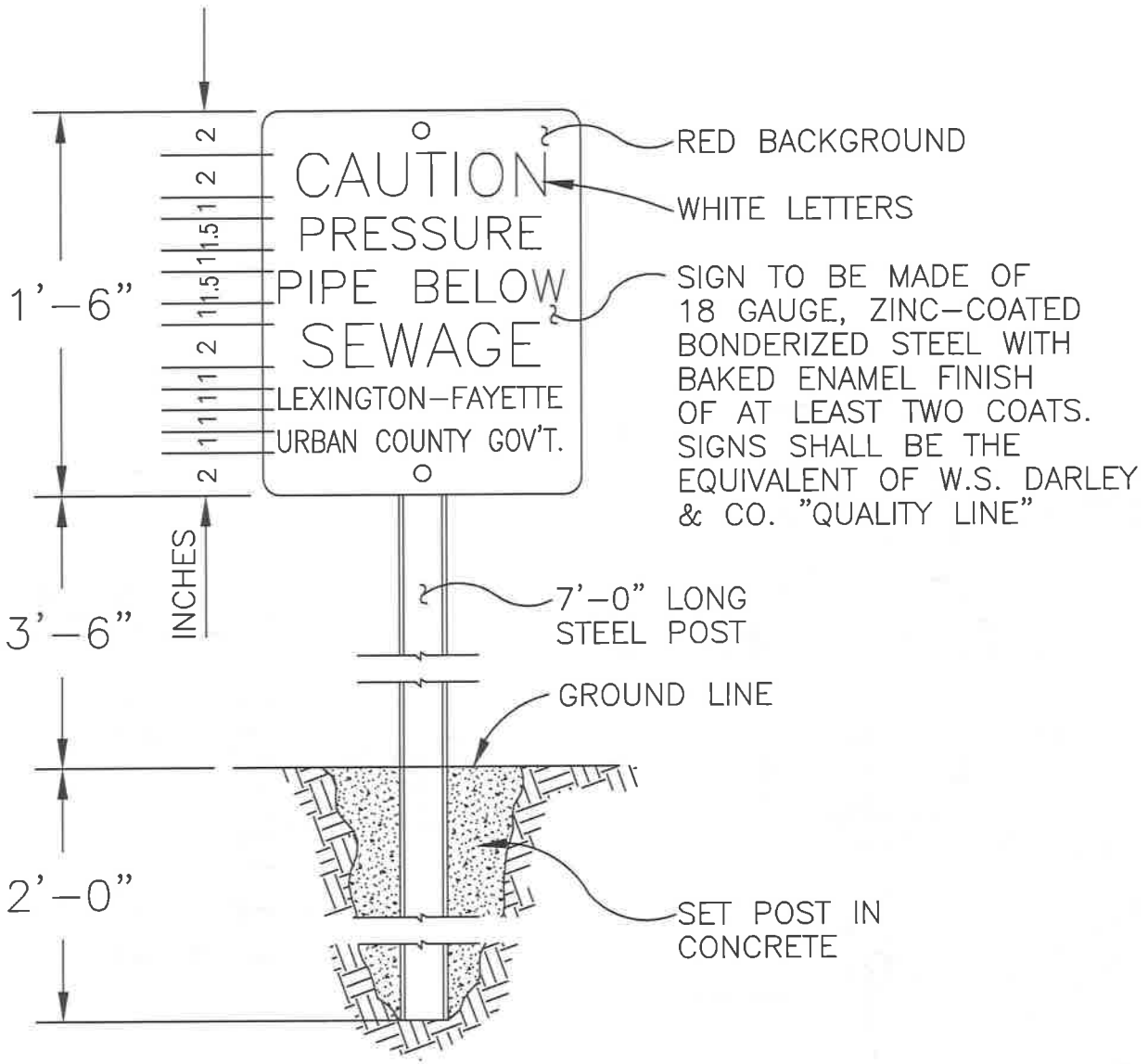


TYPICAL MANHOLE FOR TRANSITION FROM FORCE MAIN TO GRAVITY SEWER

1/1/09

STANDARD SANITARY SEWER DRAWING NO. PS407--0

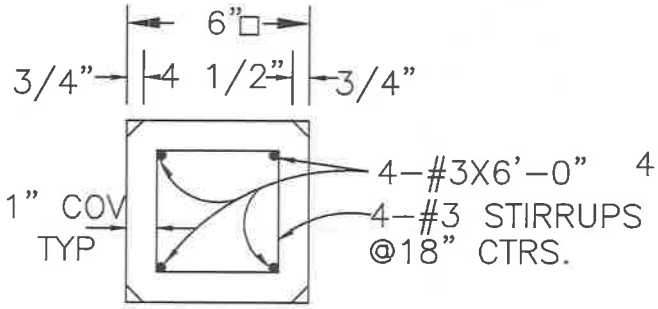
LEXINGTON – FAYETTE URBAN COUNTY GOVERNMENT



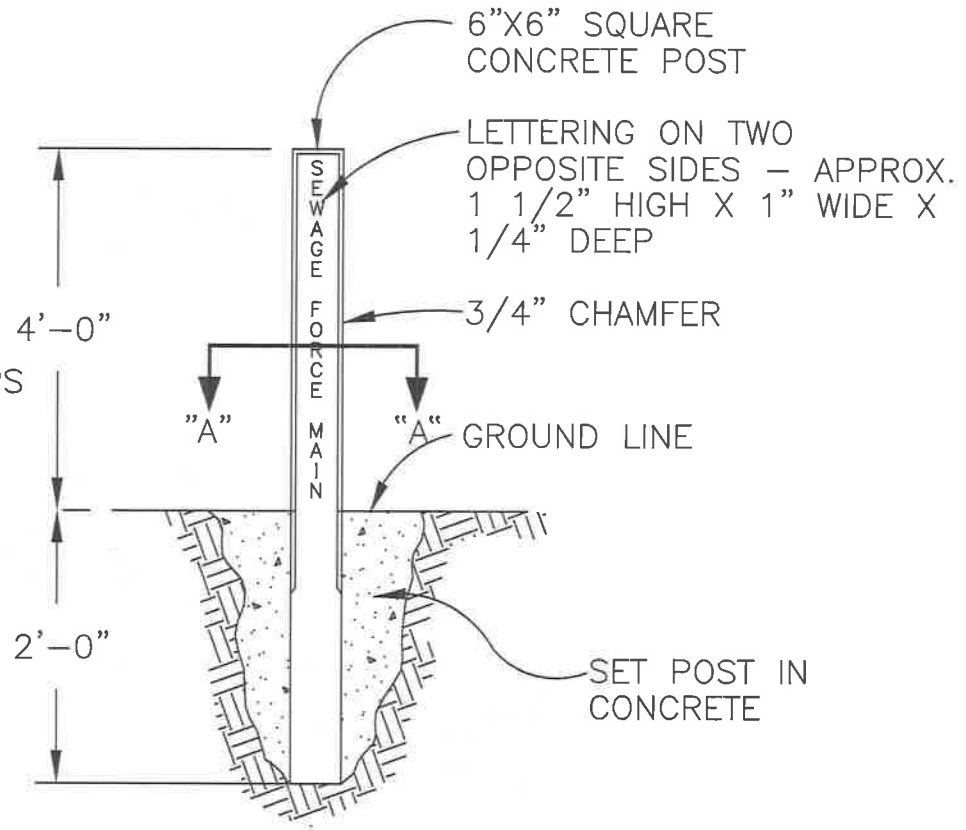
STEEL POST AND
LINE MARKER

1/1/09

STANDARD SANITARY SEWER DRAWING NO. PS408–0



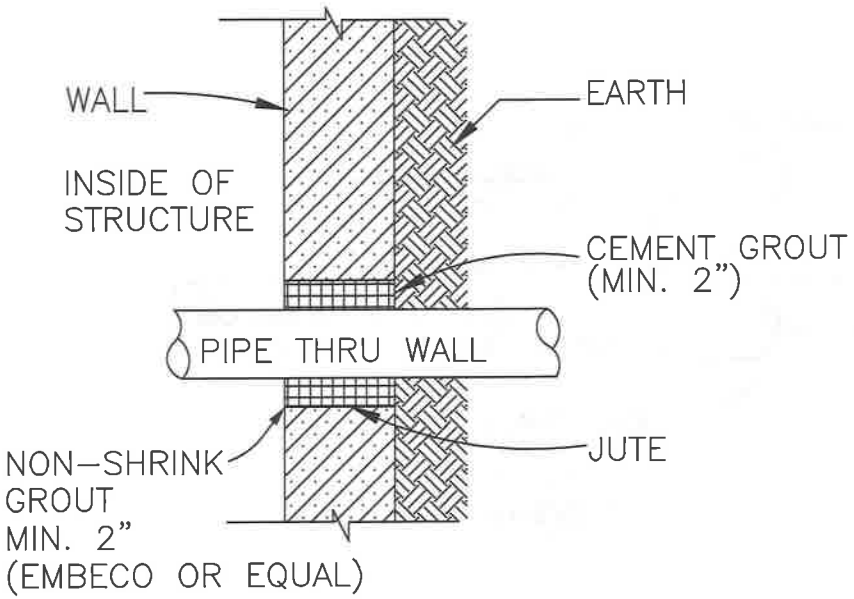
SECTION "A"

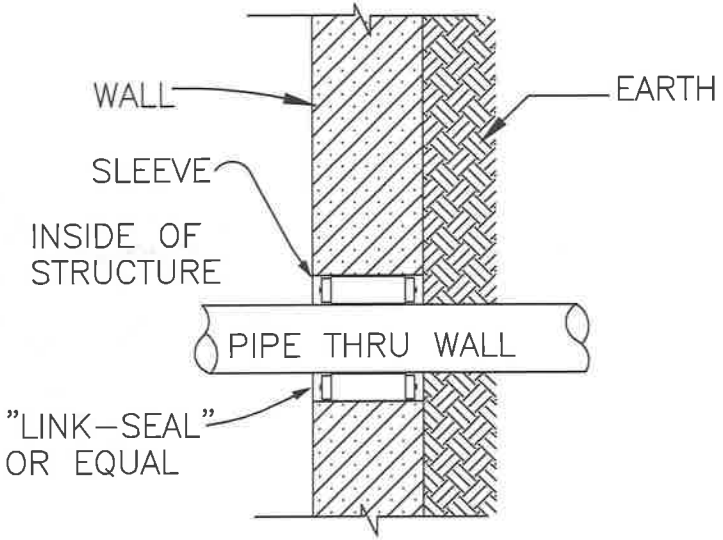


CONCRETE LINE MARKER

1/1/09

STANDARD SANITARY SEWER DRAWING NO. PS409–0

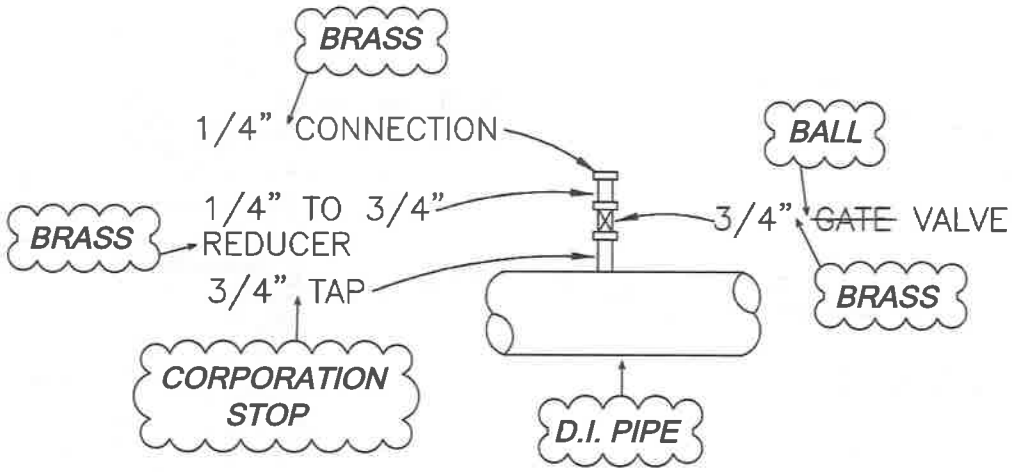




WALL PENETRATION DETAIL

1/1/09

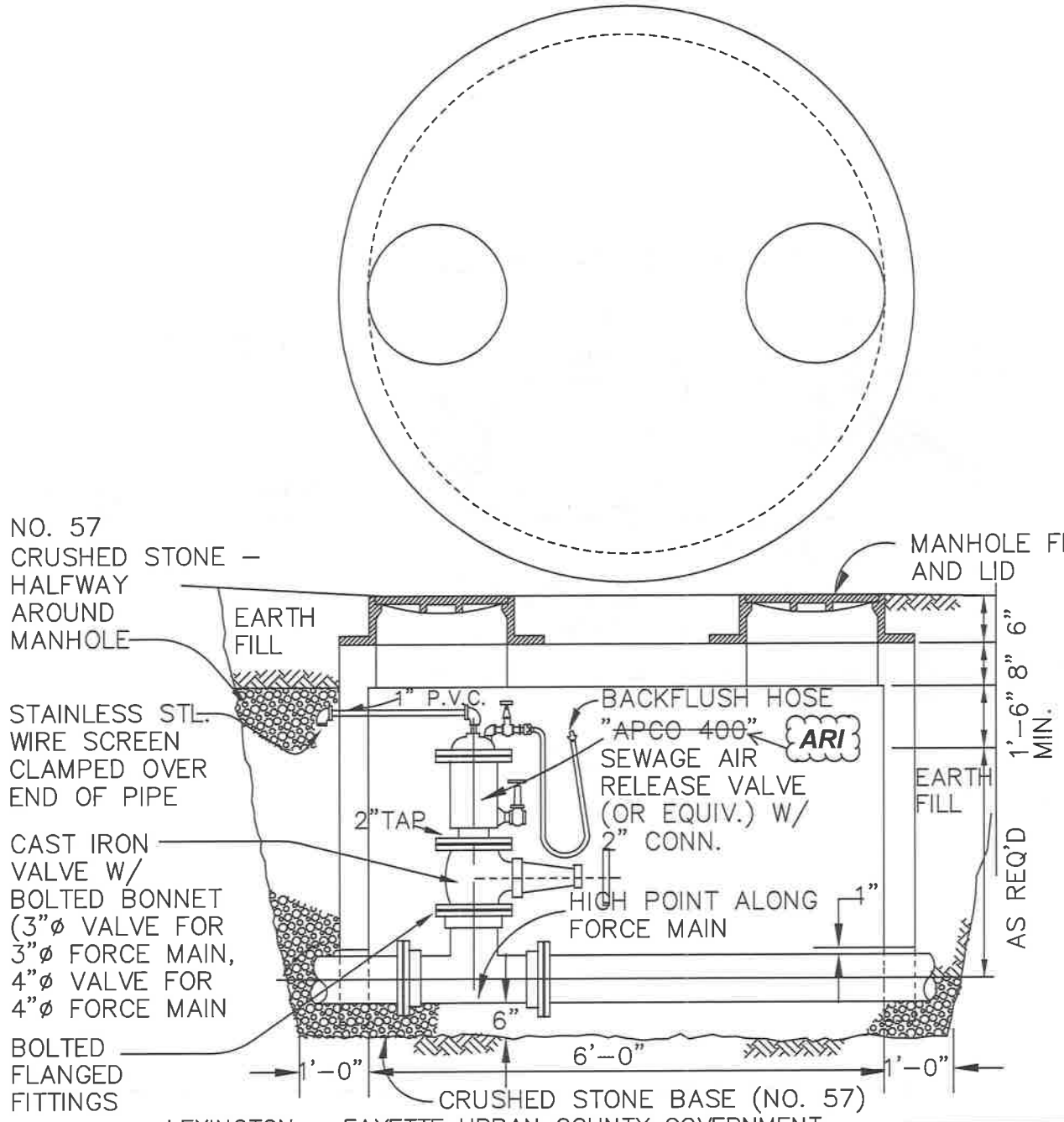
STANDARD SANITARY SEWER DRAWING NO. PS410-0



GAUGE TAP DETAIL

1/1/09

STANDARD SANITARY SEWER DRAWING NO. PS411-0

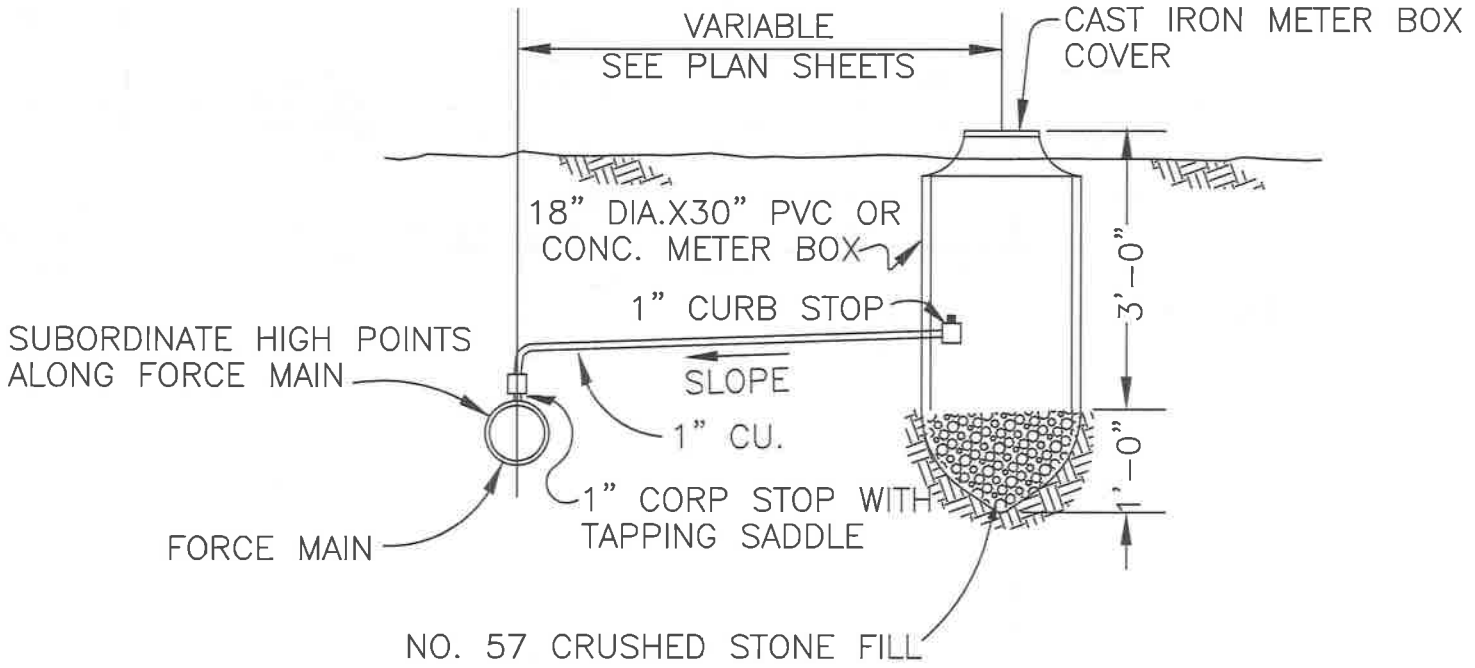


AUTOMATIC AIR
RELEASE ASSEMBLY

1/1/09

STANDARD SANITARY SEWER DRAWING NO. PS415–0

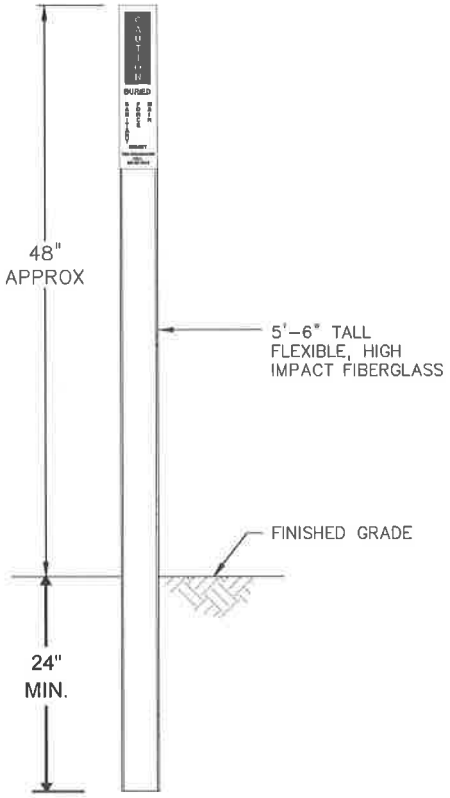
LEXINGTON – FAYETTE URBAN COUNTY GOVERNMENT

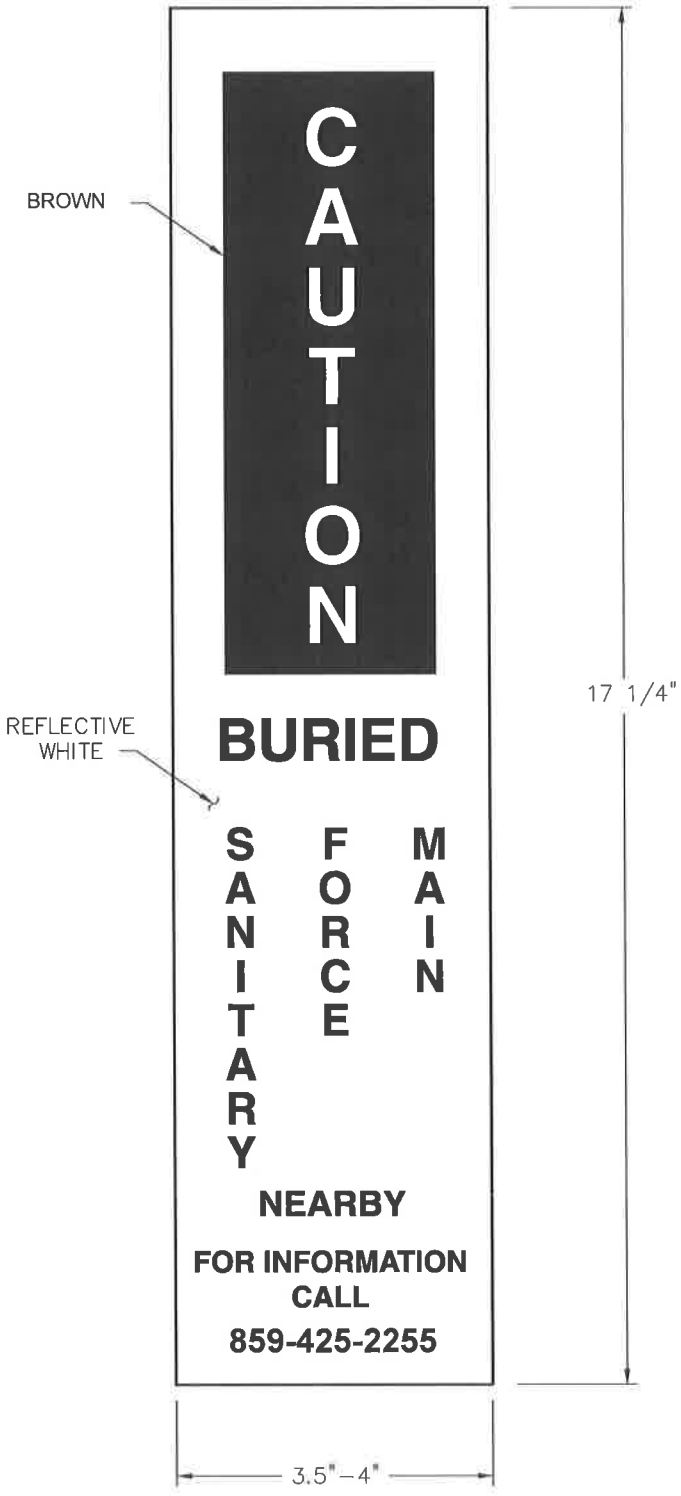


MANUAL AIR RELEASE ASSEMBLY

1/1/09

STANDARD SANITARY SEWER DRAWING NO. PS416-0





FIBERGLASS FORCE MAIN
LINE MARKER