curvature indicates improper backfill placement methods that must be corrected. Slight peaking of the cross-sectional shape should be taken as indicative of achieving proper compaction requirements. Soil consolidation continues with time after installation of the pipe. While 30 days will not encompass the time frame for complete consolidation of the soil surrounding the pipe, it is intended to give sufficient time to observe some of the effects that this consolidation will have. However, occasionally pavement is placed over the pipe sooner than 30 days. While the 30-day time limit should be maintained, a brief inspection of the pipe prior to paving over it, particularly for the first few joints, may be prudent to ensure that good construction practices are being applied. It is recommended that inspection personnel not enter culverts less than 24 in. in diameter. Internal inspection of culverts in this size range is best conducted using video cameras. Culverts should only be entered by inspection personnel trained in working within confined spaces and using procedures in full compliance with applicable State, Local, and Federal OSHA regulations.

25.3.12.2 Installation Deflection

The pipe shall be evaluated to determine whether the internal diameter of the barrel has been reduced more than 5 percent when measured not less than 30 days following completion of installation. Pipes shall be checked for deflection using a mandrel or any other device approved by the Engineer that can physically verify the dimensions of the pipe and is not limited by poor lighting, water flow, pipe length, or other limiting conditions of the installed environment. Pipes larger than 24 in. may be entered and deflection levels measured directly. In all pipe installations, at least 10 percent of the total number of pipe runs representing at least 10 percent of the total project footage on the project shall be randomly selected by the Engineer and inspected for deflection. Also, as determined by the 100 percent visual inspection, all areas in which deflection can be visually detected shall be inspected for deflection. Where direct measurements are made, a measurement shall be taken once every 10 ft. for the length of the pipe, and a minimum of four measurements per pipe installation is required. If a mandrel is used for the deflection test, it shall be a nine (or greater odd number) arm mandrel, and shall be sized and inspected by the Engineer prior to testing. A properly sized proving ring shall be used to check or test the mandrel for accuracy. The mandrel shall be pulled through the pipe with a force not greater than 1,000 lb. For locations where pipe deflection exceeds 5 percent of the inside diameter, an evaluation shall be conducted by the Contractor and submitted to the Engineer for review and approval considering the severity of the deflection, structural integrity, environmental conditions, and the design service life of the pipe. Pipe remediation or replacement shall be required for locations where the evaluation finds that the deflection could be problematic. For locations where pipe deflection exceeds 7.5 percent of the inside diameter, remediation or replacement of the pipe is required.

Inspection criteria is newly added to the specification as there was minimal guidance in the previous specification. Ten percent of each pipe installation shall be defined as 10 percent of the number of pipe runs, and not less than 10 percent of the total length of installed pipe on the project. The requirement of deflection testing 10 percent of each pipe installation is intended to serve as a minimum and does not limit owners from more stringent requirements. The pipe inside diameters should be provided by the pipe manufacturer for every size and type of pipe delivered. If the pipe inside diameter is not provided, or is not available, pipe inside diameter can be developed by averaging the diameters measured at eight equally spaced locations around a section of unloaded pipe for every given size and manufacturer. There are many appropriate methods suitable for measuring deflection, including video inspection equipment, mandrels, and other direct measurement devices. For pipes tested by a mandrel, the mandrel shall be pulled through the entire pipe. Whichever method is used for deflection measurement, a minimum of 10 percent of the total length of installed pipe shall be tested, in addition to any areas that were identified in the visual inspection as having deflection. Installed pipe deflections that exceed 5 percent of the initial inside diameter may indicate that the installation was substandard. Appropriate remediation, if any, will depend upon the severity of the deflection, the condition of the pipe, and evaluation of the factor of safety using section 12, "Buried Structures and Tunnel Liners," of the AASHTO LRFD B*ridge Design Specifications.* Installed pipe deflections that exceed 7.5 percent of the initial inside diameter will require remediation or replacement of the pipe.

25.3.13 Inspection

All HDPE and PP pipe shall be inspected in accordance with Section 26 Internal Inspection of Sewer Pipe: CCTV as directed by the Engineer.

25.4 BASIS OF PAYMENT

Accepted quantities for HDPE and PP Storm Sewer will be paid for at the Contract Unit Price as quoted for various sizes (which shall be full compensation for all work required under this Section) and paid per linear foot of specified HDPE or PP Storm Sewer satisfactorily placed. Any removal of pavement and sidewalk and any rock encountered between zero (0) and eight (8) feet shall be paid for under appropriate Bid Items in addition to the Unit Price for HDPE or HP Storm Sewer. Concrete caps shall be paid under the Bid Item for unfinished concrete. Surface restoration (seeding, sod, pavement, etc.) and CCTV inspection will be paid separately under the appropriate Bid Items. Pay limits for surface restoration shall be in accordance with the appropriate Standard Drawings. Limits of surface restoration will be those limits as shown on the plans.

All labor, materials (other than the HDPE or PP storm sewer), equipment, excavation, bedding, disposal and backfilling shall be incidental to the placement of HDPE or PP Storm Sewer.

TECHNICAL SPECIFICATIONS

SECTION 26 - INTERNAL INSPECTION OF SEWER PIPE: CCTV

26.1 SCOPE:

A CLOSED CIRCUIT TELEVISION (CCTV) survey is required for all newly installed sewer pipe, whether PVC, DIP, RCP, HDPE and/or any designated existing pipe. The television survey shall be performed by an experienced CCTV Contractor approved by the LFUCG Division of Engineering.

The CCTV inspections should be performed by the approved contractor a minimum of thirty (30) days after any new pipe has been backfilled, unless otherwise approved by the Engineer.

26.2 GENERAL:

All lines designated and/or designed by the Engineer shall be internally inspected. The purpose of the inspection is to locate structural damage that may be present in the collection pipe.

Any structural damage found in the pipe impairing the CCTV inspection, shall be documented and the Engineer should be notified immediately. The Engineer and Owner will evaluate the damage and, if cost-effective, the Engineer will notify the Contractor in writing to proceed with cleaning or additional repairs. These repairs will be made at the unit prices shown on the Contractor's Bid Proposal.

The Owner makes no guarantee that all of the sewers to be entered are clear for the passage of a camera. The methods used for securing passage of the camera are to be at the option of the Contractor, and the costs must be included in the bid price for television inspection. The cost of retrieving the television camera, under all circumstances, when it becomes lodged during inspection, shall be incidental to this portion of the work.

26.3 EQUIPMENT:

The CCTV mainline inspection system television shall be one specifically designed and constructed for such inspection. The inspection system shall be able to perform pan/tilt or pan/rotate operations. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The system shall be operable in 100 percent humidity conditions. The camera, television monitor and other components of the CCTV system shall be capable of producing a minimum 500-line resolution video picture. Picture quality and definition shall be to the satisfaction of the Engineer and if unsatisfactory, equipment shall be removed and no payment made for unsatisfactory inspection.

26.4 RECOMMENDED METHOD FOR INTERNAL INSPECTION:

After thoroughly cleaning the pipe, the camera shall be moved through the sewers in the downstream direction at a uniform rate not to exceed 30 ft./min., stopping when necessary to insure proper documentation of the sewer's condition. Manual winches, power winches, TV cable and power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions may be used to move the camera through the sewer line.

If during the inspection operation, the television camera will not pass through the entire manhole section, the Contractor shall set up his equipment so that the inspection can be performed from the opposite manhole. If the camera again fails to pass through the entire manhole section, the Contractor shall notify the Engineer of the situation.

26.5 INSPECTION LOGS AND CD/DVDS:

All CD/DVDS, and logs shall be labeled with the Contractors Name, Contract number, DVD number (logs must match that number) and with each Contractor the DVD/ logs must start at number 1 and progress upward till the end of this contract.

A log approved by the Engineer shall be provided for all line inspections listing the watershed, line segment ID, line segment location, upstream manhole depth, downstream manhole depth, lateral connection distance and position, pipe diameter, pipe material, defects and defect ratings, also see notes above. Printed and digital records shall be kept by the Contractor and will clearly show the location of each infiltration point observed during inspection. In addition, other points of significance such as locations of service connections, unusual conditions, roots, storm sewer connections, damaged pipe, presence of scale and corrosion and other discernable features will be recorded and a copy of such records in both hard copy and digital format will be supplied to the Engineer. The digital records must be in a Microsoft Database format (.mdb file extension) or other format approved by the Engineer. A key to all observations used shall be included on each log sheet.

The locations of all the defective areas to be repaired will be identified by logging the distance frame at each defect or point of interest measured from the center of the starting manhole to the plane of focus of the camera. The importance of accurate distance measurements is emphasized. Confirmation of measurement for location of defects shall be above ground by means of a meter device. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape or other suitable device, and the accuracy shall be satisfactory to the Engineer. Marking on the cable or the like, which would require interpolation for depth of manhole, will not be allowed.

The purpose of DVD recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. DVD recording playback shall be at the same speed that it was recorded. DVDs shall be considered property of the Owner and the Contractor shall possess backup copy of all DVDs until completion of the Contract. All CCTV work done must be recorded on DVD's using the software Visual Pipes, or other approved software. The

Contractor shall supply the LFUCG a licensed (if applicable) copy of said software to view these DVD's.

26.6 FINAL ACCEPTANCE:

Acceptance of this portion of work shall be made upon the successful review of the DVD submitted to the LFUCG. If the DVDs are of such poor quality and/or the sewer line needs additional cleaning that the Owner is unable to evaluate the condition of the sewer line or to locate service connections, the Contractor shall be required to re-televise and provide a suitable DVD of the line at no additional cost. If a suitable DVD cannot be provided of such quality that the Owner can review it, no payment shall be made for additional cleaning and/or closed circuit television (CCTV). Also, no payment shall be made for portions of lines not televised or portions where manholes cannot be negotiated with the television camera.

26.7 BASIS OF PAYMENT:

Accepted quantities for Internal Inspection of Storm Sewer Pipe: CCTV will be paid for at the Contract Unit Price as quoted per linear foot (which shall be full compensation for all Work required under this Section) and paid per foot satisfactorily inspected. All labor, cleaning, materials, equipment, and excavation shall be incidental to the Internal Inspection of Storm Sewer Pipe: CCTV.

TECHNICAL SPECIFICATIONS

SECTION 27 - HEADWALLS

27.1 SCOPE

Work for this Section shall conform to Kentucky Department of Highways Standard Specifications for Road and Bridge Construction Section 610 and 710, Current Edition and the Lexington-Fayette Urban County Government Standard Drawings 150, 153, 154-1, 154-2 and 154-3, and shall include all labor, excavation, materials, equipment and necessary incidentals. Drawings for Straight Headwalls 30" and greater will be provided by the ENGINEER.

Dimensions for the placement of Headwalls will be as specified by the Purchase Order.

27.2 BASIS OF PAYMENT

Accepted quantities for Headwalls will be paid for at the Contract Unit Price as quoted for various sizes (which shall be full compensation for all Work required under this Section) and paid per specified Headwall satisfactorily placed. All labor, materials, grates (if required), equipment, and excavation shall be incidental to the placement of Headwalls.

TECHNICAL SPECIFICATIONS

SECTION 28 - IMPACT STILLING BASIN

28.1 SCOPE

Work for this Section shall include all labor, materials, excavations, equipment, and incidentals necessary to construct Impact Stilling Basins for Pipes in accordance with Lexington-Fayette Urban County Government Standard Drawings 164 and 165, and Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, Section 601, 602, 603 and 710 requirements.

Dimensions for the placement of Impact Stilling Basins will be as specified by the Purchase Order.

28.2 BASIS OF PAYMENT

Accepted quantities for Impact Stilling Basins will be paid for at the Contract Unit Price as quoted for various sizes (which shall be full compensation for all Work required under this Section) and paid per specified Impact Stilling Basin satisfactorily placed. All labor, materials, equipment, and excavation shall be incidental to the placement of Impact Stilling Basins.

TECHNICAL SPECIFICATIONS

SECTION 29 - PAVED DITCH

29.1 SCOPE

Work for this Section shall conform to Kentucky Department of Highways Standard Specifications Section 709, Current Edition and the Lexington-Fayette Urban County Government Standard Drawing 132 and shall include all labor, excavation, materials, equipment and incidentals necessary to complete the Work.

Dimensions for the placement of a Paved Ditch will be as specified by the Purchase Order.

29.2 BASIS OF PAYMENT

Accepted quantities for Paved Ditch will be paid for at the Contract Unit Price as quoted for various sizes (which shall be full compensation for all Work required under this Section) and paid per square yard of specified Paved Ditch satisfactorily placed. All labor, materials, equipment, and excavation shall be incidental to the placement of Paved Ditches.

TECHNICAL SPECIFICATIONS

SECTION 30 - AGGREGATE CHANNEL LINING FOR SLOPE PROTECTION

30.1 SCOPE

Work under this Section shall be in conformance to Lexington-Fayette Urban County Government Standard Drawings 130-1 and 130-2, for aggregate channel lining and shall include all labor, excavation, materials, equipment, and incidentals necessary to complete the Work. Type I Geotextile fabric shall be required and considered as incidental to the accomplishment of this Work.

30.2 BASIS OF PAYMENT

Accepted quantities for Aggregate Channel Lining will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work under this Section) and paid per ton of Aggregate Channel Lining satisfactorily placed. No direct measurement shall be made. Payment will be based on weight tickets of No.2 stone delivered and accepted for the work. All labor, excavation, materials (other than the aggregate), and equipment shall be incidental to the placement of an Aggregate Channel Lining.

TECHNICAL SPECIFICATIONS

SECTION 31 - SEEDING AND PROTECTION

31.1 SCOPE

Work under this Section shall be in conformance to Kentucky Department of Highways Standard Specifications Section 212, current edition and shall include all labor, materials, equipment, and incidentals necessary to complete the Work. Fertilizer (10-10-10) and agricultural lime will be incorporated into a 3" deep bed and applied at 28 lbs./1,000 sq. ft. and 150 lbs./1,000 sq. ft., respectively. Seeding shall be done with Kentucky Bluegrass only unless specified otherwise in the Purchase Order. Mulching material shall consist of straw or hay in an air-dry condition, and shall be substantially free of noxious weed seeds and objectionable foreign matter. Mulching material shall applied to a loose depth of 1 to 1½ inches.

Finelawn or other turf type fescue, 3 lb/1,000 sq. ft.; add ½ lb of Poa Trivialis for very heavy shade or otherwise customize as directed by ENGINEER. The desires of the owner should be considered. Species currently present should also be considered.

31.2 BASIS OF PAYMENT

Accepted quantities for Seeding and Protection will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work under this Section) and paid per square yard of Seeding and Protection satisfactorily placed. All labor, fertilizer, lime, straw, materials, and equipment shall be incidental to the application of Seeding and Protection.

TECHNICAL SPECIFICATIONS

SECTION 32 - SODDING

32.1 SCOPE

Work under this Section shall be in conformance to Kentucky Department of Highways Standard Specifications Section 212 and shall include all labor, materials, equipment, and incidentals necessary to complete the Work. Fertilizer (10-10-10) and agricultural lime will be incorporated into a 3" deep sod bed and applied at a rate of 28 lbs./1,000 sq. ft. and 100 lbs./1,000 sq. ft., respectively. Sodding shall be done with Kentucky Bluegrass, Fescue, or other species approved by the ENGINEER and available at the time of placement. Sod shall be kept moist for a minimum of two weeks. The desires of the owner and the species currently being used should be considered.

32.2 BASIS OF PAYMENT

Accepted quantities for Sodding will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work under this Section) and paid per square yard of Sodding satisfactorily placed. All labor, materials (other than the sod), and equipment shall be incidental to Sodding.

TECHNICAL SPECIFICATIONS

SECTION 33 - GABION MATTRESS CHANNEL LINING

33.1 SCOPE

Work for Gabion Mattress Channel Lining including Type I geotextile fabric shall conform to Kentucky Department of Highways Standard Specifications Section 613 and 813.13, current edition and the Lexington-Fayette Urban County Government Standard Drawing 131, and shall include all labor, excavation, materials, equipment and incidentals necessary to complete the Work.

33.2 BASIS OF PAYMENT

Accepted quantities respectively for Gabion Mattress Channel Lining will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work required under this Section) and paid per cubic yard of stone satisfactorily placed and contained within the gabion wire baskets. Payment shall be based on weight tickets for stone delivered and accepted for the work. All labor, materials, equipment, and excavation shall be incidental to the placement of Gabion Mattress Channel Linings.

TECHNICAL SPECIFICATIONS

SECTION 34 – HIGH DENSITY POLYETHYLENE PERFORATED PIPE

34.1 SCOPE

The Work consists of furnishing and installing High Density Polyethylene Perforated Pipe at depths of zero (0) to four (4) feet. Work for this Section shall conform to Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, Sections 704 and associated cross references, Current Edition and to Lexington-Fayette Urban County Government Standard Drawings 320, 320-1, 321, and 322, and shall include all labor, materials, equipment, and incidentals necessary to complete the Work, using only polyethylene perforated pipe.

34.2 BASIS OF PAYMENT

Accepted quantities for 4" and 6" High Density Polyethylene Perforated Pipe with incidental geotextile fabric, aggregate cover, and bedding will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work required under Section) and paid per linear foot of Polyethylene Perforated Pipe satisfactorily placed at a depth of four (4) feet. All labor, materials, and equipment shall be incidental to the placement of Polyethylene Perforated Pipe.

For High Density Polyethylene Perforated Pipe at depths greater than four (4) feet additional pay items such as materials, stone and excavation will be paid separately.

TECHNICAL SPECIFICATIONS

SECTION 35 - SANITARY SEWER

35.1 SCOPE

Work under this Section shall be of the size indicated and shall include all service, labor, materials, and equipment involved in performing the various tasks necessary to construct the Gravity Sanitary Sewers described in the plans and specifications in accordance with Lexington-Fayette Urban County Government Standard Drawings 200, 201-1, 201-2 and 204. Such tasks include, but are not limited to, furnishing pipe, excavating trenches (including rock excavating), bedding, laying, jointing, testing, backfilling, connecting to the new manholes, removing existing pipe, connecting existing services, and plugging. Any other necessary incidental tasks shall also be included in Work under this Section.

35.2 PVC (POLYVINYL CHLORIDE PIPE)

PVC Sewer Pipe shall conform to ASTM D-2152, D-2444 and D-3033, or D-3034 and shall have a maximum SDR of 35 (SDR rating shall be per LFUCG Std Dwg. 204). The manufacturers shall submit five (5) copies of certification of tests for each lot of material represented by shipment to the job site.

All pipe shall be marked with the manufacturer's name, production lot number, ASTM Designation, PVC and the nominal diameter.

35.3 JOINTS FOR PVC PIPE

All joints shall be of the elastomeric gasket type and installed per the manufacturer's recommendations. Solvent cement joints shall not be used.

Pipe that has been field cut must be beveled for insertion into gasketed joints. Bevels can be made with hand or power tool. In either case, the finished bevel should be the same as the factory bevel.

35.4 DUCTILE IRON PIPE

Work under this Section shall be performed in accordance with applicable ASTM specifications which include but are not limited to the following:

Ductile iron pipe shall conform to the current requirements of AWWA, C151, Pressure Class 250, with push-on joints unless otherwise noted on drawings.

The interior of the pipe shall be cement-mortar lined with asphalt seal coat in accordance with the current requirements of AWWA C104. Thickness of the lining shall be set forth in Section 4.10.1 of the aforementioned specification unless otherwise directed by the ENGINEER. The exterior of all pipe, unless otherwise specified, shall receive either coal or tar or asphalt base coating a minimum of 1 mil thick.

Each piece of pipe shall bear the manufacturer's name or trademark, the year in which it was produced and the letters "DI" or the word "DUCTILE". Pipe manufacturer shall furnish notarized certificate of compliance to the above AWWA or ANSI specifications.

All ductile iron pipe shall be polyethylene encased. All materials and installation shall be in accordance with AWWA C105. The polyethylene film shall be a minimum of 8 mils for low-density polyethylene film and 4 mils for high-density cross-laminated polyethylene film.

35.5 INTERNAL PIPE DIAMETER

All sewer provided shall have a minimum actual internal diameter which is equal to or greater than diameters indicated on the Contract Drawings.

35.6 EXCAVATION FOR PIPELINE TRENCHES

Unless otherwise directed by the ENGINEER, trenches in which pipes are to be laid shall be excavated in open cut to the depths required by field conditions or as specified by the ENGINEER. In general this shall be interpreted to mean that machine excavation in earth shall not extend below an elevation permitting the pipe to be properly bedded. Excavation shall be in accordance with Lexington-Fayette Urban County Government Standard Drawings and ASTM D-2321.

Excavation shall be undercut to a depth below the required invert elevation that will permit laying the pipe in a bed of granular material to provide continuous support for the bottom quadrant of the pipe. The bedding shall be as set out in the following section.

Trenches shall be constructed according to LFUCG Standard Drawings 200, 201-1 and 201-2. Trenches shall be of sufficient width to provide free working space on each side of the pipe and to permit proper backfilling around the pipe, but unless specifically authorized by the ENGINEER, trenches shall in no case be excavated or permitted to become wider than 2'0" plus the nominal diameter of the pipe at the level of or below the top of the pipe plus 12".

All excavated materials shall be placed a minimum of two feet (2') back from the edge of the trench.

Before laying the pipe, the trench shall be opened far enough ahead to reveal obstructions that may necessitate changing the line or grade of the pipeline.

The trench shall be straight and uniform so as to permit laying pipe to lines and grades given by the ENGINEER. It shall be kept free of water during the laying of the pipe and until the pipeline has been backfilled. Removal of trench water shall be at the CONTRACTOR'S expense. Dry conditions shall be maintained in the excavations until the backfill has been placed. During the excavation, the grade shall be maintained so that it will freely drain and prevent surface water from entering the excavation at all times.

When directed by OWNER, temporary drainage ditches shall be installed to intercept or direct surface water which may affect work. All water shall be pumped or drained from the excavation and disposed of in a suitable manner without damage to adjacent property or to other work.

Minimum cover of 30" shall be provided for all pipeline.

35.7 PIPE BEDDING

All pipe shall be supported in a bed of well compacted #9 crushed stone. Bedding material shall be free from rock, foreign material, frozen earth, and be acceptable to the ENGINEER. In no case shall pipe be supported directly on rock. When rock is encountered in the trench bottom, bedding shall consist of fine gravel or Size #9 crushed stone only. Thickness of crushed stone bedding shall be a minimum 6" below pipe barrel. Pipe bedding is not a separate pay item.

In wet, yielding mucky locations where pipe is in danger of sinking below grade or floating out of line or grade, or where backfill materials are fluid such as flowable fill, movements of the pipe might take place during the placing of the backfill. The pipe must be weighted or secured permanently in place as such means as will provide effective. When ordered by the ENGINEER, yielding and mucky materials subgrades shall be removed below ordinary trench depth in order to prepare a proper bed for the pipe. Crushed stone or other such granular material, if necessary, as determined by the ENGINEER to replace subgrade material, shall be a separate pay item and classified as "Special Pipe Bedding". Removal of poor material is not a separate pay item.

Installation shall be in accordance with Lexington-Fayette Urban County Government (LFUCG) Standard Drawings and ASTM D-2321.

35.8 LAYING PIPE

The laying of pipe in finished trenches shall be commenced at the lowest point so the spigot ends point in the direction of flow.

All pipes shall be laid with ends snugly seated and true to line and grade. 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.

Before each piece of pipe is lowered into the trench, it shall be thoroughly inspected to ensure it is 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 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. Throughout the pipe laying process, special attention shall be given to keeping the inside of the pipe free of dirt or rock.

Pipe shall not be laid on solid rock. A pad of granular material as specified in Pipe Bedding shall be used as a pipe bedding. Pipe bedding is not a separate pay item. Irregularities in subgrade in an earth trench shall be corrected by use of granular material.

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.

When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitting into the pipe bell, so as to exclude earth or other material, and precautions taken to prevent flotation of pipe by runoff or seepage into trench.

No backfilling (except for securing pipe in place) over pipe will be allowed until the ENGINEER has an opportunity to make an inspection of the joints, alignment, and grade in the section laid.

A concrete collar shall be provided where two dissimilar materials meet if a seal can not be made between the existing sanitary sewer and the new Pipe. It shall extend above and below the pipe joint 6" and be 18" in length, minimum.

35.9 BACKFILLING PIPELINE TRENCHES

Backfilling or pipeline trenches shall be accomplished in accordance with Lexington-Fayette Urban County Government Standard Drawings. All backfill shall be placed in a manner approved by the ENGINEER, and those materials requiring compaction shall be carefully compacted to avoid displacement of the pipe. Compaction shall be accomplished by hand-tamping or by approved mechanical methods.

Before final acceptance, the CONTRACTOR will be required to level off all trenches or to bring the trench up to grade. The CONTRACTOR shall also remove from roadways, rights-of-way and/or private property all excess earth or other materials resulting from construction.

In the event that pavement is not placed immediately following trench backfilling in paved areas, the CONTRACTOR shall be responsible for maintaining the trench surface in a level condition at proper pavement grade at all times.

35.10 SETTLEMENT OF TRENCHES

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 Kentucky Department of Highways.

35.11 TESTING OF GRAVITY SANITARY SEWERS

On all projects involving installation of sanitary sewer lines, the finished work shall comply with provisions listed below or similar requirements which will ensure equal or better results:

1. After the collecting and/or outfall lines or system have been brought to completion, 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 removal from the lines of any and all dirt, debris and trash.

2. During the final inspection, the ENGINEER will inspect each individual line, from manhole to manhole, either by use of lights or other means at his disposal to determine whether the completed lines are true to line and grade as laid out or as shown on the plans.

3. The ENGINEER will require that the CONTRACTOR pass through the system under momentum a wooden ball of a diameter of one-inch less than the nominal diameter of the pipe, except that no ball larger than eight (8) inches in diameter shall be used.

4. Deflection tests shall be performed on a flexible pipe. The test shall be conducted after final backfill has been in place at least 30 days to permit stabilization of the system. No pipe shall exceed a deflection of 5 percent. If deflection exceeds 5 percent, pipe shall be replaced or corrected. The rigid ball cylinder or mandrel used for deflection test shall have a diameter not less than 95 percent of the base inside diameter or average inside diameter of the pipe depending on which is specified in the ASTM Specification, including the appendix, to which the pipe is manufactured. The pipe shall be measured in compliance with ASTM D-2122 Standard Test Method of Determining Dimensions of Thermoplastic Pipe and Fittings. The test shall be performed without mechanical pull devices.

5. All lines or sections of lines that are found to be laid improperly with respect to line or grade, that are found to contain broken or leading sections of pipe, or are obstructed in such a manner that they cannot be satisfactorily corrected otherwise, shall be removed and replaced at the CONTRACTOR'S expense.

6. The CONTRACTOR shall lay sewer lines, including house connections, so that the access of ground water or loss of water from the sewer system or other gravity flow piping which does not normally flow full will be limited to 10 gallons per inch diameter per mile per day. This limitation is inclusive of manholes, sewers, house connections, and appurtenances. This requirement may be applied to a portion of the contract work, such as the sewers in a separate drainage area or to a single section of the line between two manholes.

7. To test for leaks, the ENGINEER will require that all completed piping as specified herein after backfilling be tested by low-pressure air test, exfiltration, or infiltration test. Low pressure air test will be restricted to sewer up through 24-inch diameter. Sewer larger than 24-inch diameter shall receive an exfiltration test if above ground

water, or infiltration test if below ground water. Should the low pressure air test results be inconclusive, or at the request of the ENGINEER, an exfiltration or infiltration test will be required on the low pressure air tested segments. Services, labor, equipment, and supplies required for all tests shall be furnished by the CONTRACTOR. These tests shall not be required on "lives" sewers.

8. Smoke testing may be used only to locate leaks and in no case shall be considered conclusive. In all cases the smoke test shall be accomplished by an air test, exfiltration test or infiltration test. Smoke testing may only be performed where ground water is low and smoke is blown into a conduit that is properly sealed. All such leaks or breaks discovered by the smoke test shall be repaired and/or corrected by the CONTRACTOR at his own expense. Equipment and supplies required for smoke tests shall be furnished by the CONTRACTOR. The CONTRACTOR may also be required to smoke test the first section (manhole-to-manhole) of each size of pipe and type of joint on each construction contract prior to backfilling to establish and check laying and jointing procedures. Other supplementary smoke tests prior to backfilling may be performed by the CONTRACTOR at his option; however, any such test shall not supplant the final tests of the completed work unless such final tests are waived by the ENGINEER.

9. The low pressure air test shall consist of meeting a required holding time during measured pressure drop. The maximum test pressure shall be 4.0 psi (minimum pressure shall be 3.5 psi), with the allowable pressure loss being 1.0 psi during calculated holding time. Holding time shall be calculated from the equation:

$$0.472 \times \text{pipe diameter (inches)} = \text{holding time (minutes)}$$

This formula shall apply for all sizes of pipe and lengths of line tested. Failure to maintain calculated holding time during pressure drop from 3.5 psi to 2.5 psi for each section shall be deemed test failure.

10. In order to test for infiltration the ENGINEER may also require exfiltration tests on section of pipe between manholes after it has been laid but prior to backfilling. Exfiltration tests shall be conducted by plugging the lower end of the section of sewer to be tested and filling the sewer with water to a point approximately five feet above the invert at the lower end and at least one foot above the pipe at the upper end, observing leakage at all joints and measuring the amount of leakage for a given interval count. Exfiltration shall not exceed 110 percent times the infiltration limits set out hereinabove. All observed leaks shall be corrected even though exfiltration is within the limits.

11. To test for infiltration, the ENGINEER may also require that the CONTRACTOR plug the ends of all lines at the manhole so that measurements may be made at each section of sewer line. Infiltration tests shall consist of weir measurements to determine quantity if any infiltration. Measurements shall be taken at line locations directed by the ENGINEER. This infiltration test will not be made until the sewer line is completed, and the CONTRACTOR will be required to correct all conditions that are

conducive to excessive infiltration that may be required to relay such sections of the line that may not be corrected even though infiltration is within allowable limits.

12. A closed circuit television(CCTV) survey is required for all newly installed sewer pipe, and/or any designated existing pipe. The television survey shall be performed according to Section 26 of these Specifications.

35.12 HOUSE CONNECTIONS

In those instances where 4-inch or 6-inch sanitary sewer pipe is used to connect a house to a sewer main, installation must be done by a Licensed Master Plumber. All House Laterals shall be connected per LFUCG Standard Drawings 230, 231, and 232. Lateral Cleanout shall be provided and installed as per the Two-Way Cleanout Drawing included in the Standard Drawing Section of these Specifications.

35.13 CLEAN UP

Upon completion of installation of the piping and appurtenances, the CONTRACTOR shall remove any surplus construction materials resulting from the Work. The CONTRACTOR shall grade the ground on each side of pipe trenches in a uniform and neat manner leaving the construction area in a shape as close as possible to the original ground line.

35.14 BY-PASS PUMPING

By-pass pumping shall be used to divert flow around an existing sanitary sewer most typically when a segment of sewer is being replaced. At least 24 hours prior to commencing by-pass pumping, the Contactor shall notify all affected residents, e.g; residents with lateral connections feeding the sewer segment to be replaced.

Contractor shall furnish and maintain all equipment necessary for by-pass pumping, including fully automatic self-priming trailer mounted pump, plugs, valves, pipe, hose, fuel and all incidental materials.

Pumping conditions will be site-specific. LFUCG will provide Contractor with suction lift, static head, distance and flow requirements. Pump shall be shall be capable of passing a 3" solids at 500 gpm @ 100 ft TDH with up to 20 ft of suction lift.

35.15 BASIS OF PAYMENT

Accepted quantities of gravity sanitary sewer line shall be paid for at the Contract Unit Price per linear foot and shall be full compensation for all Work under this Section.

All labor, ancillary materials, equipment, excavation, bedding, backfilling, testing (except CCTV) and incidental items necessary to the Work shall be included in the payment for PVC Sanitary Sewer or Ductile Iron Sanitary Sewer. Items such as rock excavation, removal of existing pipe, concrete collars and removal of pavement and sidewalk are paid under other UPC bid items.

A closed circuit television (CCTV) survey will be paid for at the Contract Unit Price as described in Section 26 of these Specifications.

Bypass pumping, when required to perform the work specified, will be paid for at the Contract Unit Price per day, and shall be full compensation for all labor (including set-up and break-down), materials, ancillary equipment, and fuel. The day shall commence at start-up of the pump and end when the pump is no longer in use.

TECHNICAL SPECIFICATIONS

SECTION 36 – TWO WAY SEWER SERVICE CLEANOUT

36.1 SCOPE

Work under this Section shall include all labor, excavation, materials, equipment, bedding and backfilling in accordance with the LFUCG Standard Drawing 234 in Appendix A and all incidentals necessary to construct a Two Way Sewer Service Cleanout (including tee, pipe, plug, frame, cover and concrete pad).

Any removal of pavement and sidewalk and any rock encountered shall be paid for under appropriate Bid Items in addition to the prices for Two Way Sewer Service Cleanouts.

36.2 BASIS OF PAYMENT

Accepted quantities for Two-Way Sewer Service Cleanouts will be paid for at the Contract Unit Price as quoted and paid per each satisfactorily placed. Payment shall include all labor, materials, connections, equipment, excavation, bedding, backfilling, and incidental items necessary for providing a two-way cleanout and connecting to the existing house lateral.

Surface restoration (seeding, sod, pavement, etc.) shall be paid separately in accordance with the appropriate Bid Items. Pay limits for surface restoration shall be in accordance with the Standard Drawings.

TECHNICAL SPECIFICATIONS

SECTION 37- SANITARY SEWER TEES AND BRANCHES

37.1 SCOPE

Work for this section consists of furnishing and installing Sanitary Sewer Tees and up to six (6) feet of branch or stub line (dimensions as specified by the Purchase Order). Branches and fittings shall be provided and laid as and where directed. T-branches, placed in the sewer for property service connection, shall be located by the CONTRACTOR, as directed by the ENGINEER, at such points in the sewer so as to result in the property service connection having the shortest length possible between the sewer and property line or easement line, unless otherwise indicated on the Drawings or directed by the ENGINEER. T-branches shall be plugged in such a manner that it will facilitate convenient connection to a service line. Materials shall be as approved and accepted by the ENGINEER and correspond to the specification for the type of sanitary sewer pipe material used.

In those instances where 4 inch or 6 inch sanitary sewer pipe is used to connect a house to a sanitary sewer main, installation must be done by a Licensed Master Plumber.

37.2 BASIS OF PAYMENT FOR SANITARY SEWER TEES

Accepted quantities for Sanitary Sewer Tees will be paid for at the Contract Unit Price as quoted for various sizes and pipe materials (which shall be full compensation for all Work under this Section) and paid per specified Sanitary Sewer Tee and up to six (6) feet of related sewer satisfactorily placed. Concrete caps shall be paid under the Bid Item for unfinished concrete. Surface restoration (seeding, sod, pavement, etc.) will be paid separately under the appropriate Bid Items and the pay limits for surface restoration shall be in accordance with the appropriate Standard Drawings.

All labor, materials, equipment, excavation, bedding, and backfilling shall be incidental to the placement of Sanitary Sewer Tee.

37.3 BASIS OF PAYMENT FOR BRANCHES INCLUDING FITTINGS

Accepted quantities for Sanitary Sewer Branch or Stub line in excess of six (6) feet will be paid for at the Contract Unit Price as quoted for various sizes and pipe materials (which shall be full compensation for all Work under this Section) and paid per linear foot of specified Sanitary Sewer Branch or Stub line satisfactorily placed. Concrete caps shall be paid under the Bid Item for unfinished concrete. Surface restoration (seeding, sod, pavement, etc.) will be paid separately under the appropriate Bid Items and the pay limits for surface restoration shall be in accordance with the appropriate Standard Drawings.

All labor, materials, equipment, excavation, bedding, and backfilling shall be incidental to the placement of Sanitary Sewer.

TECHNICAL SPECIFICATIONS

SECTION 38 - FENCING

38.1 SCOPE

Work for this section consists of furnishing and installing Woven Wire, Chain Link or Privacy Fencing (type as specified by the Purchase Order). Woven Wire and Chain Link shall conform to the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, Section 721, 722, 816, and 817 current edition, and/or LFUCG Standard Drawings 308, 310, 312 and 314, (as directed by the ENGINEER), and shall include all labor, materials, equipment and incidentals necessary to complete the Work. Privacy Fencing shall match existing fencing as closely as possible and shall include all labor, materials, equipment and incidentals to complete the work.

38.2 BASIS OF PAYMENT

38.2.1 WOVEN WIRE AND CHAIN LINK FENCING

Accepted quantities for Woven Wire or Chain Link Fencing will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work required under this Section) per linear foot of Fencing satisfactorily placed. All labor, gates, materials, equipment, and excavation shall be incidental to the placement of Fencing.

38.2.2 PRIVACY FENCING

Accepted quantities for Privacy Fencing will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work required under this Section except for the cost of the posts, rails, panels, gates and gate hardware) per linear foot of Privacy Fencing satisfactorily placed. All labor, other materials not identified above, equipment, and excavation shall be incidental to the placement of Fencing.

The cost of the Privacy Fence posts, rails, panels, gates and gate hardware shall be paid for at cost plus 15% for overhead and profit (to be submitted as Contract progresses and as needed). No payments will be made for Privacy Fencing without proper invoices for materials furnished.

TECHNICAL SPECIFICATIONS

SECTION 39 - SMALL EQUIPMENT WITH OPERATOR

39.1.A SMALL BACKHOE/LOADER WITH OPERATOR - SCOPE

Work under this Section shall consist of furnishing a small rubber tire backhoe of Case 580 or equivalent with operator for excavation and loading at various locations to be determined. The backhoe shall be in good working order, and with the trained operator, be capable of completing the required Work in a timely manner. Should the ENGINEER feel that the backhoe and/or operator are not adequate, he may reject either the backhoe and/or operator and no payment will be made.

39.1.B SMALL BACKHOE/LOADER WITH OPERATOR - BASIS OF PAYMENT

Accepted equipment and operator time for a Small Backhoe/Loader with an Operator will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work under this Section) and paid per hour of Work satisfactorily completed. No direct payment will be made for delivery time to or from the Work site.

39.2.A SKID LOADER WITH OPERATOR - SCOPE

Work under this Section shall consist of furnishing a skid loader of Case SR 250 or equivalent with operator for loading, lifting, augering, etc., at various locations to be determined. The skid loader shall be in good working order, and with the trained operator, be and capable of completing the required Work in a timely manner. Should the ENGINEER feel that the skid loader and/or operator are not adequate, he may reject either the skid loader and/or operator and no payment will be made.

39.2.B SKID LOADER WITH OPERATOR - BASIS OF PAYMENT

Accepted equipment and operator time for a Skid Loader and Operator will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work under this Section) and paid per hour of Work satisfactorily completed. No direct payment will be made for delivery time to or from the Work site.

39.3.A JACKHAMMER WITH OPERATOR - SCOPE

Work under this Section shall consist of furnishing an excavator with a hydraulic hammer of Case CX130C or equivalent with operator for jack hammering at various locations to be determined. The backhoe shall be in good working order, and with the trained operator, be capable of completing the required Work in a timely manner. Should the ENGINEER feel that the excavator/hammer and/or operator are not adequate, he may reject either the excavator/hammer and/or operator and no payment will be made.

39.3.B JACKHAMMER WITH WORKER - BASIS OF PAYMENT

Accepted equipment and operator time for a Jackhammer with Operator will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work under this Section) and paid per hour of Work satisfactorily completed. No direct payment will be made for delivery time to or from the Work site.

TECHNICAL SPECIFICATIONS

SECTION 40 - SINGLE OR TRIPLE AXLE DUMP TRUCK

40.1 SCOPE

Work under this Section shall consist of furnishing a single or triple axle dump truck with minimum eight (8) cubic yard capacity with driver for miscellaneous hauling of dirt and/or rock and other materials as requested by the ENGINEER. The truck and driver supplied shall be in good working order and capable of completing the Work in a timely manner. Should the ENGINEER feel that the truck and/or driver are not adequate, he may reject either the truck and/or driver and no payment will be made.

40.2 BASIS OF PAYMENT

Accepted truck and driver for a Single Axle Dump Truck or Triple Axle Dump Truck will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work under this Section) and paid per hour of Work satisfactorily completed. Payment shall be based on accepted hours of working under the direction of the ENGINEER.

The cost of the material (such as clean fill) or tipping fees (such as excess soil disposal) if applicable, shall be paid for at cost plus 15% for overhead and profit (to be submitted as Contract progresses and as needed). LFUCG must approve the tonnage rate prior to commencement of work. Furthermore, no payments will be made without proper invoices for materials furnished or disposed.

TECHNICAL SPECIFICATIONS

SECTION 41 – EROSION AND SEDIMENT CONTROL

41.1 SCOPE

This section describes requirements for the planning and implementation of non-structural and structural best management practices (BMPs) to be used for erosion and sediment control during construction activities in Fayette County, Kentucky. Erosion control refers to efforts to maintain soil on a construction site. Sediment control refers to keeping the material that erodes from leaving the site.

The preparation of an erosion and sediment control plan integrating the non-structural and structural practices and procedures is a requirement for all construction projects that disturb one acre or more. The plan shall be submitted to the LFUCG Division of Engineering before beginning construction. Once the erosion and sediment control practices have been constructed, a grading permit can be obtained. For more information on permits, see Chapter 2 of the Storm Water Manual.

Work for this Section shall be in accordance to the Lexington-Fayette Urban County Government Standard Drawings and Chapter 11 of the Storm Water Manual and shall include all labor, excavation, materials, equipment, and incidentals necessary to complete the work.

Structural Sediment Control BMPs

Check Dam

A check dam is a small temporary dam constructed across a swale or drainage ditch. Check dams shall be installed in newly-constructed, vegetated, open channels, which drain 10 acres or less. Check dams shall be constructed prior to the establishment of vegetation.

Stone check dams shall be constructed of KYTC Class II channel lining.

Regular inspections shall be made to ensure that the measure 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. Check dams shall be checked for sediment accumulation after each rainfall. Sediment shall be removed when it reaches one-half of the original height or before. 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.

Sediment Trap

A sediment trap is formed by an excavation of an area in a suitable location to retain sediment and other waterborne debris. Sediment traps shall be used where physical site conditions or other restrictions prevent other erosion control measures from adequately controlling erosion and sedimentation. Sediment traps may be used down slope from construction operations that expose areas to erosion. Sediment traps shall be removed after the exposed areas are adequately protected against erosion by vegetative or mechanical means. Sediment traps shall be installed below all disturbed areas of less than 5 acres that do not drain to a sediment pond

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. Seeding, fertilizing, and mulching of the material taken from the excavation shall comply with the applicable seeding sections of these specifications. 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 pond by rainfall:

- uniformly spread to a depth not exceeding 3 feet and graded to a continuous slope away from the trap
- 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

Sediment shall be removed from the trap when the capacity is reduced to 50 percent of the design volume. Plans for the sediment trap shall indicate the methods for disposing of sediment removed from the trap.

Sediment Pond

A sediment pond is formed by a barrier or dam constructed across a drainage way or other suitable location to retain sediment and other waterborne debris.

Sediment ponds are appropriate where physical site conditions or other restrictions prevent other erosion control measures from adequately controlling erosion and sedimentation. Sediment ponds may be used down slope from construction operations that expose areas to erosion. Sediment ponds shall be removed after the exposed areas are adequately protected against erosion by vegetative or mechanical means. 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. The pond shall be designed to reduce peak discharges during construction to pre-development levels for 10-year and 100-year storms.

Design and construction shall comply with all federal, state, and local laws, ordinances, rules, and regulations regarding dams.

Sediment shall be removed from the pond when the capacity is reduced to 50 percent of the design volume. Plans for the sediment pond shall indicate the methods for disposing of sediment removed from the pond.

Silt Fence

Silt fence is a temporary barrier to trap sediment that consists of a filter fabric stretched between supporting posts, with the bottom entrenched in the soil and with a wire support fence. Silt fence shall be installed down-slope of areas to be disturbed prior to clearing and grading. Silt fence must 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.

Silt fences are appropriate where the size of the drainage area is no more than one-fourth acre per 100 feet of silt fence length; the maximum slope length behind the barrier is 100 feet; and

the maximum gradient behind the barrier is 50 percent (2H:1V). Silt fences can be used at the toe of stockpiles where the slope exceeds 2H:1V, but in that case, the slope length should not exceed 20 feet.

Silt fences can be used in minor swales or ditch lines where the maximum contributing drainage area is no greater than 2 acres. Under no circumstances shall silt fences be constructed in streams or in swales or ditch lines where flows are likely to exceed 1 cubic foot per second (cfs).

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 75% (minimum)
- Tensile Strength at 20% 50 lbs./linear inch (minimum)
- Flow Rate 0.3 gal./ sq. ft/ min. (minimum)
- 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.
- 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. 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.

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. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed after each storm event or when deposits reach approximately one-half the height of the barrier. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform with the existing grade, prepared, and seeded. Silt fences shall be replaced every 6 months.

Storm Drain Inlet Protection

A sediment filter installed around a storm drain drop inlet or curb inlet is referred to as storm drain inlet protection. Curb inlet protection is not required if other soil stabilization and sediment control measures are in place to prevent sediment from entering the street. Storm drain inlet protection shall only be used around drop inlets when the up-slope area draining to the inlet has no other sediment control.

The drainage area shall be no greater than 1 acre.

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. Inlet

protection devices shall be constructed in such a manner that any resultant ponding of storm water will not cause excessive inconvenience or damage to adjacent areas or structures.

The structure shall be inspected after each rain, and repairs made as needed. Sediment shall be removed and the device restored to its original dimensions when the sediment has accumulated to one-half the design depth of the filter. 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. Structures shall be removed after the drainage area has been properly stabilized.

Filter Strips

A filter strip is a strip of vegetation for removing sediment and related pollutants from runoff. Filter strips are also called vegetative filters. Filter strips shall be used on each side of permanent constructed channels. The buffer strips described in the Storm Water Manual satisfy the filter strip requirement for streams and wetlands.

Filter strips shall only be used to remove sediment from overland flow.

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. See Storm Water Manual for seeding mixture

When planting filter strips, prepare seedbed, incorporate fertilizer, and apply mulch consistent with the seeding sections of this manual. Filter strips using areas of existing vegetation shall be over seeded, as necessary, with the above mixtures to obtain an equivalent density of vegetation. The over seeding shall be accomplished prior to the land disturbing activity.

Filter strips shall be inspected regularly to ensure that a healthy vegetative growth is maintained. Sediment shall be removed when it becomes visible in the filter. Construction traffic shall not be permitted to drive upon filter strips.

Stream Crossing

A temporary stream crossing is a temporary structural span installed across a flowing water course for use by construction traffic. Structures may include bridges, round pipes, or pipe arches. The purpose of a temporary stream crossing is to provide a means for construction traffic to cross flowing streams without damaging the channel or banks and to keep sediment generated by construction traffic out of the stream. 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. If applicable, U.S. Army Corps of Engineers and the Kentucky Division of Water permits, as indicated in the Storm Water Manual, may be required.

Temporary stream crossings are applicable to flowing streams with drainage areas less than one square mile. Structures that must handle flow from larger drainage areas shall be designed as permanent structures by a professional engineer.

When using a culvert crossing, the top of a compacted earth fill shall be covered with six inches of KTC No. 57 stone. No. 57 stone shall also be used for the stone pads forming the crossing approaches.

Clearing and excavation of the streambed and banks shall be kept to a minimum. The structure shall be removed as soon as it is no longer necessary for project construction. 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.

The structure shall be inspected after every rainfall and at least once a week and all damages repaired immediately.

Pump-Around Flow Diversion
Pump-around flow diversions must be used to divert flow during excavation operations in streams. Pump-around flow diversions provide dry working conditions during construction in streams. 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 or deposition of sediment in the stream. Bid quotes for pump around assume a 4 inch pump.

Sandbags shall be woven polypropylene bags with approximate dimensions of 18-1/2 inches by 28 inches. Tie the ends of filled bags closed using either draw strings or wire ties.

Schedule operations such that diversion installation, in-stream excavation, in-stream construction, stream restoration, and diversion removal are completed as quickly as possible.

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. Add sandbags as required to seal leaks in checks.

Construction Dewatering
Dewatering is the pumping of storm water or groundwater from excavation pits or trenches. The sediment-laden water must be pumped to a dewatering structure before it is discharged offsite.

The dewatering structure should be inspected frequently to ensure it is functioning properly and not overtopping. Accumulated sediment should be spread out on site and stabilized, or disposed of offsite.

41.2 BASIS OF PAYMENT

Accepted quantities for Erosion and Sediment Control will be paid for at the Contract Unit Price as quoted which shall be full compensation for all Work required under this Section: The LFUCG will make payment for the completed and accepted quantities under the following: All labor, materials (except as noted), equipment, fuel and excavation shall be

incidental to the placement and removal of Erosion and Sediment Control. Maintenance of erosion and sediment control is incidental to installation.

Check Dam	Ton
Sediment Trap (excluding geotexile)	Cubic Yard
Sediment Pond	Cubic Yard
Silt Fence	Linear Foot
Storm Water Inlet Protection	Each
Filter Strip	Square Yards
Stream Crossing (excluding pipe)	Each
Pump-Around Flow Diversion (including sand bags)	Day
Construction Dewatering	Day

Payment for a Stormwater Pollution Prevention Plan,(SWPP) a Notice of Intent (NOI-SWCA), a Notice of Termination (NOT), and a Land Disturbance Permit (LDP), will be paid in accordance with Section A.20 of these Technical Specifications.

TECHNICAL SPECIFICATIONS

SECTION 42 - GEOTEXTILE CONSTRUCTION

42.1 SCOPE

Work for this Section shall be in accordance to Kentucky Department of Highways Standard Specifications Sections 214 and 843 (Type 1 for slope protection and channel lining, Type II for underdrains, Type III for subgrade or embankment foundation stabilization, and Type IV for drainage blankets and pavement edge drains), current edition and shall include all labor, grading, materials, equipment, and incidentals necessary to complete the work.

42.2 BASIS OF PAYMENT

Accepted quantities for Geotextile Construction will be paid for at the Contract Unit Price per various types as quoted which shall be full compensation for all Work required under this Section and paid per square yard of geotextiles satisfactorily placed. All labor, materials (other than the geotextile fabric), equipment, and grading shall be incidental to the placement of geotextile fabric (Type I, Type II, Type III or Type IV).

TECHNICAL SPECIFICATIONS

SECTION 43 - EDGE KEY

43.1 SCOPE

This Work shall consist of the construction of edge keys in accordance with the Plans, Contract Documents and Specifications, and Lexington-Fayette Urban County Government (LFUCG) Standard Drawing 318 and 319, current edition.

In performing this Work, the CONTRACTOR shall furnish a neat edge along the pavement, obtained by using an approved saw to cut a smooth and straight line (approximately two (2) inches deep) in the existing pavement surface prior to breaking away the adjacent pavement. Any existing facility, which is not marked for removal by the ENGINEER, but is nevertheless removed, shall be replaced at the CONTRACTOR'S expense.

43.2 BASIS OF PAYMENT

Payment for the accepted quantity will be made at the unit bid price per linear foot, which payment shall be full compensation for all Work required by this section.

TECHNICAL SPECIFICATIONS

SECTION 44 – PIPE PLUGGING

44.1 SCOPE

Work in this section shall also conform to the Kentucky Department of Highways (KDOH) Standard Specifications, Section 708 current edition, but only to the extent that this KDOH section does not conflict with the content of the Plans, Contract Documents and Specifications.

The Work consists of construction of pipe plugs in existing storm sewer and/or gravity sanitary sewer lines, which are to be taken out of service once the corresponding new sewer lines have been put into operation. Such Work shall be performed where indicated on the Drawings and shall conform to standard practices acceptable to the Lexington-Fayette Urban County Government (Division of Engineering and Division of Water Quality).

44.2 BASIS OF PAYMENT

Accepted quantities for Pipe Plugging will be paid at the unit bid price per each as quoted for various sizes, which payment shall be full compensation for all Work required by this section.

TECHNICAL SPECIFICATIONS

SECTION 45 – FLOWABLE FILL

45.1 SCOPE

This Work shall consist of the use of flowable fill in accordance with the Plans, Contract Documents and Specifications. Work in this section shall also conform to the Kentucky Department of Highways (KDOH) Standard Specifications, Section 601 current edition, but only to the extent that this KDOH section does not conflict with the content of the Plans, Contract Documents and Specifications.

45.2 BASIS OF PAYMENT

Payment for the accepted quantity will be made at the unit bid price per cubic yard, which payment shall be full compensation for all Work required by this section. Payment shall be based on delivery tickets for flowable fill delivered and accepted for the work.

TECHNICAL SPECIFICATIONS

SECTION 46 – FIBER REINFORCED PCC PAVEMENT

46.1 SCOPE

This specification covers formed fiber-reinforced, Portland cement concrete pavement. Concrete shall be class A modified (minimum 28 day strength shall be 4,000 psi.). Thickness shall be as indicated by the bid item.

Requirements in the KDOH Standard Specifications, KDOH Standard Drawings, plans, or proposal related to Portland cement concrete pavement shall apply except that this specification has precedence in any conflict. The placement process includes mandatory 10-foot straight edge examination and surface correction during finishing. Procedures and pavement requirements are in KDOH Section 501 and its various cross references. The Work will be consider and utilize the KDOH Standard Drawings, particularly RPN-015, RPS-010 through RPS-039 (12 drawings total), RPX-010 through RPX-020 (3 drawings total), but any other standard drawing needed to successfully complete the work.

If severe drying conditions are anticipated, a pour will not be permitted unless an approved method of inhibiting drying is available.

The desired slump for slip forming is 2 inches. The slump may be as much as 7 inches when forms are used.

The typical section for the pavement and its base and location of all sawed and sealed joints shall be as established by the Purchase Order for the Work.

- All transverse contraction joints shall be at right angles to the roadway. The joints will be sawed but without dowels.

- Spacing for contraction joints shall not exceed 18 feet.

- Joints may be sawed conventionally or with a soft cut saw to a depth of 1 ½ inch. All joints shall be sawed, then sealed with Dow-Corning silicone 890SL or equivalent. Immediately prior to sealing, joints shall be thoroughly cleaned, including sand blasting in both directions. Backing strips are required. Sealing shall be in accordance with KDOH Standard Drawing RPX-020 and KDOH Section 501.03.17.

- Traffic shall not be permitted on newly sealed joints until the silicone seal is sufficiently "skinned over" to prevent tracking due to traffic. The skin-over time for silicone seals typically is one hour; however, longer times may be required, depending upon specific weather conditions. The CONTRACTOR shall be responsible for replacement/repair of damaged seals until curing is complete (21 days).

- It is anticipated that each lane will be placed in a continuous operation without transverse construction joints. Before placement of a lane commences, the CONTRACTOR shall provide assurance to the ENGINEER that the concrete supplier has committed enough equipment to accomplish a continuous pour.

- Synthetic fibers shall be added to the mixture at the plant or otherwise, as recommended by the manufacturer. Fiber length shall be ¾-inch. The fibers shall be graded, fibrillated, polypropylene fibers and shall be added to the fresh concrete at a dosage rate of 3.0 pounds per cubic yard of concrete (or at a lesser rate if directed by the ENGINEER or the Purchase Order). The cost of the fibers and any additional labor cost shall be included in the bid unit price for Fiber-reinforced Concrete.

46.2 BASIS OF PAYMENT

Accepted quantities for Fiber-reinforced PCC Pavement will be measured to the nearest cubic yard. Payment will be made at the unit bid price per cubic yard. Payment shall be based on delivery tickets for PCCP delivered and accepted for the work. The price includes concrete and all other material, plant, labor, joint sawing, sealing and incidentals necessary to install Fiber-reinforced PCC Pavement.

TECHNICAL SPECIFICATIONS

SECTION 47 – SINGLE BLOCK MASONRY RETAINING WALL

47.1 SCOPE

This Work shall consist of furnishing all materials and construction of a modular concrete gravity retaining wall system (Keystone, VERSA-LOK or approved equal) in accordance with these specifications, manufacturer's recommendations and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans. Work includes furnishing and placing concrete blocks, caps, and pins. Work also includes excavation, preparing foundation soil, installing leveling pad, drainage fill and backfill to the lines and grades shown on the construction drawings. This modular concrete gravity retaining wall will be limited to the maximum height recommended by the manufacturer as measured from the base of the wall to the top.

47.2 BASIS OF PAYMENT

Accepted quantities of Single Block Masonry Retaining Wall will be paid at the Contract Unit Price per square foot as measured from the free face, which shall be full compensation for all Work required by this section. It does not include the material cost of drain pipe, drainage fill, backfill material brought from off-site, and materials for the leveling pad as specified in the construction drawings. Those items shall be paid for at their respective unit bid price determined elsewhere under this Contract. Where such a unit cost is not furnished, the item shall be separately negotiated.

TECHNICAL SPECIFICATIONS

SECTION 48 – EROSION CONTROL BLANKET

48.1 DESCRIPTION OF WORK

The Work covered by this specification consists of furnishing all materials, equipment, and labor for preparing the seedbed, fertilizing, seeding, and installation of permanent Erosion Control Blankets in the areas as directed by the ENGINEER.

There are two types of erosion control blankets. The Degradable Erosion Control Mat serves as a slope protector and is designed to hold seeds and soil in place until vegetation is established. The Turf Reinforcement Mat (TRM) serves as a permanent erosion control device designed to retain seed and soil using durable synthetic materials stabilized against ultraviolet degradation and inert to chemicals normally encountered in soil.

48.2 MATERIALS

Degradable Erosion Control Mat shall be woven from a chosen material and is meant to slow down the speed at which water moves across the surface. The material chosen is usually something with lots of ridges and obstructions for the water to slow down on. There are many different types of erosion control mats, some that are synthetic and some that are natural. There are even a few that are both synthetic and natural. These mats can be made out of straw, coconut fiber, aspen fiber, jute, and polypropylene (plastic).

Reinforcement shall be Contech Ero-Mat or approved equal or equivalent. The erosion control matting shall be a minimum width of 6.5 feet and approximately 1/8 inch to ½ inch thick. The mat shall be made with weed free chopped straw or equivalent evenly distributed on photodegradable polypropylene mesh and attached with high strength thread.

Turf Reinforcement Mat-Turf Reinforcement shall be Contech TRM C-45 or approved equal. The erosion control matting shall be a minimum width of 6.5 feet with approximately ½-inch x ½-inch mesh openings: weighing not less than 10 ounces per square yard. Mat fasteners shall be stakes or staples. Stakes shall consist of wood, shall have a minimum length of six inches, and shall be installed flush to the ground. Staples shall be U-shaped and made from steel wire. The staples shall have a minimum width of one inch and a minimum length of six inches. Turf Reinforcement Mat should be used after proper soil preparation, fertilization, and seeding. Installation of Turf Reinforcement Mat shall conform to the details shown in the drawings.

Seed-Seed shall consist of Kentucky Bluegrass sown at the rate of 12 lbs/1,000 sq. ft. or Finelawn or other turf type fescue at a rate of 3 lbs/1,000 sq. ft.; add ½ lb of Poa Trivialis for very heavy shade or otherwise customize as directed by ENGINEER. The desires of the owner or the species currently being used should be considered. Seed labeled in accordance with US Department of Agriculture Rules and Regulations under the Federal Seed Act shall be furnished. Seed shall be furnished in sealed, standard containers unless written exception

is granted. Seed that is wet or moldy or that has been otherwise damaged in transit or storage will not be acceptable.

Preparation of ground surface-The surface shall be suitably tilled or scraped such that the top 3 to 4 inches of soil is loose and the soil condition is acceptable to the ENGINEER. The Work shall be performed only during periods when, in the ENGINEER'S opinion, beneficial results are likely to be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed.

Fertilizer-10x10x10 fertilizer and agricultural lime will be applied at 28 lbs./1,000 sq. ft. and 150 lbs./1,000 sq. ft., respectively.

Seeding-Seed shall be broadcast either by hand or with approved hydraulic seeding equipment, as specified herein before at the rates herein before specified. Seed shall be distributed uniformly over designated areas. Half of seed shall be sown with sower moving in one direction, and the remainder with sower moving at right angles to the first sowing. Seeds shall be covered to an average depth of 1/4-inch hand rake. Seed shall not be broadcast during windy weather.

48.3 PROTECTION AND MAINTENANCE

Protection shall be provided against traffic or other use by erecting barricades immediately after treatment is completed, and by placing warning signs, as directed, on various areas.

Seeded areas shall be maintained until all seeding work or designated portions thereof have been completed and accepted. Any damage shall be repaired, and mulch material that has been removed by wind or other causes shall be replaced and secured.

48.4 ESTABLISHMENT

The CONTRACTOR shall be responsible for proper care of seeded areas while grass is becoming established. Where seeding work is done after the acceptance of other work under this Contract, the grass will be considered to be established and ready for acceptance when it reaches an average height of three inches over all seeded areas.

48.5 REPAIR

When any portion of the surface becomes eroded or otherwise damaged or treatment is destroyed, the affected portion shall be repaired to reestablish condition and grade of soil and treatment prior to injury, as directed. Repair work required because of faulty operations or negligence on the part of the CONTRACTOR shall be performed without cost to the OWNER.

48.6 MEASUREMENT AND PAYMENT

The unit of measure for Erosion Control Blanket: Degradable Erosion Control Mat or Turf Reinforcement Mat will be the square yard. Payment for Degradable Erosion Control Mat or Turf Reinforcement Mat will be the Contract Price per square yard as exposed, which shall include all costs in connection with preparation, seeding, and installation of Erosion Control Blanket: Degradable Erosion Control Mat or Turf Reinforcement Mat. Payment as specified above shall be considered full compensation for all equipment and incidentals necessary to perform the work as required.

TECHNICAL SPECIFICATIONS

SECTION 49 – PROJECT SIGN

49.1 SCOPE

The Work covered by this specification consists of furnishing all materials, equipment, and labor for erecting the Project Sign as indicated in the LFUCG Standard Drawing 323. All statements included with the drawing are pertinent with the exception of Line 1. Payment for the Project Sign will be as indicated below.

49.2 BASIS OF PAYMENT

Accepted quantities for Project Sign will be paid for at the Contract Unit Price as quoted per each (which shall be full compensation for all Work under this Section) and paid per specified Project Sign satisfactorily placed. All labor, materials, equipment, and excavation shall be incidental to the placement of Project Sign.

TECHNICAL SPECIFICATIONS

SECTION 50 - STEEL W BEAM GUARDRAIL & END TREATMENTS

50.1 SCOPE

Work for this Section shall include all labor, materials, excavations, equipment, and incidentals necessary to construct Steel W Beam Guardrail in accordance with Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, Section 719 and 814 requirements and Kentucky Department of Highways Standard Drawings, latest edition.

50.2 BASIS OF PAYMENT

Accepted quantities for Steel W Beam Guardrail will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work required under this Section) and paid per linear foot of guardrail satisfactorily placed. Unless noted otherwise in the drawings, all steel W beam guardrail shall include two (2) Type 2 Terminal Sections. All other end treatments for guardrail shall be bid separately. All labor, materials, equipment, and excavation shall be incidental to the placement of Steel W Beam Guardrail.

TECHNICAL SPECIFICATIONS

SECTION 51 – ARTICULATING CONCRETE BLOCK

51.1 SCOPE

All Work for this Section shall consist of installation of Articulating Concrete Blocks(ACB). It shall include grading and installation of geotextile filter fabric and articulating concrete blocks.

51.2 MATERIALS

ARTICULATING CONCRETE BLOCKS shall be four-inch thick blocks, and shall be **ARMORLOC™ 3510** (mfgrd by Armortec of Bowling Green, KY), **ARMORFLOC™** (distributed by ConTech of Middletown, OH), **GEOLINK™ PL41216** (manufactured by PetraTech/American Concrete Products of Woodstock, IL), or approved equal. Submit cut sheets and a sample before any construction commences.

The GEOTEXTILE FILTER FABRIC placed under the ACB shall be a woven monofilament geotextile with a minimum weight of 4 oz./sq. yd. and shall be **MARAFI 5XT , MARAFI FW500**, or equal as approved by the ENGINEER.

51.3 CONSTRUCTION METHODS

ARTICULATING CONCRETE BLOCKS shall be installed according to the plans, details, and manufacturer's instructions.

51.4 BASIS OF PAYMENT

Accepted quantities shall be paid for at the Contract Unit Price per square yard as quoted as in the Bid Schedule and shall be full compensation for all Work under this Section including geotextile filter fabric. All labor, materials, equipment, excavation, and grading shall be incidental to the installation of ARTICULATING CONCRETE BLOCKS.

TECHNICAL SPECIFICATIONS

SECTION 52 – RCP PIPE AND MANHOLE REPAIRS

(REINFORCED CONCRETE PIPE (RCP) CRACK REPAIRS AND MANHOLE REHABILITATION)

52.1 SCOPE:

Aging cracked reinforced concrete pipe and manholes may require repair prior to replacement. Contractor shall be solely responsible for personnel safety during the execution of this work. Normally, unless otherwise noted, a closed circuit television video tape will be required after all pipe work is completed. See separate specification concerning this inspection.

52.2 GENERAL:

The following is a procedure for the repairs to a cracked reinforced concrete pipe or manhole. Note that the minimum pipe size to be repaired by this section shall be 30" diameter. If cracks leak with any water flow at the proposed time of repair, repairs must be delayed until water flow stops. If water flow does not stop before planned repair time, do not proceed but contact ENGINEER for revised instructions on the use of alternate but similar materials.

52.3 PRODUCTS:

All products shall be:

- Xypex Patch'n Plug as distributed by The Williams Coatings Consultants, Inc., of Nashville, TN.
- Strong Seal QSR as manufactured by Strong Seal Inc (SSI), of Pine Bluff, Arkansas.
- or ENGINEER approved equal. Note any proposed substitute must be submitted prior to any work commencement and approved in writing .

Submit product cut sheets for intended product prior to any work.

52.4 APPLICATION:

- Remove any and all debris including tree roots through out the structure. Note that wherever tree roots are encountered the top or side of the pipe must be exposed and patch materials must be applied to the top (or sides) of the pipe as well as the interior pipe face.

- Remove all loose concrete or mortar from cracks or joints.

- Apply material in strict conformance with all Manufacturer's instructions.

- With CCTV Video record the completed installation in accordance with Section 26 of these Technical Specifications.

52.5 BASIS OF PAYMENT:

Accepted quantities under this section shall be paid for at the Contract Unit Price per linear foot of pipe or manhole repaired. Payment shall be considered full compensation for all materials and labor to complete the work described in this Section.

TECHNICAL SPECIFICATIONS

SECTION 53 - SAWCUTTING WALK, CURB, PAVEMENT, ETC.

53.1 SCOPE

When sawcutting of sidewalks, curb/curb and gutter, pavement, etc. is called for in these Specifications it shall require the use of an approved saw in order to obtain a smooth, straight line. Any existing facility, which is not marked for removal by the ENGINEER, but is nevertheless removed, shall be replaced at the CONTRACTOR'S expense.

53.2 BASIS OF PAYMENT

Accepted quantities for Sawcutting will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work required under this Section) and paid per linear foot, satisfactorily performed. All labor, materials, equipment, and excavation shall be incidental to Sawcutting.

TECHNICAL SPECIFICATIONS

SECTION 54 - PRECAST REINFORCED CONCRETE BOX CULVERT

54.1 SCOPE

Work under this Section shall include all labor, excavation, materials, equipment, bedding, backfilling and legally disposing of unneeded and unsatisfactory material at site obtained by the CONTRACTOR in accordance to the Lexington-Fayette Urban County Government Standard Drawings and all incidentals necessary to construct Precast Reinforced Concrete Box Culvert (RCBC) to the sizes and types indicated. The work for this Section shall also conform to the Kentucky Department of Highways Standard Specifications for Road and Bridges Section 611, Current Edition.

54.2 LAYING

The Precast RCBC shall be laid in sections to the line and grade shown on the drawings on a compacted bedding of crushed aggregate up to ¾ inch maximum size. The compacted bedding shall be leveled with a template or straightedge to ensure uniform support throughout the entire length and width of the structure.

The Precast RCBC shall be laid by placing the sections starting at the outlet end of the culvert with the bell or groove end being laid upgrade.

Provide drainage with 4-inch weep holes, except that for side-by-side installations separated by grout, the weep holes shall be placed on the extreme outside walls only.

Openings formed between the precast sections and any side entry of pipes. or top entry of manholes shall be grouted to form a water tight joint. When manholes are to be placed directly on the top slab of the precast sections, additional steel reinforcement in the top slab shall be provided to sufficiently compensate for the section removed.

54.3 JOINTS

The Contractor shall make sure that the joints of each unit are properly fitted. The Contractor shall use rubber, flexible plastic gaskets or asphalt mastic joint sealing compound in joints between the Precast Box Sections. Regardless of the type of sealant to be used, the Contractor shall ensure proper meshing of the joints.

No sand or foreign material of any kind shall be allowed to intrude into the joints. If sand or foreign material has intruded into the joints upon joining the sections, the joints shall be thoroughly cleaned until no sand or foreign material is present, then the joints shall be resealed.

The exterior joint gap on the top of the Precast RCBC shall be filled with mortar and shall be covered with a minimum of a 15-inch double layer geotextile fabric joint wrap. The joint wrap shall be applied to all joint sections.

54.4 BACKFILLING

Backfilling of the trench for the Precast Reinforced Concrete Box culvert shall be done in accordance to the Plans, Standards and Specifications of the Lexington - Fayette Urban County Government and in accordance to Subsection 603.03 of the Kentucky Department of Highways Standards and Specifications for Highways and Bridges.

54.5 BASIS OF PAYMENT

Accepted quantities for Precast Reinforced Concrete Box culverts will be paid for at the Contract Unit Price as quoted for various sizes (which shall be full compensation for all work required under this Section) and paid per linear foot of Precast Reinforced Concrete Box Culvert according to the length specified in the Plans and satisfactorily placed. Any removal of pavement and sidewalk and any rock encountered between zero (0) and eight (8) feet shall be paid for under appropriate Bid Items in addition to the Unit Price for Precast RCBC. Concrete caps shall be paid under the Bid Item for unfinished concrete. Surface restoration (seeding, sod, pavement, etc.) will be paid separately under the appropriate Bid Items and the pay limits for surface restoration shall be in accordance with the appropriate Standard Drawings. Additional reinforcements will be paid under the Bid Item for Steel Reinforcement for Concrete. Limits of surface restoration will be those limits as shown on the plans.

All labor, joint materials (including the geotextile fabric wrap and shear connectors required for joining sections), equipment, excavation, bedding, disposal and backfilling shall be incidental to the placement of the Precast RCBC.

TECHNICAL SPECIFICATIONS

SECTION 55 – DETECTABLE WARNING SURFACE TILE

55.1 SCOPE OF WORK

This Section specifies furnishing and installing Detectable Warning Surface Tiles Overlay or Imbedded where indicated concurrent with the installation of concrete sidewalk rampsper Section 14.1 of these Specifications.

55.2 SHOP DRAWINGS

- Product Data: Submit manufacturer's literature describing products, installation procedures.
- Samples for Verification Purposes: Submit two (2) tile samples minimum 6"x8" of the kind proposed for use.
- Shop drawings are required for products specified showing fabrication details; composite structural system; plans of tile placement including joints, and material to be used as well as outlining installation materials and procedure.
- Material Test Reports: Submit test reports from qualified independent testing laboratory indicating that materials proposed for use are in compliance with requirements and meet the properties indicated. All test reports shall be conducted on a Surface Applied tactile tile system as certified by a qualified independent testing laboratory.
- Maintenance Instructions: Submit copies of manufacturer's specified maintenance practices for each type of tactile tile and accessory as required.

55.3 OVERLAY MODULES

A. QUALITY ASSURANCE

- Provide Surface Applied tactile tiles and accessories as produced by a single manufacturer.
- Installer's Qualifications: Engage an experienced Installer certified in writing by tactile manufacturer as qualified for installation, who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.
- Americans with Disabilities Act (ADA): Provide tactile warning surfaces which comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act (Title 49 CFR TRANSPORTATION, Part 37.9 STANDARDS FOR ACCESSIBLE TRANSPORTATION FACILITIES, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES.
- Vitrified Polymer Composite (VPC) Surface Applied tiles shall be an epoxy polymer composition with an ultra violet stabilized coating employing aluminum oxide particles in the truncated domes. The tile shall incorporate an in-line dome pattern of truncated domes 0.2" in height, 0.9" diameter at the base, and 0.4" diameter at top of dome spaced 2.35" nominal as measured on a diagonal and 1.70" nominal as measured

side by side. For wheelchair safety the field area shall consist of a non-slip surface with a minimum of 40 - 90° raised points 0.045" high, per square inch; "Armor-Tile" as manufactured by Engineered Plastics Inc., Tel: 800-682-2525, or approved equal.

1. Dimensions: Tiles shall be held within the following dimensions and tolerances:

			Nominal	**Tile Size**			
Length and Width:	12" x 12"	24" x 24"	24" x 36"	24" x 48"	24" x 60"	36" x 48"	36" x 60"
Depth				0.1875" ±	5% max.		
Face Thickness				0.1875 ±	5% max.		
Warpage of Edge				± 0.5%	max.		

2. Water Absorption of Tile when tested by ASTM-D 570 not to exceed 0.35%.
3. Slip Resistance of Tile when tested by ASTM-C 1028 the combined wet/dry static co-efficient of friction not to be less than 0.80 on top of domes and field area.
4. Compressive Strength of tile when tested by ASTM-D 695-91 not to be less than 18,000 psi.
5. Tensile Strength of Tile when tested by ASTM-D 638-91 not to be less than 10,000 psi.
6. Flexural Strength of Tile when tested by ASTM - C293-94 not to be less than 24,000 psi.
7. Chemical Stain Resistance of Tile when tested by ASTM-D 543-87 to withstand without discoloration or staining - 1% hydrochloric acid, urine, calcium chloride, stamp pad ink, gum and red aerosol paint.
8. Abrasive Wear of Tile when tested by BYK - Gardner Tester ASTM-D 2486* with reciprocating linear motion of 37± cycles per minute over a 10" travel. The abrasive medium, a 40 grit Norton Metallite sand paper, to be fixed and leveled to a holder. The combined mass of the sled, weight and wood block to be 3.2 lb. Average wear depth shall not exceed 0.030 after 1000 abrasion cycles measured on the top surface of the dome representing the average of three measurement locations per sample.
9. Fire Resistance: When tested to ASTM E84 flame spread be less than 25.
10. Gardner Impact to geometry "GE" of the standard when tested by ASTM-D 5420-93 to have a mean failure energy expressed as a function of specimen thickness of not less than 450 in. lbf/in. A failure is noted if a hairline fracture is visible in the specimen.
11. Accelerated Weathering of Tile when tested by ASTM-G26-95 for 2000 hours shall exhibit the following result - no deterioration, fading or chalking of surface of tile.

- Vitrified Polymer Composite (VPC) Surface Applied tiles embedded in concrete shall meet or exceed the following test criteria:

1. Accelerated Aging and Freeze Thaw Test of Tile when tested to ASTM-D 1037 shall show no evidence of cracking, delamination, warpage, checking, blistering, color change, loosening of tiles or other defects.
2. Salt and Spray Performance of Tile and Adhesive System when tested to ASTM-B 117 not to show any deterioration or other defects after 100 hours of exposure.

B. DELIVERY, STORAGE AND HANDLING

Tiles shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy wrappings and tile type shall be identified by part number. Tiles shall be delivered to location at building site for storage prior to installation.

C. SITE CONDITIONS

Environmental Conditions and Protection: Maintain minimum temperature of 40°F in spaces to receive tactile tiles for at least 48 hours prior to installations, during installation, and for not less than 48 hours after installation. Store tactile tile material in spaces where they will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 40°F in areas where work is completed. The use of water for work, cleaning or dust control, etc. shall be contained and controlled and shall not be allowed to come into contact with the passengers or public. Provide barricades or screens to protect passengers or public. Disposal of any liquids or other materials of possible contamination shall be made in accordance with federal state and local laws and ordinances. Cleaning materials shall have code acceptable low VOC solvent content and low flammability if used on the site.

D. EXTRA STOCK

Deliver extra stock to storage area designated by engineer. Furnish new materials from same manufactured lot as materials installed and enclose in protective packaging with appropriate identification for Surface Applied tactile tiles. Furnish not less than two (2) % of the supplied materials for each type, color and pattern installed.

E. PRODUCTS: MANUFACTURERS

- Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
- The Vitrified Polymer Composite (VPC) Surface Applied Tactile Tile specified is based on Armor- Tile manufactured by Engineered Plastics Inc. (800-682-2525). Existing engineered and field tested products which are subject to compliance with requirements, may be incorporated in the work and shall meet or exceed the specified test criteria and characteristics.

- Color: Yellow conforming to Federal Color No. 33538. Color shall be homogeneous throughout the tile.

F. MATERIALS

- Fasteners: Color matched, corrosion resistant, flat head drive anchor: ¼" diameter x 1 ¾" long. Armor-Drive by Engineered Plastics or equal.
- Adhesive: Armor-Bond as supplied by Engineered Plastics Inc.
- Sealants: Armor-Seal as supplied by Engineered Plastics Inc.

G. INSTALLATION – OVERLAY TILES

- During all surface preparation and tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.
- The application of all tile, adhesives, mechanical fasteners, and caulking shall be in strict accordance with the guidelines set by their respective manufacturers.
- Work with the Contractor or Engineer to ensure that the surfaces being prepared and fabricated to receive the tiles are constructed correctly and adequately for tile installation. Review design drawings with the Contractor prior to the construction and refer any and all discrepancies to the Engineer.
- Set the tile true and square to the curb ramp area as detailed in the design drawings, so that its location can be marked on the concrete surface. A thin permanent marker works well. Remove tile when done marking its location.
- The surface to receive the detectable warning surface tile (not recommended for asphalt) is to be mechanically cleaned with a diamond cup grinder or shot blaster to remove any dirt or foreign material. This cleaning and roughening of the concrete surface should include at least 4 inches around the perimeter of the area to receive the tile, and also along the cross pattern established by the corresponding areas on the backside of the tile. Those same areas should then be cleaned with a rag soaked in Acetone.
- Immediately prior to installing the detectable warning surface tile, the concrete surfaces must be inspected to ensure that they are clean, dry, free of voids, curing compounds, projections, loose material, dust, oil, grease, sealers and determined to be structurally sound and cured for a minimum of 30 days.
- Using Acetone, wipe the backside of the tile around the perimeter and along the internal cross pattern, to remove any dirt or dust particles from the area to receive the adhesive.
- Apply the adhesive on the backside of the tile, following the perimeter and internal cross pattern established by the tile manufacturer. Sufficient adhesive must be placed on the prescribed areas to have full coverage across the 2" width of the adhesive locator. A 3 x 4 foot tile will typically require an entire tube of adhesive.
- Set the tile true and square to the curb ramp area as detailed in the design drawings.
- Standing with both feet applying pressure around the molded recess provided in the tile, drill a hole true and straight to a depth of 3½" using the recommended

diameter bit. Drill through the tile without hammer option until the tile has been successfully penetrated, and then with hammer option to drill into the concrete.

- Immediately after drilling each hole, and while still applying foot pressure, vacuum, brush or blow away dust and set the mechanical fastener as described below, before moving on to the next hole.
- Mechanically fasten tiles to the concrete substrate using a hammer to set the fasteners. Ensure the fastener has been placed to full depth in the dome, straight, and flush to the top of dome. Drive the pin of the fastener with the hammer, taking care to avoid any inadvertent blows to the truncated dome or tile surface. A plastic deadblow or leather hammer is recommended.
- Working in a sequence which will prevent buckles in the tile, proceed to drill and install all fasteners in the tile's molded recesses.
- Following the installation of the tiles, the perimeter caulking sealant should be applied. Follow the perimeter caulking sealant manufacturer's recommendations when applying. Tape all perimeter edges of the tile and also tape the adjacent concrete back 1/2" from the tile's perimeter edge. Tool the perimeter caulking with a plastic applicator or spatula to create a straight edge in a cove profile between the tile and adjacent concrete. Remove tape immediately after tooling perimeter caulking sealant.
- Do not allow foot traffic on installed tiles until the perimeter caulking sealant has cured sufficiently to avoid tracking.

If installing adjacent tiles, note the orientation of each tile. Careful attention will reveal that one of the long edges of the tile is different than the other, in regard to the tiny dotted texture. You may also note a larger perimeter margin before the tiny dotted texture pattern begins. Consistent orientation of each Armor-Tile is required in order that the truncated domes on adjacent tiles line up with each other.

In order to maintain proper spacing between truncated domes on adjacent tiles, the tapered edge should be trimmed off using a continuous rim diamond blade in a circular saw or mini-grinder. The use of a straightedge to guide the cut is advisable. All cuts should be made prior to installation of the tiles.

If installing adjacent tiles, care should be taken to leave a 1/8 inch gap between each.

If tiles are custom cut to size, and if pre-molded recesses (to receive fasteners) are removed by the cut, then any truncated dome can be center-drilled with a ¼ inch through hole, and counter sunk with a suitable bit, to receive mechanical fasteners. New holes should be created no closer to the edge of the tile than any of the other perimeter fastener pre-molded recesses. Care should be taken to not countersink too deeply. Fasteners should be flush with the top of the truncated dome when countersunk properly.

Adhesive or caulking on the surface of the Armor-Tile can be removed with Acetone.

H. CLEANING AND PROTECTING

- Protect tiles against damage during construction period to comply with tactile tile manufacturer's specification.
- Protect tiles against damage from rolling loads following installation by covering with plywood or hardwood.
- Clean tactile tiles not more than four days prior to date scheduled for inspection intended to establish date of substantial completion in each area of project. Clean tactile tile by method specified by tactile tile manufacturer.

55.4 IMBEDDED MODULES

A. SHOP DRAWINGS

- Product Data: Submit manufacturer's literature describing products and installation procedures.
- Samples for Verification Purposes: Submit two (2) 12"x12" tile samples of the kind proposed for use.
- Shop drawings are required for products specified showing fabrication details; material to be used as well as outlining installation materials and procedure.
- Material Test Reports: Submit test reports from qualified independent testing laboratory indicating that materials proposed for use are in compliance with requirements and meet the properties indicated. All test reports shall be conducted on a Detectable Warning Surface Tile system as certified by a qualified independent testing laboratory.

B. QUALITY ASSURANCE

- Provide Detectable Warning Surface tiles and accessories as produced by a single manufacturer.
- Installer's Qualifications: Engage an experienced installer who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.
- Americans with Disabilities Act (ADA): Provide tactile warning surfaces which comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act (Title 49 CFR TRANSPORTATION, Part 37.9 STANDARDS FOR ACCESSIBLE TRANSPORTATION FACILITIES, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES.
- Detectable Warning Surface Tile shall be "Access Tile", same manufacture as Amor-Tile manufactured by Engineered Plastics, Inc., Tel: 800-682-2525, **or approved equal.**
  1. Water Absorption when tested by ASTM-D 570 not to exceed 0.2%.
  2. Slip Resistance when tested by ASTM-C 1028 the combined wet/dry static co-efficient of friction not to be less than 0.80 on top of domes.

3. Compressive Strength when tested by ASTM C 109 not to be less than 10,000 psi.
4. Tensile Strength when tested by ASTM-C 307 not to be less than 1,800 psi.
5. Flexural Strength when tested by ASTM – C384 not to be less than 3,000 psi.
6. Fire Resistance when tested to ASTM E84 flame spread to be less than 50.

C. DELIVERY, STORAGE AND HANDLING

Tiles shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy wrappings and tile type shall be identified by part number. Tiles shall be delivered to location at building site for storage prior to installation. All materials furnished shall be from same manufactured lot and shall be enclosed in protective packaging with appropriate identification.

D. SITE CONDITIONS

Environmental Conditions and Protection: Maintain minimum temperature of 40°F in spaces to receive tactile tiles for at least 48 hours prior to installations, during installation, and for not less than 48 hours after installation. Tiles shall be within +/- 10% of ambient temperature when placed. Subsequently, maintain minimum temperature of 40°F in areas where work is completed. The use of water for work, cleaning or dust control, etc. shall be contained and controlled and shall not be allowed to come into contact with nearby structures, fixtures, motor vehicles, pedestrians, etc. Provide barricades or screens to protect passengers or public. Disposal of any potentially hazardous liquids or other materials shall be made in accordance with federal state and local laws and ordinances. Cleaning materials shall have code acceptable low VOC solvent content and low flammability if used on the site.

F. PRODUCTS: MANUFACTURERS

- Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
- The Detectable Warning Surface Tile specified is based on ADA Solutions and Access Tile as manufactured by Engineered Plastics Inc. (800-682-2525). Other engineered and field tested products compliant with these requirements may be incorporated in the work provided they meet or exceed the specified test criteria and characteristics. Alternates shall be approved by the Engineer prior to installation.
- Color: Yellow conforming to Federal Color No. 33538. Color shall be homogeneous throughout the tile.

F. INSTALLATION – IMBEDDED TILES

- During all surface preparation and tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.
- The installation of the structural embedment flange system and related materials shall be in strict accordance with the contract documents and the guidelines set by their respective manufacturers.
- The physical characteristics of the concrete shall be consistent with the contract specifications while maintaining a slump range of 4 - 7 to permit solid placement of the imbedded tiles.. An overly wet mix will cause the tile to float and will be rejected.
- The concrete pouring and finishing operations require typical mason's tools, however, a 4' long level with electronic slope readout, 25 lb. weights, and a large non-marring rubber mallet are specific to the installation of the Imbedded tiles. A vibrating mechanism such as that manufactured by Vibco or equal can be employed, if desired. The vibrating unit should be fixed to a soft base such as wood, at least 1 foot square.
- The factory-installed plastic sheeting must remain in place during the entire installation process to prevent the splashing of concrete onto the finished surface of the tile.
- When preparing to set the tile, it is important that no concrete be removed in the area to accept the tile. It is imperative that the installation technique eliminates any air voids under the tile. Holes in the tile perimeter allow air to escape during the installation process. Concrete will flow through the large holes in each embedment flange on the underside of the tile. This will lock the tile solidly into the cured concrete.
- The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. Immediately after finishing concrete, the electronic level should be used to check that the required slope is achieved. The tile shall be placed true and square to the curb edge in accordance with the contract drawings. The Cast In Place Detectable/Tactile Warning Surface Tiles shall be tamped (or vibrated) into the fresh concrete to ensure that the field level of the tile is flush to the adjacent concrete surface. The embedment process should not be accomplished by stepping on the tile as this may cause uneven setting which can result in air voids under the tile surface. The contract drawings indicate that the tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes.
- In cold weather climates it is recommended that the imbedded tiles be set deeper such that the top of domes are level to the adjacent concrete on the top and sides of ramp and that the base of domes to allow water drainage. This installation will reduce the possibility of damage due to snow clearing operations.
- Immediately after placement, the tile elevation is to be checked to adjacent concrete. The elevation and slope should be set consistent with contract drawings to permit water drainage to curb as the design dictates. Ensure that the field surface

of the tile is flush with the surrounding concrete and back of curb so that no ponding is possible on the tile at the back side of curb.

- While concrete is workable, a 3/8" radius edging tool shall be used to create a finished edge of concrete, then a steel trowel shall be used to finish the concrete around the tile's perimeter, flush to the field level of the tile.
- During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external forces placed on the tile that may rock the tile causing a void between the underside of tile and concrete.
- Following tile placement, review installation tolerances to contract drawings and adjust tile before the concrete sets. Two suitable weights of 25 lb each may be required to be placed on each tile as necessary to ensure solid contact of the underside of tile to concrete.
- Following the concrete curing stage, protective plastic wrap is to be removed from the tile surface by cutting the plastic with a sharp knife, tight to the concrete/tile interface. If concrete bled under the plastic, a soft brass wire brush will clean the residue without damage to the tile surface.
- If desired, individual tiles can be bolted together using ¼ inch or equivalent hardware. This can help to ensure that adjacent tiles are flush to each other during the installation process. Tape or caulking can be placed on the underside of the bolted butt joint to ensure that concrete does not rise up between the tiles during installation. Any protective plastic wrap which was peeled back to facilitate bolting or cutting, should be replaced and taped to ensure that the tile surface remains free of concrete during the installation process.
- Tiles can be cut to custom sizes, or to make a radius, using a continuous rim diamond blade in a circular saw or mini-grinder. Use of a straightedge to guide the cut is advisable where appropriate.
- Any sound-amplifying plates on the underside of the tile, which are dislodged during handling or cutting, should be replaced and secured with construction adhesive. The air gap created between these plates and the bottom of the tile is important in preserving the sound on cane audible properties of the Armor-Tile system as required in various jurisdictions.

G. CLEANING AND PROTECTING

- Protect tiles against damage during construction period to comply with tactile tile manufacturer's specification.
- Protect tiles against damage from rolling loads following installation by covering with plywood or hardwood.

55.5 BASIS OF PAYMENT:

Detectable Warning Surface Tile-Overlay: Accepted quantities under this section shall be paid for at the Contract Unit Price per square foot for the appropriate size and type of Detectable Warning Surface Tile. Payment shall be considered full compensation for all materials and labor required to complete the work described in this Section.

Detectable Warning Surface Tile-Imbedded: Accepted quantities under this section shall be paid for at the Contract Unit Price per square foot for the appropriate size and type of Detectable Warning Surface Tile installed. Payment shall be considered full compensation for labor only. Any fastening hardware, tape or caulking the Contractor chooses to use shall be incidental to the cost of installation. The LFUCG will provide the Cast in Place Detectable Warning Surface Tile and CONTRACTOR is required to install the tile described in this Section.

TECHNICAL SPECIFICATIONS

SECTION 56 - UNSPECIFIED, INCIDENTAL MATERIALS

56.1 SCOPE

Work under this Section shall be for furnishing materials, not specified in this Document, to be determined as needed by the ENGINEER and delivered to the Work Site.

56.2 BASIS OF PAYMENT

Work under this Section shall be paid for at a price agreed upon between the CONTRACTOR and the ENGINEER and shall include cost plus 15% for overhead and profit (to be submitted as Contract progresses and as needed). No payments will be made under this Section without proper invoices for materials furnished.

TECHNICAL SPECIFICATIONS

SECTION 57 - UNSPECIFIED, INCIDENTAL LABOR

57.1 SCOPE

Work under this Section shall be for furnishing labor, not specified in this Document, to be determined as needed by the ENGINEER.

57.2 BASIS OF PAYMENT

Work under this Section shall be paid for at a price agreed upon between the CONTRACTOR and the ENGINEER and shall include Direct Wages Plus Certified Overhead Plus 15% Profit (to be submitted as Contract progresses and as needed). Payments under the Section shall require daily payroll sheets for the labor required.

TECHNICAL SPECIFICATIONS

SECTION 58 – THIS SECTION RESERVED

TECHNICAL SPECIFICATION

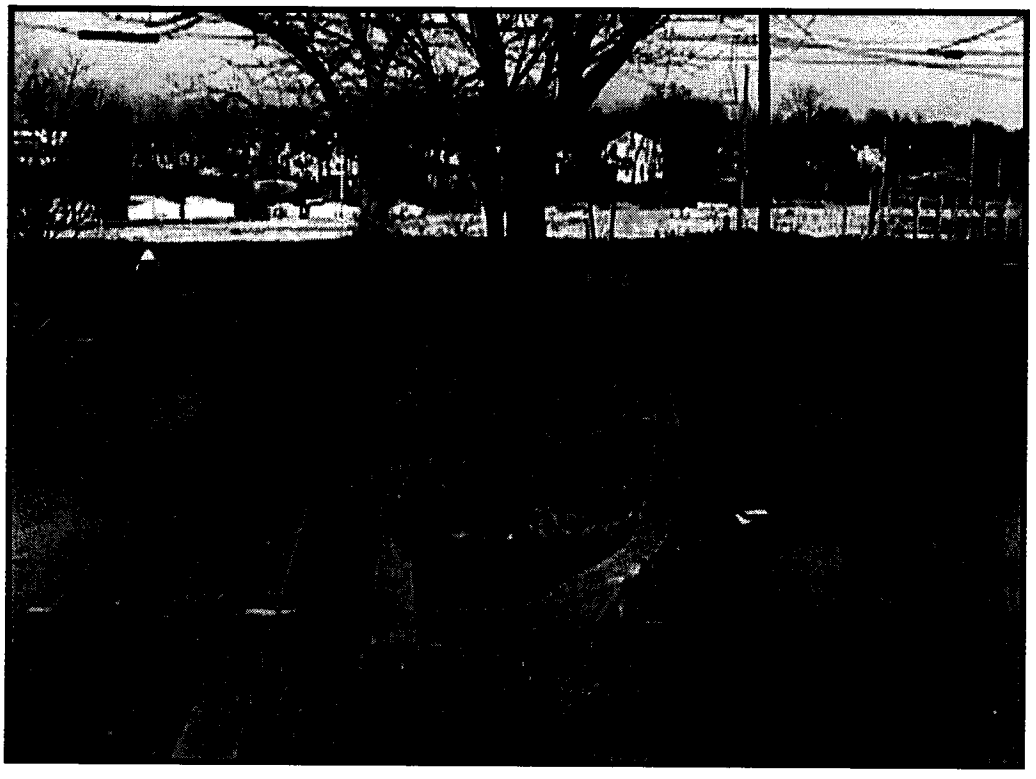
SECTION 59 – BULB-OUTS

59.1 SCOPE

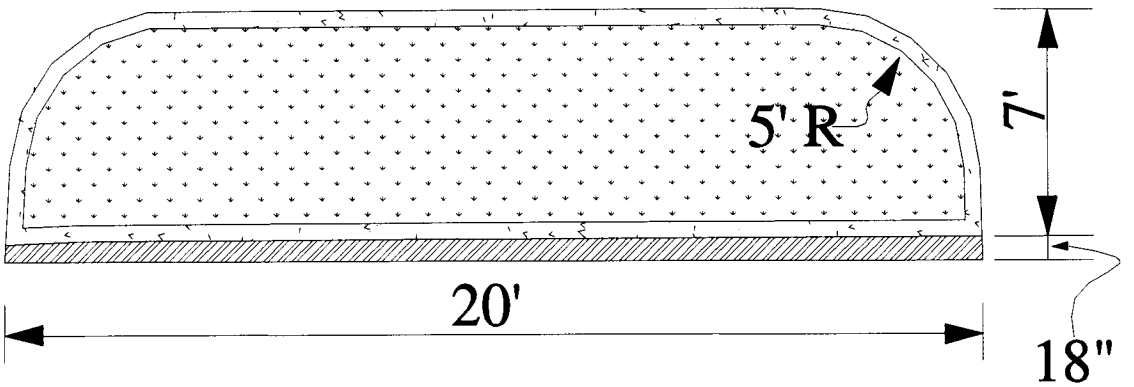
The Work shall consist of the bulb-outs as indicated on the plans. Work for this Section shall include all labor, materials, equipment, disposal, and incidentals necessary to complete Work. Excavation, header curb, asphalt repair, gutter cover, backfill (embankment), DGA, seeding and Sodding will be paid as per each item quoted in the UPC.

59.2 INSTALLATION

- The contractor will provide all labor, materials and installation equipment. Materials and workmanship are to meet LFUCG standards.
- The contractor is to provide proper traffic control to promote safe vehicular and pedestrian access.
- The contractor has 60 working days from the date of notification to complete the installation.
- The contractor is to notify the Division of Traffic Engineering of the scheduled installation date and must obtain the necessary permits to perform the work including but not limited to a Lane Blockage Permit from the Division of Traffic Engineering.
- The Division of Traffic Engineering reserves the right to have an inspector on site to insure that proper procedures are being followed and the bulbout installation meets LFUCG standards.



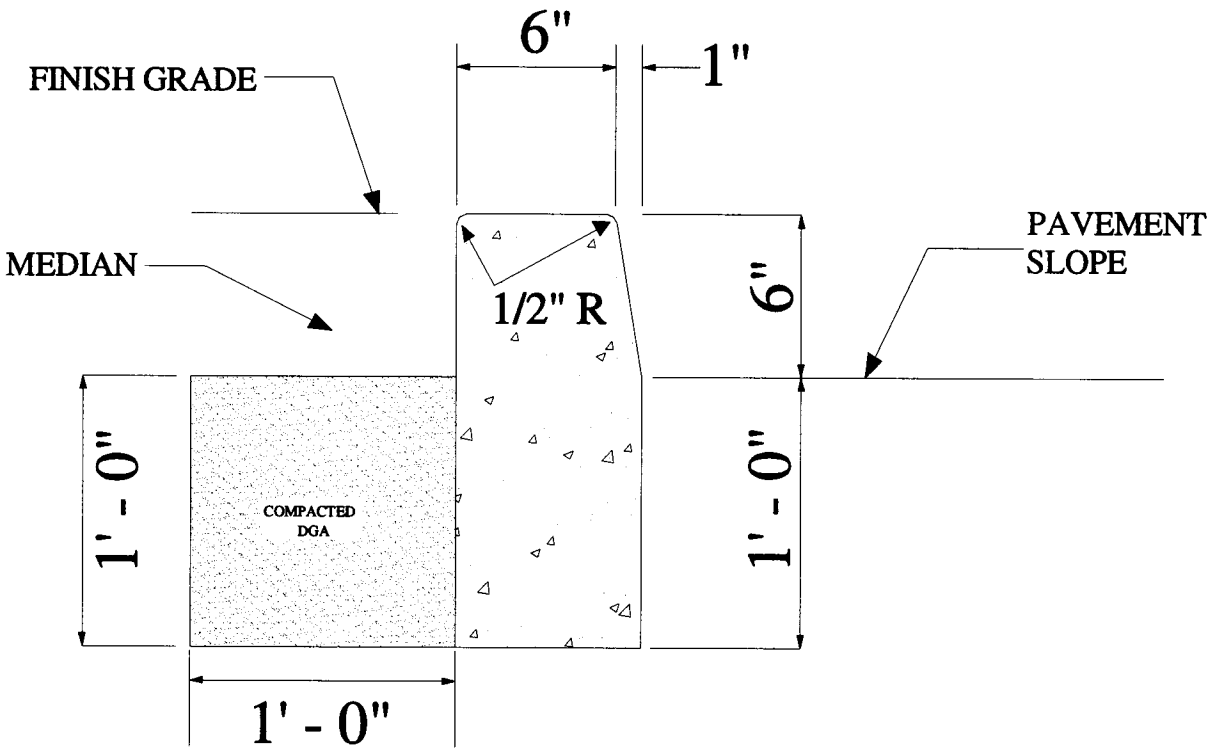
Bulb-out



NOTES:

1. HEADER CURB CONCRETE SHALL BE KDOT CLASS "A".
2. SAWED CONTRACTION JOINTS SHALL BE CONSTRUCTED EVERY 20 FEET, 3" MINIMUM DEPTH.
3. EXPANSION JOINTS SHALL BE CONSTRUCTED AT ALL BREAKS IN ALIGNMENT, AT ALL DRAINAGE INLETS AND AT THE BEGINNING AND ENDING POINTS OF CURVES.
4. ALL CONCRETE, EXCEPT BONDING SURFACES, SHALL BE CURED WITH WHITE PIGMENTED MEMBRANE FORMING COMPOUND (AASHTO M 148, TYPE 2)
5. ALL PAVEMENT AND BASE ARE TO BE REMOVED FULL DEPTH IN AREAS WHERE BULBOUTS ARE TO BE CONSTRUCTED.
6. ALL AREAS ARE TO BE BACK FILLED TO THE TOP OF CURB WITH TOPSOIL AND ARE TO BE SEEDED TO PROVIDE ADEQUATE COVERAGE.

Header Curb



NOTES:

1. CONCRETE SHALL BE KDOT CLASS "A".
2. SAWED CONTRACTION JOINTS SHALL BE CONSTRUCTED EVERY 20 FEET, 3" MINIMUM DEPTH.
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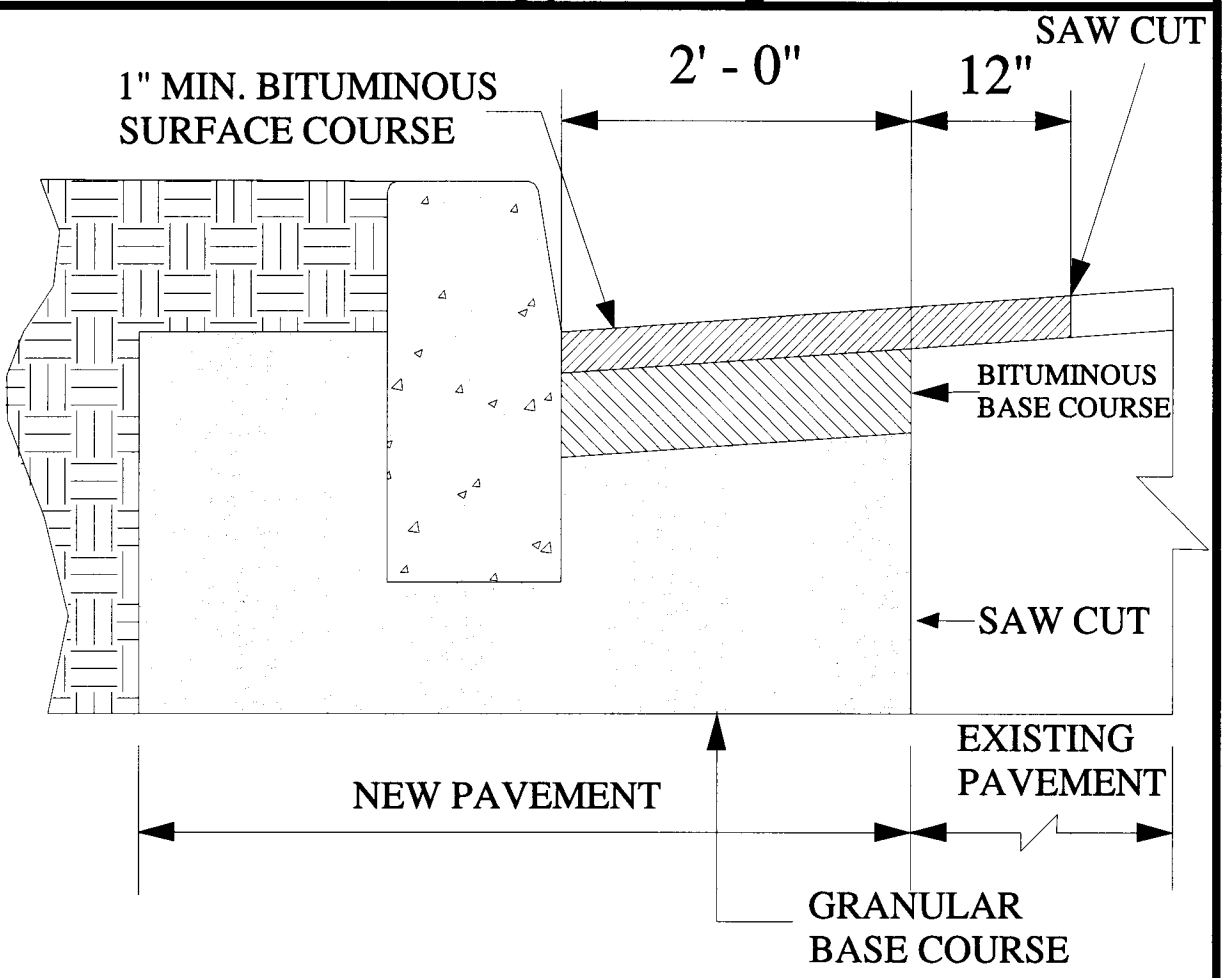
4. ALL CONCRETE, EXCEPT BONDING SURFACES, SHALL BE CURED WITH WHITE PIGMENTED MEMBRANE FORMING COMPOUND (AASHTO M 148, TYPE 2)

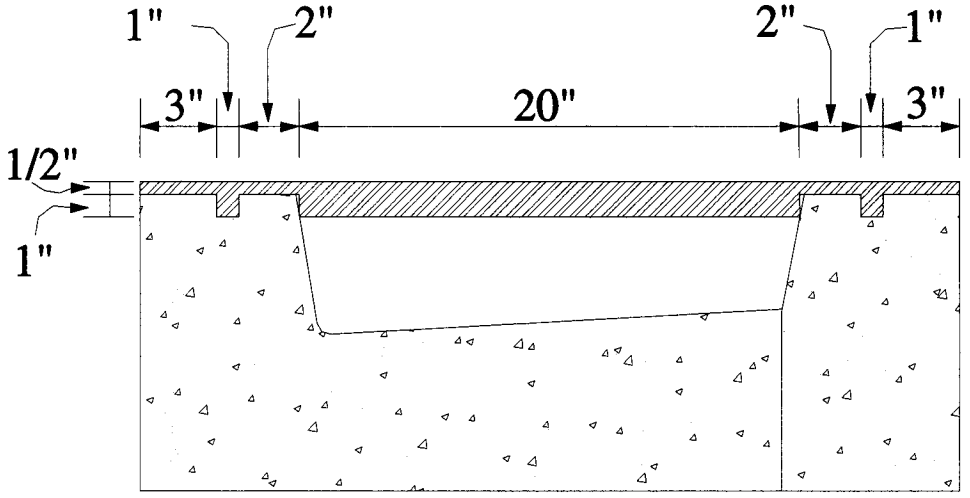
Edge Key



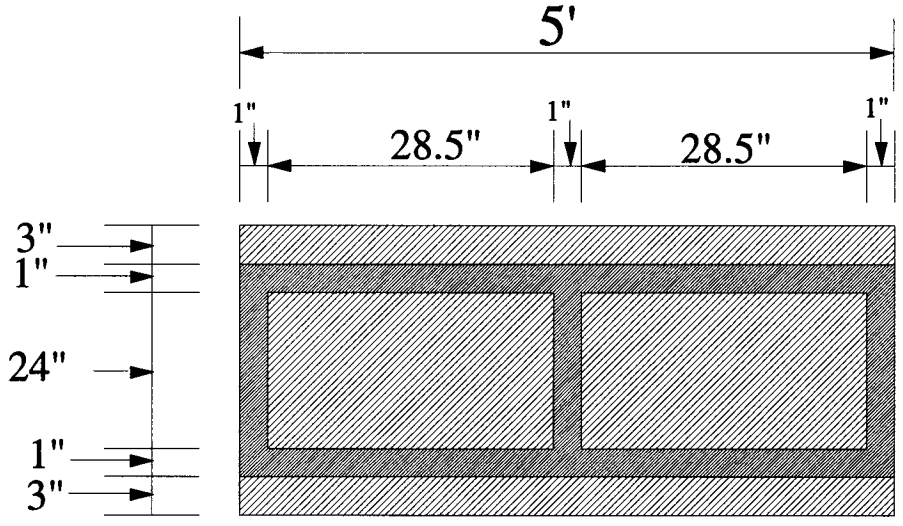
NOTES:

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.

Bulbout/Gutter Cover

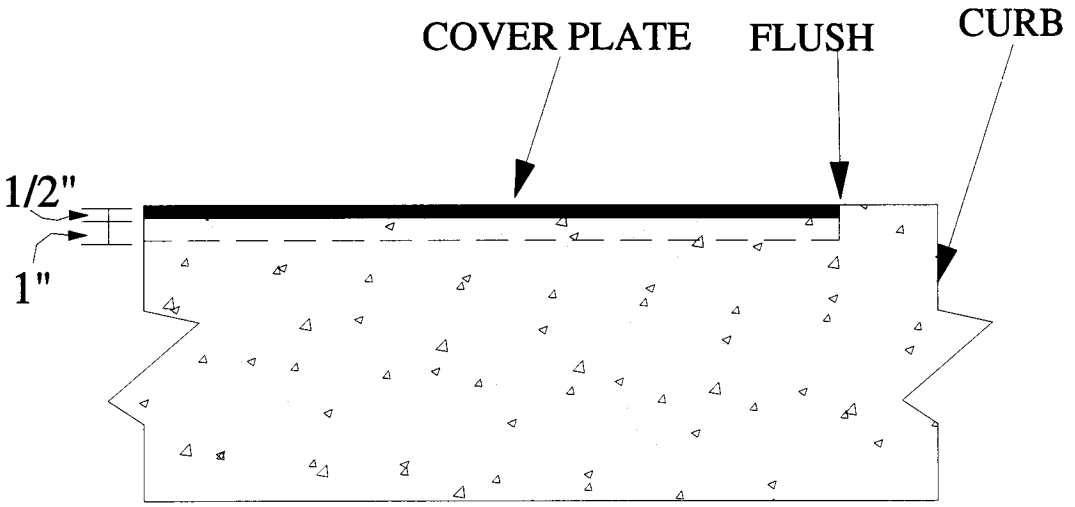


Bulbout Gutter X-section



Gutter Cover

Bulbout/Gutter Cover Notes

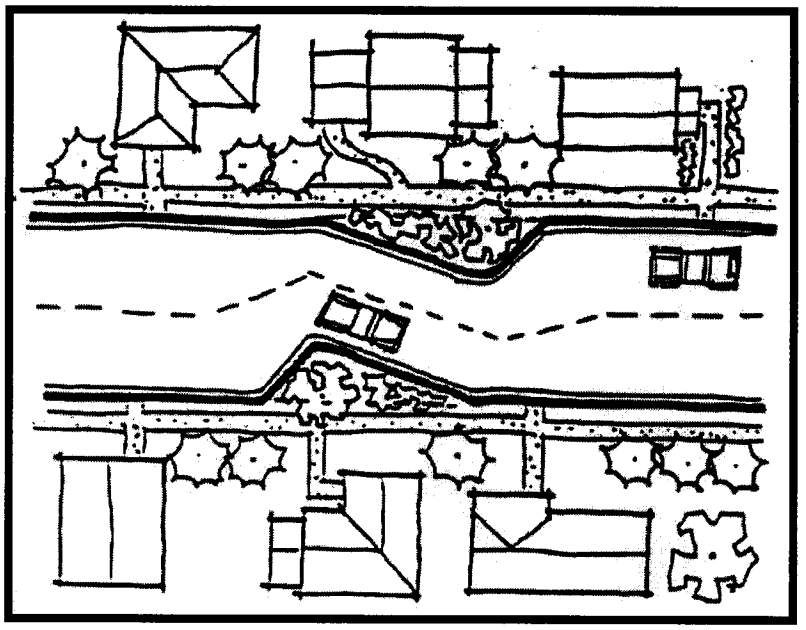


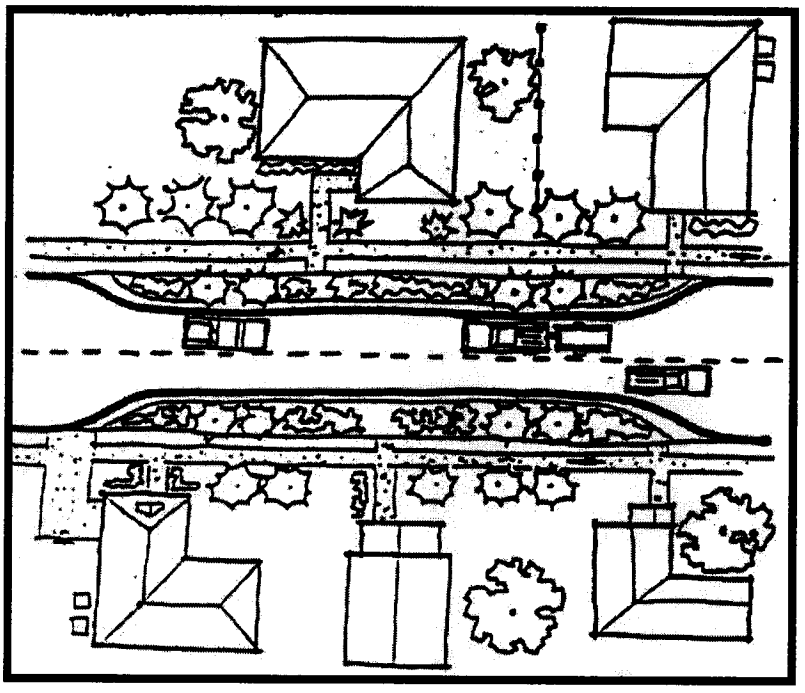
NOTES:

1. Gutter Covers shall be 1/2" thick weathered steel with 1" thick supports.
2. Existing curb sections and new header curb sections are to be formed or saw cut so that the steel cover sections are flush with the top of curb at each end of the bulbout.
3. Gutter Covers are to be held in place by the 1" thick notches in the curb.
4. Gutter Covers are to be 5' in length for a total of 4 sections per bulbout.
5. Gutter Covers are to be modified to account for non-parallel curb and gutter sections.

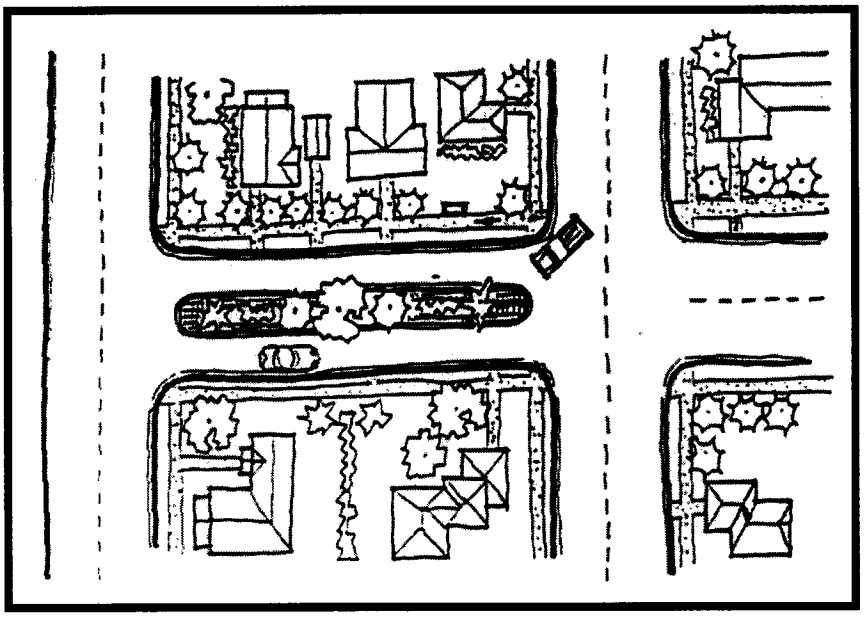
Example of non-standard bulbout types:

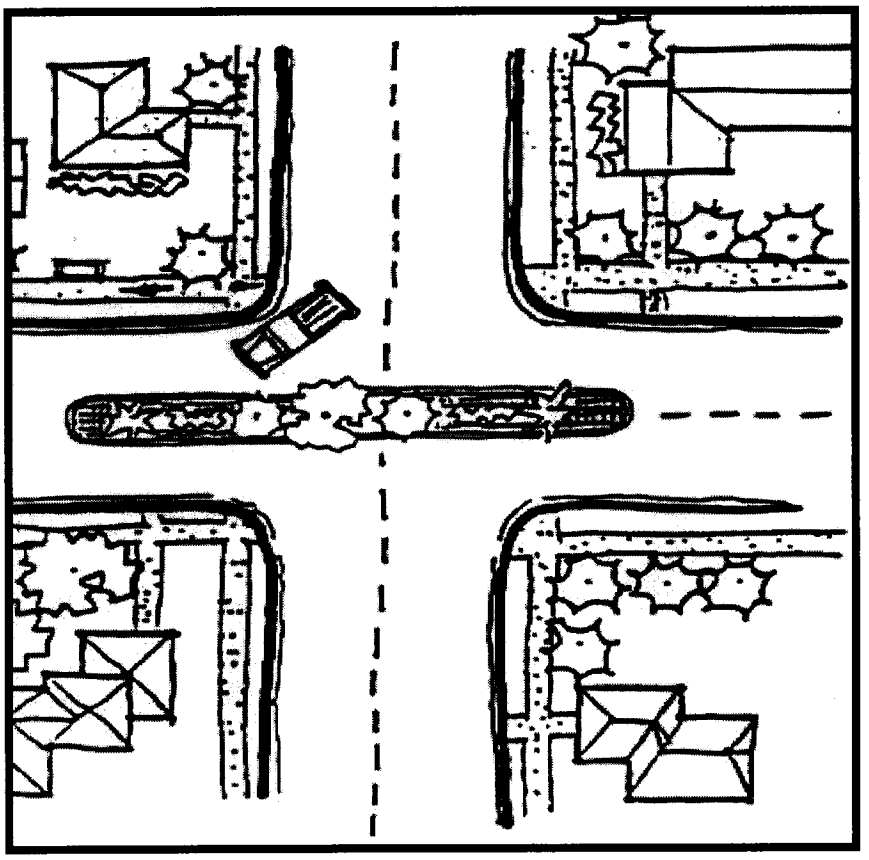
Chicanes



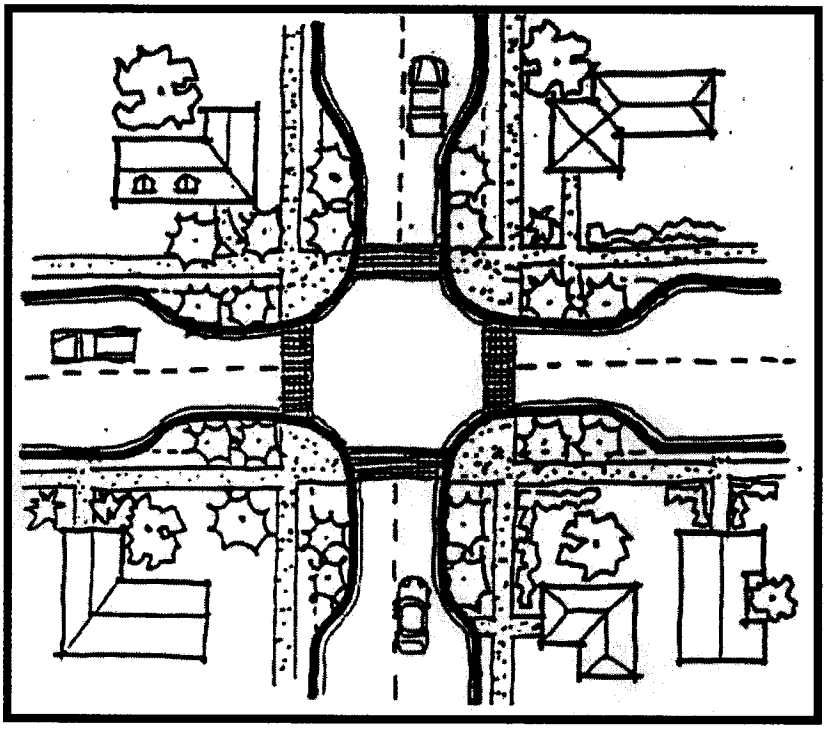


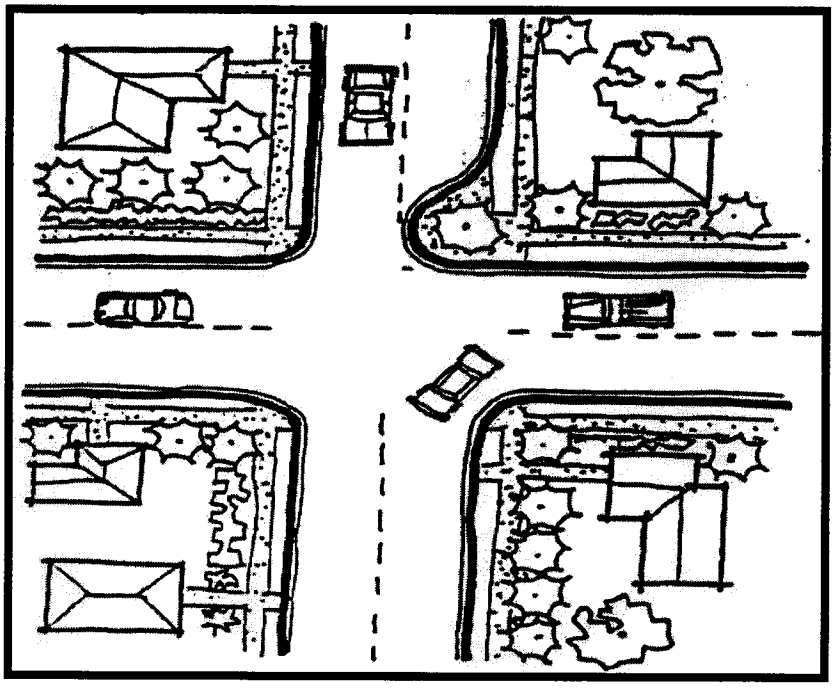
Medians



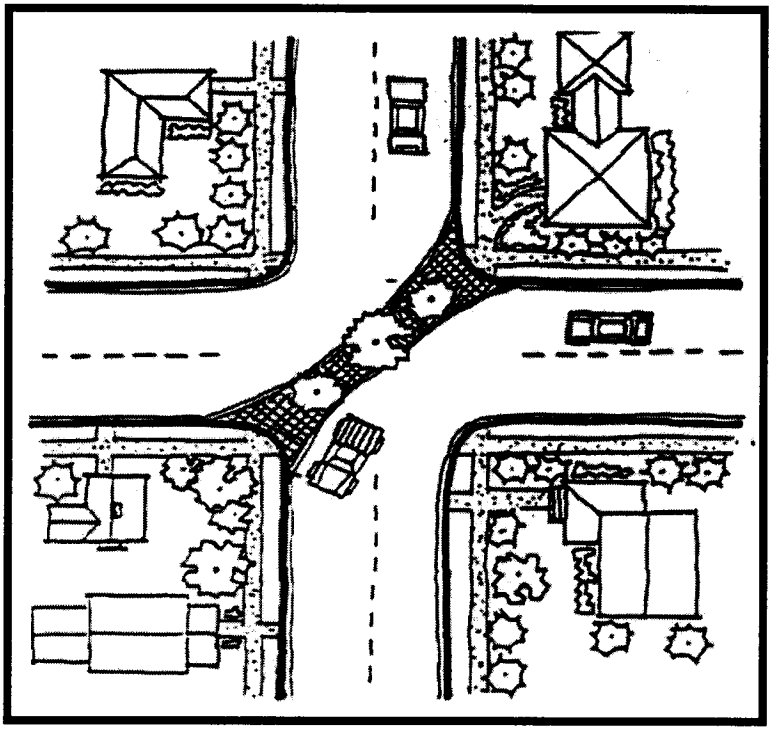


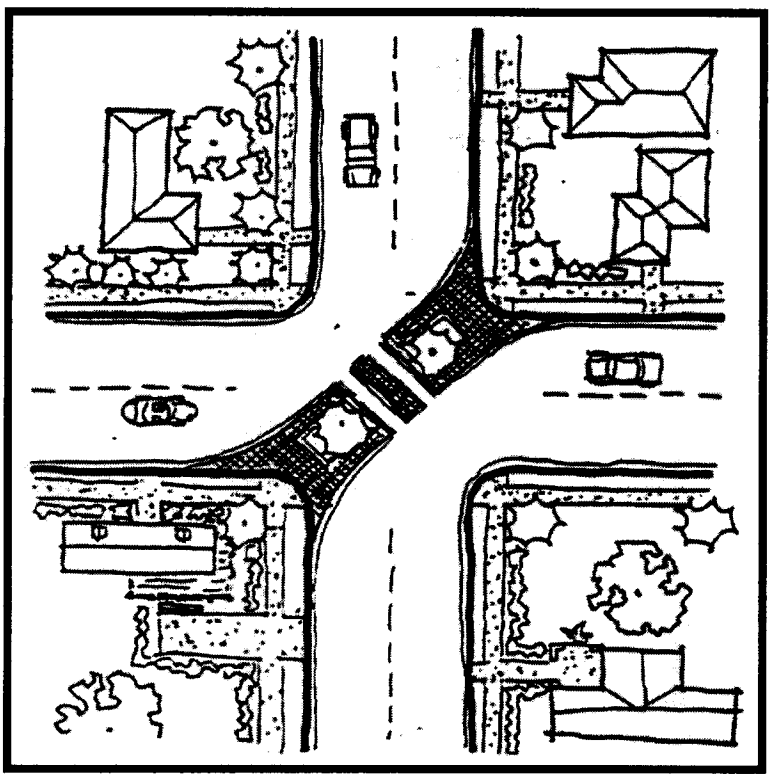
Choker/Semi-Diverter



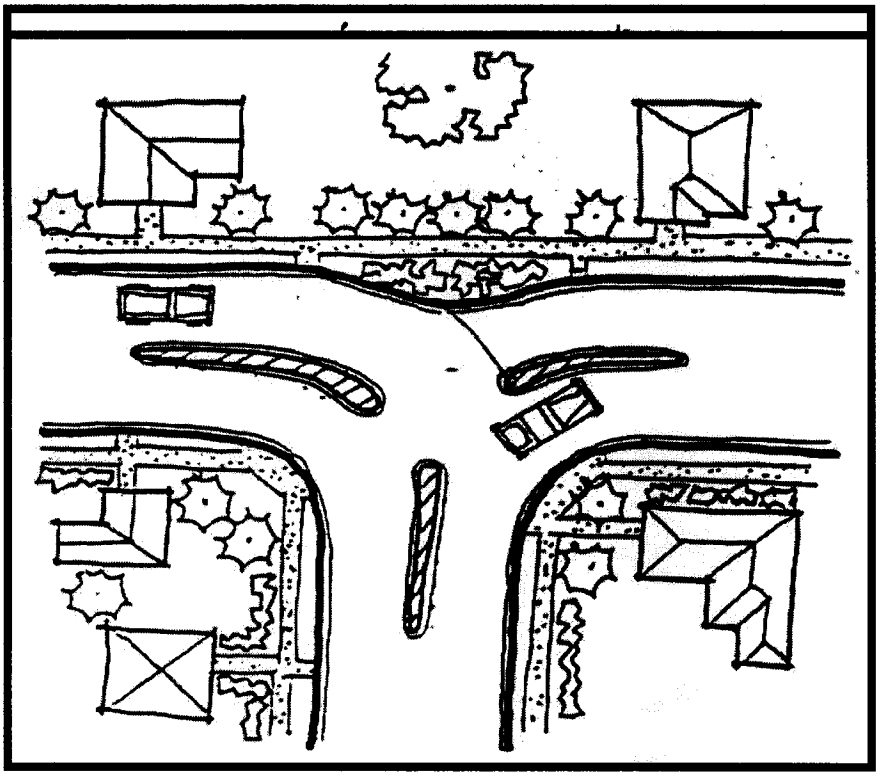


Diagonal Diverter

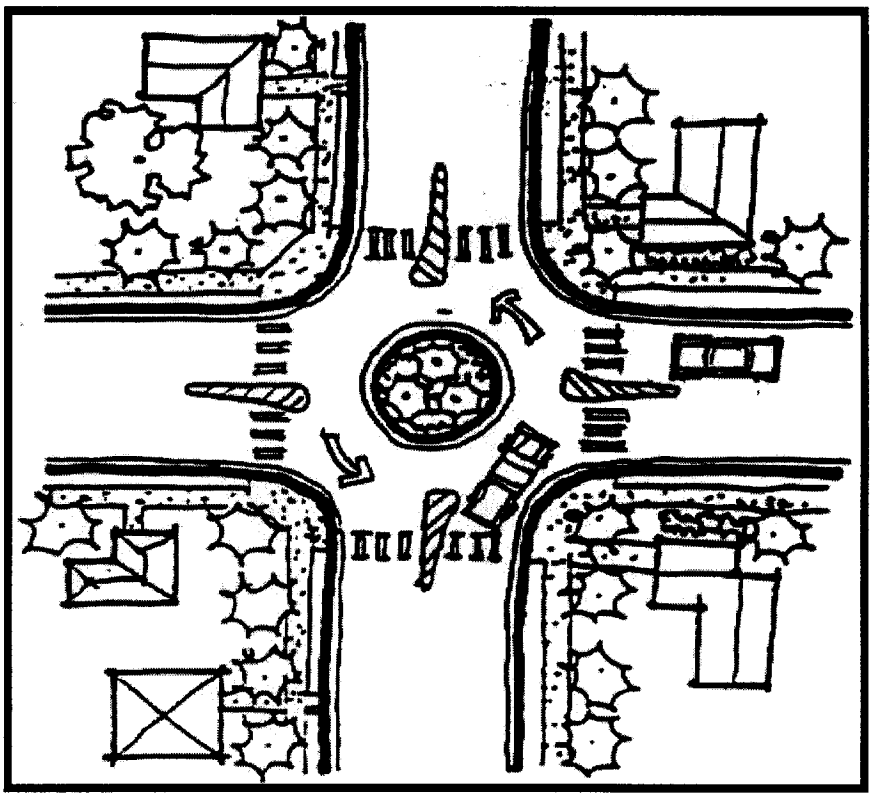


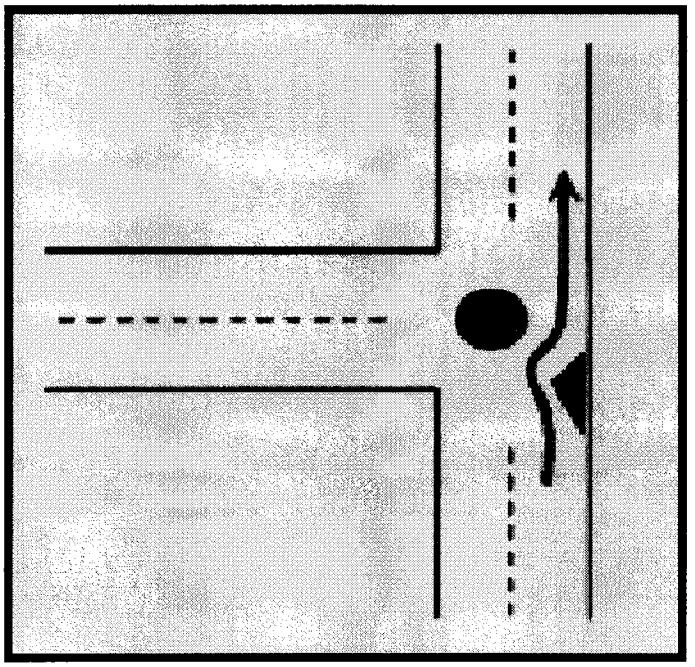


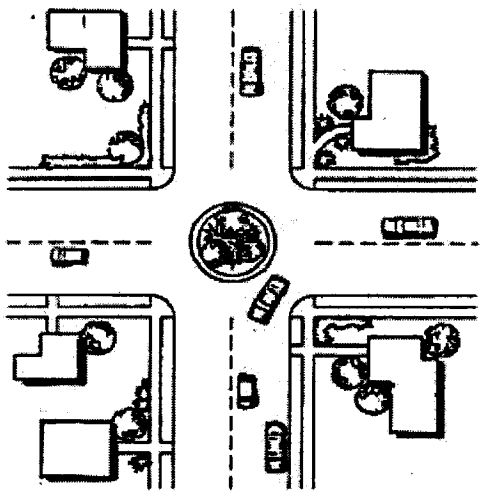
Channelization Medians



Traffic Circle







59.3 BASIS OF PAYMENT

Accepted quantities for Bulb-Outs will be paid for at the respective Contract Unit Price as quoted (which shall be full compensation for all Work under this Section) and paid per cubic yard for excavation, per linear foot for header curb, per square foot for asphalt repair, per linear foot for gutter cover, per cubic yard for backfill (embankment), per ton for DGA, per square yard for seeding and per square yard for sod satisfactorily installed. All labor, materials, and equipment with the exception of the items above shall be incidental to the installation of the Bulbouts.

TECHNICAL SPECIFICATIONS

SECTION 60 – GRADER WITH OPERATOR

60.1 SCOPE

Work under this Section shall consist of furnishing a grader with operator for grading at various locations to be determined. The grader supplied shall be in good working order, and with the trained operator, be capable of completing the required Work in a timely manner. Should the ENGINEER feel that the grader and/or operator are not adequate, he may reject either the grader and/or operator and no payment will be made.

60.2 BASIS OF PAYMENT

Accepted equipment and operator time for a Grader with an Operator will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work under this Section) and paid per hour of Work satisfactorily completed. No direct payment will be made for delivery time to or from the Work site.

TECHNICAL SPECIFICATIONS

SECTION 61 – ROLLER/COMPACTOR WITH OPERATOR

61.1 SCOPE

Work under this Section shall consist of furnishing a roller/compactor with operator for work at various locations to be determined. The roller/compactor supplied shall be in good working order, and with the trained operator, be capable of completing the required Work in a timely manner. Should the ENGINEER feel that the roller/compactor and/or operator are not adequate, he may reject either the roller/compactor and/or operator and no payment will be made.

61.2 BASIS OF PAYMENT

Accepted equipment and operator time for a roller/compactor with an Operator will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work under this Section) and paid per hour of Work satisfactorily completed. No direct payment will be made for delivery time to or from the Work site.

TECHNICAL SPECIFICATIONS

SECTION 62 - TOPSOIL PLACEMENT

62.1 SCOPE

The Work for this Section shall consist of furnishing and placing topsoil in locations as determined by the Engineer and shall include all labor, materials, equipment, excavation, and incidentals necessary to complete the Work in place, ready for use and constructed in conformance with KDOH Standard Specifications. Work for this Section shall conform to Kentucky Department of Highways Standard Specifications for Road and Bridge Construction Section 212.03.02, 827.10, Current Edition and the Lexington-Fayette Urban County Government Standard Drawings and shall include labor, excavation, materials, equipment and necessary incidentals.

62.2 WORK

Furnish and Place Topsoil: When the bid item is furnish and place topsoil, obtain topsoil conforming to Section 827 from source outside the project area. Avoid injury to existing planted growths, structures, and paved surfaces during topsoil operations.

Proper equipment and methods of operation that prevent the loading of subsoil or other unsuitable material with the topsoil. During hauling operations, keeping pavement surfaces clean. Promptly and completely remove any topsoil or other substances dropped on the surfaces before it is compacted by traffic.

Prepare areas designated to received topsoil. Then place and spread topsoil to a sufficient loose depth so that after natural settlement and rolling, the completed work conforms to the required line, grades, and elevations. Compact the topsoil and prepare the area for seeding according to Specifications.

Spreading Stockpiled Topsoil: When the bid item is spreading stockpiled topsoil, obtain the material from existing stockpiled on or near the project.

Do not spread topsoil until grading and shaping of the area to receive the topsoil has been completed and seeding and protection operations are ready to begin. Spread and lightly compact the topsoil to a uniform depth of approximately 6 inches over areas specified on the Plans or as the Engineer directs. Do not place topsoil on slopes steeper than 3:1. Compact the topsoil and prepare the area for seeding according to Specifications.

62.3 MATERIAL

Topsoil is the portion of the soil profile defined technically as the "A" horizon by the Soil Science Society of America. Use loose, friable, topsoil that is free of stones, 1 inch or greater in overall dimensions, admixture of subsoil, refuse, stumps, roots, brush, weeds, and other material that prevent the formation of a suitable seed bed. Before stripping the topsoil, inspect for existing

vegetation. Do not use topsoil from sites having Johnson Grass, Canada Thistle, Quack Grass, Nodding Thistle, or excessive amounts of noxious weeds or their rhizomes.

62.4 PAYMENT

Accepted quantities for Topsoil Placement will be paid for at the Contract Unit Price per cubic yard as quoted and this shall be full compensation for all Work required under this Section. All labor, materials, equipment, and excavation shall be incidental to the placement of Topsoil.

PART IX

ADDENDA

Addendum Number	Title	Date
1.	Correction to Bid Date	08/06/2014
2.		
3.		
4.		
5.		

Lexington-Fayette Urban County Government
DEPARTMENT OF FINANCE & ADMINISTRATION

Jim Gray
Mayor

William O'Mara
Commissioner

ADDENDUM #1

Bid Number: #107-2014

Date: August 6, 2014

Subject: **Construction Unit Price Contract**

Please address inquiries to:
Theresa Maynard (859) 258-3320

TO ALL PROSPECTIVE BIDDERS:

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

Revising bid due date on Economic Engine only; the correct date is Monday, August 25th, as on the bid documents and on the Lynn Imaging website.

Todd Slatin, Director
Division of Central Purchasing

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

COMPANY: _____

ADDRESS: _____

SIGNATURE OF PROPOSER: _____

APPENDIX A

Lexington-Fayette Urban County Government
Division of Engineering
Standard Drawings

Drawing	Drawing Title		
Manholes-Storm Drainage:			
100	Storm Sewer Manhole Type "A" Circular Wall		
102	Storm Sewer Manhole Details		
103	Manhole Frames, Covers & Steps		
104	Storm Sewer Manhole Circular Slabs		4'-0' & 5'-0' Diameter
105	Storm Sewer Manhole Circular Slabs		6'-0' Diameter
Surface Inlets & Catch Basins:			
120	Surface Inlet Type "A"		
121	Surface Inlet Type "B"		
122-1	Curb Box Inlet Type "A"	4'x4' Box	15"–18" Pipes
122-2	Curb Box Inlet Type "A"	4'x4' Box	15"-18" Pipes
123-1	Curb Box Inlet Type "B"	5'x5' Box	15"–24" Pipes
123-2	Curb Box Inlet Type "B"	5'x5' Box	15"–24" Pipes
124-1	Curb Box Inlet Type "C"	4'x3' Box	Single Pipe 15" or Less
124-2	Curb Box Inlet Type "C"	4'x3' Box	Single Pipe 15" or Less
125	Curb Box Inlet Type "D"		
128	Security Devices for Frames and Grates		
Channels & Ditches:			
130-1	Aggregate Channel Lining		
130-2	Aggregate Channel Lining		
131	Mattress Channel Lining		
132	Paved Ditch		
Headwalls:			
150	Straight Headwalls		
153	Pipe Culvert Headwalls-0° Skew		15"–27" Circular Pipe
154-1	Pipe Culvert Headwalls-0° Skew		30"–108" Pipe
154-2	Dimensions and Quantities-30"–108" Diameter-Circular Pipe Headwalls-0° Skew		
154-3	Bill of Reinforcement 30"–90" Diameter-Circular Pipe Headwalls-0° Skew		
162	Sloped and Flared Box Inlet-Outlet		18"-24"-30"-36" All Skews
163	Grates For Sloped and Flared Box Inlet-Outlet		
164	Impact Stilling Basin		15"–24" Pipes
165	Impact Stilling Basin		27"–48" Pipes

Trenching:

200 Typical Details for Sanitary Sewer Gravity Lines and Force Mains Trenching, Laying, Backfilling & Bedding Not Under Pavement
201-1 Pavement Replacement for Trenches Under Street Pavement
201-2 Pavement Replacement for Trenches Under Street Pavement Using CLSM
204 Sanitary Sewer Pipe: Types & Maximum Allowable Fill Height

Manholes:

210 Typical Precast Concrete Shallow Manhole for Pipes 24" and Larger
211 Typical Standard Precast Concrete Manhole for Pipe up to 24"
212 Typical Precast Concrete Drop Manhole for Pipes up to 36"
213 Standard Manhole Junction and Water Stop Details
214 Sewer Manhole Adjustment Grade Rings
216 Manhole Size Standards and General Notes for Deep Manholes
217 Deflection Angle Criteria for Sanitary Manholes
220 Standard Circular Manhole Frame & Cover
222 Standard Watertight Manhole Frame & Cover

Connections:

230 House Lateral for Greater than 6'Deep Sewer in Soil & Rock Excavation
231 House Lateral for Greater than 6' Deep Sewer in Soil
232 House Lateral for Shallow Sewer in Soil or Rock
233 Lateral Cleanout in Non-Paved Areas and Yards
234 Right of Way or Easement Lateral Cleanout in Non-paved areas and Yards
240 Typical Creek Crossing for Sanitary Sewer Line
260 Sewer Connection to Existing Manhole

Streets & Roads:

301 Curb & Gutter
302 Integral Curb, Header Curb, Monolithic Curb & Sidewalk
303 Sidewalk Construction Specifications
304 Sidewalk Ramp Type 1
305 Sidewalk Ramp Type 2 (sic)
306 Sidewalk Ramp Type 3
307 Residential Entrance Details
307-1 Commercial Entrance Details
308 Chain Link Fence 3'-6"
310 Chain Link Gate
312 Woven Wire Right-of-Way Fence Type 1
314 Woven Wire Gates

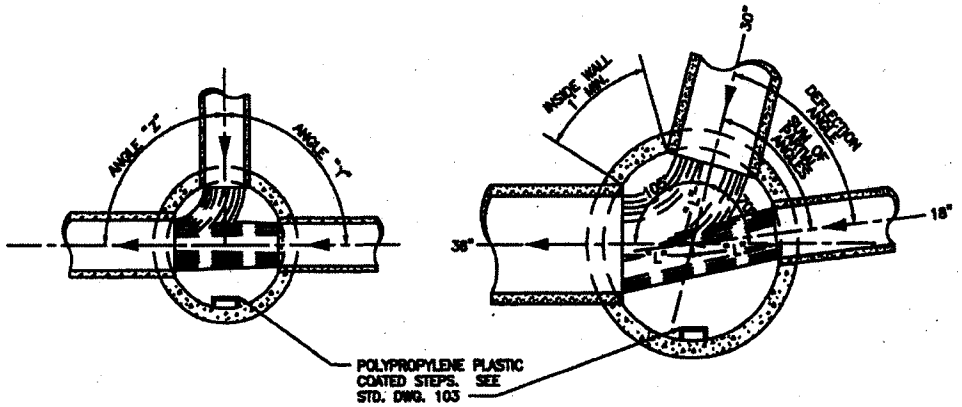
315 Concrete Steps
318 Edge Key
319 Typical Edge Key for Minimum Overlays, Short Projects, Low Speed
320 Perforated Pipe Subgrade Drainage Along Roadway
320-1 Perforated Pipe Subgrade Drainage for Raised Non-Paved Medians
321 Perforated Pipe for Subgrade Drainage
322 Perforated Pipe Underdrains
323 Public Improvement Sign

All LFUCG Division of Engineering Standard Drawings may be viewed on Division of Engineering's web site:

http://www.lexingtonky.gov/Modules/ShowDocument.aspx?documentid=5036
or,
http://tinyurl.com/o9e6yxc

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"	28°	1'-10"	20°	2'-4"	18°	2'-11"	12°	3'-5"	11°	3'-11"
18"	43°	1'-9"	32°	2'-3"	28°	2'-10"	22°	3'-3"	21°	3'-11"
24"	83°	1'-7"	61°	2'-2"	52°	2'-8"	40°	3'-1"	38°	3'-10"
27"	—	—	76°	2'-1"	65°	2'-8"	50°	3'-1"	48°	3'-10"
30"	—	—	98°	2'-0"	77°	2'-7"	60°	3'-0"	57°	3'-9"
36"	—	—	84°	1'-10"	44°	2'-6"	87°	3'-0"	83°	3'-9"
42"	—	—	—	—	84°	2'-5"	65°	2'-11"	62°	3'-8"
48"	—	—	—	—	65°	1'-9"	50°	2'-9"	48°	3'-6"
54"	—	—	—	—	—	—	39°	2'-8"	37°	3'-5"
60"	—	—	—	—	—	—	31°	2'-7"	30°	3'-4"



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 IN 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.

TYPE "A" MANHOLE – CIRCULAR WALLS
CAST–IN–PLACE OR PRECAST CONCRETE

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.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

STORM SEWER
MANHOLE TYPE "A"–
CIRCULAR WALLS

STANDARD DRAWING NO. 100

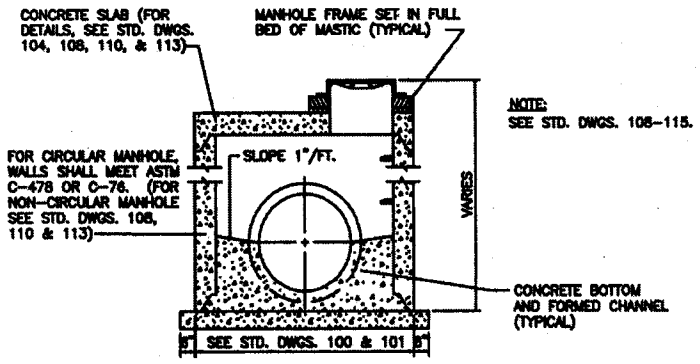
APPROVED 5/1/08

DIRECTOR

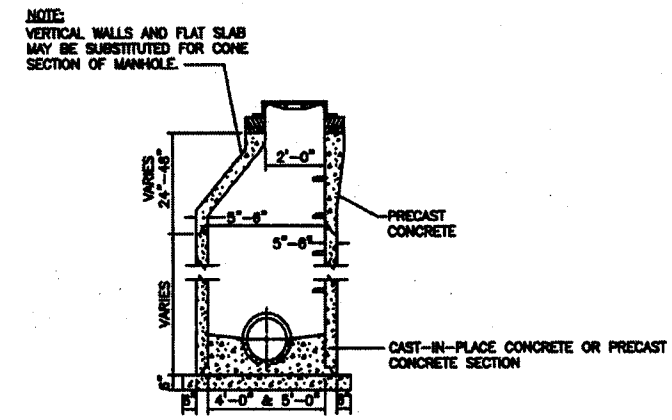
COMMISSIONER

DATE

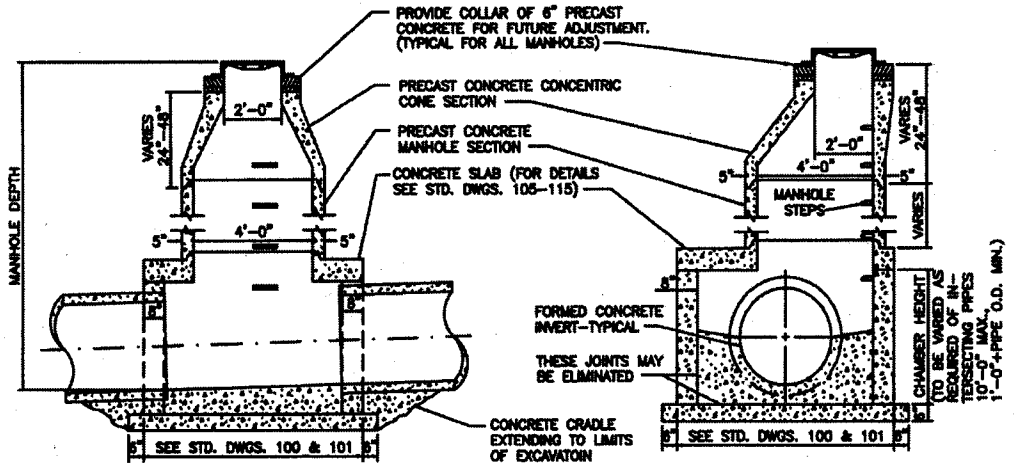
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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"

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

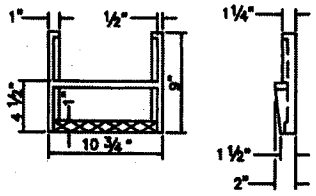
NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

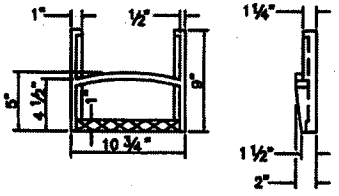
STORM SEWER MANHOLE DETAILS

STANDARD DRAWING NO. 102

5/1/08



STEP TYPE NO. 1



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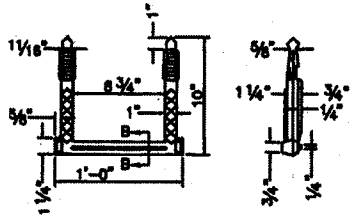
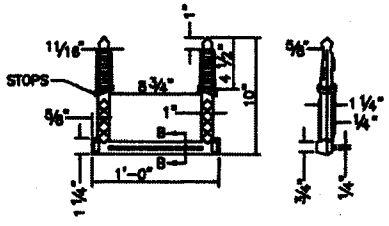
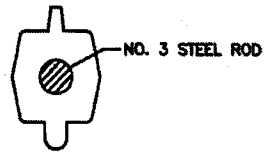


STEP TYPE NO. 3

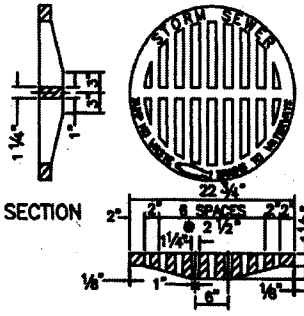


STEP TYPE NO. 4

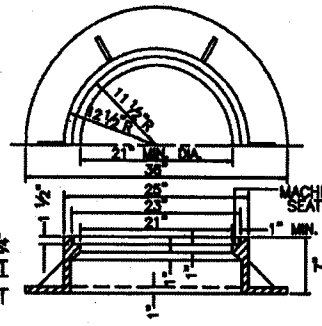
MANHOLE STEPS



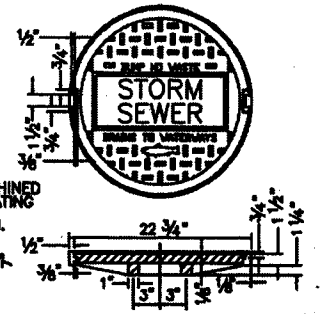
SECTION B–B



SECTION GRATING COVER



FRAME



SOLID COVER

MANHOLE FRAME AND COVERS

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.

NOTES:
1. STEPS SHALL BE ASPHALT COATED CAST IRON OR POLYPROPYLENE PLASTIC COATED STEEL ROD OR OF A TYPE AND SIZE APPROVED BY THE ENGINEER.
2. STEPS SHALL BE SPACED APPROXIMATELY 12" TO 16" 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 NO MORE THAN 18" FROM TOP OF RIM.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

MANHOLE FRAMES, COVERS, & STEPS

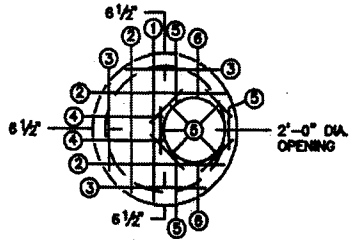
STANDARD DRAWING NO. 103

APPROVED: [signature] 5/1/08

DIRECTOR, DIVISION OF ENGINEERING

DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

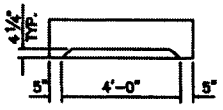


MARK	NO.	SIZE	LENGTH	TYPE
1	1	4	4'-5"	STR.
2	3	"	4'-0"	"
3	3	"	2'-8"	"
4	2	"	2'-0"	"
5	8	"	1'-6"	"
6	2	"	1'-0"	"

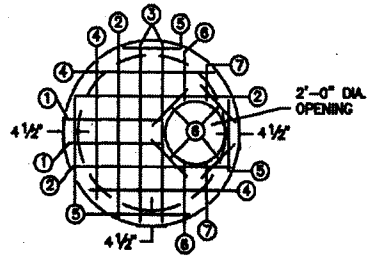
4'-0" DIA. SHALLOW MANHOLES

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

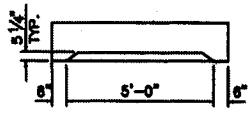


MARK	NO.	SIZE	LENGTH	TYPE
1	2	4	3'-2"	STR.
2	3	"	5'-3"	"
3	2	"	5'-8"	"
4	3	"	4'-2"	"
5	4	"	2'-2"	"
6	6	"	1'-6"	"
7	2	"	1'-0"	"

5'-0" DIA. SHALLOW MANHOLES

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.

NO.	DATE	REVISION DESCRIPTION	BY

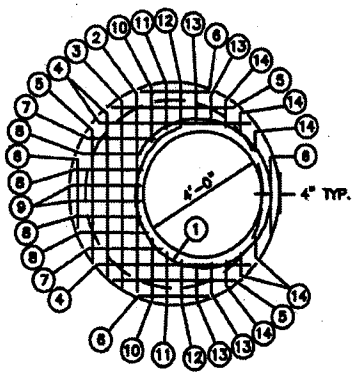
DIVISION OF ENGINEERING

STORM SEWER
MANHOLE CIRCULAR SLABS
4'-0" & 5'-0" DIAMETER

STANDARD DRAWING NO. 104

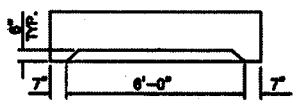
5/1/00

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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"	"

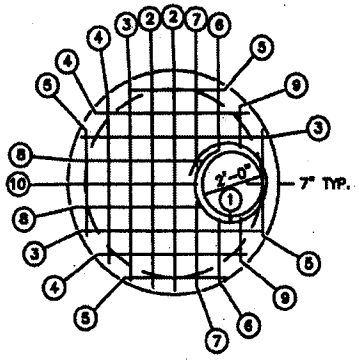
6'-0" DIA. STANDARD MANHOLES



SIDE VIEW

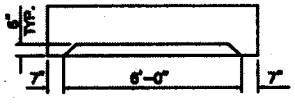
NOTES:

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

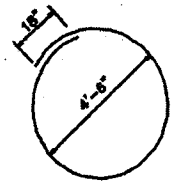


SIDE VIEW

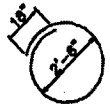
NOTES:

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.

NO.	DATE	REVISION DESCRIPTION	BY

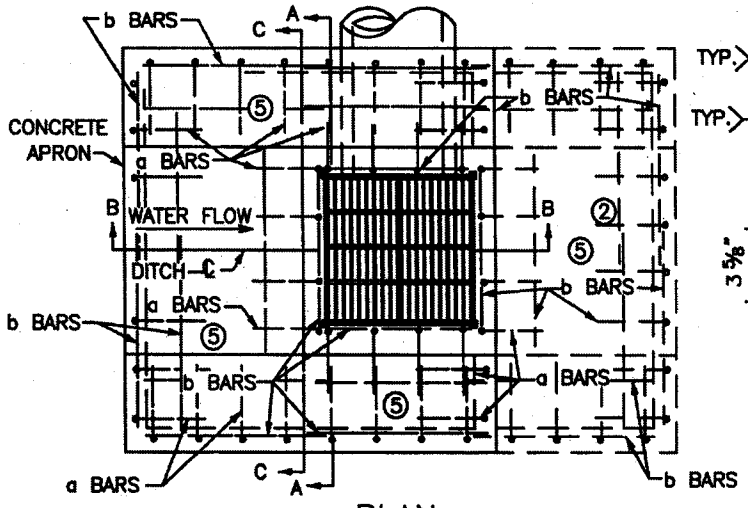
DIVISION OF ENGINEERING

STORM SEWER
MANHOLE CIRCULAR SLABS
6'-0" DIAMETER

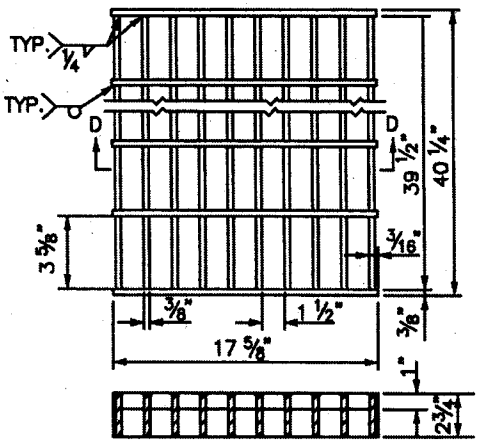
STANDARD DRAWING NO. 105

APPROVED BY [signature] 5/1/08
DIRECTOR
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
COMMISSIONER DATE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

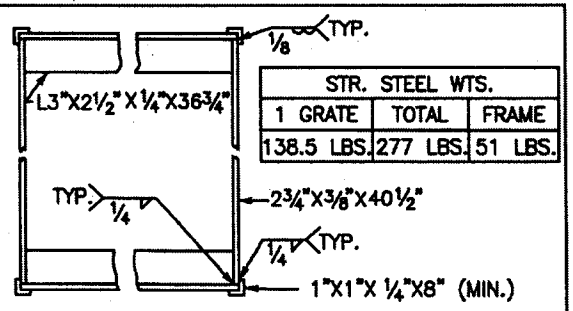


PLAN



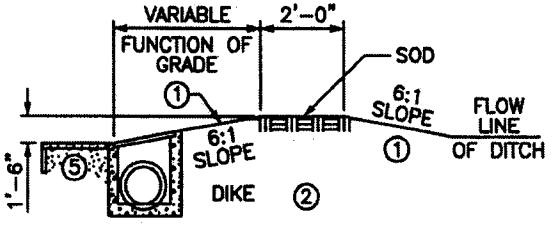
SECTION D–D

DETAIL OF GRATE
(TWO REQUIRED)

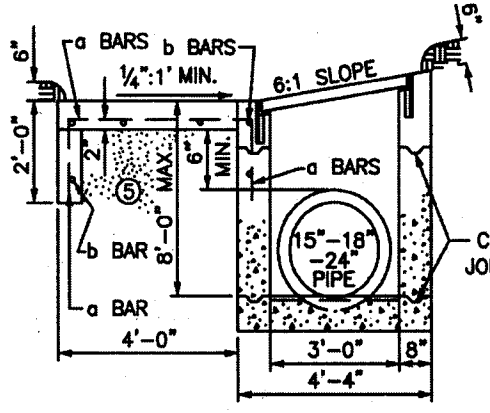


STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
138.5 LBS.	277 LBS.	51 LBS.

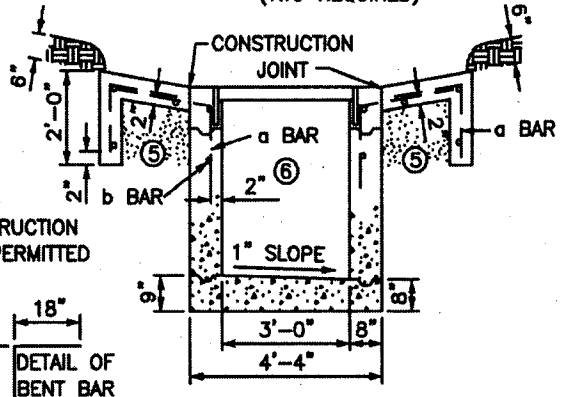
DETAIL OF FRAME



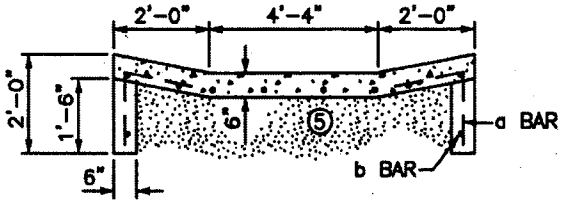
SECTION OF DIKE



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. [6:2:0] 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

NO.	DATE	REVISION DESCRIPTION	BY

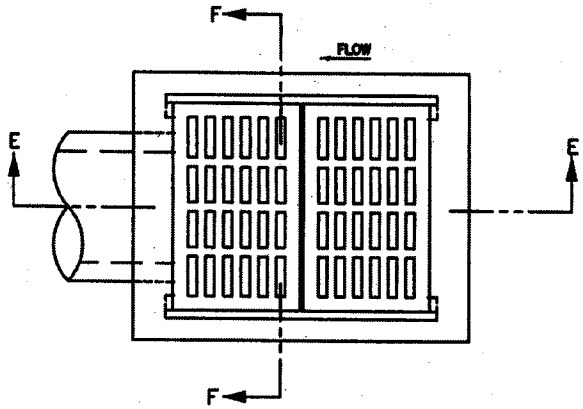
DIVISION OF ENGINEERING

SURFACE INLET TYPE "A"

STANDARD DRAWING NO. 120

APPROVED 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

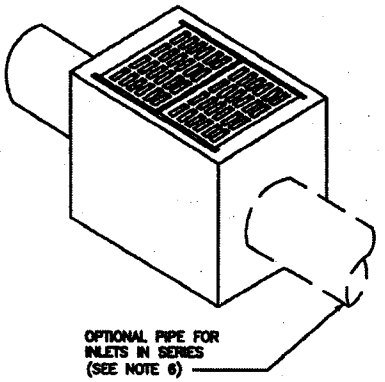


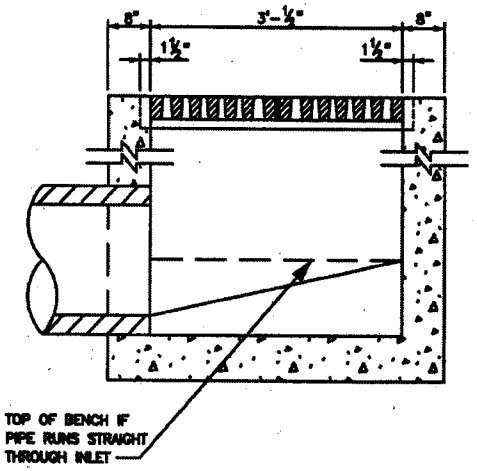
PLAN VIEW

NOTES:

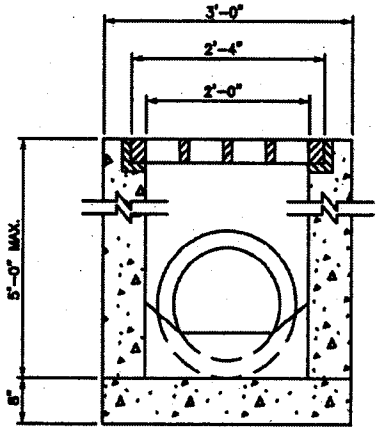
1. NO. 5 STEEL SHALL BE USED THROUGHOUT ON 12" CENTERS.
2. ALL STEEL SHALL HAVE A 2" MINIMUM CLEARANCE TO ANY CONCRETE FACE.
3. NO STEEL IS REQUIRED IN THE BOTTOM SLAB.
4. ALL VERTICAL STEEL SHALL EXTEND 4" INTO BOTTOM SLAB.
5. FOR USE IN PAVED AREAS ONLY.
6. PROVIDE MINIMUM 0.1' SLOPE THROUGH STRUCTURE FOR PIPES IN SERIES. CARRY TROUGH THROUGH. ONLY STRAIGHT THROUGH CONNECTIONS ARE ALLOWED.

ISOMETRIC VIEW

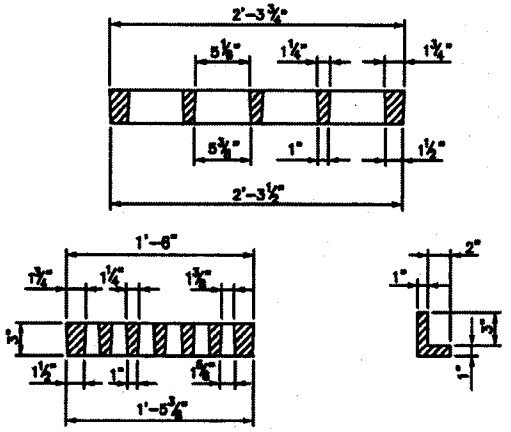




SECTION E-E



SECTION F-F



GRATE DETAILS

NO.	DATE	REVISION DESCRIPTION	BY

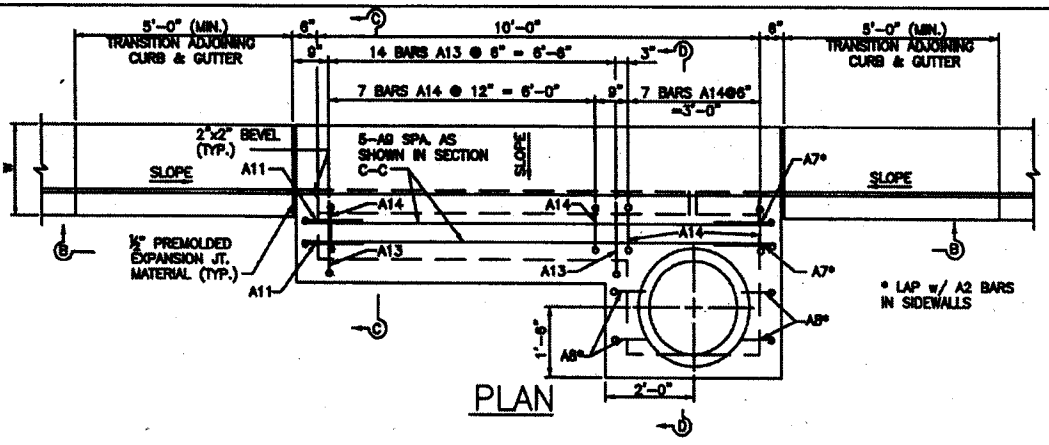
DIVISION OF ENGINEERING

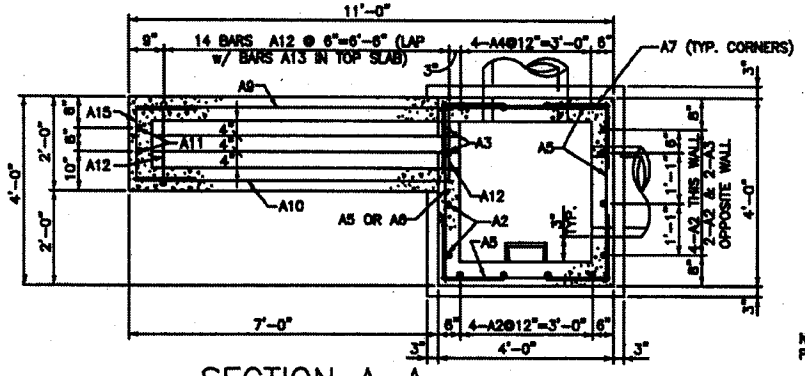
SURFACE INLET TYPE "B"

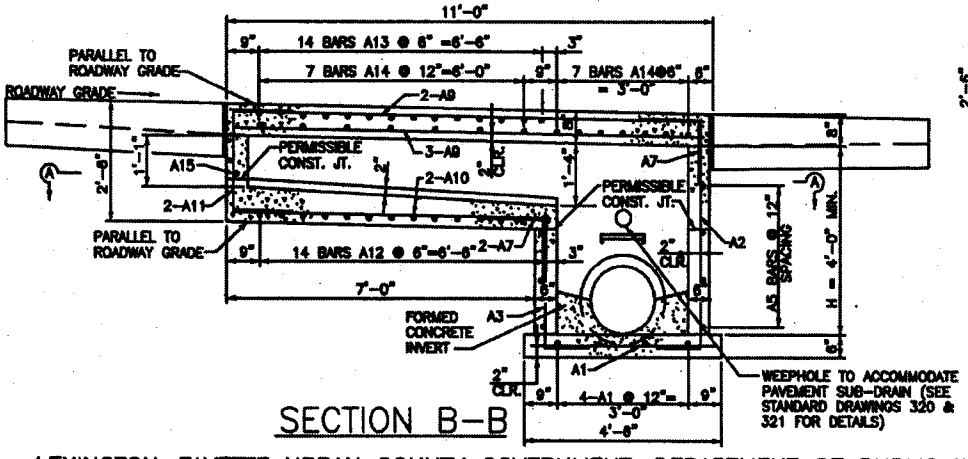
STANDARD DRAWING NO. 121

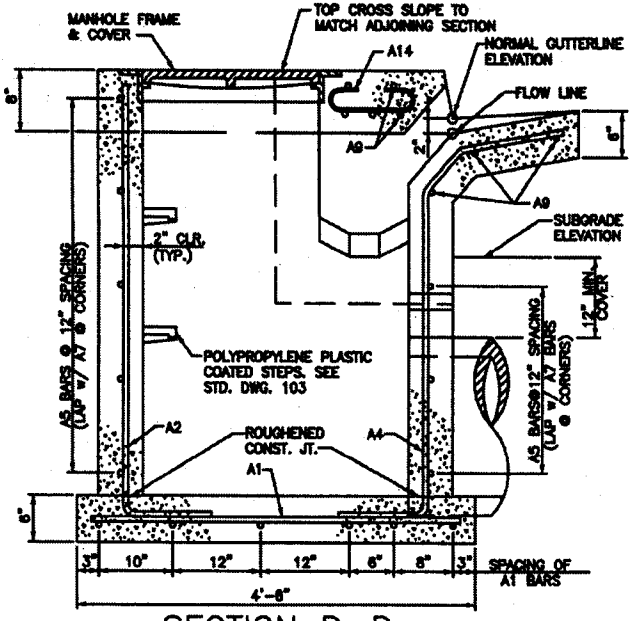
APPROVED 5/1/07

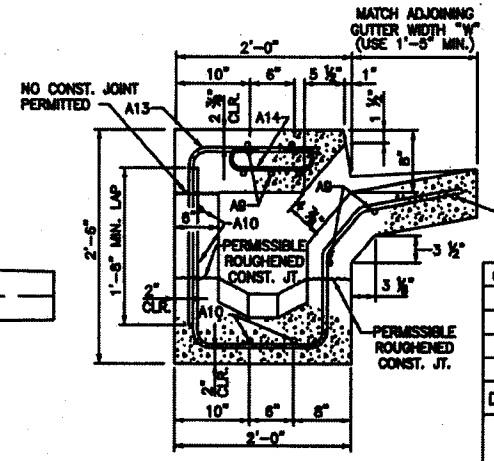
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT











SEE STD. DWG. 122-2 FOR BILL OF REINFORCEMENT & ADDITIONAL DETAILS

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

CURB BOX INLET TYPE "A"
4'X4' BOX
15"-18" PIPES

STANDARD DRAWING NO. 122-1

APPROVED 5/1/08
DIRECTOR DATE
COMMISSIONER DATE

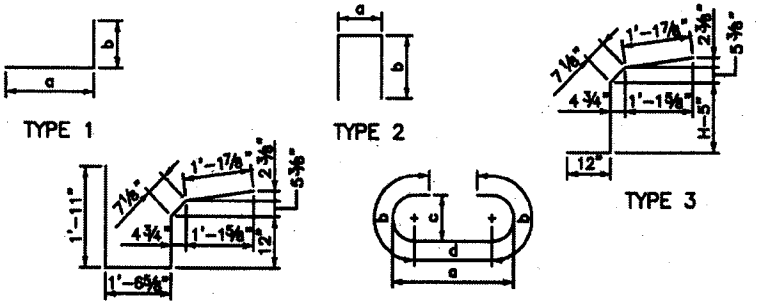
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

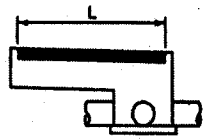
BILL OF REINFORCEMENT

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				

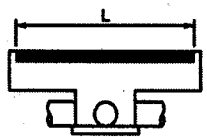
* NO. OF BARS REQUIRED FOR H=4'-0"
ADD OR DEDUCT 4-A5 & 4-A7 FOR EACH 1'-0" INCREASE OR DECREASE IN H.

BAR TYPES

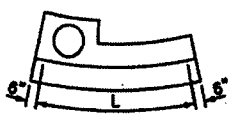




GRADE



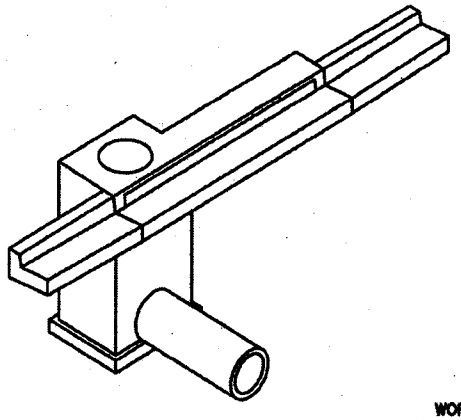
SAG



CURVE LENGTH

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 ¾" 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.

WORK THIS DWG. WITH STD. DWG. 122-1

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

CURB BOX INLET TYPE "A"
4'X4' BOX
15'-18" PIPES

STANDARD DRAWING NO. 122-2

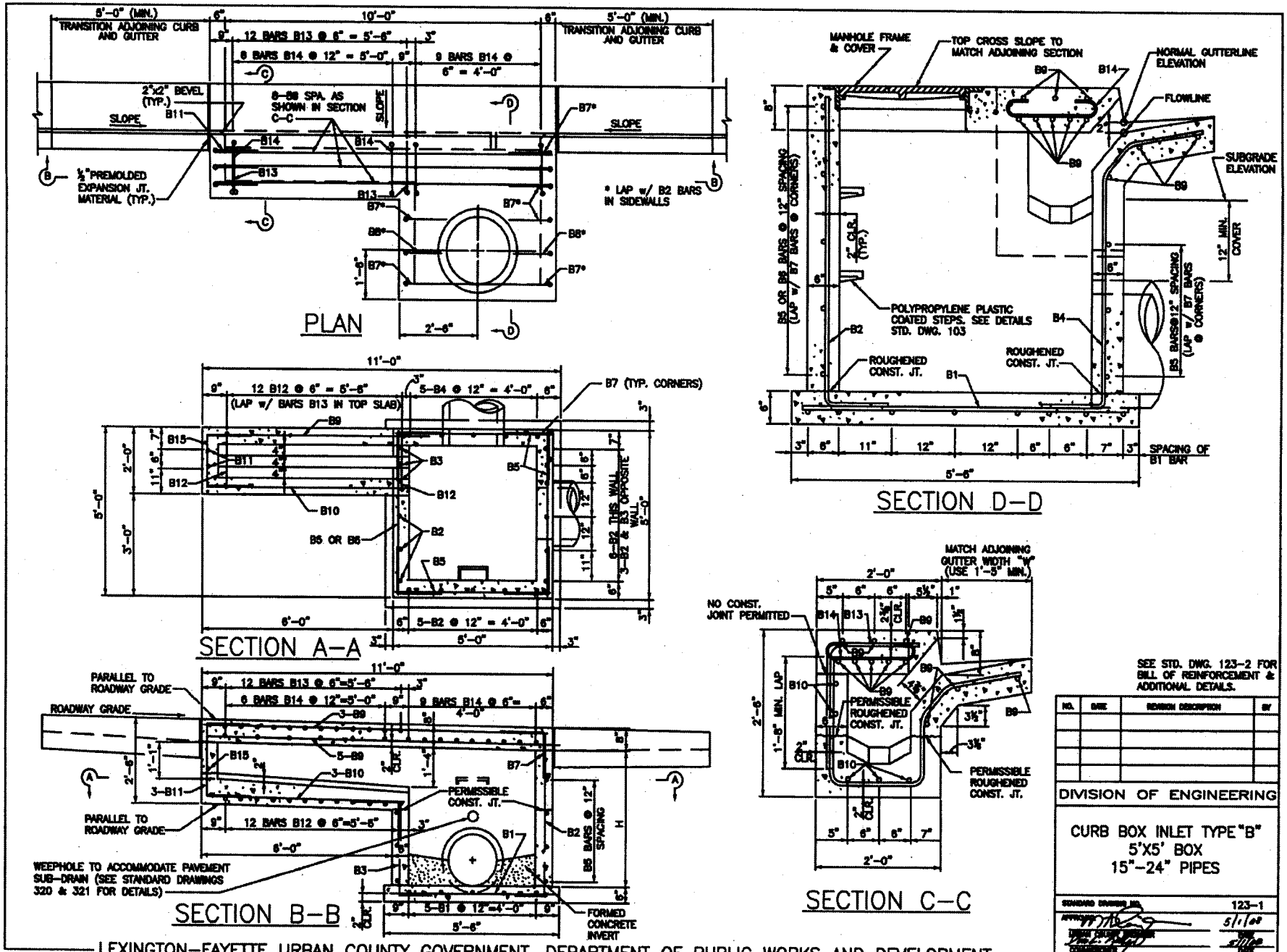
APPROVED [signature] 5/1/08

DIRECTOR, DIVISION OF ENGINEERING

COMMISSIONER, DEPARTMENT OF PUBLIC WORKS & DEVELOPMENT

DATE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

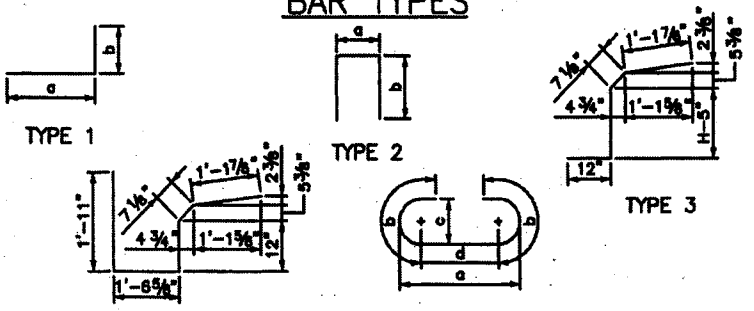

PLAN
SECTION A–A
SECTION B–B
SECTION C–C
SECTION D–D
TRANSITION ADJOINING CURB AND GUTTER
12 BARS B13 @ 6" = 5'-6"
9 BARS B14 @ 6" = 4'-0"
8 BARS B14 @ 12" = 5'-0"
8–B8 SPA. AS SHOWN IN SECTION C–C
2"x2" BEVEL (TYP.)
½"PREMOLDED EXPANSION JT. MATERIAL (TYP.)
* LAP w/ B2 BARS IN SIDEWALLS
12 B12 @ 6" = 5'-6"
(LAP w/ BARS B13 IN TOP SLAB)
5–B4 @ 12" = 4'-0"
B7 (TYP. CORNERS)
6–B2 THIS WALL & B3 OPPOSITE WALL
5–B2 @ 12" = 4'-0"
PARALLEL TO ROADWAY GRADE
ROADWAY GRADE
WEEPHOLE TO ACCOMMODATE PAVEMENT SUB–DRAIN (SEE STANDARD DRAWINGS 320 & 321 FOR DETAILS)
PERMISSIBLE CONST. JT.
B5 BARS @ 12" SPACING
FORMED CONCRETE INVERT
5–B1 @ 12"=4'-0"
MANHOLE FRAME & COVER
TOP CROSS SLOPE TO MATCH ADJOINING SECTION
NORMAL GUTTERLINE ELEVATION
FLOWLINE
SUBGRADE ELEVATION
12" MIN. COVER
POLYPROPYLENE PLASTIC COATED STEPS. SEE DETAILS STD. DWG. 103
ROUGHENED CONST. JT.
B5 OR B6 BARS @ 12" SPACING (LAP w/ B7 BARS @ CORNERS)
B5 BARS@12" SPACING (LAP w/ B7 BARS @ CORNERS)
SPACING OF B1 BAR
MATCH ADJOINING GUTTER WIDTH "W" (USE 1'-5" MIN.)
NO CONST. JOINT PERMITTED
PERMISSIBLE ROUGHENED CONST. JT.
1'-5" MIN. LAP
SEE STD. DWG. 123–2 FOR BILL OF REINFORCEMENT & ADDITIONAL DETAILS.
NO. DATE REVISION DESCRIPTION BY
DIVISION OF ENGINEERING
CURB BOX INLET TYPE "B"
5'X5' BOX
15"–24" PIPES
STANDARD DRAWING NO. 123–1
5/1/08
DIRECTOR
COMMISSIONER
DATE
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

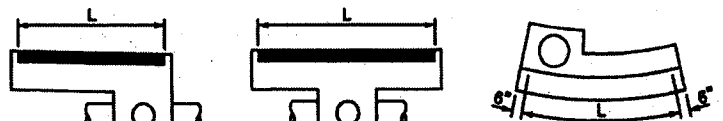
BILL OF REINFORCEMENT

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

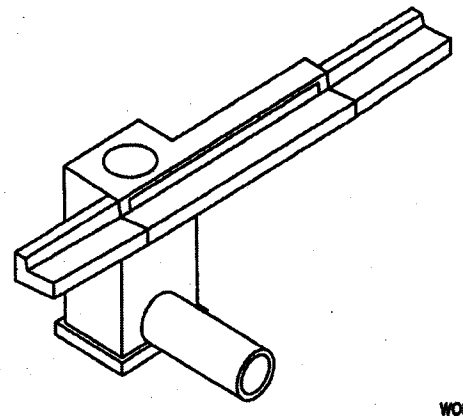




GRADE SAG CURVE LENGTH

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 ¾" 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.

WORK THIS DWG. WITH STD. DWG. 123-1

NO.	DATE	REVISION DESCRIPTION	BY

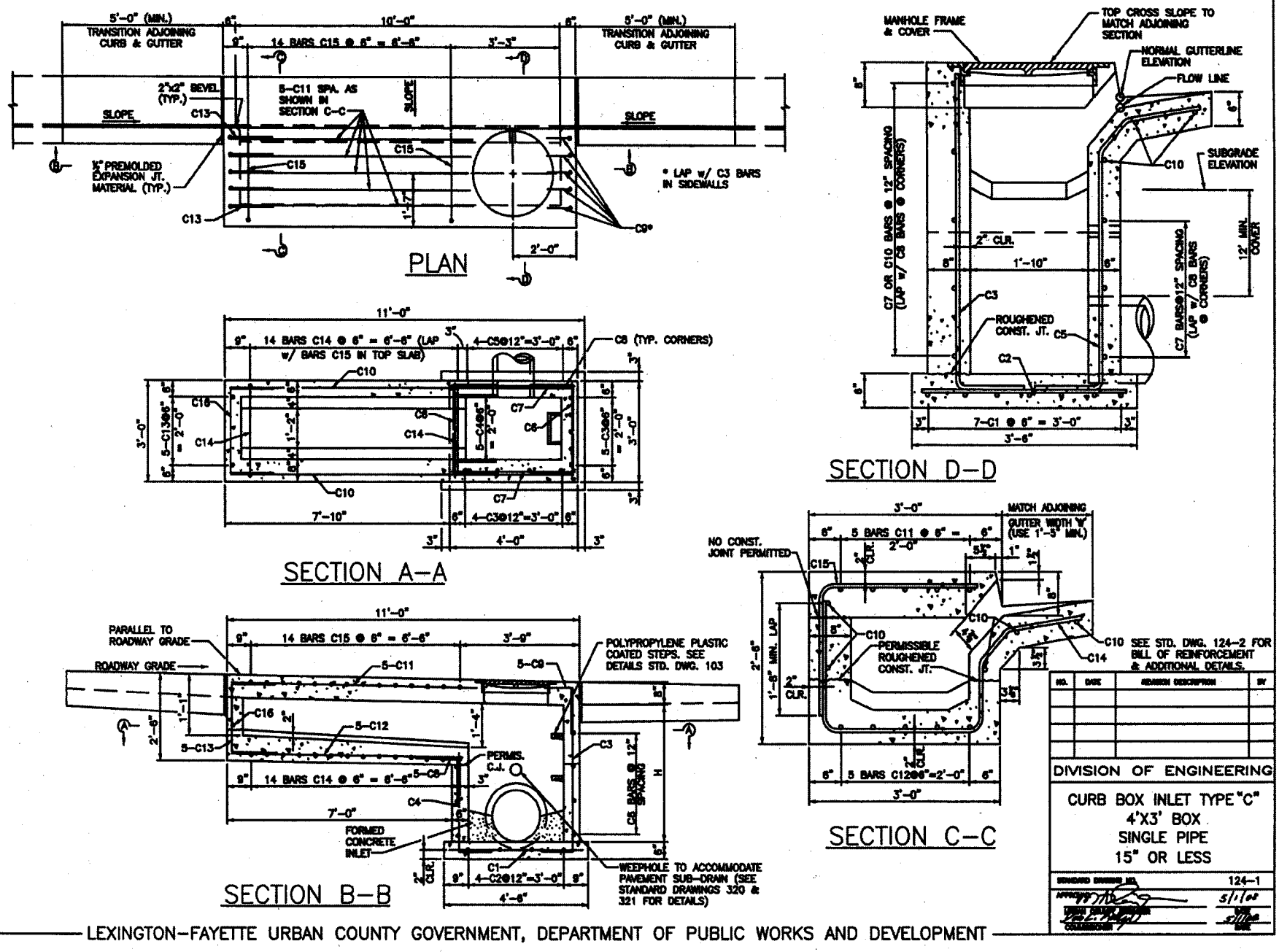
DIVISION OF ENGINEERING

CURB BOX INLET TYPE "B"
5'X5' BOX
15"-24" PIPES

STANDARD DRAWING NO. 123-2

APPROVED [signature] DATE 5/1/89

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

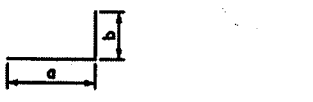

PLAN
SECTION A–A
SECTION B–B
SECTION C–C
SECTION D–D
CURB BOX INLET TYPE "C"
4'X3' BOX
SINGLE PIPE
15" OR LESS
124–1
DIVISION OF ENGINEERING
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

BILL OF REINFORCEMENT

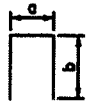
MARK	TYPE	SIZE	NO.	LENGTH FT.	LENGTH IN.	LOCATION	a FT.	a IN.	b FT.	b IN.	c FT.	c IN.	d FT.	d IN.
C1	STR	#5	7	4	2	FOOTING								
C2	STR	#5	4	3	2	FOOTING								
C3	1	#5	9	H+(1'-10")		CHAMBER WALLS	1	0	H+10"					
C4	1	#5	5	H-4"		CHAMBER WALLS	1	0	H-(1'-4")					
C5	3	#5	4	H+(2'-4")		CHAMBER WALLS								
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.

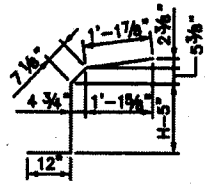
BAR TYPES



TYPE 1



TYPE 2



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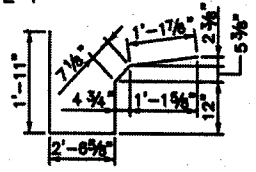

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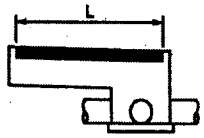
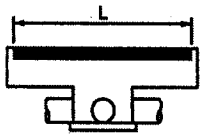


GRADE

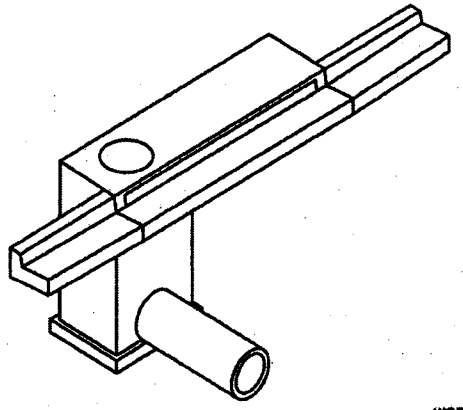


SAG

CURVE LENGTH

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 ¾" 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.

WORK THIS DWG. WITH STD. DWG. 124-1

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

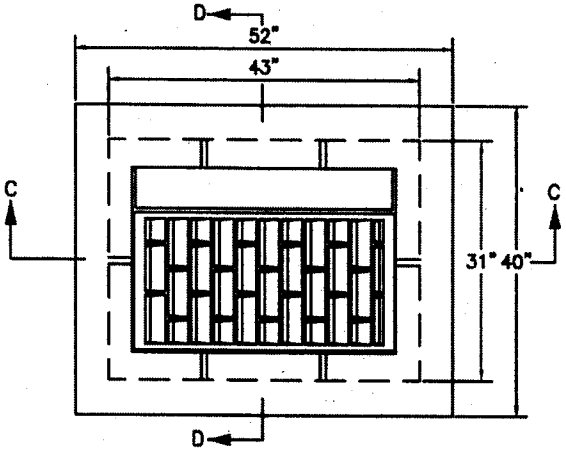
CURB BOX INLET TYPE "C"
4'X3' BOX
SINGLE PIPE
15" OR LESS

STANDARD DRAWING NO. 124-2

APPROVED [signature] 5/1/08

DIRECTOR [signature] DATE

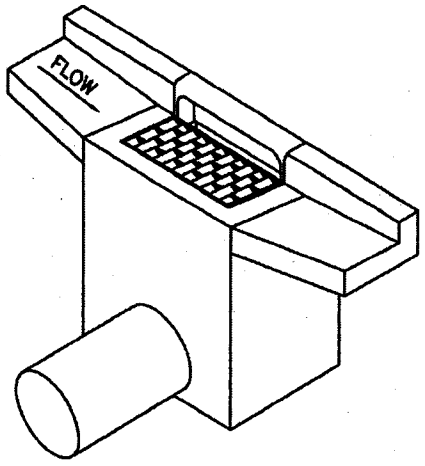
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



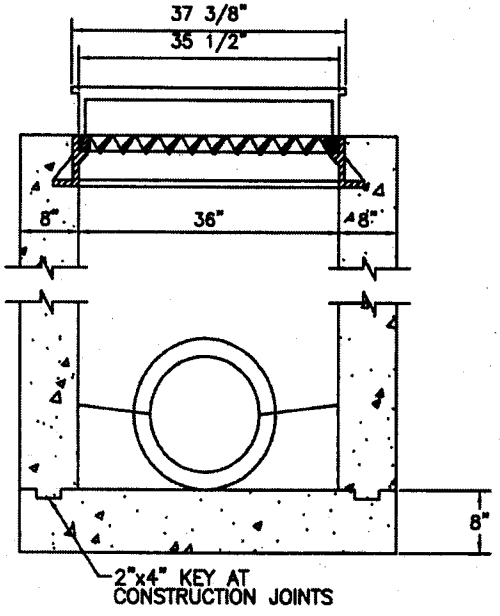
PLAN

NOTES:

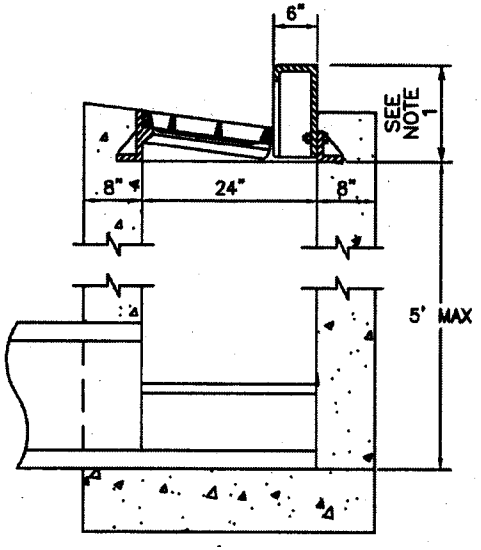
1. CURB BOX ADJUSTABLE 6" TO 9" TO MATCH TOP OF CURB.
2. NO. 5 STEEL SHALL BE USED THROUGHOUT ON 12" CENTERS. 2" CLEARANCE ON ALL EXTERIOR WALL BARS. EXTERIOR HORIZ. WALL BARS SHALL HAVE A 12" MIN. LAP AT CORNERS.
3. ALL EXPOSED FLATWORK SHALL HAVE A HAND FLOATED AND BROOMED FINISH.
4. NO STEEL IS REQUIRED 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.



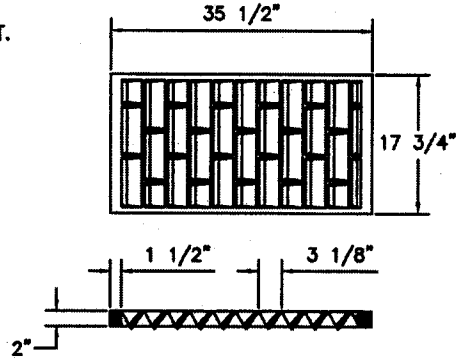
ISOMETRIC VIEW



SECTION C–C



SECTION D–D



GRATE DETAIL

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

CURB BOX INLET
TYPE "D"

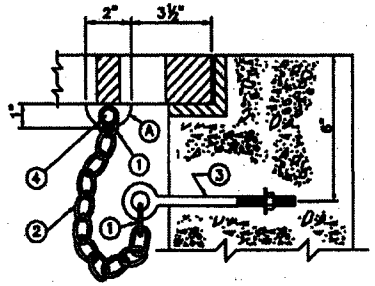
STANDARD DRAWING NO. 125

APPROVED 5/1/08

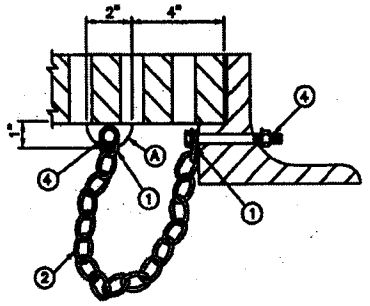
DIRECTOR, DIVISION OF ENGINEERING

COMMISSIONER DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



GRATE CONNECTED TO WALL

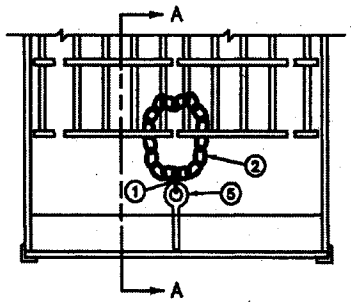


GRATE CONNECTED TO FRAME

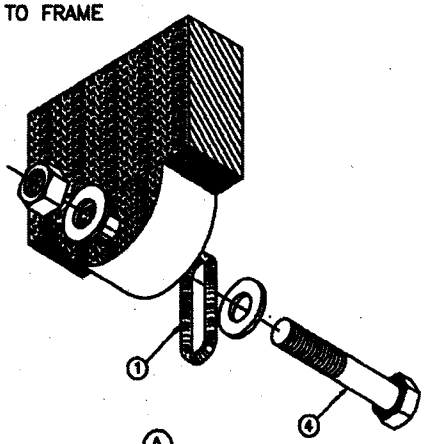
TYPICAL ILLUSTRATIONS FOR CASTINGS

NOTES:

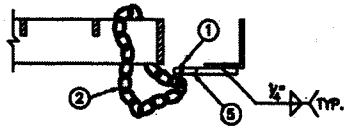
1. CHAIN SHACKLE, OR COLD SHUT OF AN APPROVED TYPE.
2. ⅜" PROOF COIL CHAIN OF SUFFICIENT LENGTH TO ALLOW REMOVAL AND DISPLACEMENT OF GRATE, 18" MIN.
3. ⅜" x 6" EYE BOLT, NUT, AND WASHER.
4. ⅜" HEX HEAD CAP SCREW (GRADE 2), NUT AND WASHERS. LENGTH DETERMINED BY THICKNESS OF FRAME OR GRATE. 7/16" DIA. 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.



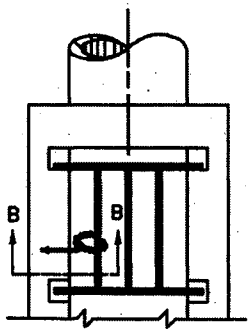
PLAN VIEW



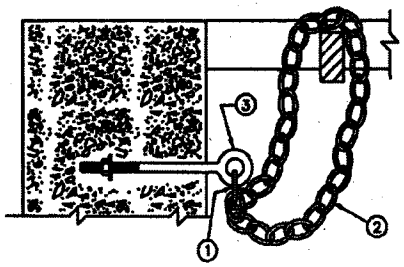
Ⓐ
LUG ON CENTER CROSS MEMBER AND BOLT ASSEMBLY (AXONOMETRIC VIEW)



SECTION A–A
GRATE CONNECTED TO FRAME

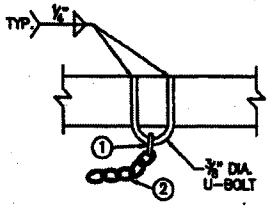


PLAN VIEW



SECTION B–B

GRATE CONNECTED TO WALL



ALTERNATE FOR STRUCTURAL STEEL MEMBERS

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

SECURITY DEVICES FOR FRAMES AND GRATES

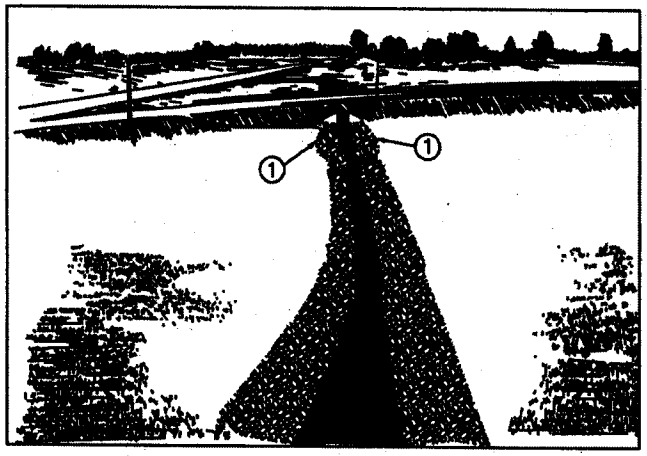
STANDARD DRAWING NO. 128

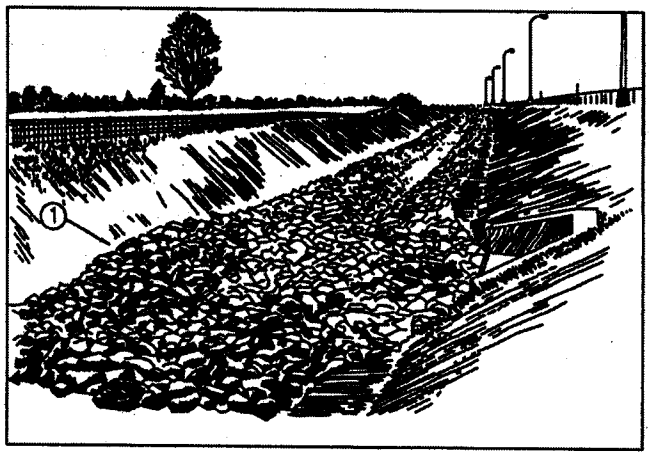
APPROVED _____ DATE 5/1/08

TRAFFIC ENGINEER _____ DATE _____

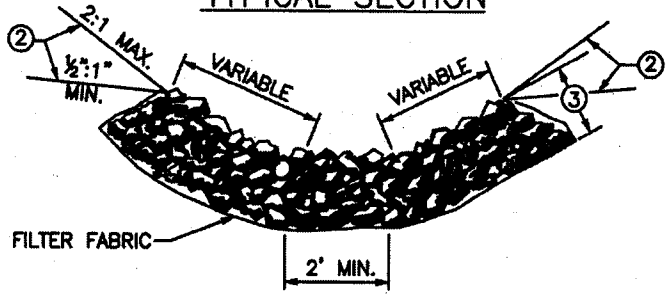
TYPICAL ILLUSTRATIONS FOR STRUCTURAL STEEL UNITS

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT





TYPICAL SECTION



SHEET 1 OF 2

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.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

AGGREGATE CHANNEL LINING

STANDARD DRAWING NO. 130-1

APPROVED: 5/1/08

DIRECTOR, DIVISION OF ENGINEERING — DATE

COMMISSIONER — DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

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 ½	100
2 ½	70–85
1 ½	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	2½
6	5
8	9
10	14

SHEET 2 OF 2

NO.	DATE	REASON DESCRIPTION	BY

DIVISION OF ENGINEERING

AGGREGATE CHANNEL LINING

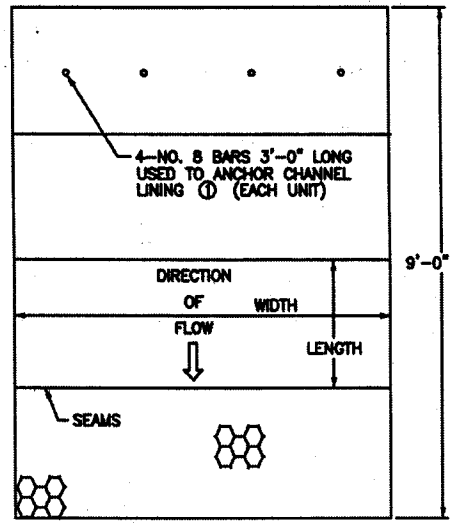
STANDARD DRAWING NO. 130–2

APPROVED 5/1/08

DIRECTOR 5/1/08

COMMISSIONER

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



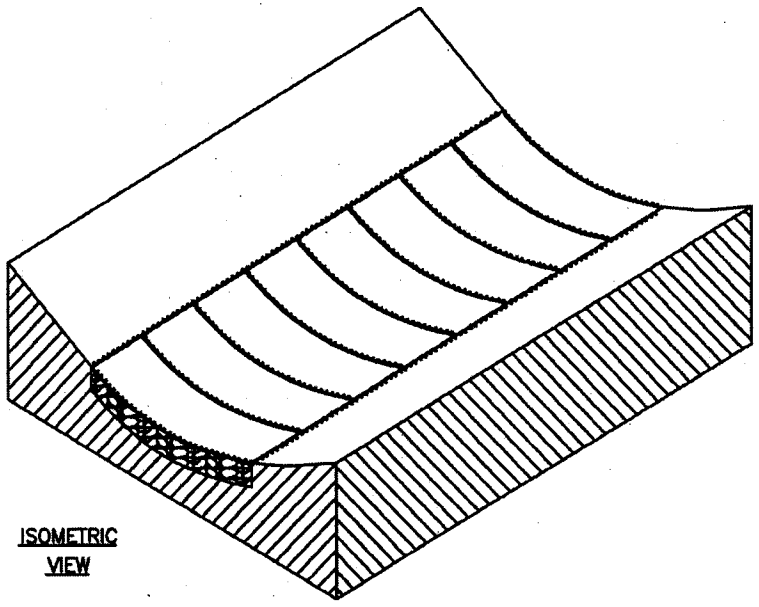
PLAN

SHEET NOTES:○

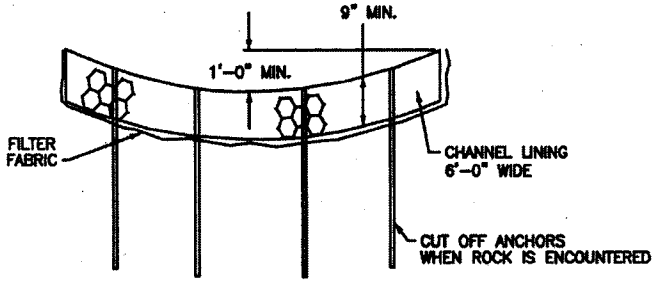
① ANCHORS REQUIRED WHEN LINING IS PLACED ON 5% GRADE OR GREATER.

NOTES:

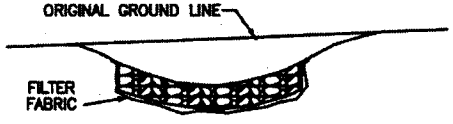
1. SECURE THE LACING WIRE AT THE CORNER OF THE BASKET BY LOOPING AND TWISTING, CONTINUE LACING THROUGHOUT WITH DOUBLE LOOPS AT APPROXIMATELY 5 INCH INTERVALS. EACH UNIT SHALL CONSIST OF LININGS SUPPLIED IN WIDTHS OF 6'–0" AS SHOWN AND LENGTHS IN MULTIPLES OF 3'–0".
2. AGGREGATE ESTIMATED ON THE BASIS 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



ELEVATION



NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

MATTRESS
CHANNEL LINING

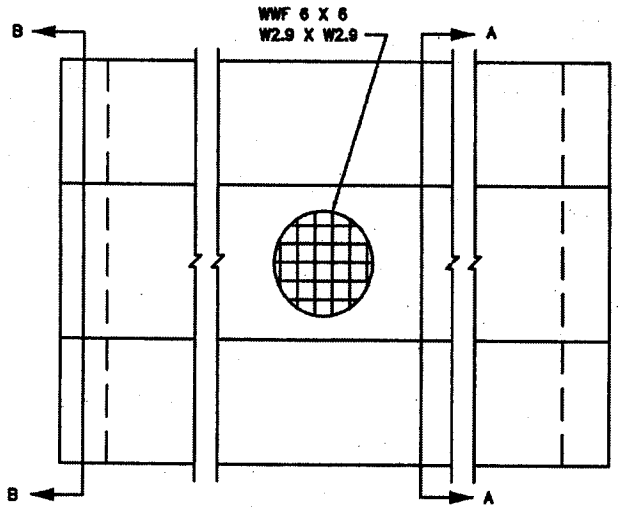
STANDARD DRAWING NO. 131

APPROVED 5/1/08

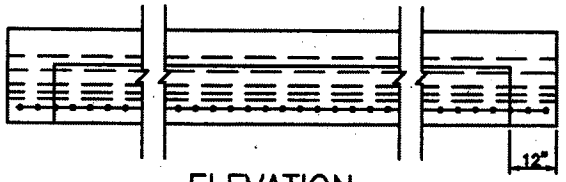
DIRECTOR DATE

COMMISSIONER DATE

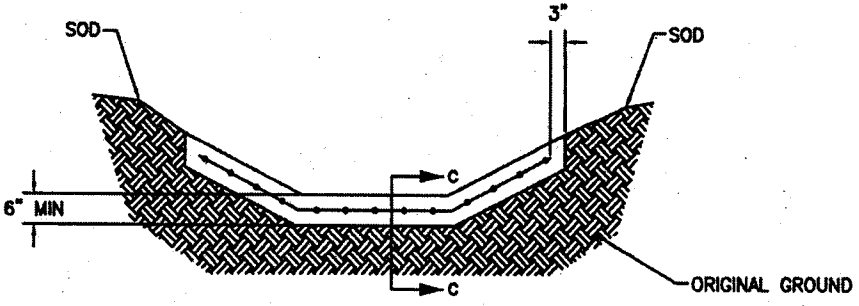
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



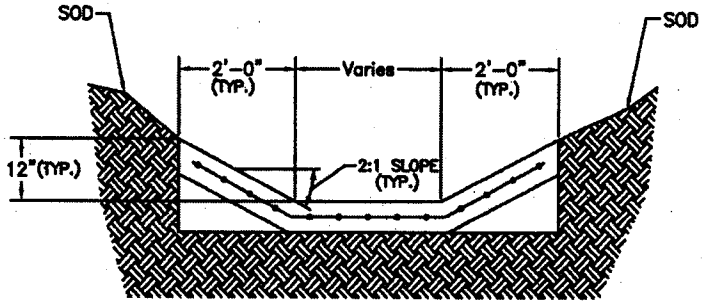
PLAN



ELEVATION



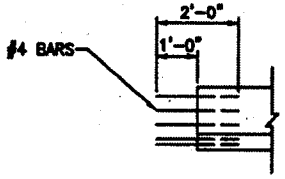
SECTION A–A



SECTION B–B

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.



SECTION C–C
(● CONSTRUCTION JOINT)

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

PAVED DITCH

STANDARD DRAWING NO. 132

APPROVED 5/1/08

DIRECTOR DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

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.

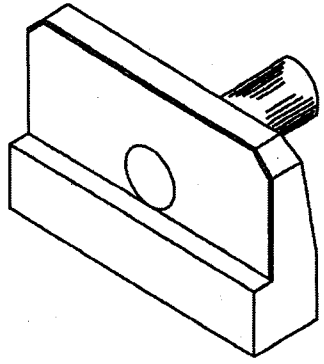
2. ALL EXPOSED EDGES TO BE CHAMFERED ¾".

3. ALL EXPOSED SURFACES TO HAVE A RUBBED FINISH.

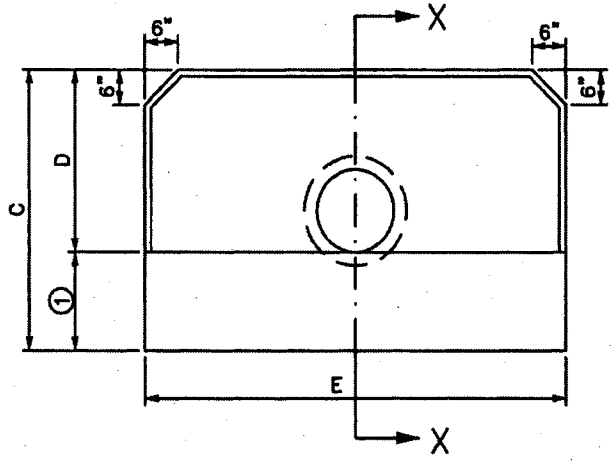
④ STANDARD HEADWALLS ARE FLUSH WITH SOIL FILL.

⑤ RAISED HEADWALLS PROTRUDE 6" ABOVE SOIL FILL.

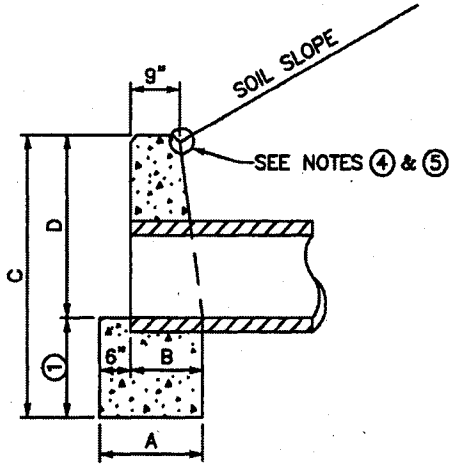
6. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "D" IS GREATER THAN 30".



ISOMETRIC VIEW



PLAN ELEVATION



SECTION X–X

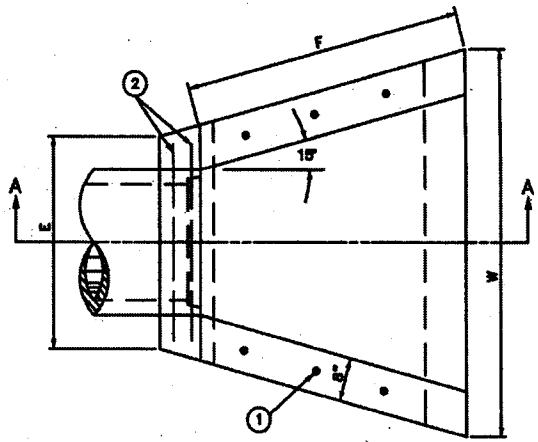
DIVISION OF ENGINEERING

STRAIGHT HEADWALLS

STANDARD DRAWING NO. 150

5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



PLAN VIEW

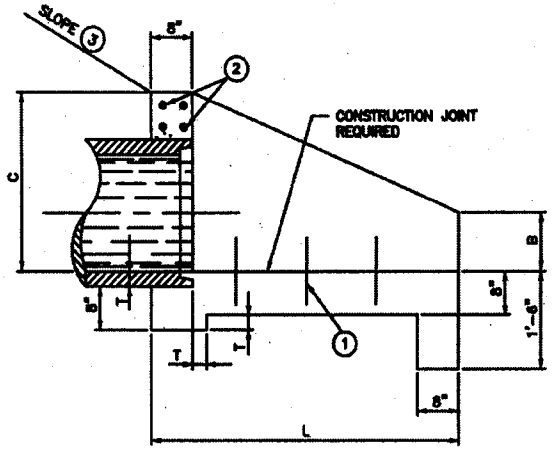
PIPE DIA.	DIMENSIONS							CLASS A CONC.	REINF. STEEL
	B	C	E	F	L	W	T	C.Y.	LBS.
15"	0'-7½"	2'-0"	2'-9"	3'-5⅜"	4'-0"	4'-10¾"	2¼"	0.90	10
18"	0'-9"	2'-3"	3'-0"	3'-11⅜"	4'-6"	5'-4 15/16"	2½"	0.97	11
21"	0'-10½"	2'-6"	3'-3"	4'-5 13/16"	5'-0"	5'-11⅛"	2¾"	1.17	12
24"	1'-0"	2'-9"	3'-6"	5'-0"	5'-6"	6'-5⅜"	3"	1.36	12
27"	1'-1½"	3'-0"	3'-9"	5'-6 3/16"	6'-0"	6'-11⅜"	3 ¼"	1.82	13

SHEET NOTES:

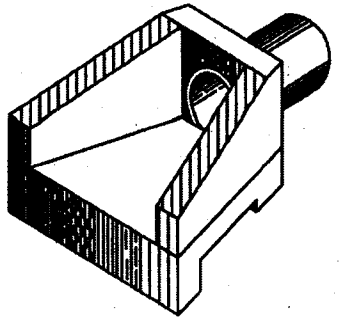
1. 6 #4 x 1'-0" DOWELS
2. 4 #4 x ("E" DIMENSION MINUS 4")
3. SLOPE SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND / OR NORMAL SLOPE VARIES FROM 2:1.

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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

PIPE CULVERT HEADWALLS
0° SKEW
15"–27" CIRCULAR PIPE

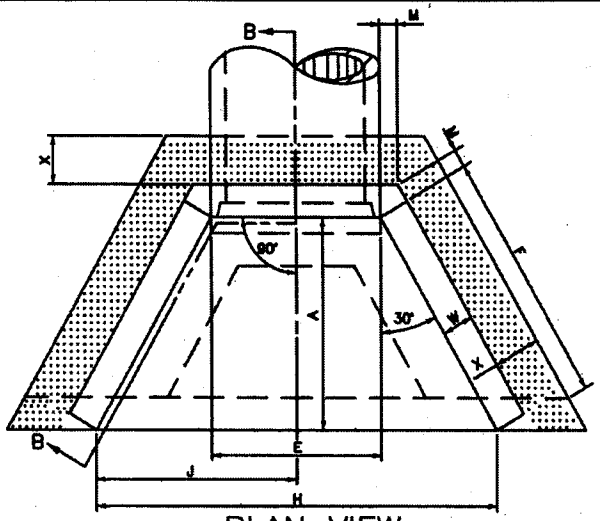
STANDARD DRAWING NO. 153

APPROVED: [signature] DATE: 5/1/08

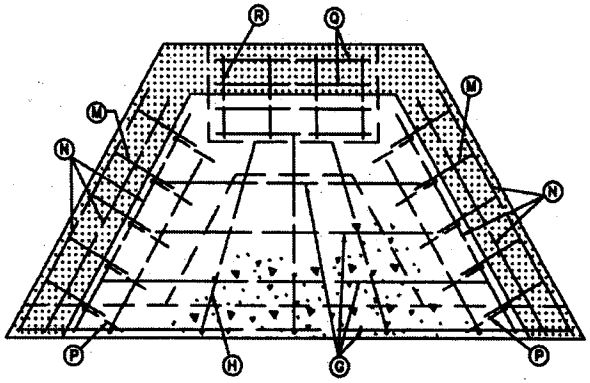
DIRECTOR, DIVISION OF ENGINEERING [signature]

COMMISSIONER [signature] DATE: 5/1/08

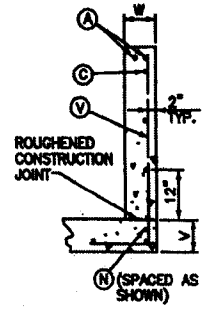
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



PLAN VIEW

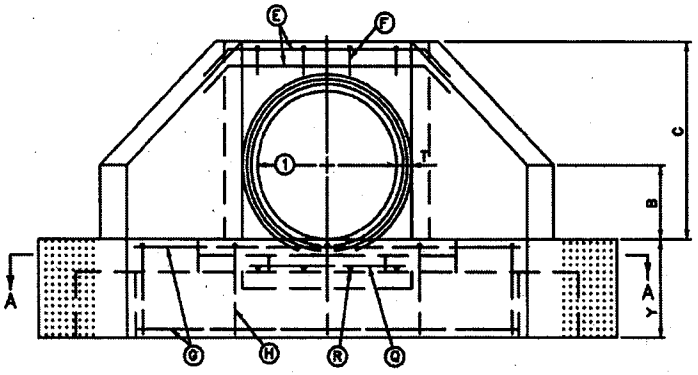


SECTION A–A

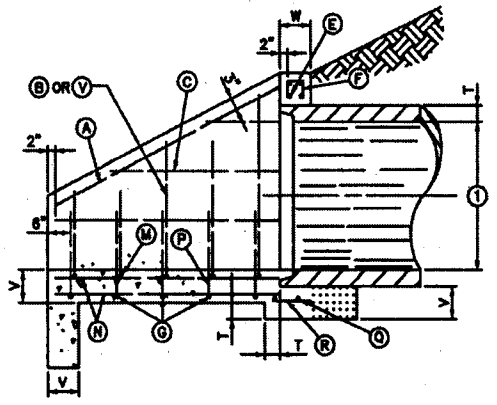


WING SECTION

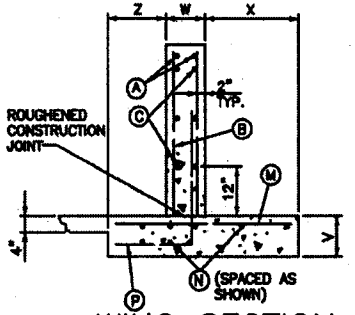
30"–60" CIRCULAR PIPE



FRONT ELEVATION



SECTION B–B



WING SECTION

66"–108" CIRCULAR PIPE

NOTES:

1. [dotted] 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 Ⓑ-Ⓒ-Ⓖ-Ⓟ-Ⓜ-Ⓥ ARE SPACED 1'–0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
6. BARS Ⓑ AND Ⓥ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
7. BARS Ⓒ 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.

SHEET NOTE: Ⓞ

① DIAMETER OF PIPE

SHEET 1 OF 4

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

PIPE CULVERT HEADWALLS
0° SKEW
30"–108" PIPE

STANDARD DRAWING NO. 154–1

APPROVED 5/1/08

URBAN COUNTY ENGINEER DATE

DIRECTOR, DIVISION OF ENGINEERING & DEPUTY COMMISSIONER DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

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. 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. HEADWALLS
LBS. STEEL HEADWALLS	281	363	430	496	583	687	1320	1571	1815	2043	2451	2753	3050	3379	LBS. STEEL HEADWALLS

SHEET 2 OF 4

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

DIMENSIONS AND QUANTITIES
30"–108" HEADWALLS
CIRCULAR PIPE
0° SKEW

STANDARD DRAWING NO. 154-2

APPROVED: 5/1/08

DIRECTOR, DIVISION OF ENGINEERING — DATE

COMMISSIONER — DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

30"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	4	8		
C_1	4	2	2	4		
C_2	4	2	4	2		
E_1	5	2	6	4	3	4
E_2	5	2	6	8	3	8
F	4	3	1	3	0	4
G_1	4	2	3	10		
G_2	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		
V_1	5	4	3	1	1	10
V_2	5	4	4	1	2	10

36"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	5	5		
C_1	4	2	1	7		
C_2	4	2	3	8		
C_3	4	2	4	10		
E_1	5	2	6	11	3	11
E_2	5	2	7	3	4	3
F	4	4	1	3	0	4
G_1	4	3	5	0		
G_2	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		
V_1	5	4	3	4	2	1
V_2	5	4	4	4	3	1
V_3	5	2	5	4	4	1

42"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	6	2		
C_1	4	2	2	9		
C_2	4	2	4	9		
C_3	4	2	5	6		
E_1	5	2	7	6	4	6
E_2	5	2	7	10	4	10
F	4	4	1	3	0	4
G_1	4	3	6	4		
G_2	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	5	6		
Q	4	2	3	11		
R	4	4	0	9		
V_1	5	4	3	6	2	3
V_2	5	4	4	6	3	3
V_3	5	4	5	6	4	3

48"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	8	11		
C_1	4	2	1	10		
C_2	4	2	3	10		
C_3	4	2	5	10		
C_4	4	2	6	2		
E_1	5	2	8	1	5	1
E_2	5	2	8	5	5	5
F	4	5	1	3	0	4
G_1	4	1	4	0		
G_2	4	3	7	5		
G_3	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		
V_1	5	4	3	9	2	6
V_2	5	4	4	9	3	6
V_3	5	4	5	9	4	6

54"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	7	7		
C_1	4	2	0	11		
C_2	4	2	3	0		
C_3	4	2	5	1		
C_4	4	4	6	10		
E_1	5	2	8	8	5	8
E_2	5	2	9	0	6	0
F	4	6	1	3	0	4
G_1	4	1	5	3		
G_2	4	3	8	9		
G_3	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		
V_1	5	4	4	0	2	9

54" (CONTINUED)

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
V_2	5	4	5	0	3	9
V_3	5	4	6	0	4	9
V_4	5	2	7	0	5	9

60"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	8	4		
C_1	4	2	2	1		
C_2	4	2	4	2		
C_3	4	2	6	3		
C_4	4	4	7	7		
E_1	5	2	9	3	6	3
E_2	5	2	9	7	6	7
F	4	6	1	3	0	4
G_1	4	2	6	6		
G_2	4	3	10	0		
G_3	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		
V_1	5	4	4	3	3	0
V_2	5	4	5	3	4	0
V_3	5	4	6	2	4	11
V_4	5	4	7	2	5	11

66"

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A	5	4	9	4		
B_1	5	8	2	10		
B_2	5	8	3	10		
B_3	5	8	4	9		
B_4	5	8	5	9		
C_1	4	4	1	5		
C_2	4	4	3	5		
C_3	4	4	5	6		
C_4	4	4	7	7		
C_8	4	8	8	4		
E_1	5	2	11	9	6	10
E_2	5	2	12	3	7	4
F	4	7	1	9	0	6
G_1	4	3	8	0		
G_2	4	3	11	4		
G_3	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		
B_1	5	8	3	0		
B_2	5	8	4	0		
B_3	5	8	4	11		
B_4	5	8	5	11		
B_5	5	4	6	10		
C_1	4	4	2	7		
C_2	4	4	4	8		
C_3	4	4	6	9		
C_4	4	4	8	10		
C_8	4	8	9	1		
E_1	5	2	12	5	7	5
E_2	5	2	12	11	7	11
F	4	8	1	9	0	6
G_1	4	3	9	2		
G_2	4	3	12	6		
G_3	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		
B_1	5	8	3	4		
B_2	5	8	4	3		
B_3	5	8	5	3		
B_4	5	8	6	2		
B_5	5	8	7	2		
C_1	4	4	1	7		
C_2	4	4	3	8		
C_3	4	4	5	10		
C_4	4	4	7	11		
C_8	4	12	9	9		
E_1	5	2	13	0	8	0
E_2	5	2	13	6	8	6
F	4	8	1	9	0	6
G_1	4	1	7	1		

78" (CONTINUED)

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
G_2	4	3	10	6		
G_3	4	3	14	0		
G_4	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		
B_1	5	8	3	6		
B_2	5	8	4	6		
B_3	5	8	5	5		
B_4	5	8	6	5		
B_5	5	8	7	4		
B_6	5	4	8	4		
C_1	4	4	2	10		
C_2	4	4	4	11		
C_3	4	4	7	0		
C_4	4	4	9	1		
C_8	4	12	10	5		
E_1	5	2	13	7	8	7
E_2	5	2	14	2	9	2
F	4	9	1	9	0	6
G_1	4	1	9	6		
G_2	4	3	11	10		
G_3	4	3	15	2		
G_4	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		
B_1	5	8	3	10		
B_2	5	8	4	9		
B_3	5	8	5	9		
B_4	5	8	6	8		
B_5	5	8	7	7		
B_6	5	4	8	6		
C_1	4	4	1	11		
C_2	4	4	4	0		
C_3	4	4	6	1		
C_4	4	4	8	3		
C_5	4	4	10	4		
C_6	4	12	11	1		
E_1	5	2	14	2	9	2
E_2	5	2	14	8	9	8
F	4	9	1	9	0	6
G_1	4	2	9	6		
G_2	4	3	13	0		
G_3	4	3	16	5		
G_4	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		

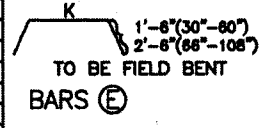
NOTES:

① NUMBER OF BARS IN ONE HEADWALL.

2. DIMENSIONS ARE OUT TO OUT OF BARS.

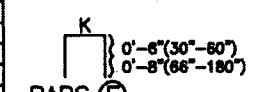
3. ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES

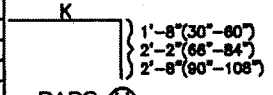


TO BE FIELD BENT

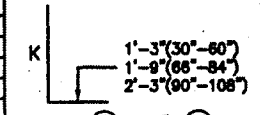
BARS (E)



BARS (F)



BARS (H)



BARS (P) AND (V)

SHEET 3 OF 4

NO.	DATE	REVISION DESCRIPTION	BY

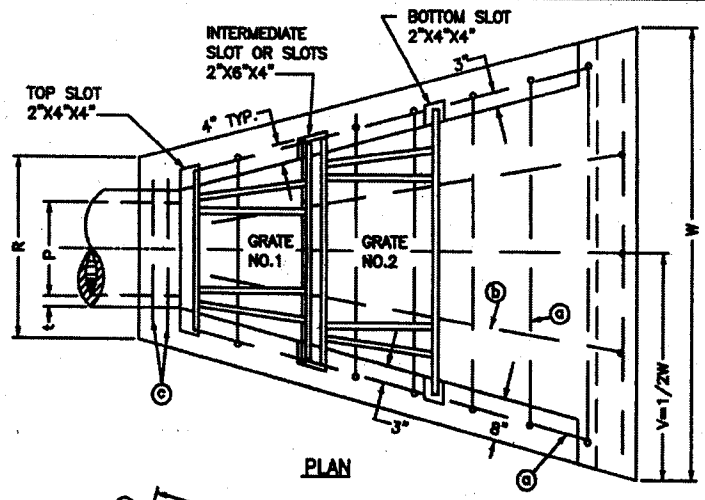
DIVISION OF ENGINEERING

BILL OF REINFORCEMENT
30"-90" DIAMETER
CIRCULAR PIPE HEADWALLS
0° SKEW

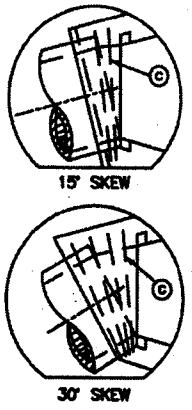
STANDARD DRAWING NO. 154-3

5/1/08

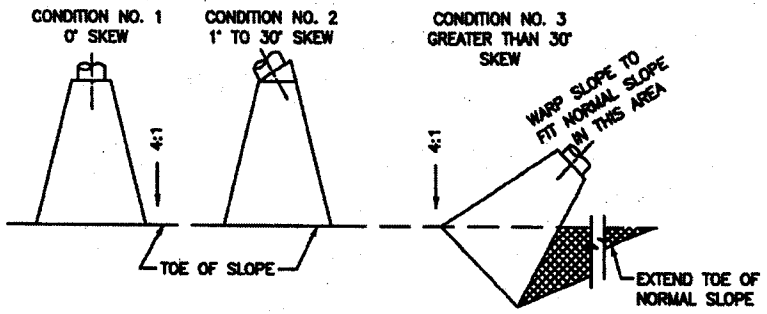
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

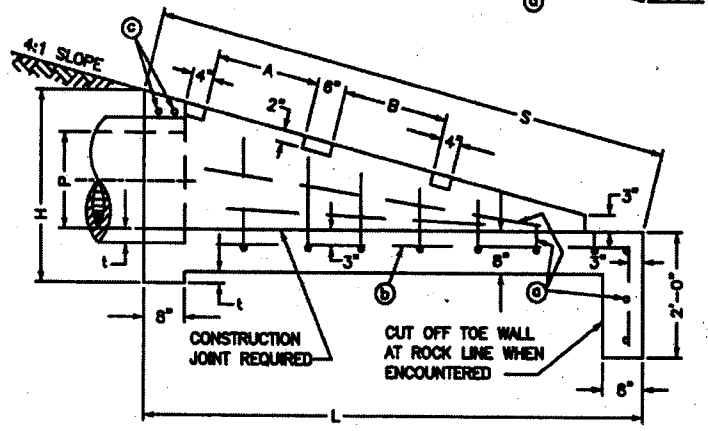


PLAN



PLAN VIEW OF STRUCTURE LOCATIONS





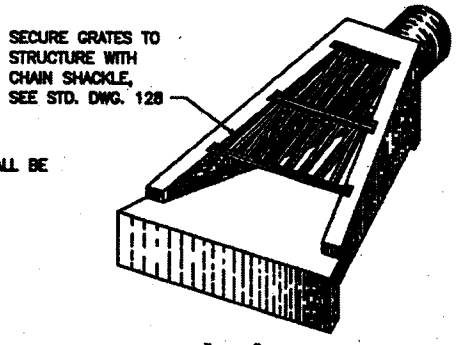
ELEVATION

NOTES:

1. THE MINIMUM REQUIREMENT FOR REINFORCING STEEL SHALL BE GRADE 40. FIELD BENDING WILL BE PERMITTED.

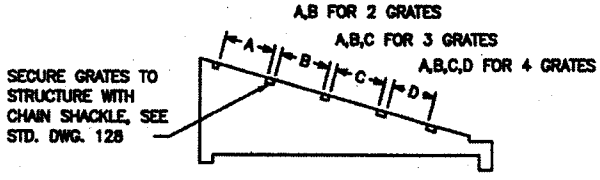
② ONE ADDITIONAL ⓒ BAR WILL BE REQUIRED FOR EACH 15° SKEW.

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				
ⓐ	ⓑ	② ⓒ	LBS.	CLASS "A" CONC. CU.YD.
14 AT 6'-5"	3 AT 8'-6"	2 AT 2'-8"	81	1.6
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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

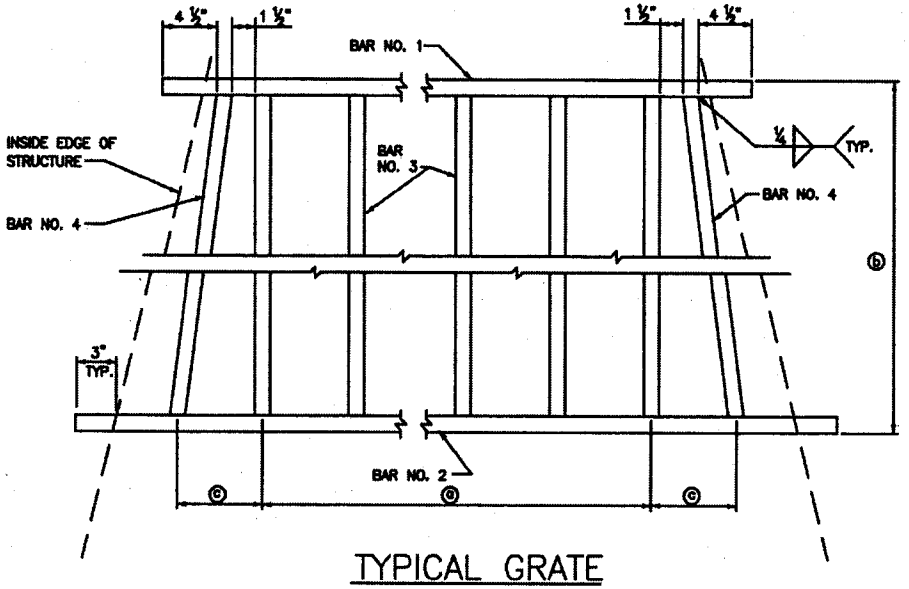
SLOPED AND FLARED BOX INLET–OUTLET 18"–24"–30"–36" ALL SKEWS

STANDARD DRAWING NO. 162

APPROVED 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

BOX INLET–OUTLET SIZE	GRATE		BAR NO. 1	BAR NO. 2	BAR NO. 3		BAR NO. 4	LBS. STRUCTURAL STEEL	
	NO.	SIZE	LENGTH	LENGTH	NO. BARS	LENGTH	LENGTH	EACH GRATE	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'–8 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.

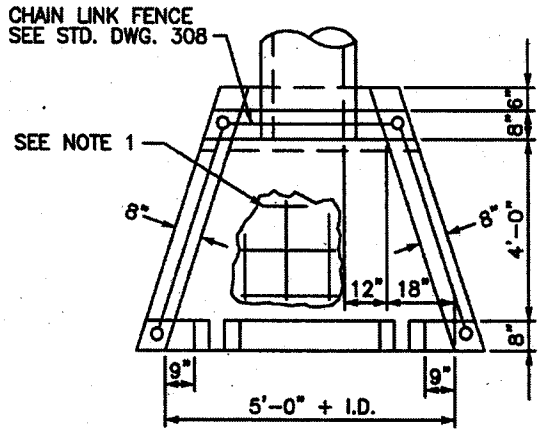
NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

GRATES FOR SLOPED AND FLARED BOX INLET–OUTLET

STANDARD DRAWING NO. 163

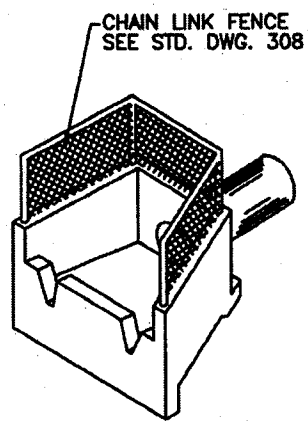
5/1/02



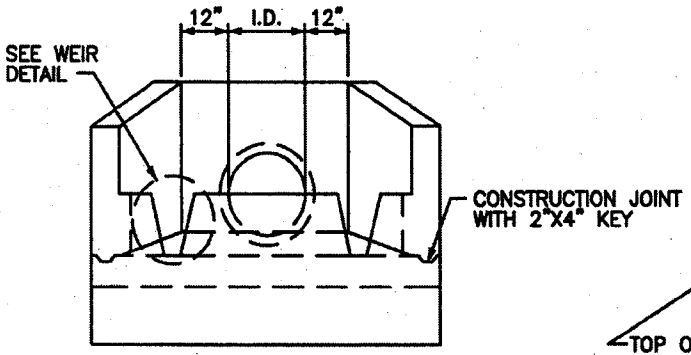
PLAN ELEVATION

NOTES:

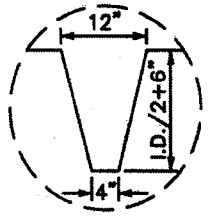
1. NO. 5 STEEL BARS TO BE USED THROUGHOUT ON 12" CENTERS.
2. HEIGHT OF WALL SHALL BE DETERMINED BY THE AMOUNT OF FILL BEHIND PIPE. TOP OF WALL SHALL BE 18" ABOVE TOP O.D. OF PIPE.
3. TOP OF END SILL SHALL BE LEVEL WITH CENTERLINE OF PIPE.
4. CHANNEL LINING TO BE WIDTH OF END SILL, 18" MINIMUM THICKNESS, 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.



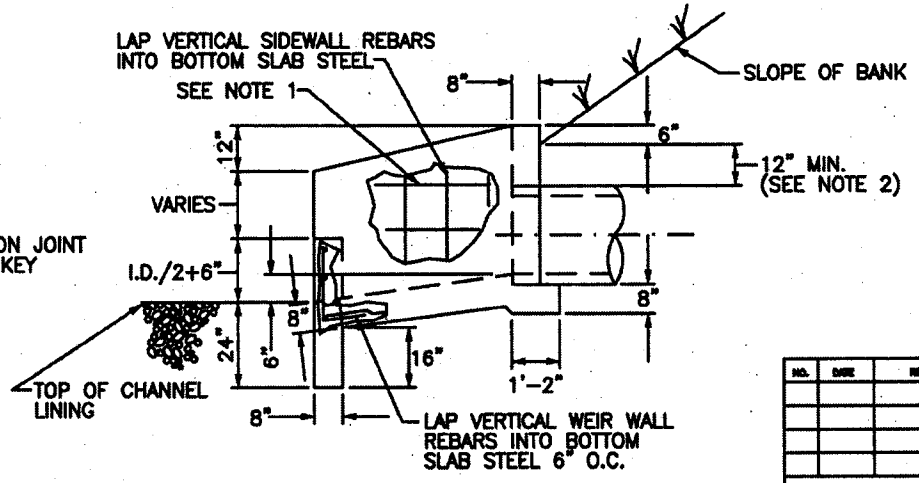
ISOMETRIC VIEW



FRONT ELEVATION



WEIR DETAIL



SIDE ELEVATION

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

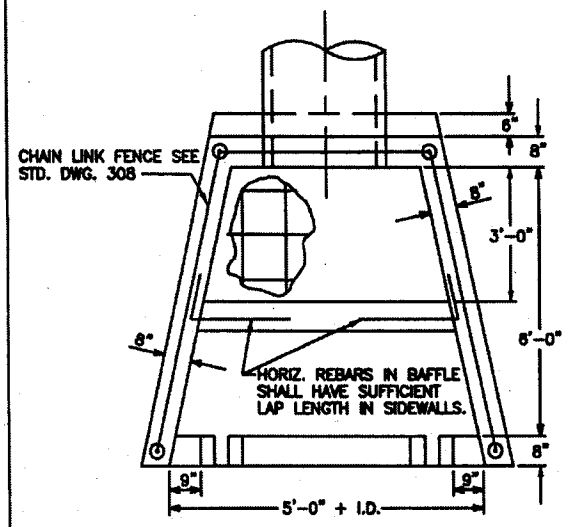
IMPACT STILLING BASIN
15"–24" PIPES

STANDARD DRAWING NO. 164

APPROVED _____ DATE 5/1/02

DESIGN ENGINEER _____ DATE _____

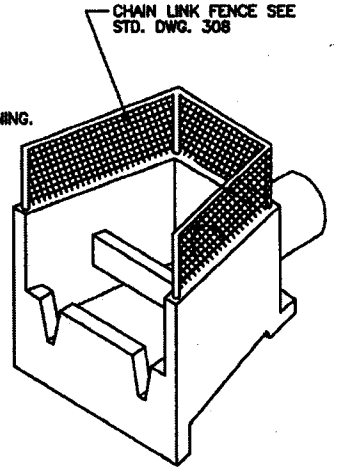
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



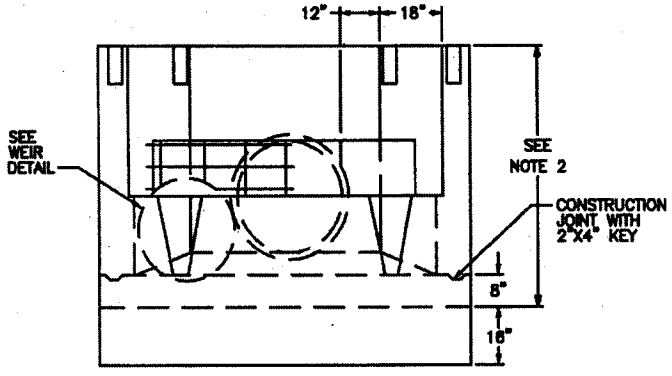
PLAN ELEVATION

NOTES:

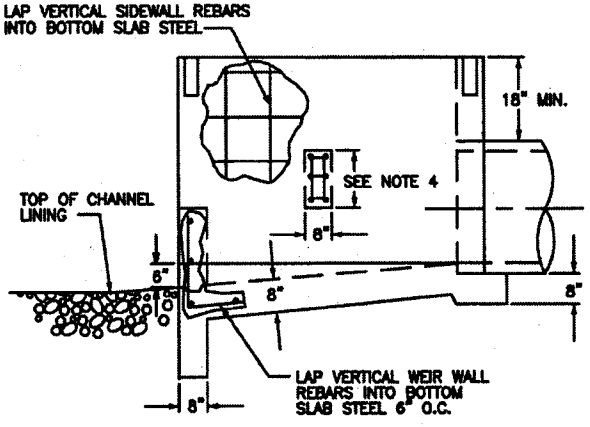
1. NO. 5 STEEL BARS SHALL BE USED THROUGHOUT ON 12" CENTERS EXCEPT ON BAFFLE WHERE HORIZONTAL AND VERTICAL STEEL WILL BE ON 6" CENTERS.
2. HEIGHT OF WALL SHALL BE DETERMINED BY THE AMOUNT OF FILL BEHIND PIPE. TOP OF WALL SHALL BE 18" ABOVE TOP O.D. OF PIPE.
3. TOP OF END SILL SHALL BE LEVEL WITH CENTERLINE 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.



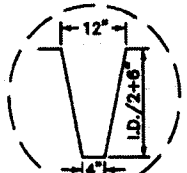
ISOMETRIC VIEW



FRONT ELEVATION



SIDE ELEVATION



WEIR DETAIL

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

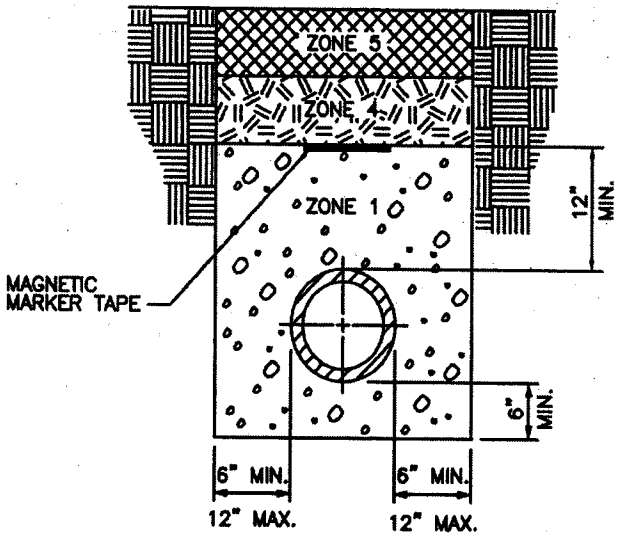
IMPACT STILLING BASIN
27"–48" PIPES

STANDARD DRAWING NO. 165

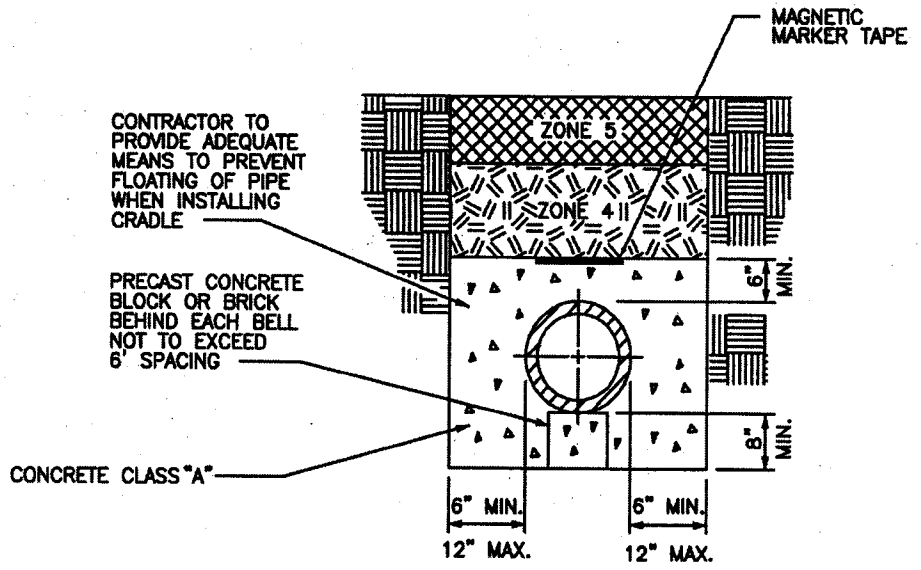
APPROVED 5/1/08

DEPUTY DIRECTOR / COMMISSIONER — DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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.

NO.	DATE	REVISION DESCRIPTION	BY

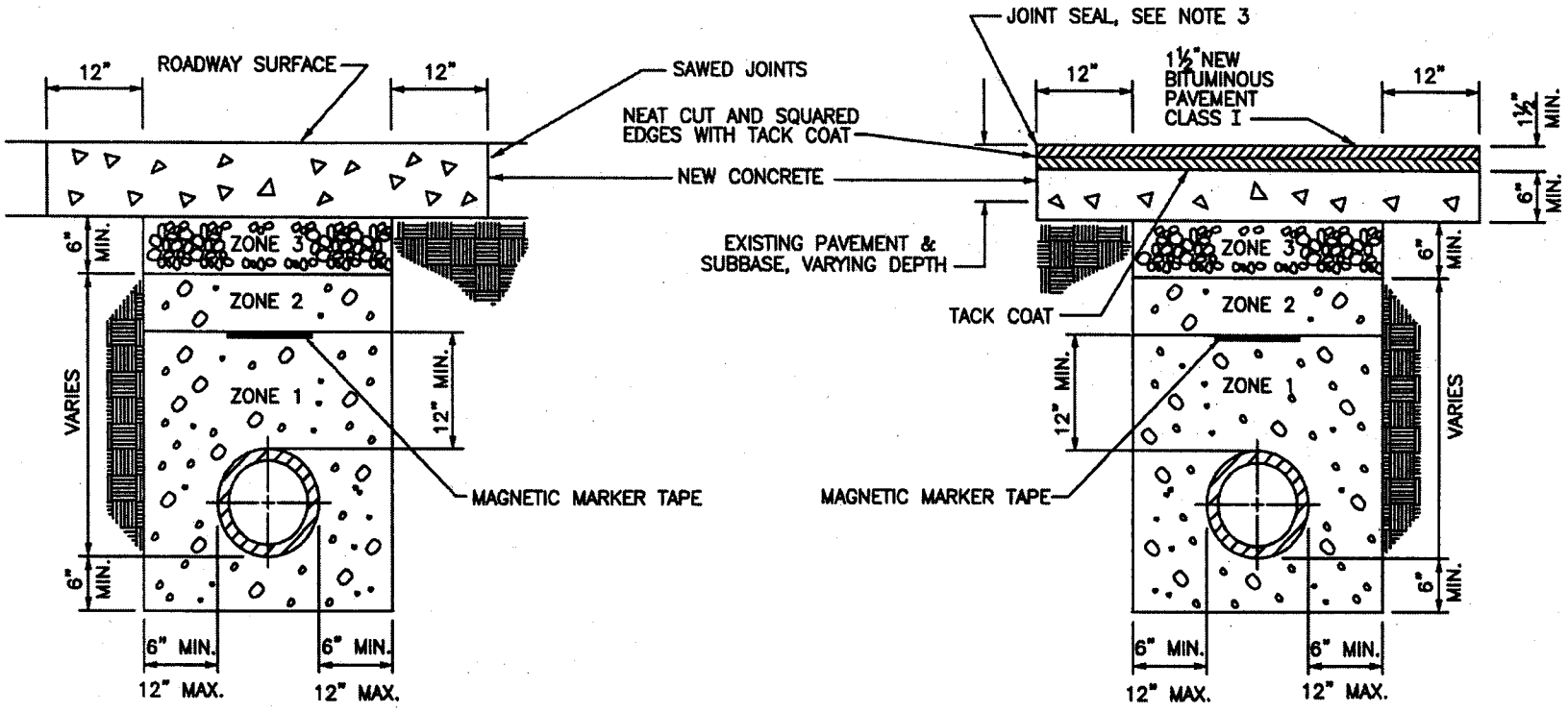
DIVISION OF ENGINEERING

TRENCHING, LAYING, BACKFILLING AND BEDDING OUTSIDE R/W LIMITS

STANDARD DRAWING NO. 200

APPROVED 5/1/07

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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. REPLACE CONCRETE PAVEMENT WITH NEW CONCRETE PAVEMENT, 6"MINIMUM OR EXISTING THICKNESS, WHICHEVER IS GREATER.
2. JOINT SEAL PERIMETER OF CUT PAVEMENT WITH FLEXMASTER POURABLE CRACK SEALANT 1109 OR APPROVED EQUAL.
3. MAGNETIC MARKER TAPE FOR SANITARY SEWER ONLY.

NO.	DATE	REVISION DESCRIPTION	BY

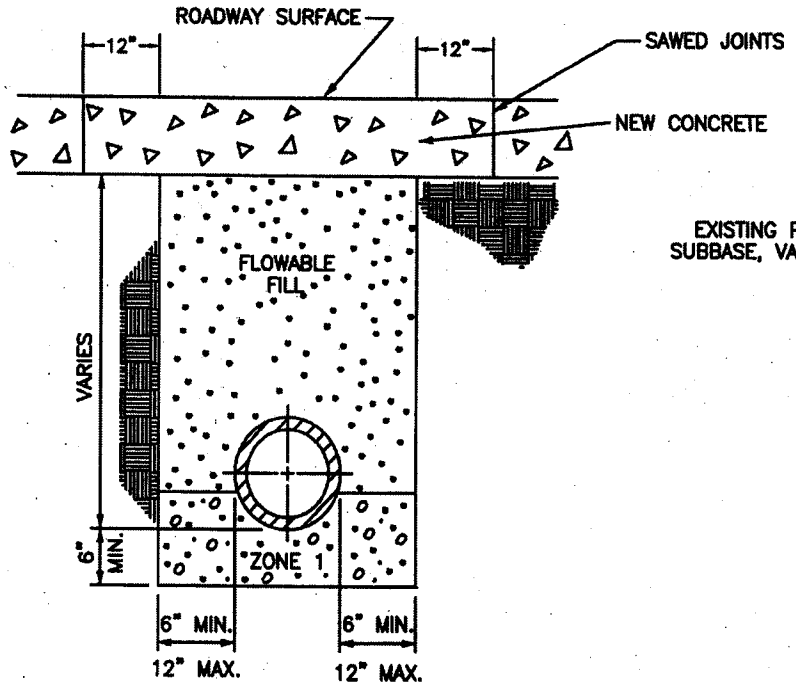
DIVISION OF ENGINEERING

TRENCHING, LAYING, BACKFILLING AND BEDDING UNDER STREET PAVEMENT

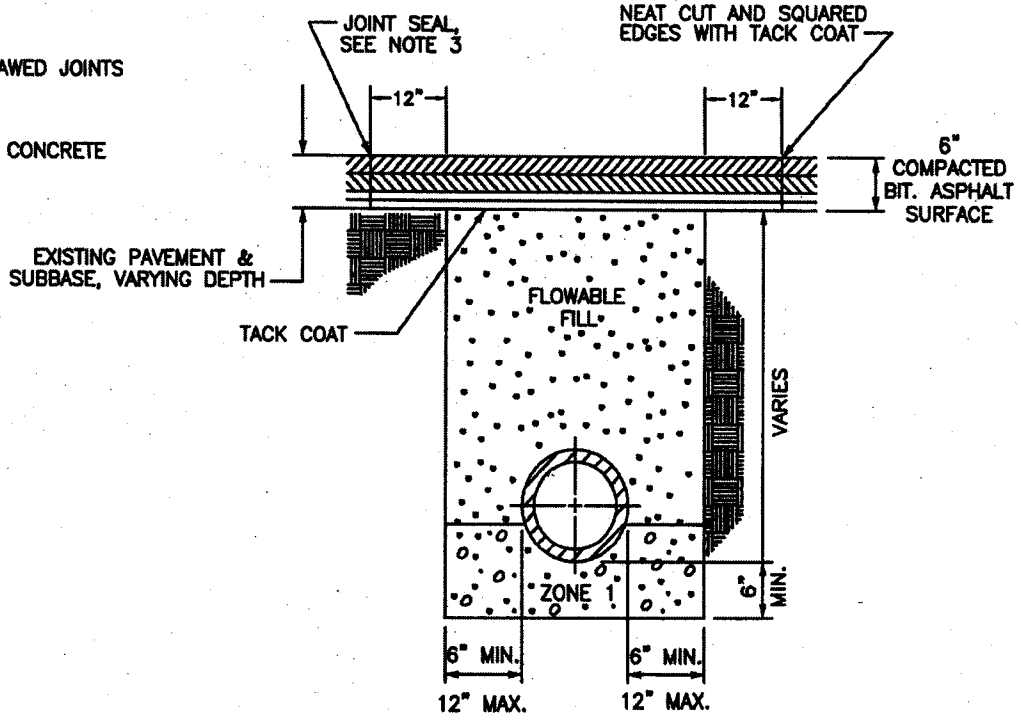
STANDARD DRAWING NO. 201-1

APPROVED 5/1/08

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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. PER KYTC SPECIFICATION 601.03.03 FROM STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION EDITION 2004, OR MOST RECENT.
2. REPLACE CONCRETE PAVEMENT WITH NEW CONCRETE PAVEMENT, 6" MINIMUM OR EXISTING THICKNESS, WHICHEVER IS GREATER.
3. JOINT SEAL PERIMETER OF CUT PAVEMENT WITH FLEXMASTER POURABLE CRACK SEALANT 1109 OR APPROVED EQUAL.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

TRENCHING, LAYING, BACKFILLING, AND BEDDING UNDER STREET PAVEMENT USING FLOWABLE FILL

STANDARD DRAWING NO. 201-2

APPROVED 5/1/08

DIRECTOR

CHIEF ADMINISTRATIVE OFFICER

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

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.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

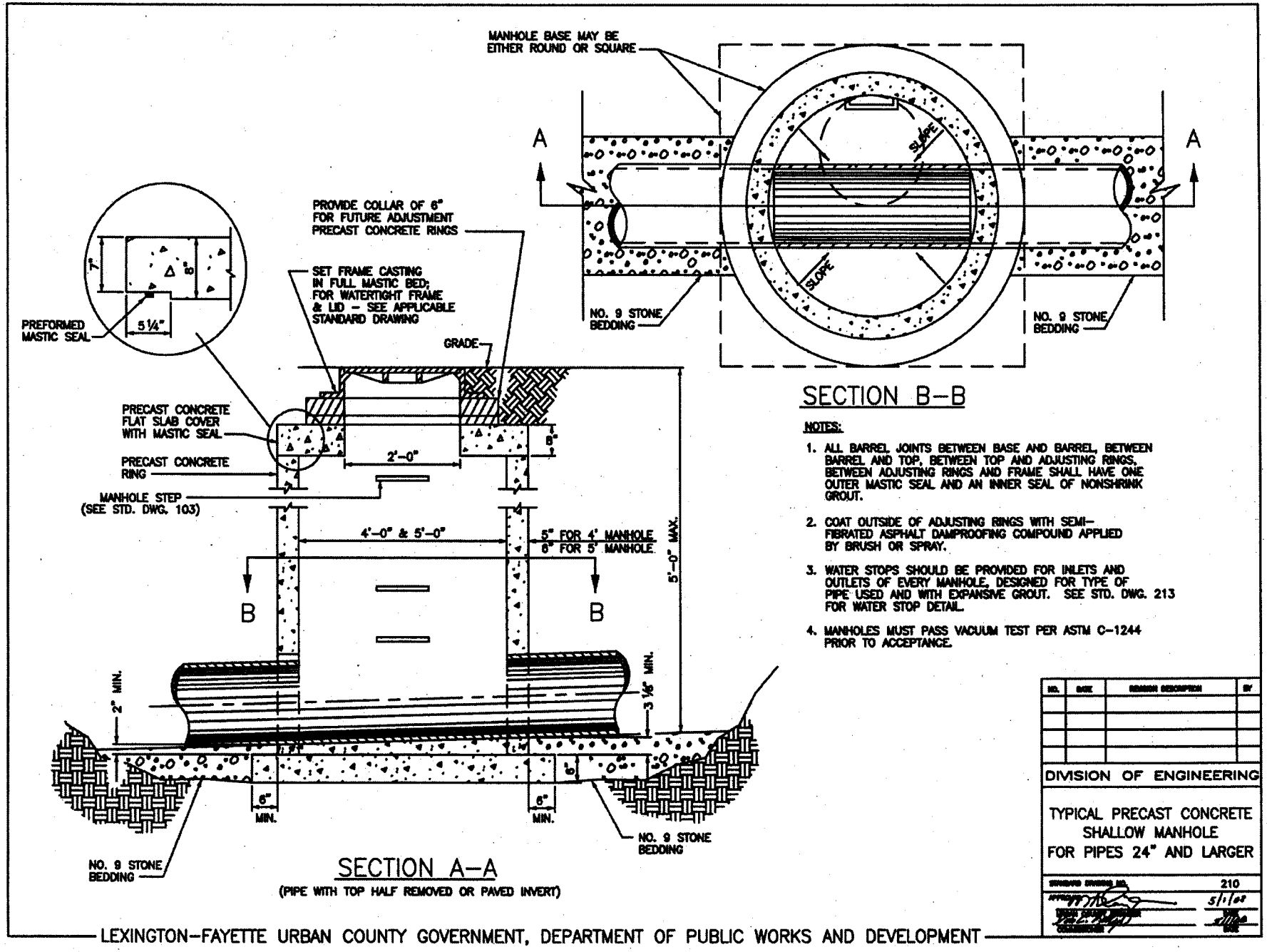
SANITARY SEWER PIPE: TYPES & MAXIMUM ALLOWABLE FILL HEIGHTS

STANDARD DRAWING NO. 204

APPROVED [signature] 5/1/08 DATE

[signature] DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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 FOR WATER STOP DETAIL.
4. MANHOLES MUST PASS VACUUM TEST PER ASTM C-1244 PRIOR TO ACCEPTANCE.

SECTION A-A

(PIPE WITH TOP HALF REMOVED OR PAVED INVERT)

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

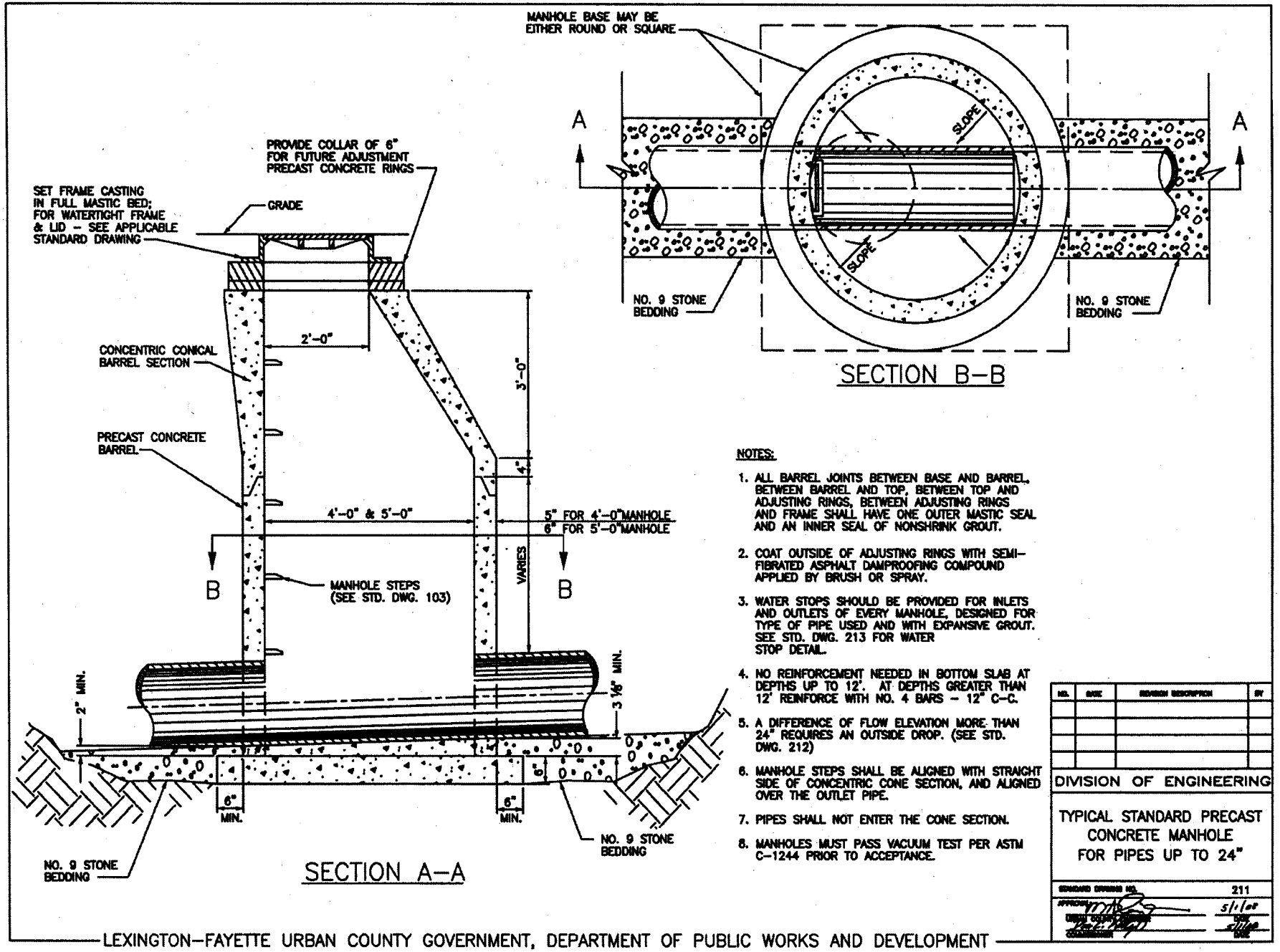
TYPICAL PRECAST CONCRETE SHALLOW MANHOLE FOR PIPES 24" AND LARGER

STANDARD DRAWING NO. 210

APPROVED [signature] 5/1/08

DIRECTOR, DIVISION OF ENGINEERING [signature] DATE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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.

NO.	DATE	REVISION DESCRIPTION	BY

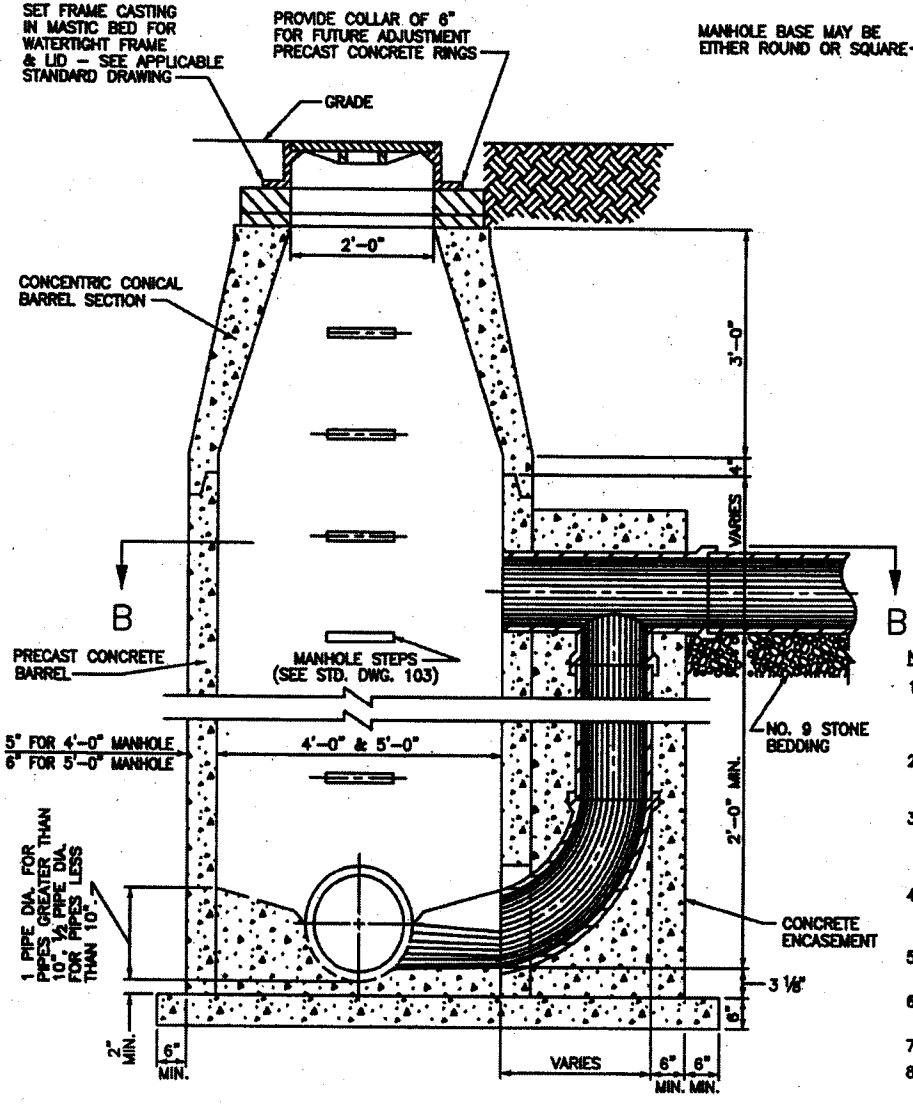
DIVISION OF ENGINEERING

TYPICAL STANDARD PRECAST CONCRETE MANHOLE FOR PIPES UP TO 24"

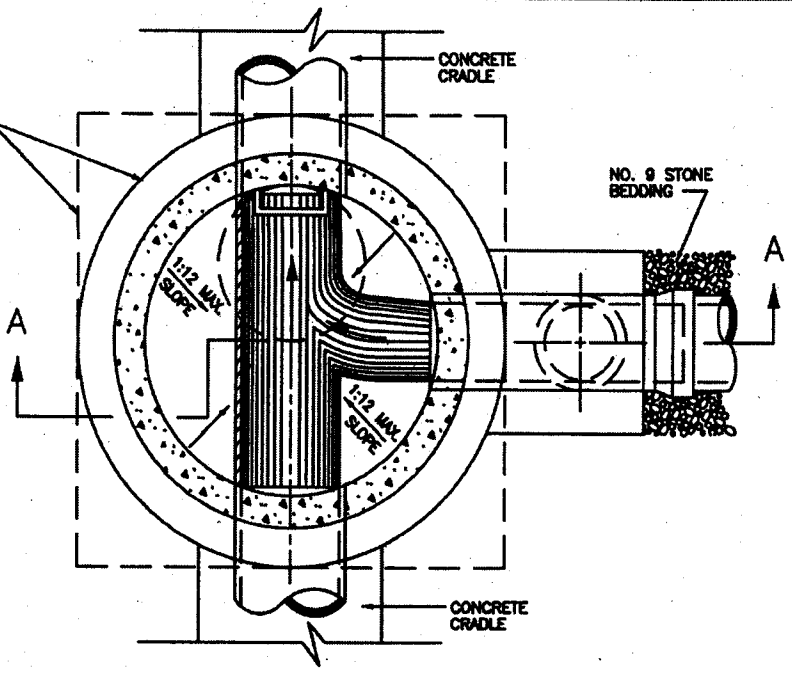
STANDARD DRAWING NO. 211

APPROVED 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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.

NO.	DATE	REVISION DESCRIPTION	BY

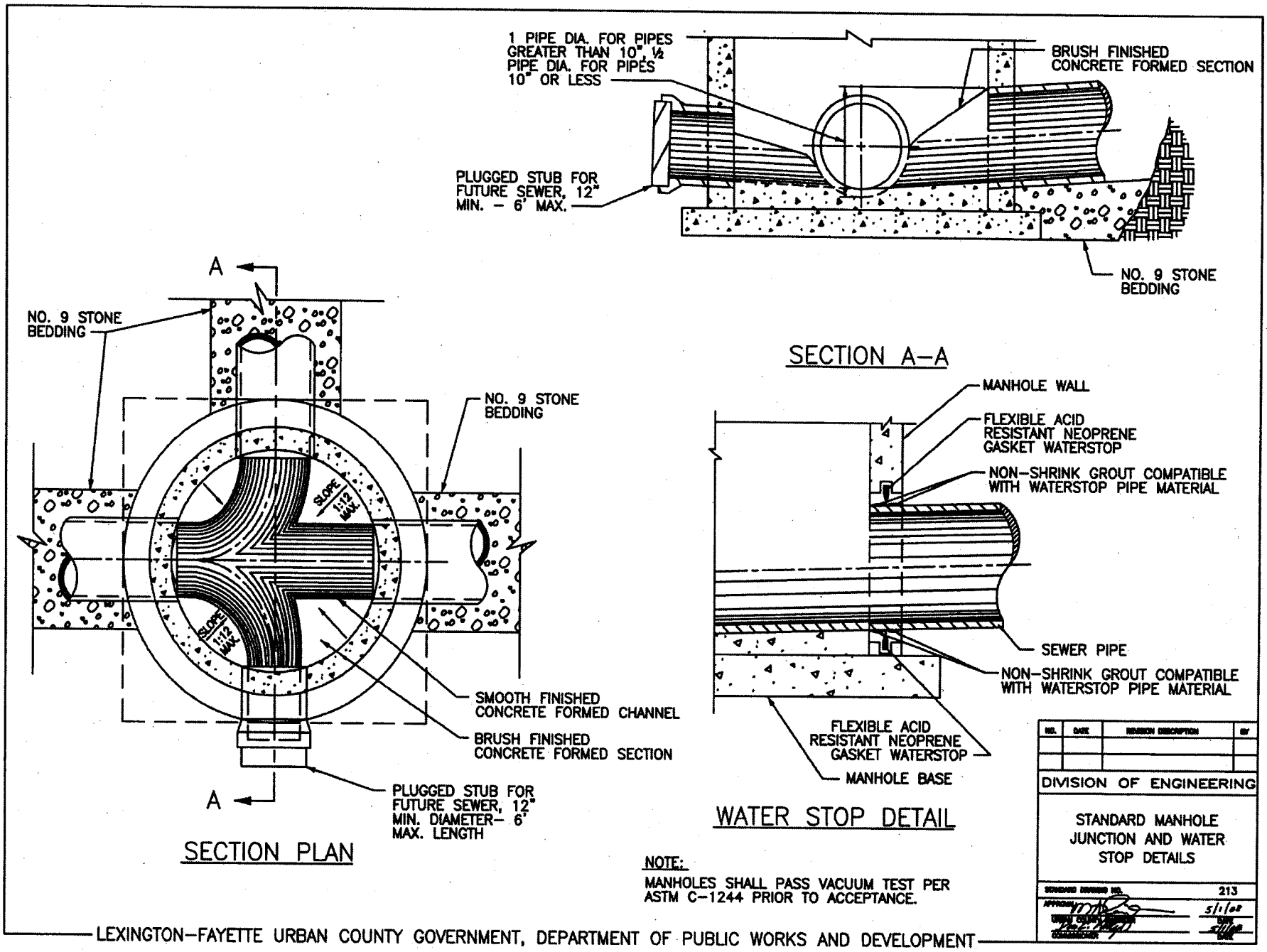
DIVISION OF ENGINEERING

TYPICAL PRECAST CONCRETE DROP MANHOLE FOR PIPES UP TO 36"

STANDARD DRAWING NO. 212

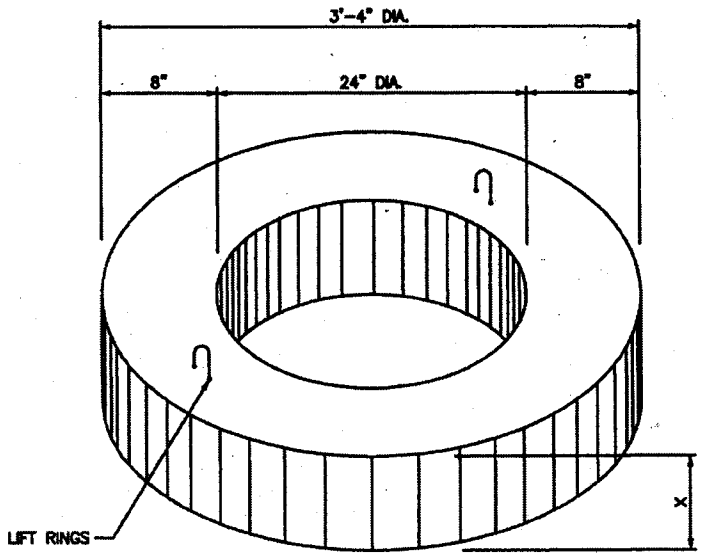
APPROVED 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT


1 PIPE DIA. FOR PIPES GREATER THAN 10", ½ PIPE DIA. FOR PIPES 10" OR LESS
BRUSH FINISHED CONCRETE FORMED SECTION
PLUGGED STUB FOR FUTURE SEWER, 12" MIN. – 6' MAX.
NO. 9 STONE BEDDING
SECTION A–A
NO. 9 STONE BEDDING
NO. 9 STONE BEDDING
A
A
SLOPE 1:12 MAX.
SLOPE 1:12 MAX.
SMOOTH FINISHED CONCRETE FORMED CHANNEL
BRUSH FINISHED CONCRETE FORMED SECTION
PLUGGED STUB FOR FUTURE SEWER, 12" MIN. DIAMETER– 6' MAX. LENGTH
SECTION PLAN
MANHOLE WALL
FLEXIBLE ACID RESISTANT NEOPRENE GASKET WATERSTOP
NON–SHRINK GROUT COMPATIBLE WITH WATERSTOP PIPE MATERIAL
SEWER PIPE
NON–SHRINK GROUT COMPATIBLE WITH WATERSTOP PIPE MATERIAL
FLEXIBLE ACID RESISTANT NEOPRENE GASKET WATERSTOP
MANHOLE BASE
WATER STOP DETAIL
NOTE:
MANHOLES SHALL PASS VACUUM TEST PER ASTM C–1244 PRIOR TO ACCEPTANCE.
NO.
DATE
REVISION DESCRIPTION
BY
DIVISION OF ENGINEERING
STANDARD MANHOLE JUNCTION AND WATER STOP DETAILS
STANDARD DRAWING NO.
213
APPROVED
5/1/08
DATE
DIRECTOR
DATE
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

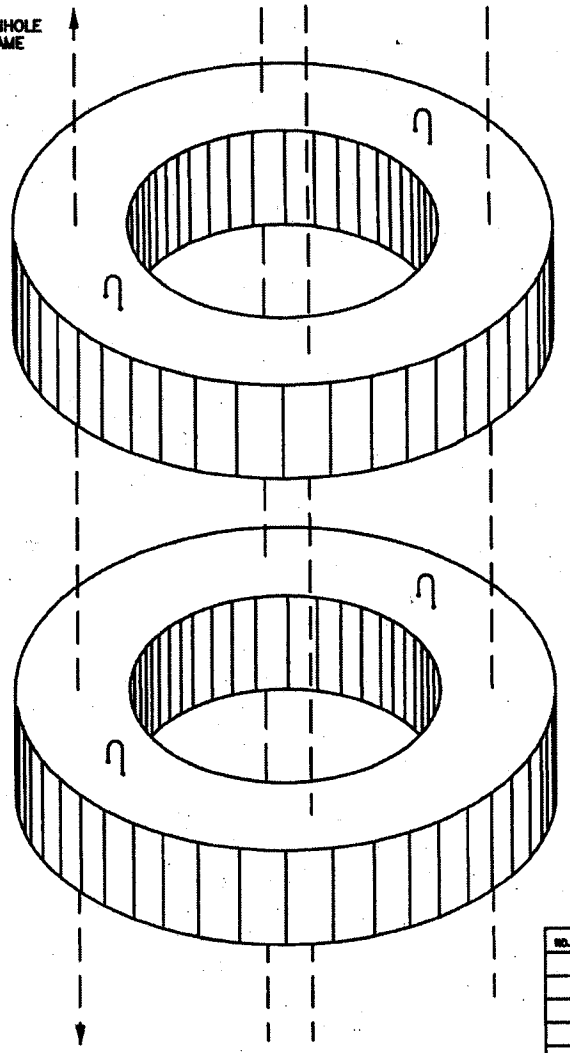
NOTES:

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 LATEST EDITION.
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



NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

SEWER MANHOLE ADJUSTMENT GRADE RINGS

STANDARD DRAWING NO. 214

APPROVED [signature] 5/1/08

DIRECTOR [signature] DATE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

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.
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.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

MANHOLE SIZE STANDARDS AND GENERAL NOTES FOR DEEP MANHOLES

STANDARD DRAWING NO. 216

APPROVAL [signature] 5/1/08

DIRECTOR, DIVISION OF ENGINEERING [signature] DATE

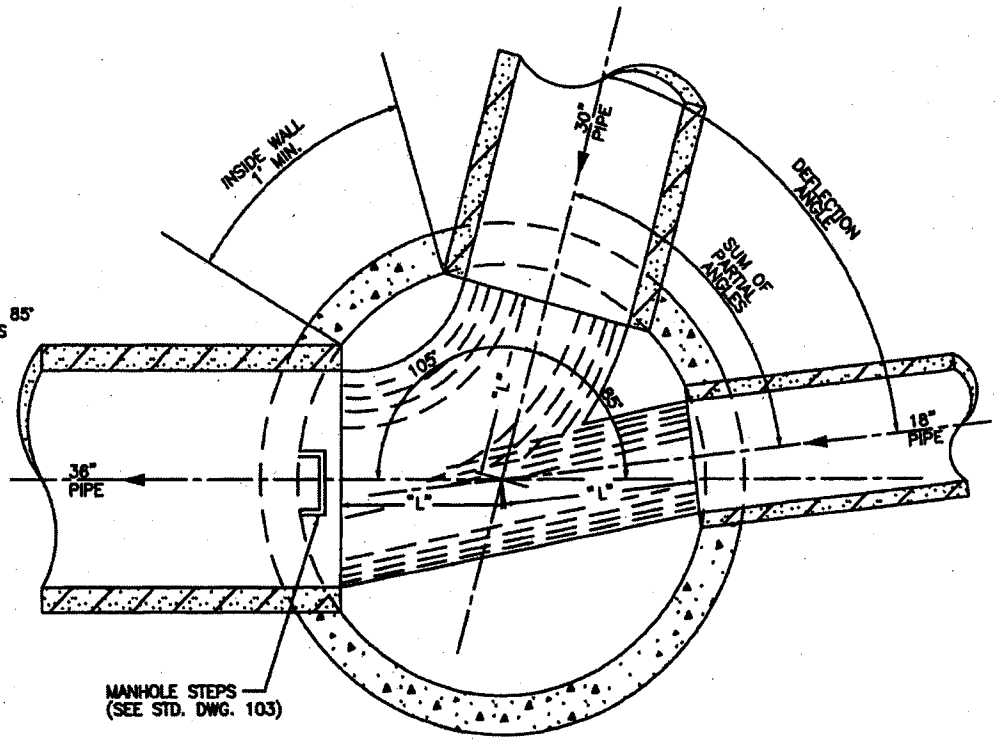
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

CIRCULAR MANHOLE NOTES:

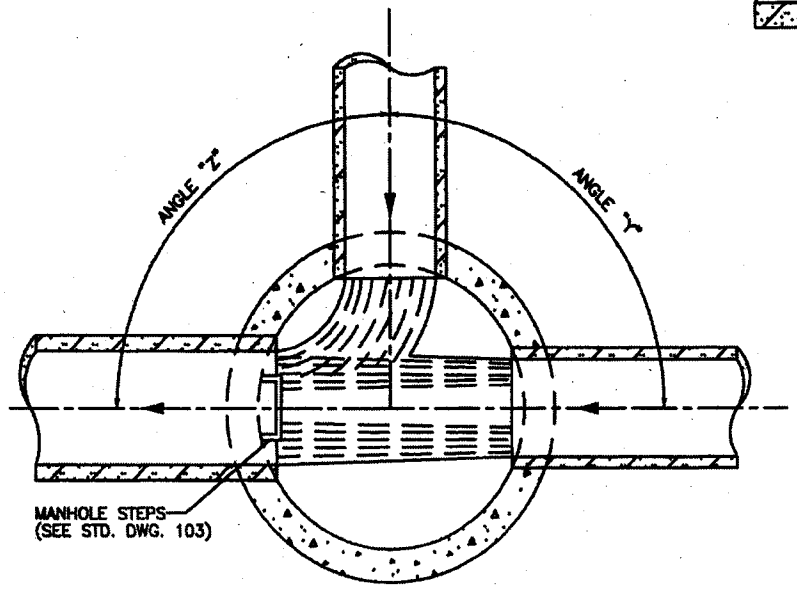
1. THE ANGLE BETWEEN ANY TWO PIPES (e.g. ANGLE "Y" OR "Z") MUST BE GREATER THAN THE SUM OF THE PARTIAL ANGLES. REFER TO SEPARATE STANDARD DRAWINGS FOR TABLE OF MINIMUM PARTIAL ANGLES. ANGLES SMALLER THAN LISTED ON TABLE SHALL REQUIRE LARGER MANHOLE SELECTION.
2. THE MAXIMUM DEFLECTION ANGLE BETWEEN ANY 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.



PLAN SECTION



PLAN SECTION

TABLE OF MINIMUM PARTIAL ANGLES FOR SANITARY MANHOLES

PIPE SIZE	MANHOLE SIZE 4'-0" P. ANGLE	4'-0" L. DIST.	5'-0" P. ANGLE	5'-0" 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"

NO.	DATE	REVISION DESCRIPTION	BY

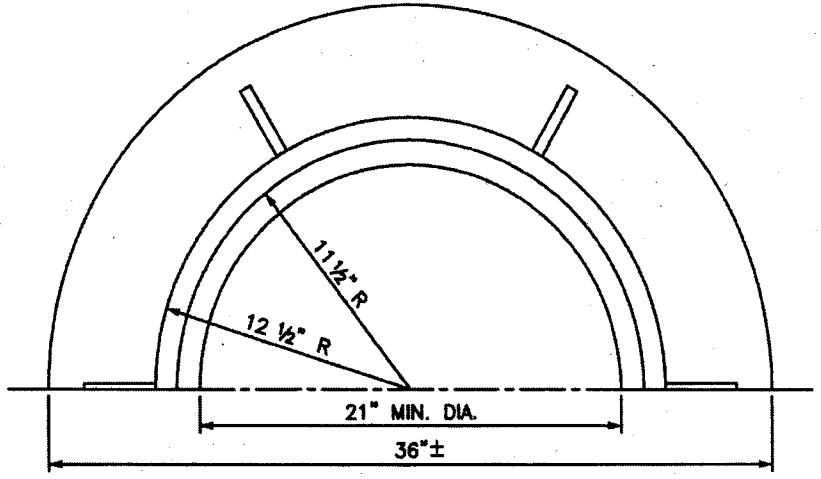
DIVISION OF ENGINEERING

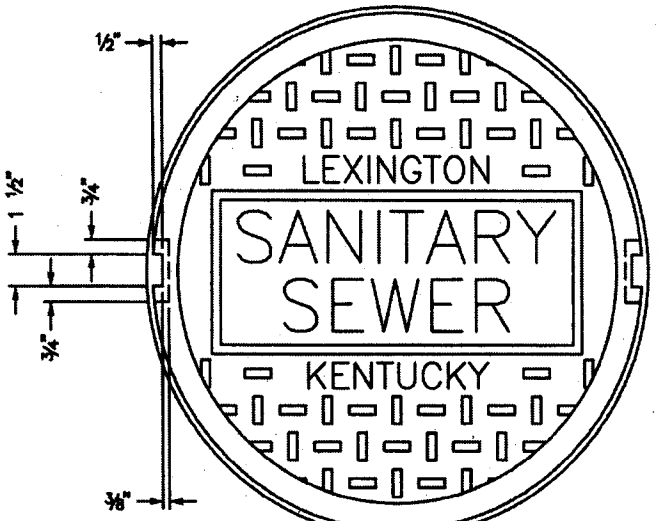
DEFLECTION ANGLE CRITERIA FOR SANITARY MANHOLES

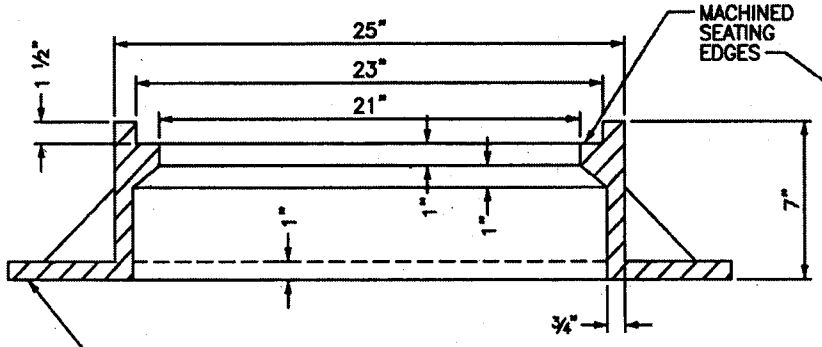
STANDARD DRAWING NO. 217

APPROVED 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT







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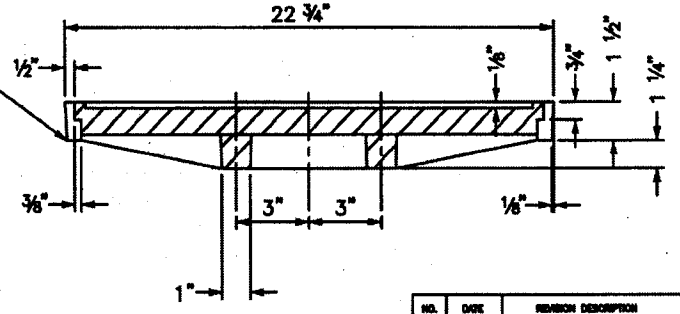


COVER DETAIL

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.

NO.	DATE	REVISION DESCRIPTION	BY

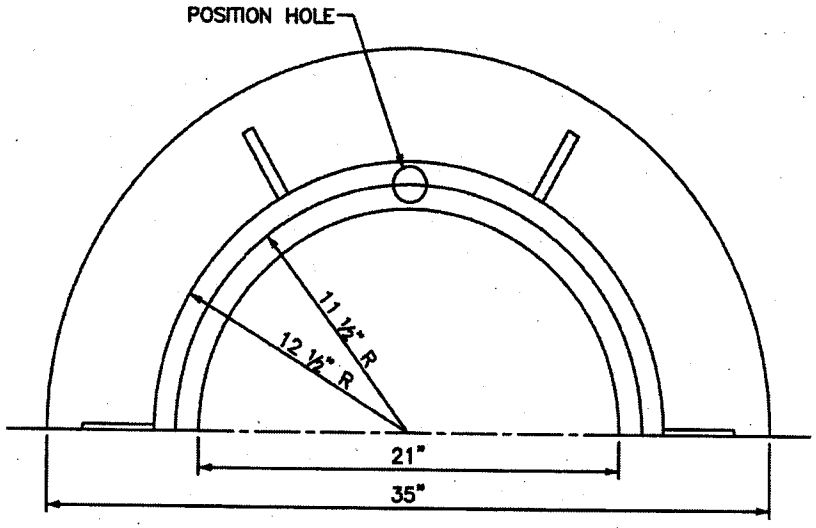
DIVISION OF ENGINEERING

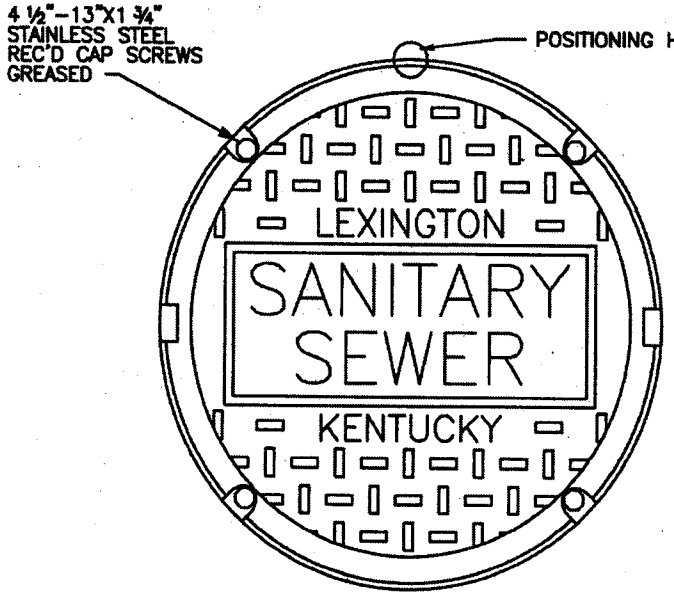
STANDARD CIRCULAR
MANHOLE FRAME & COVER

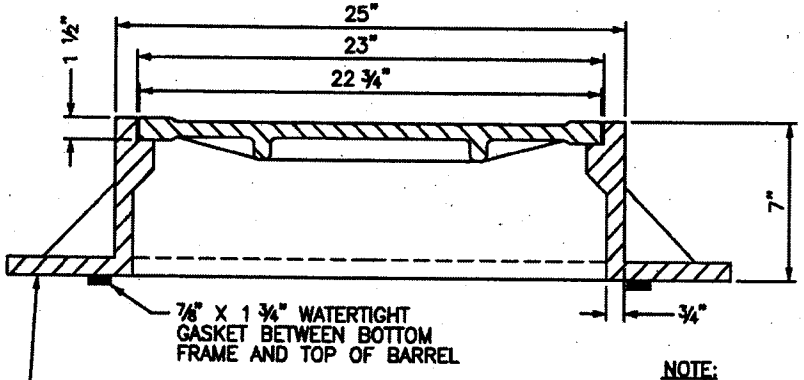
STANDARD DRAWING NO. 220

APPROVED: [signature] 5/1/08
DIRECTOR
[signature] DATE
COMMISSIONER

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT







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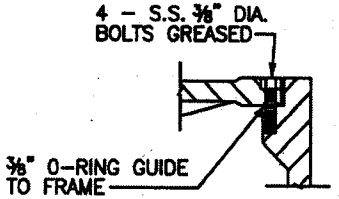
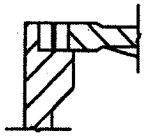


WATERTIGHT DETAIL



POSITIONING HOLE

COVER DETAIL

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.

NO.	DATE	REVISION DESCRIPTION	BY

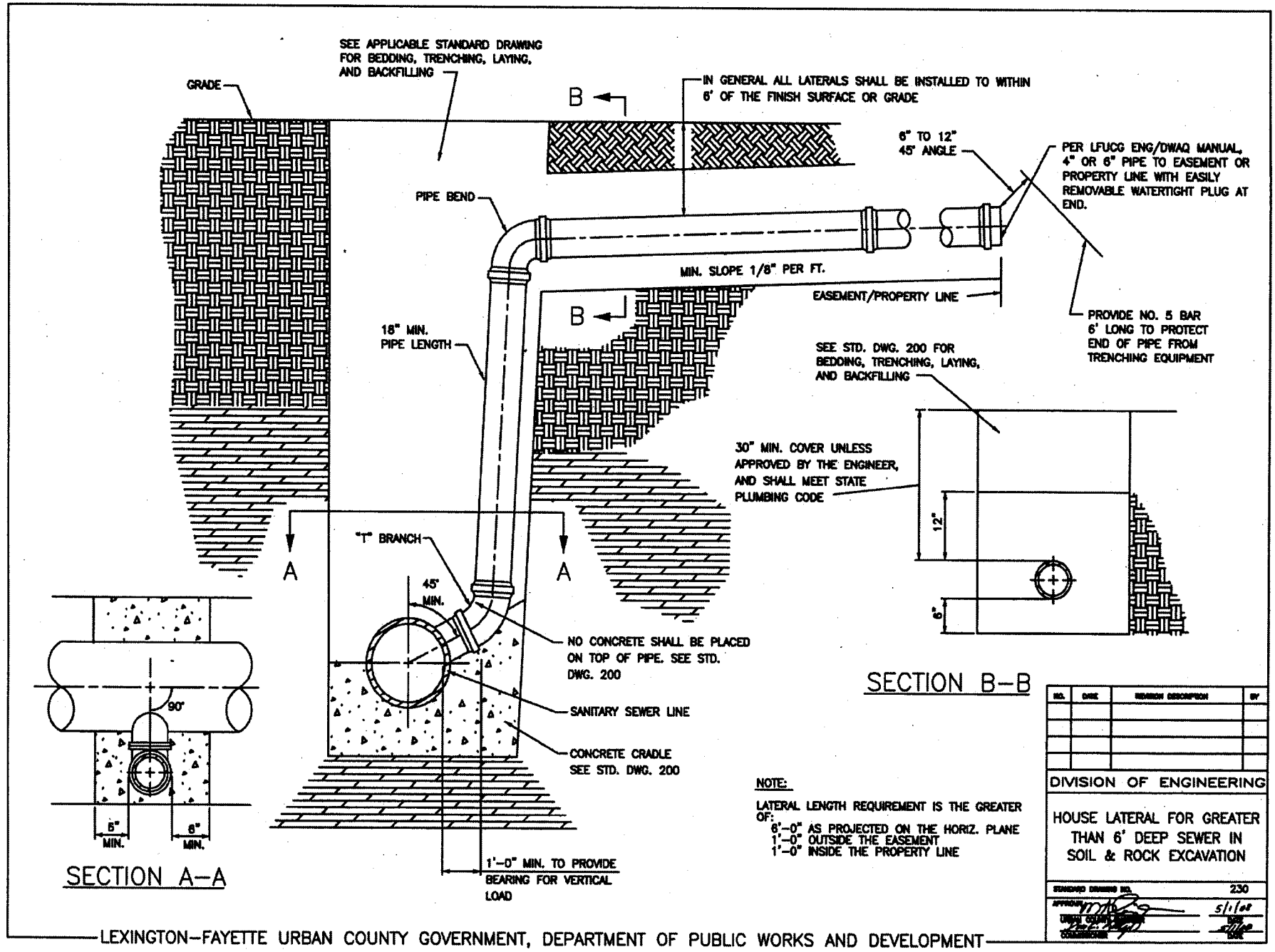
DIVISION OF ENGINEERING

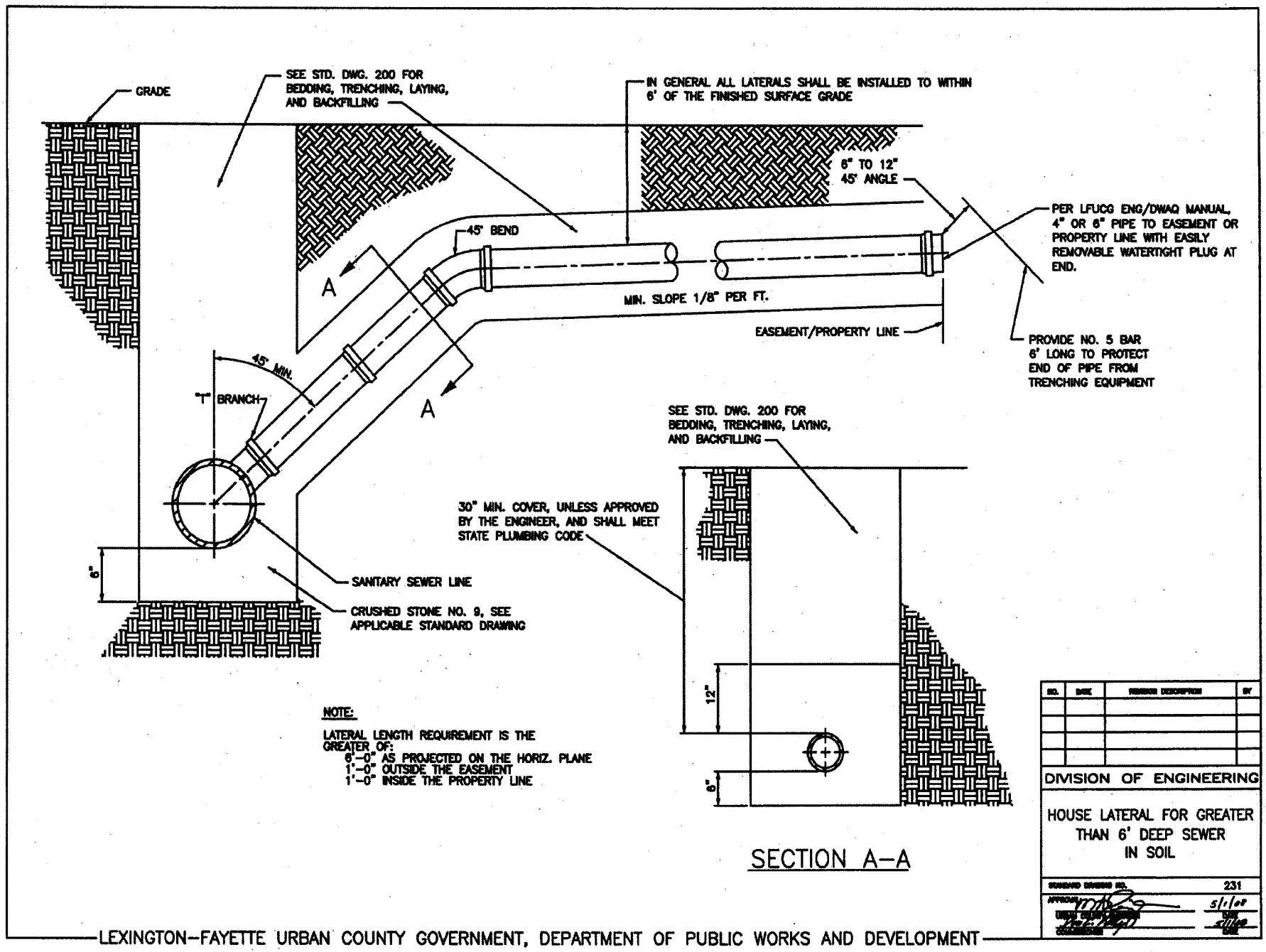
STANDARD WATERTIGHT MANHOLE FRAME & COVER

STANDARD DRAWING NO. 222

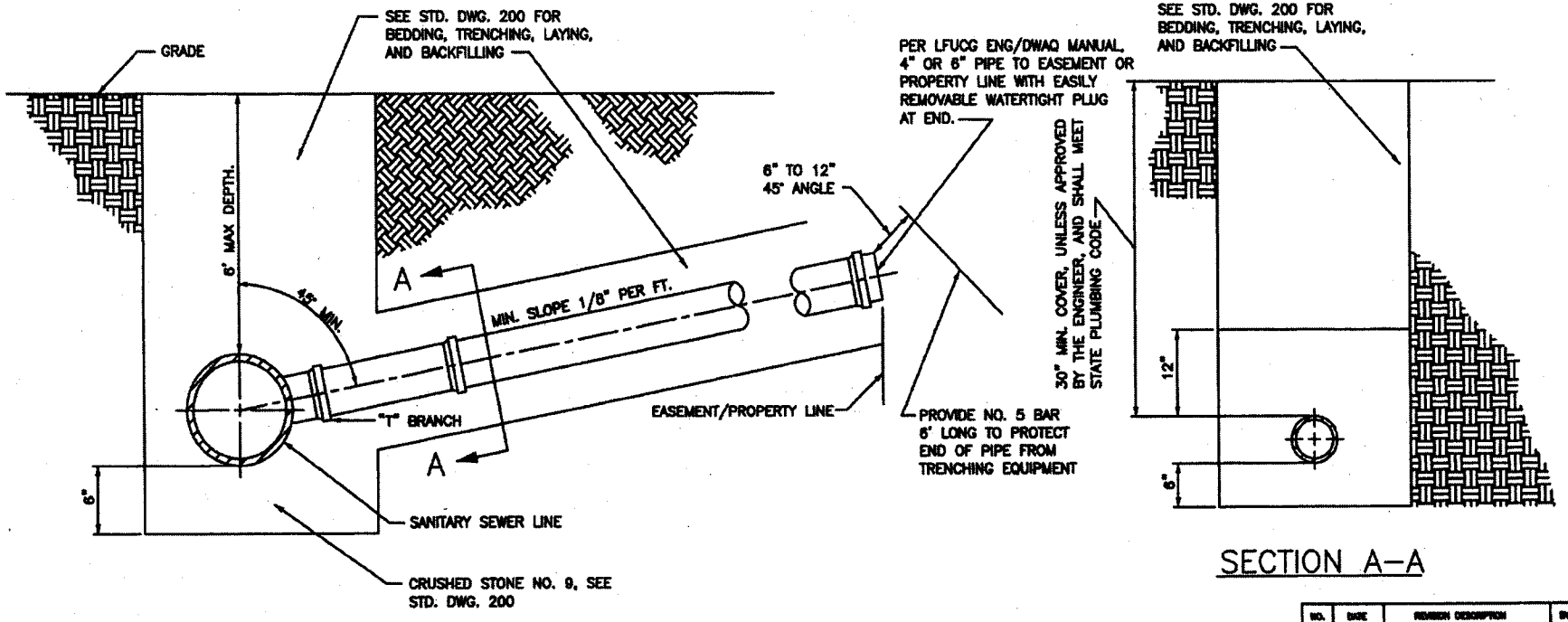
APPROVED 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT


SEE APPLICABLE STANDARD DRAWING FOR BEDDING, TRENCHING, LAYING, AND BACKFILLING
GRADE
B
IN GENERAL ALL LATERALS SHALL BE INSTALLED TO WITHIN 6' OF THE FINISH SURFACE OR GRADE
6" TO 12" 45° ANGLE
PER LFUCG ENG/DWAQ MANUAL, 4" OR 6" PIPE TO EASEMENT OR PROPERTY LINE WITH EASILY REMOVABLE WATERTIGHT PLUG AT END.
PIPE BEND
MIN. SLOPE 1/8" PER FT.
EASEMENT/PROPERTY LINE
PROVIDE NO. 5 BAR 6' LONG TO PROTECT END OF PIPE FROM TRENCHING EQUIPMENT
18" MIN. PIPE LENGTH
SEE STD. DWG. 200 FOR BEDDING, TRENCHING, LAYING, AND BACKFILLING
30" MIN. COVER UNLESS APPROVED BY THE ENGINEER, AND SHALL MEET STATE PLUMBING CODE
12"
6"
A
A
"T" BRANCH
45° MIN.
NO CONCRETE SHALL BE PLACED ON TOP OF PIPE. SEE STD. DWG. 200
SANITARY SEWER LINE
CONCRETE CRADLE SEE STD. DWG. 200
90°
6" MIN.
6" MIN.
1'-0" MIN. TO PROVIDE BEARING FOR VERTICAL LOAD
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
NO.
DATE
REVISION DESCRIPTION
BY
DIVISION OF ENGINEERING
HOUSE LATERAL FOR GREATER THAN 6' DEEP SEWER IN SOIL & ROCK EXCAVATION
STANDARD DRAWING NO. 230
APPROVED
DATE 5/1/08
DIRECTOR
DATE
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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

NO.	DATE	REVISION DESCRIPTION	BY

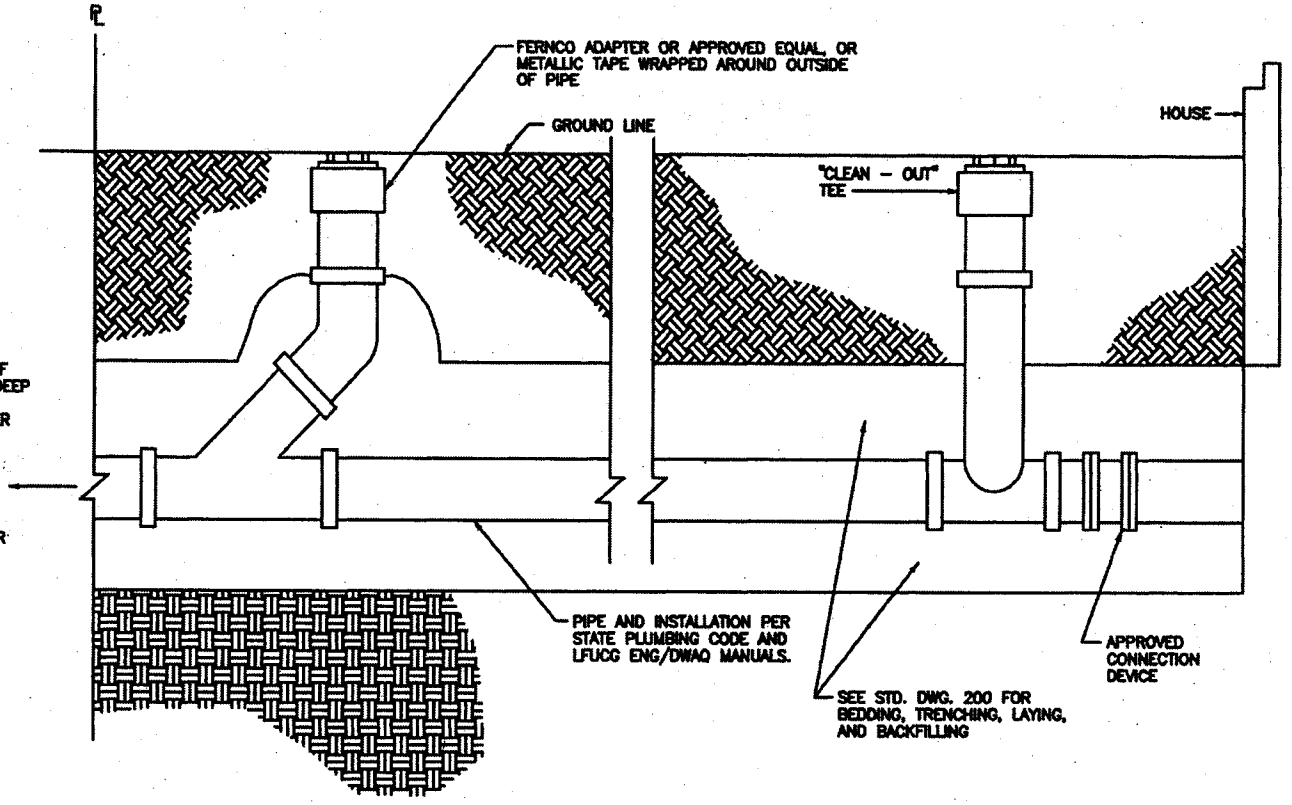
DIVISION OF ENGINEERING

HOUSE LATERAL
FOR SHALLOW SEWER
IN SOIL OR ROCK

STANDARD DRAWING NO. 232

APPROVED: 5/1/08 DATE
5/1/08 DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



NOTE:

SEWER PIPE FROM HOUSE TO THE LONG SWEEP "L" MUST BE IN ACCORDANCE WITH STATE PLUMBING CODE AND LFUCG ENG/DWAG MANUALS.

NO.	DATE	REVISION DESCRIPTION	BY

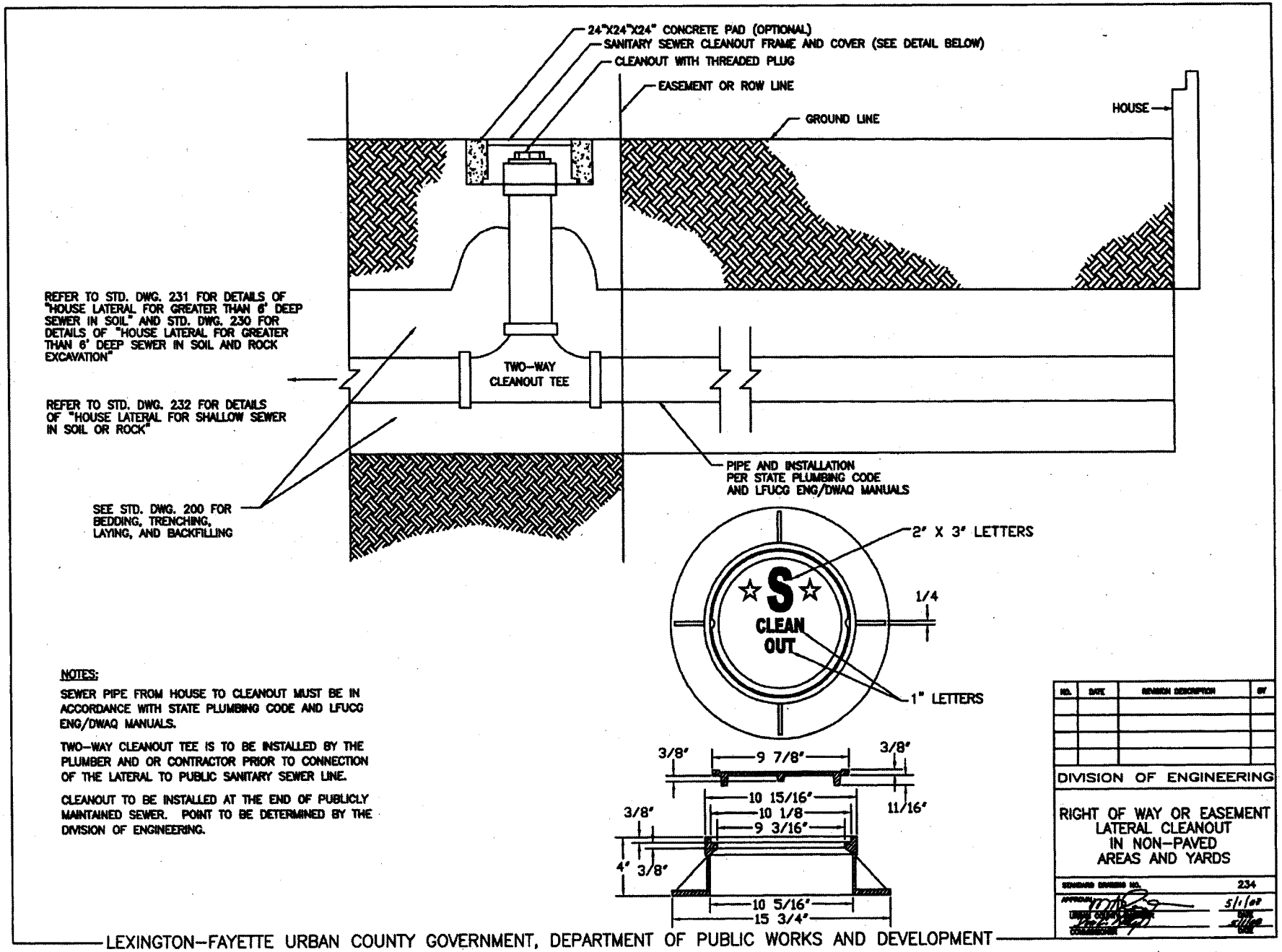
DIVISION OF ENGINEERING

LATERAL CLEANOUT IN NON-PAVED AREAS AND YARDS

STANDARD DRAWING NO. 233

APPROVED 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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.

NO.	DATE	REVISION DESCRIPTION	BY

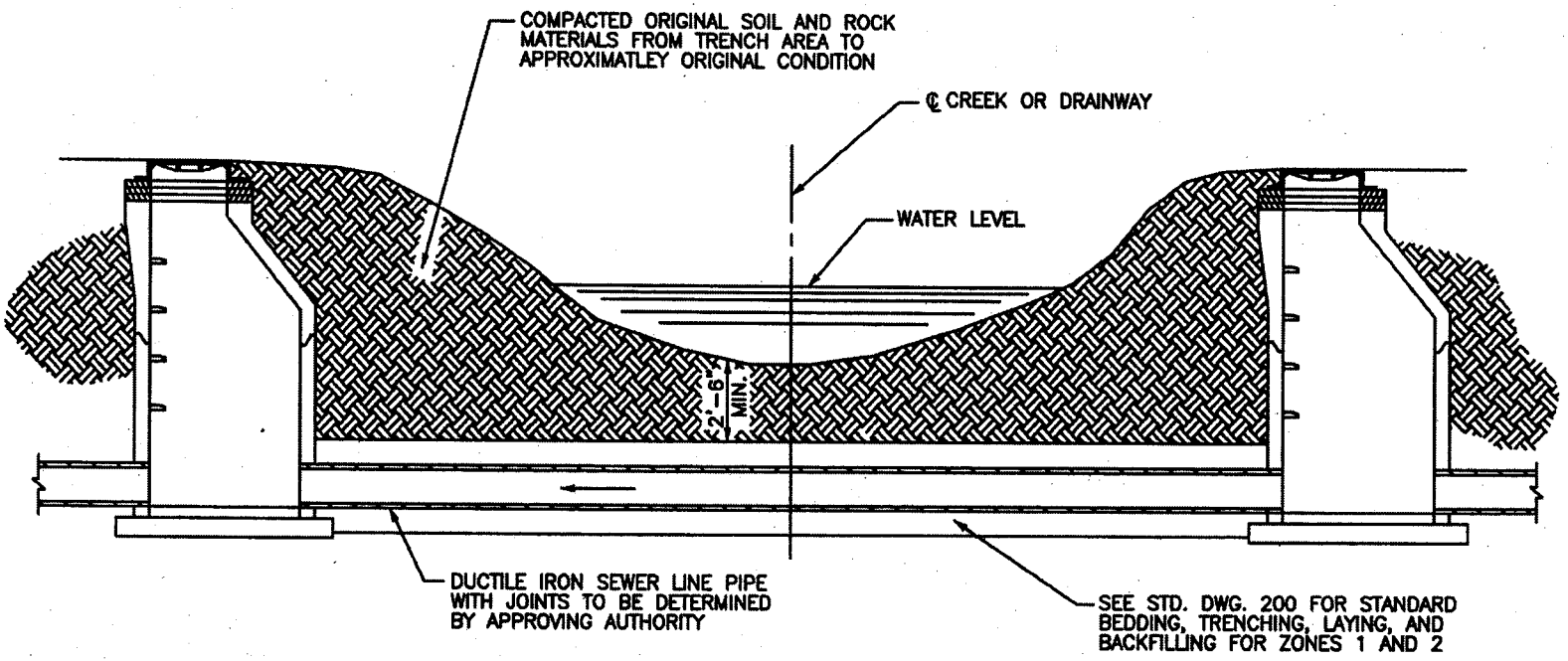
DIVISION OF ENGINEERING

RIGHT OF WAY OR EASEMENT
LATERAL CLEANOUT
IN NON-PAVED
AREAS AND YARDS

STANDARD DRAWING NO. 234

APPROVAL 5/1/08

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



NOTES:

1. A WATERSTOP SHALL BE PROVIDED ON THE UPSTREAM SIDE OF THE DOWNSTREAM MANHOLE.
2. SPECIAL DESIGN REQUIRED WHEN COVER IS 30" OR LESS.

NO.	DATE	REVISION DESCRIPTION	BY

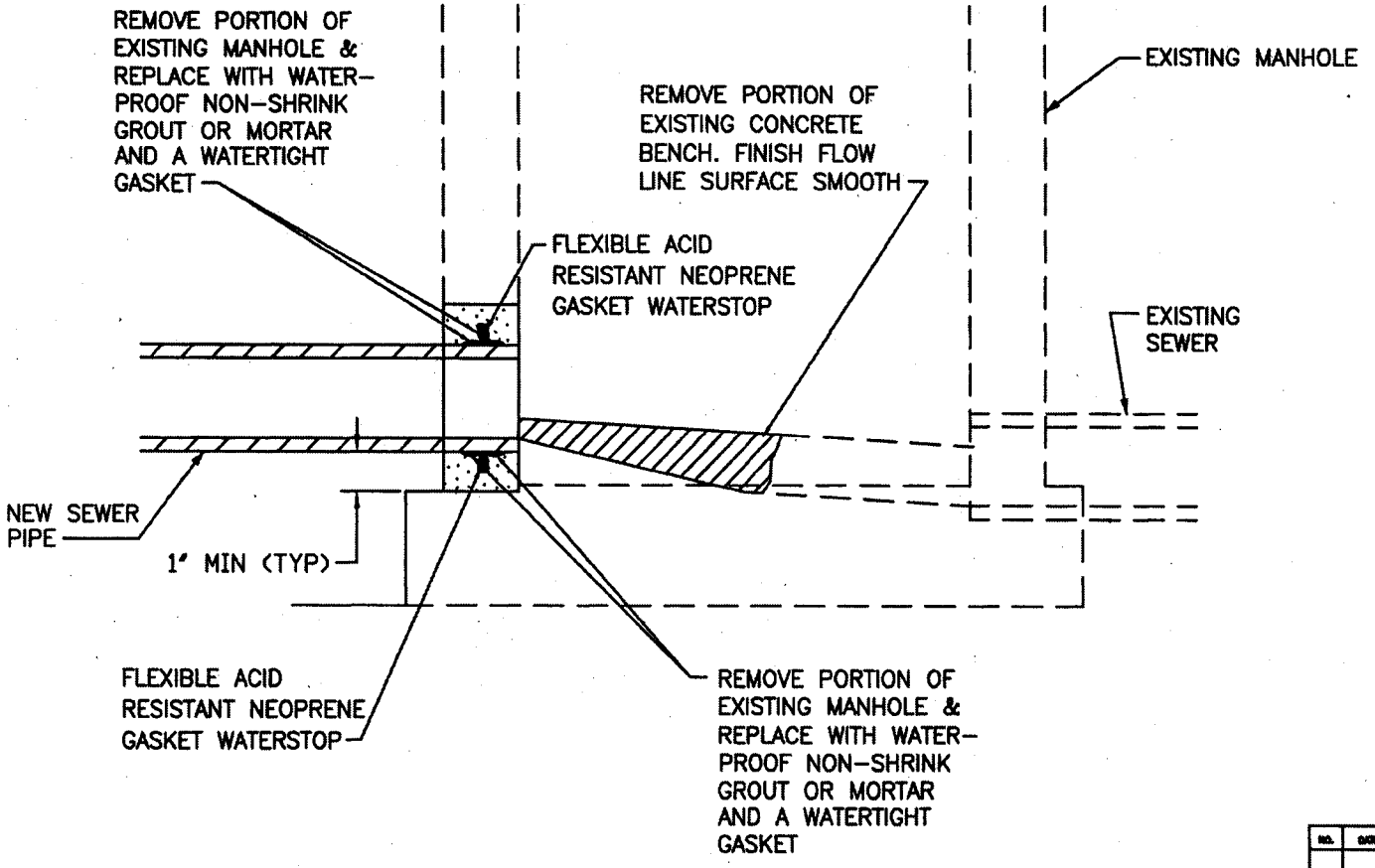
DIVISION OF ENGINEERING

TYPICAL CREEK CROSSING FOR SANITARY SEWER LINE

STANDARD DRAWING NO. 240

APPROVED 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



ALL HOLES CUT INTO SEWER MANHOLES SHALL BE CORE DRILLED.

SEWER CONNECTION TO EXISTING MANHOLE

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

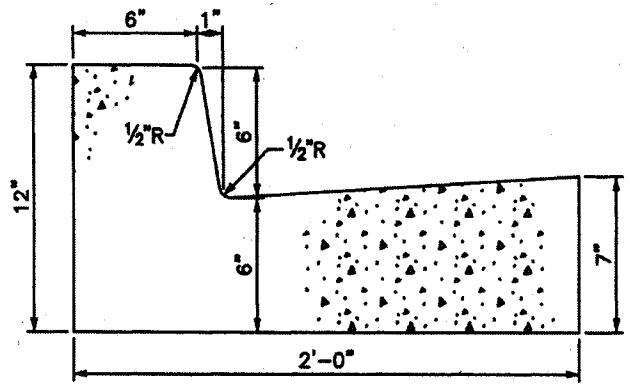
SEWER CONNECTION TO EXISTING CONCRETE MANHOLE

STANDARD DRAWING NO. 260

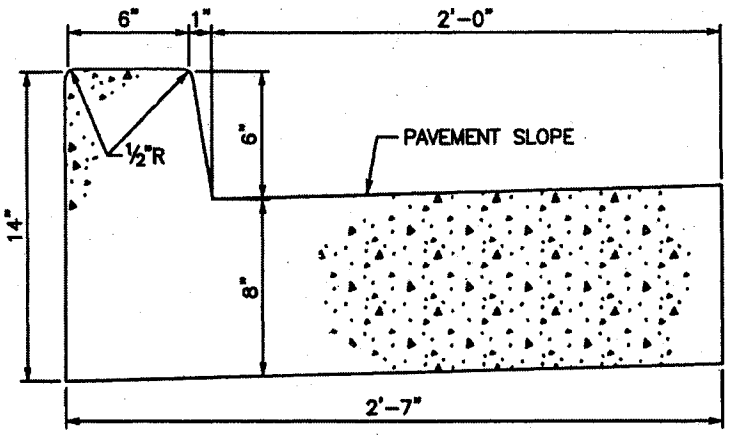
APPROVED [signature] DATE 5/1/08

DIRECTOR [signature] DATE 5/1/08

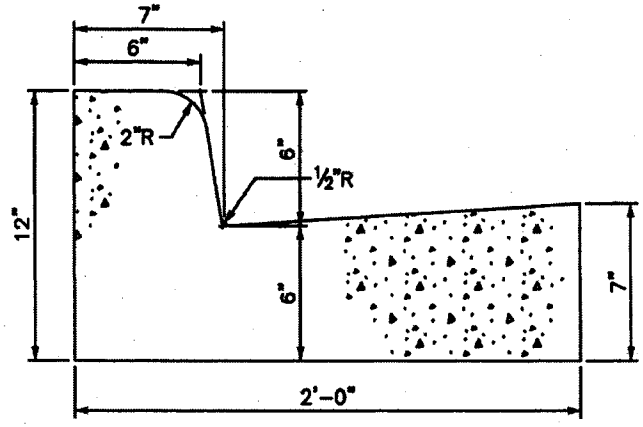
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



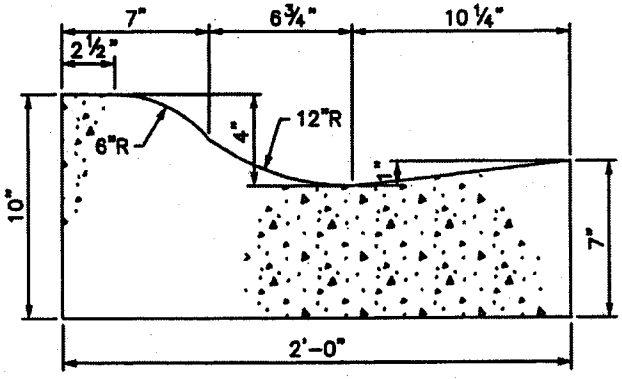
TYPE 1



TYPE 2



TYPE 3



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. 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).

NO.	DATE	REVISION DESCRIPTION	BY

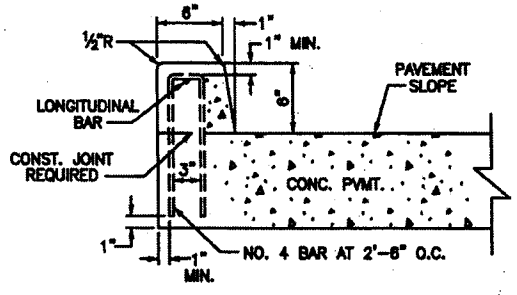
DIVISION OF ENGINEERING

CURB & GUTTER

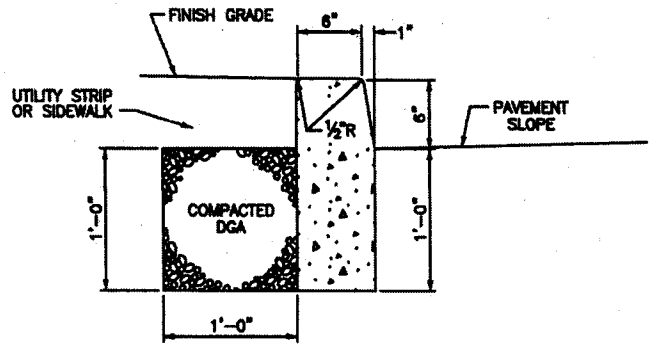
STANDARD DRAWING NO. 301

APPROVED 5/1/08

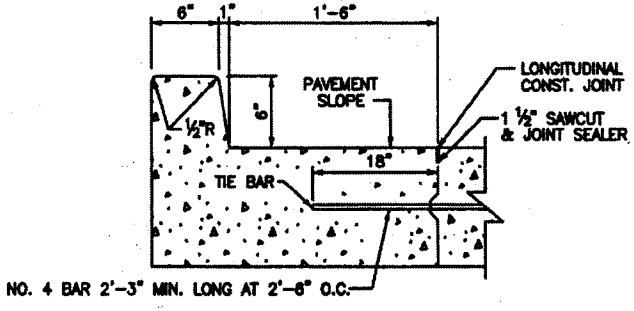
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



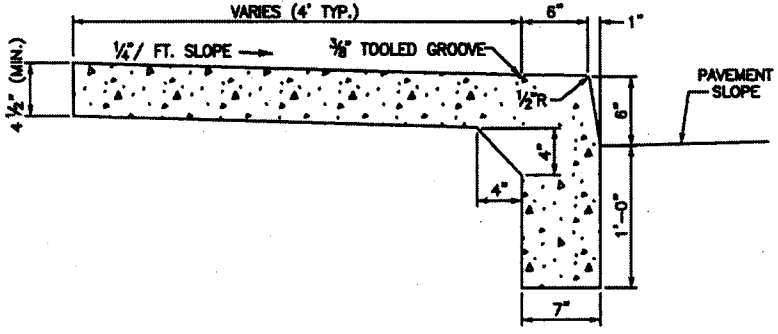
INTEGRAL CURB, TYPE 1



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. 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).

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

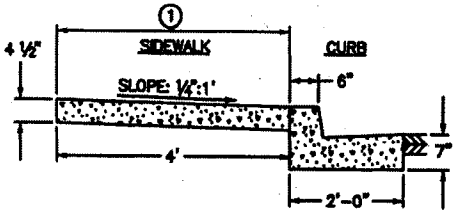
INTEGRAL CURB, HEADER CURB, MONOLITHIC CURB & SIDEWALK

STANDARD DRAWING NO. 302

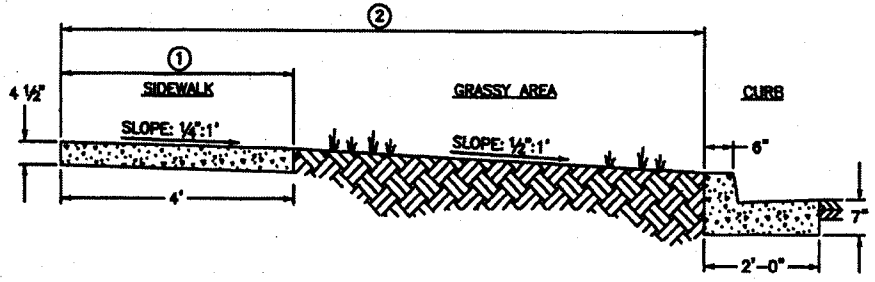
APPROVED: [signature] 5/1/08
CHIEF ADMINISTRATIVE OFFICER — DATE

[signature]
COMMISSIONER — DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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 HAVE SPECIFICATIONS FOR CLASS "A", KENTUCKY DEPARTMENT OF HIGHWAYS, STANDARD SPECIFICATIONS, CURRENT EDITION. WHITE PIGMENTED (TYPE 2, CLASS "A" OR "B") CURING COMPOUND IS REQUIRED (ALSO KENTUCKY DEPARTMENT OF HIGHWAYS, STANDARD SPECIFICATIONS, CURRENT EDITION).
2. EXPANSION JOINTS SHALL BE PLACED AT THIRTY-TWO (32) FOOT INTERVALS. IN EXISTING NEIGHBORHOODS, EXPANSION MATERIAL SHALL BE PLACED AT THE BEGINNING AND END OF NEWLY CONSTRUCTED AREAS.
3. 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.

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.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

SIDEWALK CONSTRUCTION SPECIFICATIONS

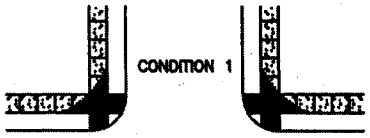
STANDARD DRAWING NO. 303

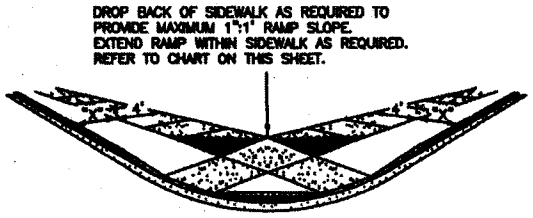
APPROVED 5/1/08

DIRECTOR DATE

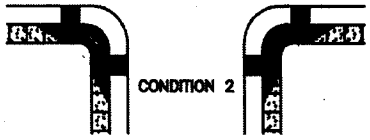
URBAN COUNTY ENGINEER DATE 5/1/08

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



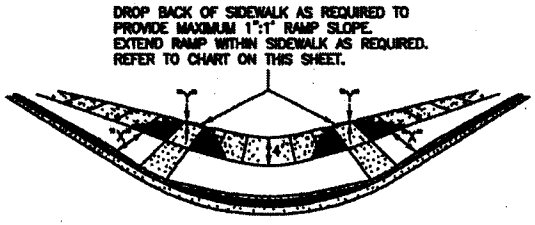


RAMP TYPE 1 CONDITION 1



RAMP TYPE 1

NORMAL TREATMENT FOR ARTERIALS AND SIGNALIZED INTERSECTIONS

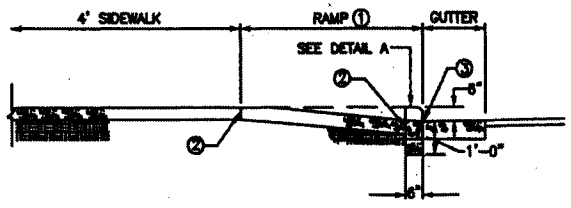


RAMP TYPE 1 CONDITION 2

NOTE:
FOR USE WITH 6" HEADER CURB OR 6" CURB AND GUTTER

① UTILITY STRIP WIDTH "X"	② BACK OF 4' SIDEWALK DROP FROM NORMAL "Y"*
0	3"
1	2 1/2"
2	2"
3	1 1/2"
4	1"
5	1/2"
≥6	0

① ½":1' CROSS SLOPE ② ¼":1' CROSS SLOPE
*WHERE ROLL CURB IS USED, "Y" DOES NOT APPLY.



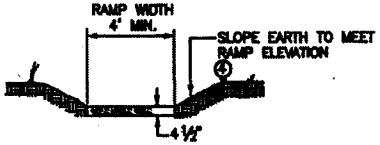
PROFILE RAMP TYPE 1

NOTES:

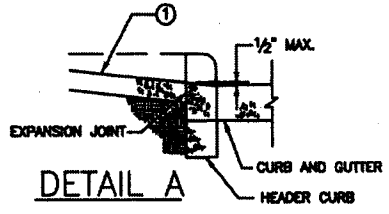
1. INLET LOCATIONS WILL VARY, DEPENDENT ON CROSSWALK AND RAMP LOCATION.
2. THE RAMP SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE. STEP-SAFE® TRANSPO INDUSTRIES TILE OR ENGINEER APPROVED EQUIVALENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. THE NORMAL GUTTER LINE SHOULD BE MAINTAINED 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.

SHEET NOTES:

① MAXIMUM RAMP SLOPE 1":1'.
② ½" EXPANSION JOINT AT BACK OF CURBLINE AND SIDEWALK LINE.
③ NO BUMP PERMITTED.
④ SLOPE VARIES UNIFORMLY TO A MAXIMUM OF 1":1' AT GUTTER LINE.



CROSS SECTION RAMP TYPE 1



DETAIL A

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

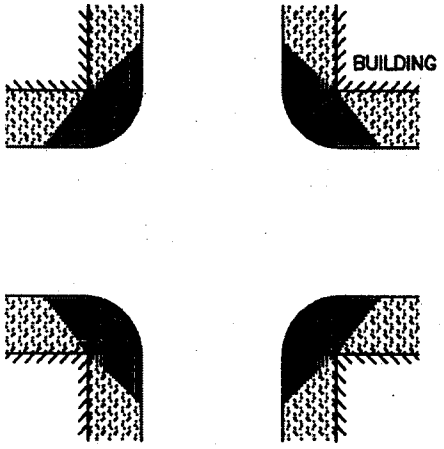
SIDEWALK RAMP TYPE 1

STANDARD DRAWING NO. 304

APPROVED [signature] 5/1/08
DIRECTOR, DIVISION OF ENGINEERING DATE

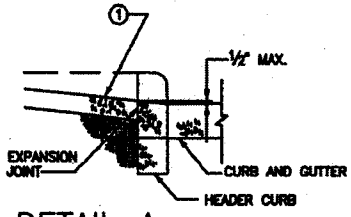
COMMISSIONER DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

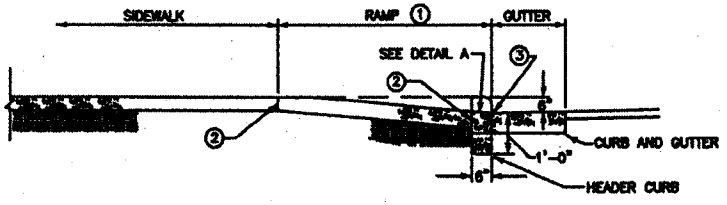


RAMP TYPE 3

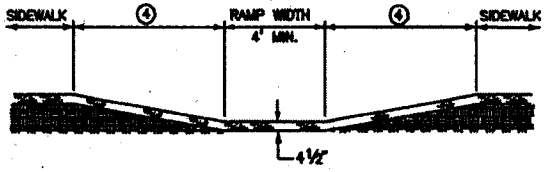
NORMAL TREATMENT FOR SIDEWALK ADJACENT TO CURB



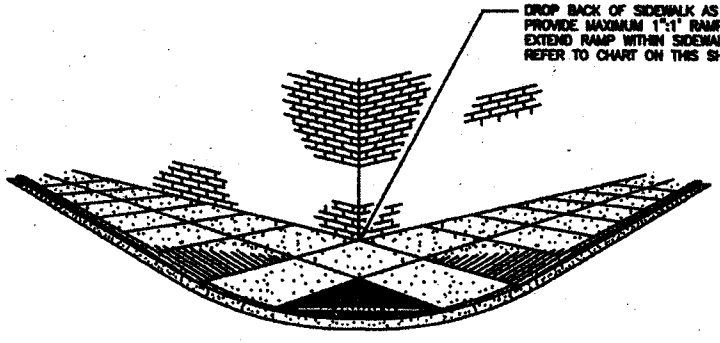
DETAIL A



PROFILE RAMP TYPE 3



CROSS SECTION RAMP TYPE 3



RAMP TYPE 3

NOTES:

1. INLET LOCATIONS WILL VARY, DEPENDENT ON CROSSWALK AND RAMP LOCATION.
2. THE RAMP SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE. STEP-SAFE® TRANSPO INDUSTRIES TILE OR ENGINEER APPROVED EQUIVALENT SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
3. THE NORMAL GUTTER LINE SHOULD BE MAINTAINED THROUGH THE RAMP.
4. RAMPS SHOULD BE LOCATED WITHIN MARKED LIMITS OF CROSSWALKS.

SHEET NOTES:

① MAXIMUM RAMP SLOPE 1":1'.
② ½" EXPANSION JOINT AT BACK OF CURBLINE AND SIDEWALK LINE.
③ NO BUMP PERMITTED.
④ SLOPE VARIES UNIFORMLY TO A MAXIMUM OF 1":1'. AT GUTTER LINE.

NOTE:
FOR USE WITH 6" HEADER CURB OR 6" CURB AND GUTTER

SIDEWALK WIDTH ① "X"	BACK OF SIDEWALK DROP FROM NORMAL "Y"*
4'	3"
5'	2¼"
6'	1½"
7'	¾"
≥ 8'	0

① ¼":1' CROSS SLOPE
* WHERE ROLL CURB IS USED, "Y" DOES NOT APPLY.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

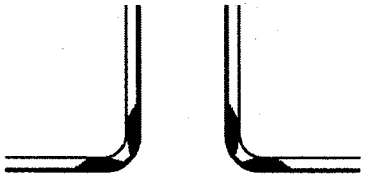
SIDEWALK
RAMP TYPE 2

STANDARD DRAWING NO. 306

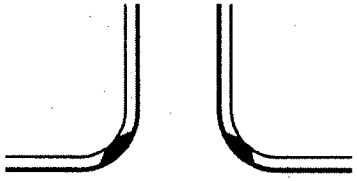
APPROVED: URBAN COUNTY ENGINEER — 5/1/00

APPROVED: URBAN COUNTY COUNCIL — DATE

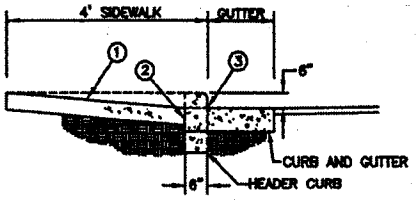
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



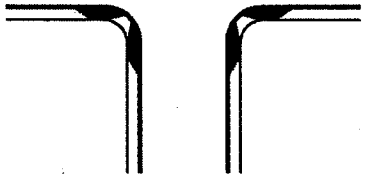
CONDITION 1



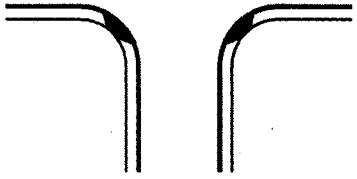
CONDITION 2



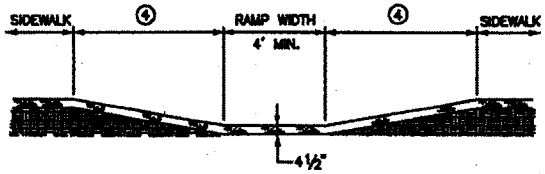
RAMP PROFILE



4' SIDEWALK ADJACENT TO CURB



4' SIDEWALK ADJACENT TO CURB



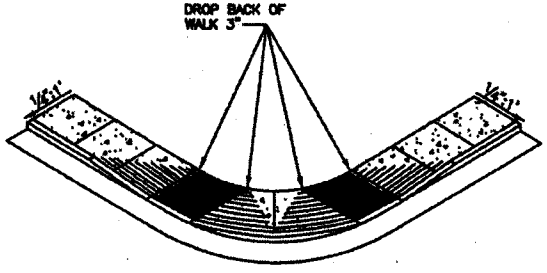
RAMP CROSS–SECTION

NOTES:

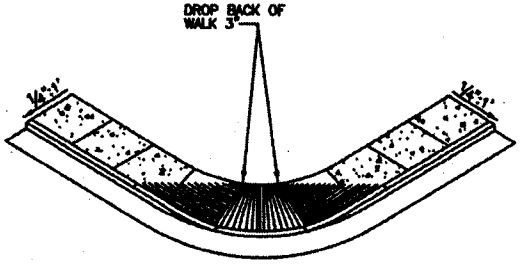
1. INLET LOCATIONS WILL VARY, DEPENDENT ON CROSSWALK AND RAMP LOCATION
2. THE RAMP SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE. STEP–SAFE® TRANSPO INDUSTRIES TILE OR ENGINEERS APPROVED EQUIVALENT SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
3. THE NORMAL GUTTER LINE SHOULD BE MAINTAINED THROUGH THE RAMP.
4. RAMPS SHOULD BE LOCATED WITHIN MARKED LIMITS OF CROSSWALKS.

SHEET NOTES:

① MAXIMUM RAMP SLOPE 1":1'.
② ½" EXPANSION JOINT AT BACK OF CURBLINE AND SIDEWALK LINE.
③ NO BUMP PERMITTED.
④ SLOPE VARIES UNIFORMLY TO A MAXIMUM OF 1":1' AT GUTTER LINE.



CONDITION 1



CONDITION 2

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

SIDEWALK RAMP
TYPE 3

STANDARD DRAWING NO. 306

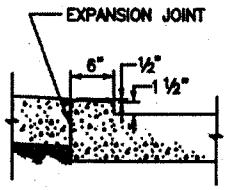
APPROVED: 5/1/08
DIRECTOR, DIVISION OF ENGINEERING — DATE

APPROVED: 5/1/08
CHIEF ADMINISTRATIVE OFFICER — DATE

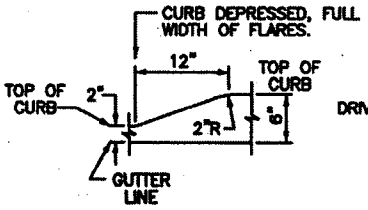
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

MAXIMUM ALLOWABLE APRON AND DRIVEWAY WIDTHS

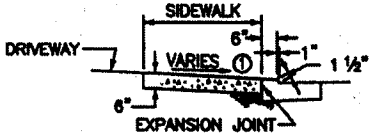
CLASSIFICATION	DRIVEWAY	APRON
SINGLE RESIDENTIAL	12'	18'
DOUBLE OR JOINT RESIDENTIAL	20'	26'



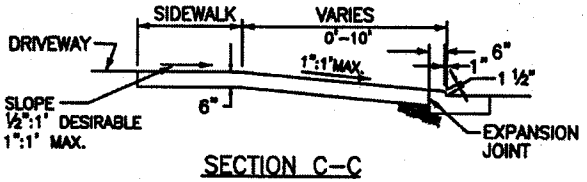
SECTION A–A



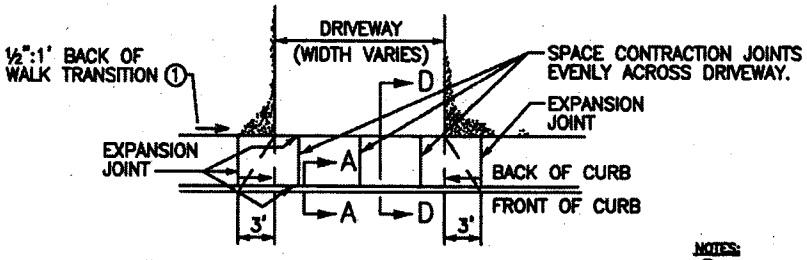
SECTION B–B



SECTION D–D



SECTION C–C

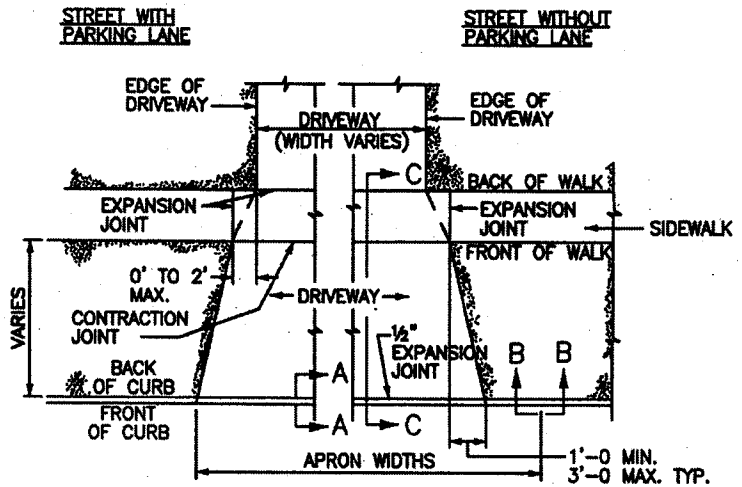


ENTRANCE WITHOUT UTILITY STRIP

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 1":1' (8.3%).
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.



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'	1½"	7.29%	N/A
2'	1½"	5.21%	8.33%
4'	1½"	3.12%	8.33%
5'	1½"	2.08%	8.33%
6'	1"	2.08%	8.33%
8'	0"	2.08%	8.33%
10'	0"	2.08%	7.80%

BASED ON UTILITY STRIP WITH ¼":1' CROSS SLOPE

UTILITY STRIP WIDTH	DROP BACK OF 4' SIDEWALK	SIDEWALK SLOPE	SLOPE ON APRON
0'	1½"	7.29%	N/A
2'	1½"	4.17%	8.33%
3'	1½"	2.60%	8.33%
4'	1"	2.08%	8.33%
6'	0"	2.08%	7.84%
8'	0"	2.08%	6.25%
10'	0"	2.08%	5.42%

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

RESIDENTIAL ENTRANCE DETAILS

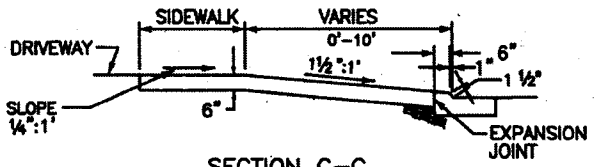
STANDARD DRAWING NO. 307

APPROVED 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

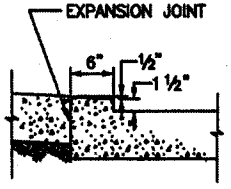
MAXIMUM ALLOWABLE APRON AND DRIVEWAY WIDTHS

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=80' CURB CUT	20' RADIAL FLARE=70' CURB CUT
INDUSTRIAL	40'	20' STRAIGHT FLARE=80' CURB CUT	25' RADIAL FLARE=90' CURB CUT

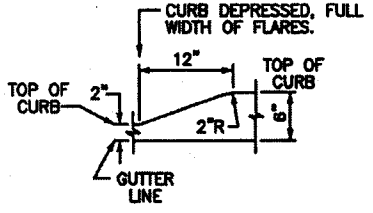


SECTION C-C

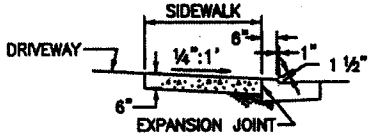
FRONT OF SIDEWALK ELEVATION DETERMINED BY ADDING ½ ": 1' ACROSS UTILITY STRIP FROM TOP OF CURB. IF COMING OFF 1½ " LIP ADD ANOTHER 4½ " TO DETERMINE ELEVATION AT FRONT OF SIDEWALK.



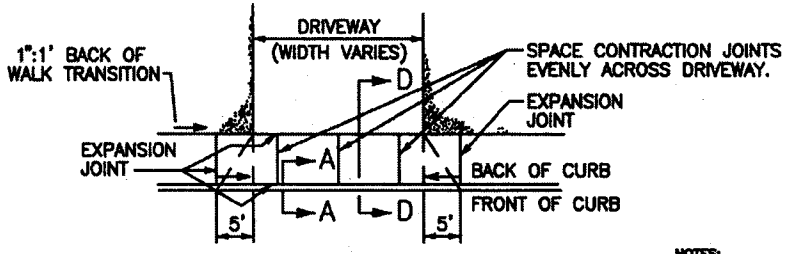
SECTION A-A



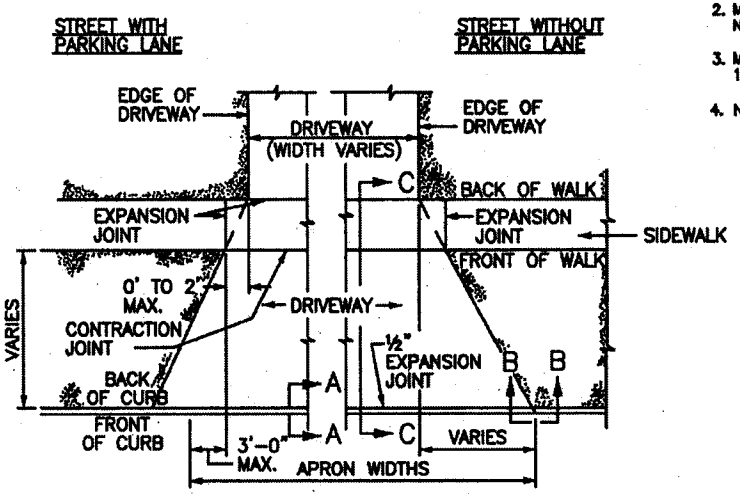
SECTION B-B



SECTION D-D



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.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

COMMERCIAL ENTRANCE DETAILS

STANDARD DRAWING NO. 307-1

APPROVED 5/1/08

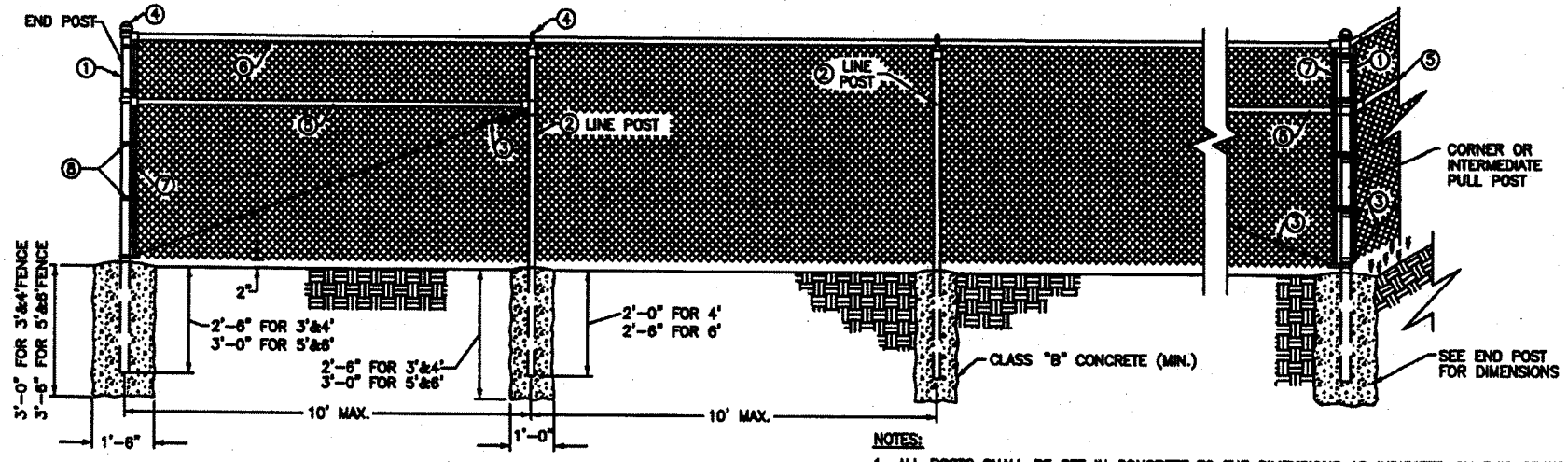
DIRECTOR, DIVISION OF ENGINEERING

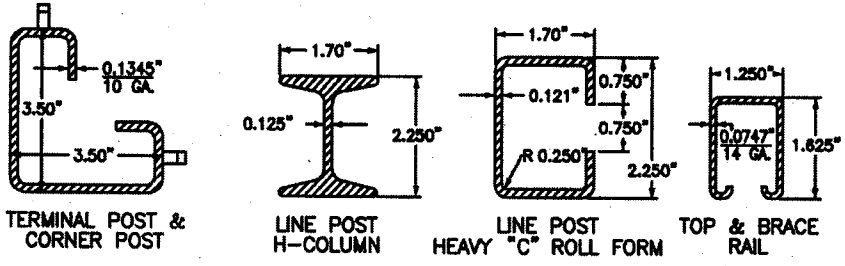
DATE

COMMISSIONER

DATE

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT





TERMINAL POST & CORNER POST

LINE POST H-COLUMN

LINE POST HEAVY "C" ROLL FORM

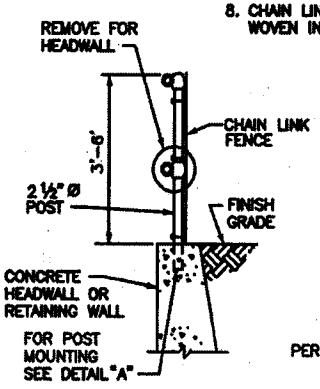
TOP & BRACE RAIL

NOTES:

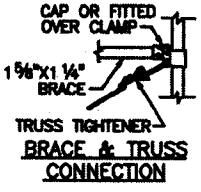
1. ALL POSTS SHALL BE SET IN CONCRETE TO THE DIMENSIONS AS INDICATED ON THIS DRAWING.
2. 3' HIGH FENCE SHALL HAVE 3' FABRIC HEIGHT. 4' HIGH FENCE SHALL HAVE 4' FABRIC HEIGHT. 5' HIGH FENCE SHALL HAVE 5' FABRIC HEIGHT. 6' HIGH FENCE SHALL HAVE 6' FABRIC HEIGHT.
3. BRACE BANDS SHALL BE 7/8"X 1/8" GALVANIZED 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)

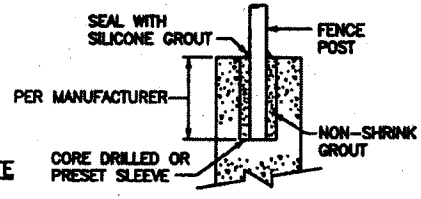
	TUBULAR	ROLL FORMED
①	2 1/2" O.D. @ 3.65#/L.F.	3.5"X3.5" @ 5.14#/L.F.
②	2" O.D. @ 2.72#/L.F.	2.250" H-COL.@ 3.26#/L.F. OR 2.250" C-COL.@ 2.64#/L.F.
③	3/8"Ø TRUSS ROD & TIGHTENER	0.375"Ø TRUSS ROD & TIGHTENER
④	APPROVED CAPS	NOT REQUIRED
⑤	1 5/8" BRACE @ 2.27#/L.F.	1.250"X1.625" @ 1.35#/L.F.
⑥	1 5/8" 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"

NO.	DATE	REVISION DESCRIPTION	BY

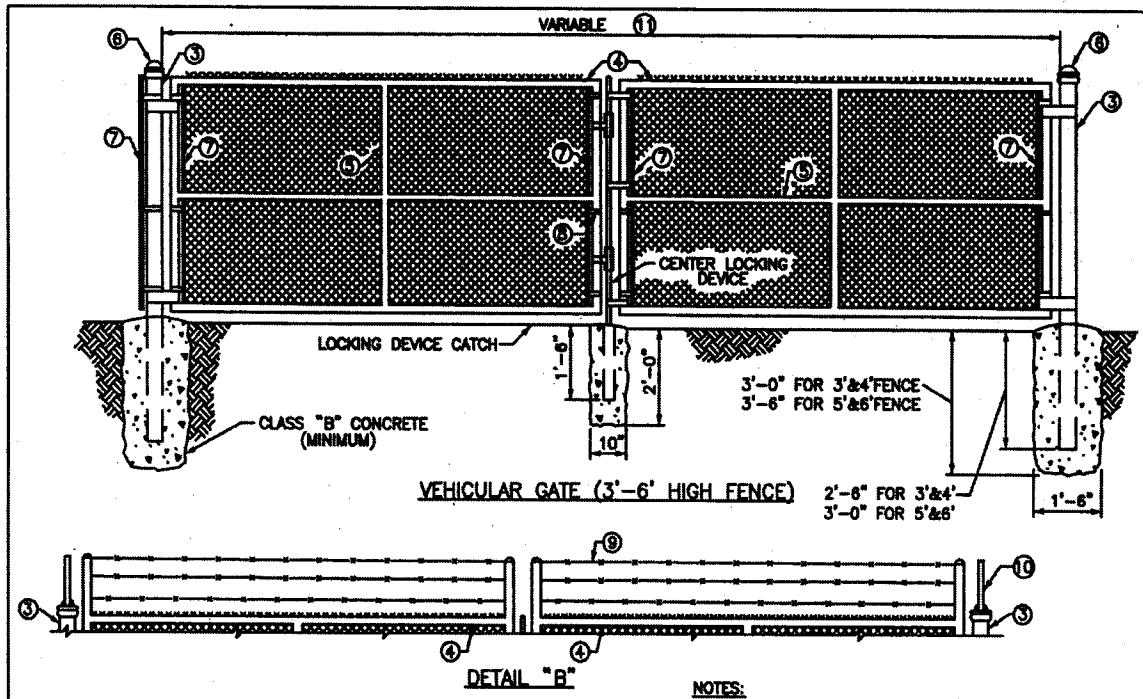
DIVISION OF ENGINEERING

CHAIN LINK FENCE
3'-6"

STANDARD DRAWING NO. 308

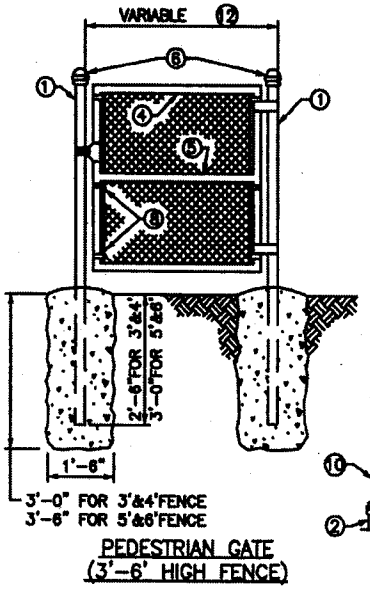
APPROVED 5/1/08

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

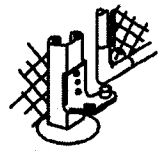


VEHICULAR GATE (3'-6' HIGH FENCE)

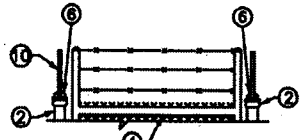
DETAIL "B"



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	¾"X⅜" 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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

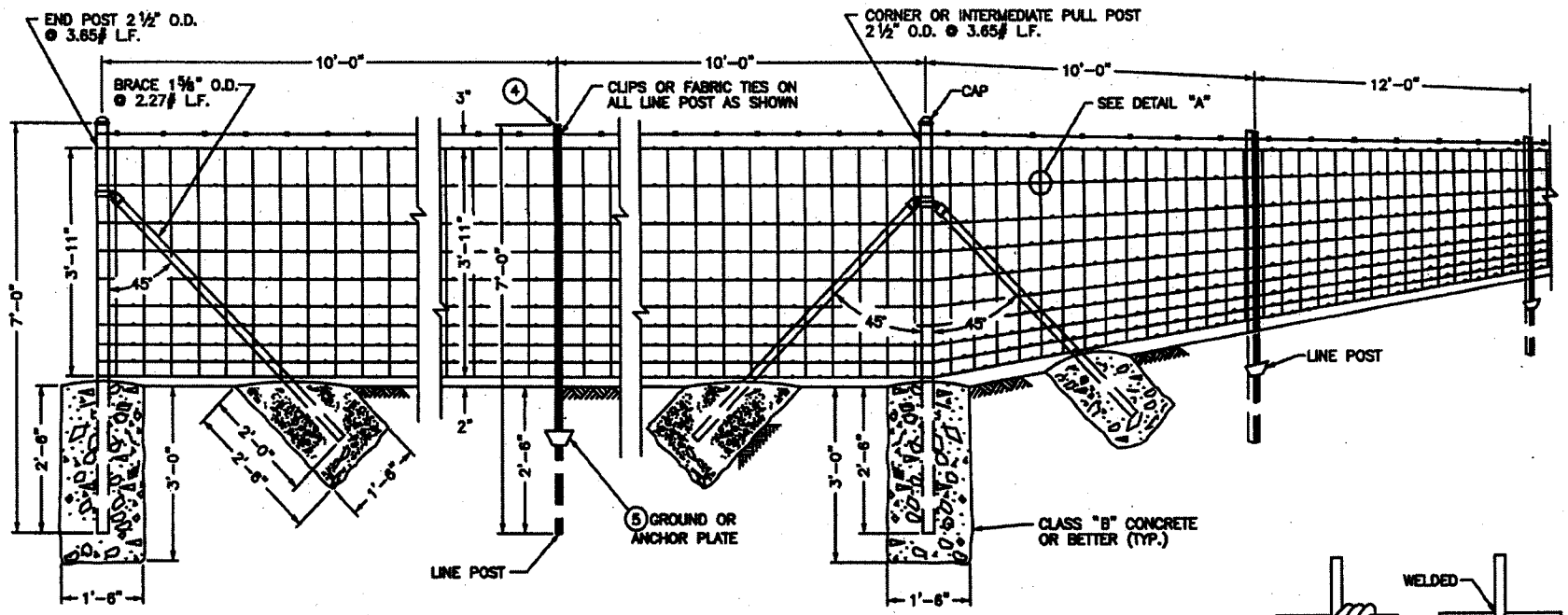
CHAIN LINK GATE

STANDARD DRAWING NO. 310

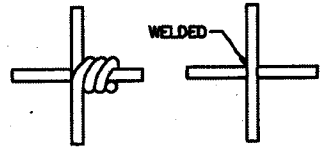
APPROVED 5/1/08

DIRECTOR DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



RIGHT-OF-WAY FENCE

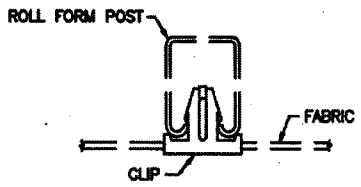


ALTERNATE METHODS OF SECURING VERTICAL STAY WIRE TO THE HORIZONTAL WIRE OF THE FABRIC.

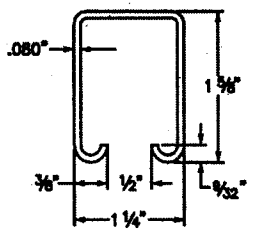
DETAIL "A"

NOTES:

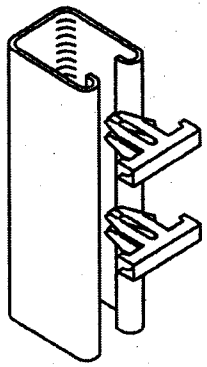
1. WOVEN-WIRE USED FABRIC IN RIGHT-OF-WAY FENCE SHALL BE EITHER ALUMINUM-COATED STEEL NO. 1047-6-9 OR ZINC-COATED STEEL NO. 1047-6-9.
2. ALL FENCE FITTINGS SHALL COMPLY WITH ASTM F 626.
3. O.D. DEPICTED FOR TUBULAR POSTS IS NOMINAL - ASTM F 1083 SHALL GOVERN.
4. STUDDED "T" POST AT 1.33 LBS. PER FOOT.
   - OR -
   ROLL FORM POST AT 1.35 LBS. PER FOOT. (SEE DETAIL)
5. NOT REQUIRED FOR ROLL FORM POST.



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

NO.	DATE	REVISION DESCRIPTION	BY

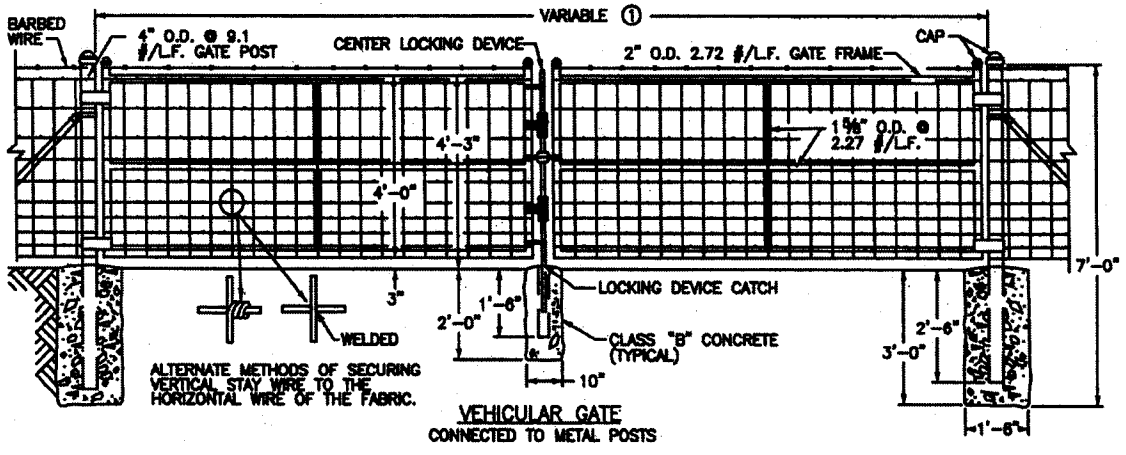
DIVISION OF ENGINEERING

WOVEN WIRE
RIGHT-OF-WAY FENCE
TYPE 1

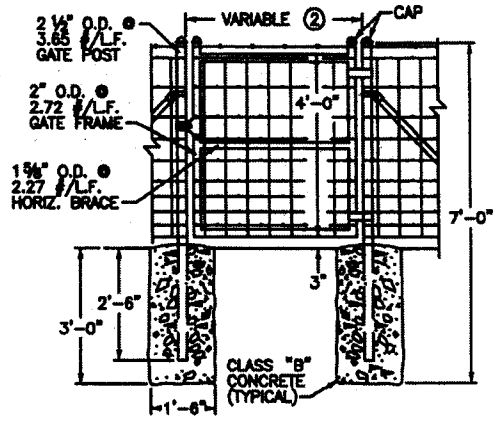
STANDARD DRAWING NO. 312

APPROVED 5/1/02

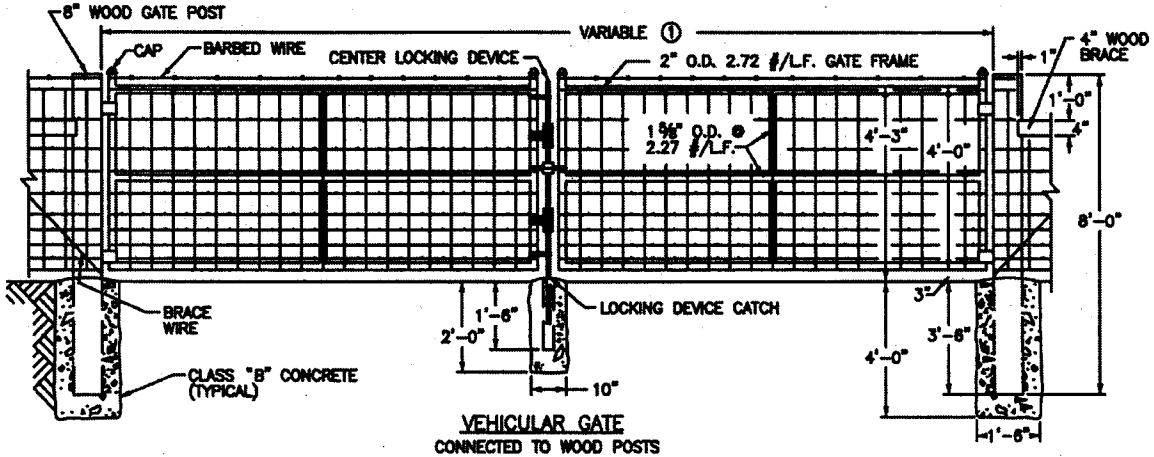
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



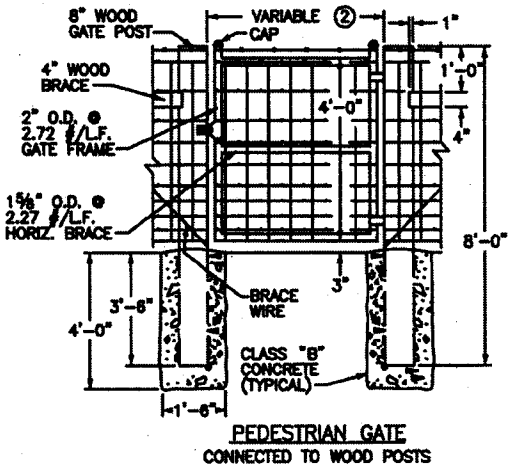
VEHICULAR GATE
CONNECTED TO METAL POSTS



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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

WOVEN WIRE GATES

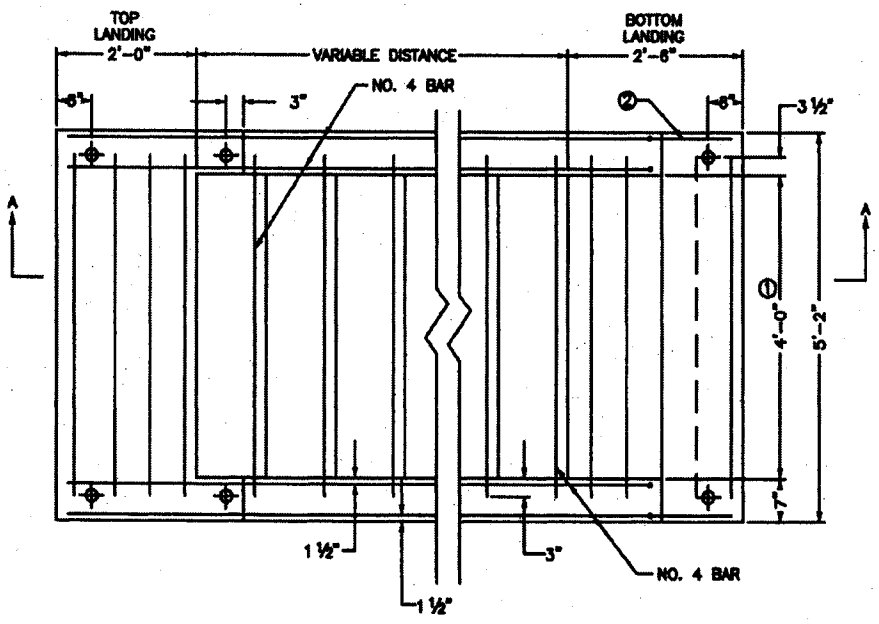
STANDARD DRAWING NO. 314

APPROVED 5/1/08

URBAN COUNTY ENGINEER

COMMISSIONER DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



PLAN

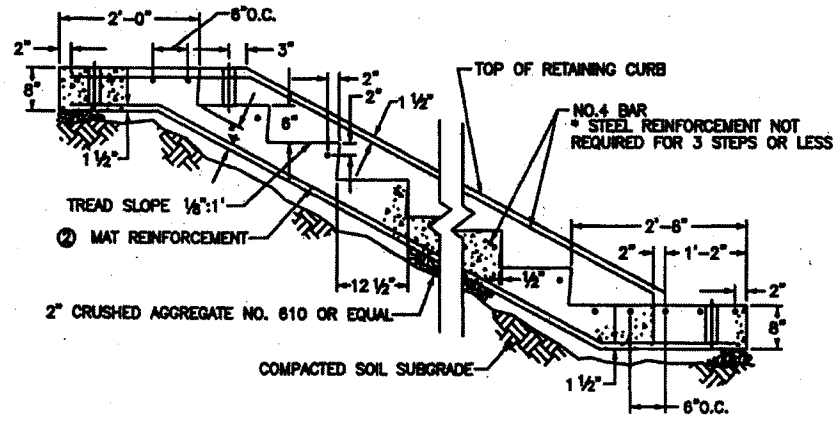
NOTES:

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.

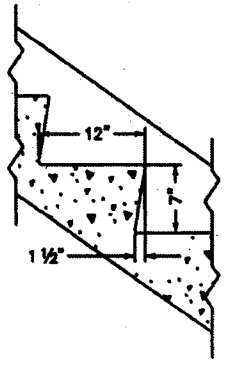
TABLE OF QUANTITIES

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	①	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	12.802	2.542	28.613	5.400	0.36	0.062
	INTERMEDIATE STEP	7.431	1.336	5.268	1.083	11.119	2.088	0.17	0.027
	TOP LANDING	22.545	3.340	9.710	1.958	21.014	3.952	0.281	0.054

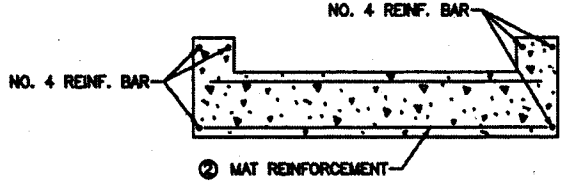
① APPROXIMATE QUANTITY TO ADD FOR EACH ADDITIONAL FOOT OF WIDTH OVER 4'–0".



SECTION A–A 2:1 SLOPE



STEP DETAIL FOR 1 ½:1 SLOPE



STEP CROSS SECTION

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

CONCRETE STEPS

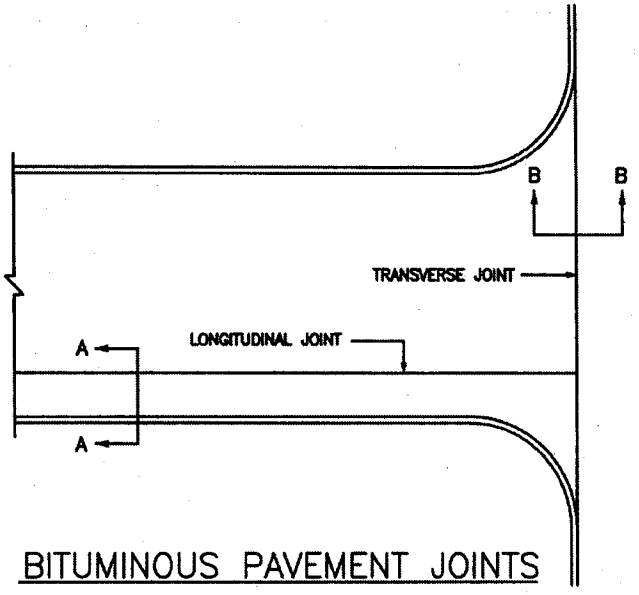
STANDARD DRAWING NO. 315

APPROVED 5/1/08

DIRECTOR

DATE

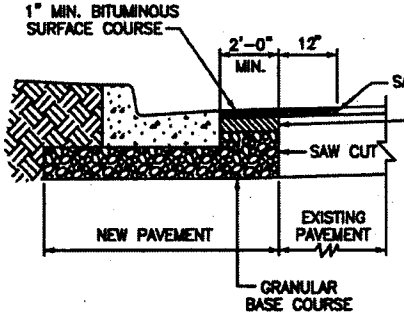
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



BITUMINOUS PAVEMENT JOINTS

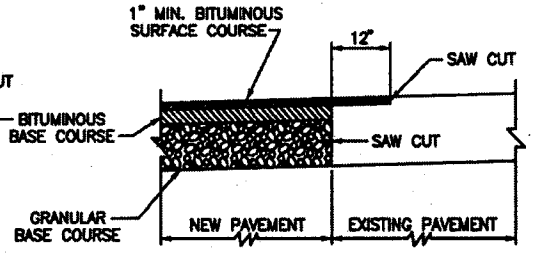
NOTES:

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.



SECTION A–A

LONGITUDINAL EDGE KEY



SECTION B–B

TRANSVERSE EDGE KEY

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

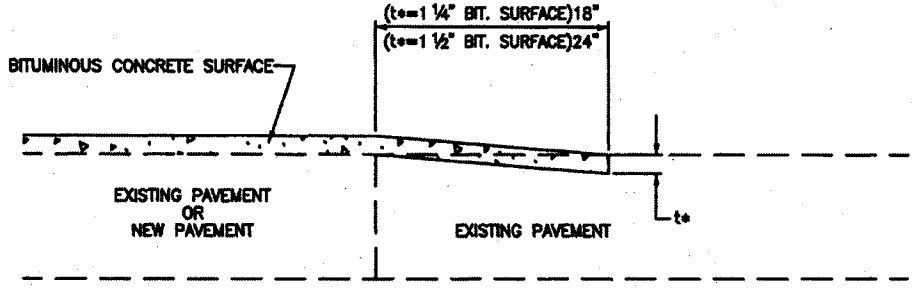
EDGE KEY

STANDARD DRAWING NO. 318

APPROVED 5/1/08 DATE

DIRECTOR DIVISION OF ENGINEERING DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



EDGE KEY

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

TYPICAL EDGE KEY
FOR
MINIMUM OVERLAYS,
SHORT PROJECTS,
LOW SPEED

STANDARD DRAWING NO. 319

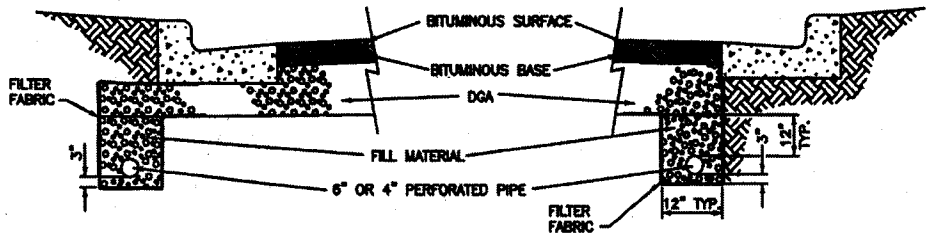
APPROVED 5/1/08

DIVISION DIRECTOR / COMMISSIONER — DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

TYPICAL SECTION

CASE 1

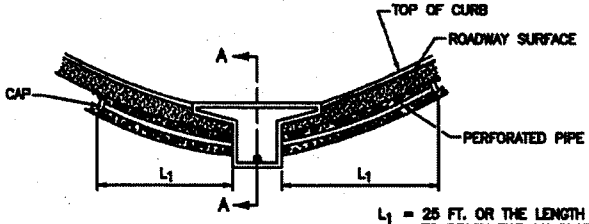


CASE 2

NOTES:

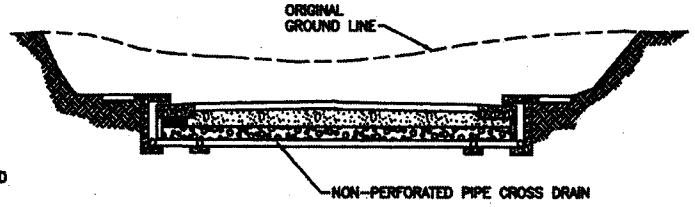
1. SUBGRADE DRAINAGE, AS DEPICTED, IS INTENDED FOR USE WITH THE SURFACING PHASE OF CONSTRUCTION, AND SHALL BE INSTALLED ONLY AFTER THE SUBGRADE HAS BEEN COMPLETED, AND PRIOR TO CONSTRUCTING PAVING MATERIALS.
2. THE CAP SHALL BE A STANDARD MANUFACTURED ITEM FURNISHED BY THE PIPE SUPPLIER.
3. TERMINATE 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

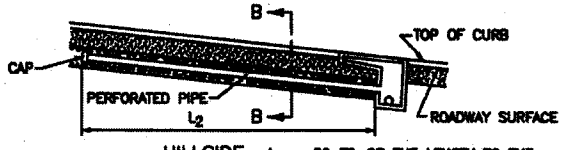


SAG VERTICAL CURVE

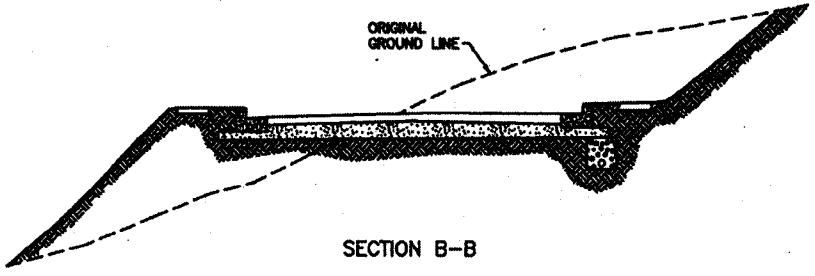
L_1 = 25 FT. OR THE LENGTH REQUIRED TO REACH THE 1% SLOPE POINT, WHICHEVER IS LARGER.



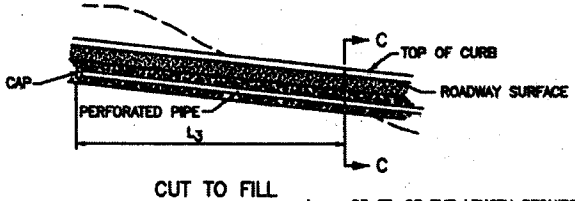
SECTION A-A



HILLSIDE L_2 = 50 FT. OR THE LENGTH TO THE CREST OF THE HILL, WHICHEVER IS LARGER.

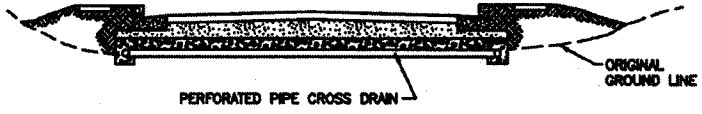


SECTION B-B



CUT TO FILL

L_3 = 25 FT. OR THE LENGTH REQUIRED TO REACH THE CREST OF THE HILL, WHICHEVER IS LARGER.



SECTION C-C

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

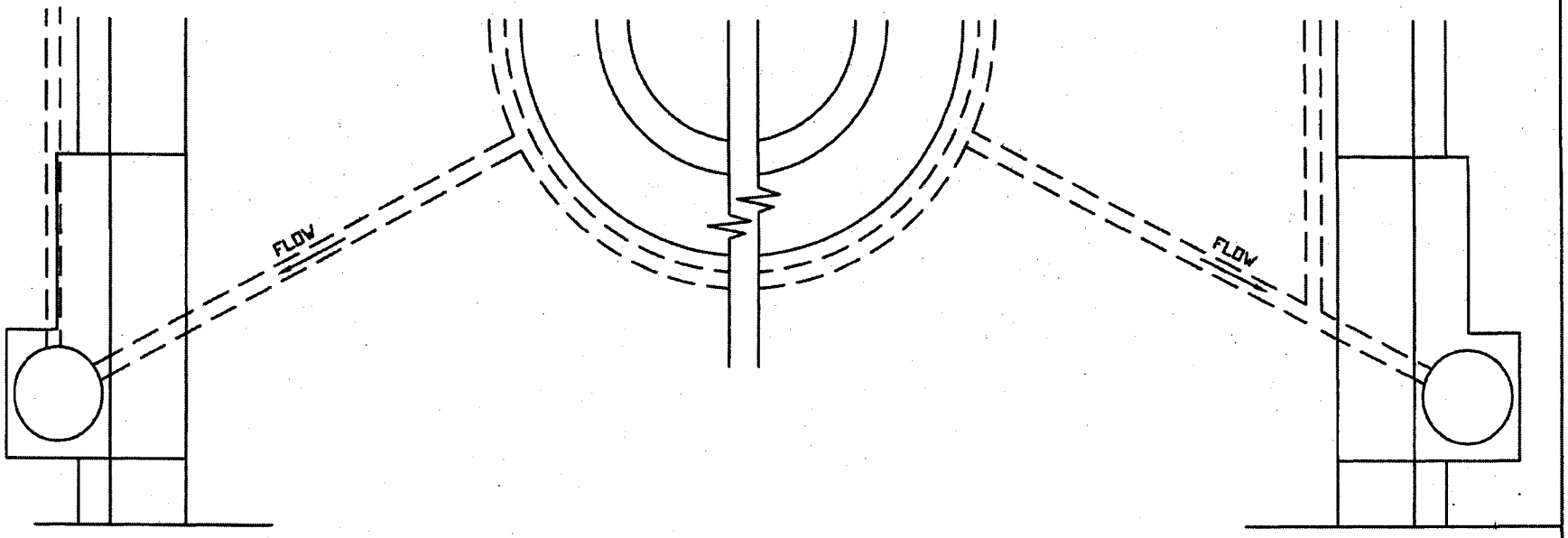
PERFORATED PIPE SUBGRADE DRAINAGE ALONG ROADWAY

STANDARD DRAWING NO. 320

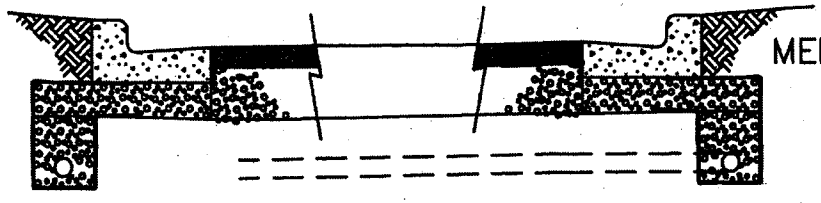
APPROVED 5/1/08

DIRECTOR DATE

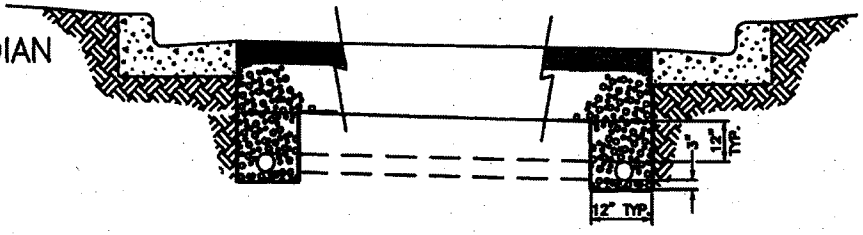
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

PERFORATED PIPE
SUBGRADE DRAINAGE
FOR RAISED
NON-PAVED MEDIANS

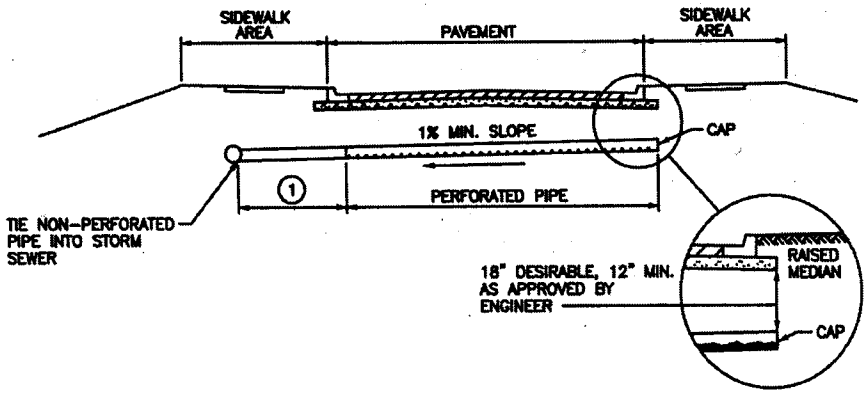
STANDARD DRAWING NO. 320-1

APPROVED 5/1/03

DIRECTOR DIVISION OF ENGINEERING — DATE

COMMISSIONER — DATE

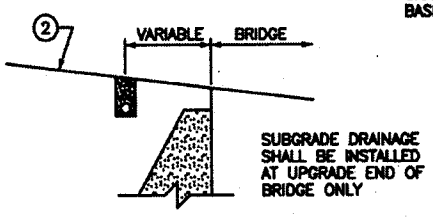
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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 ENGINEER.
3. THE 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 50' OF PERFORATED PIPE IS REQUIRED UPHILL FROM BASINS ON GRADE AND 25' OF PERFORATED PIPE IS REQUIRED EACH WAY FROM SAG BASINS.

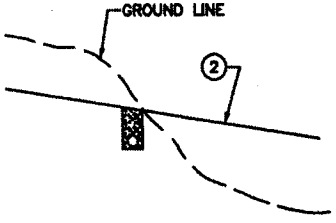
SAG VERTICAL CURVES



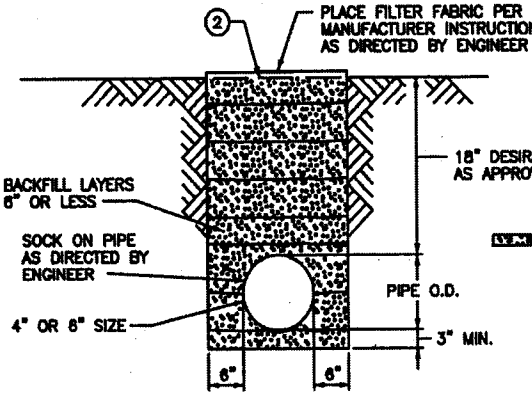
BRIDGES

(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

(NOTE) – NO. 78, 8, OR 9M COARSE AGGREGATE. THE FILL MATERIAL SHALL BE THOROUGHLY COMPACTED IN LAYERS NOT EXCEEDING 6 INCHES LOOSE MEASUREMENT.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

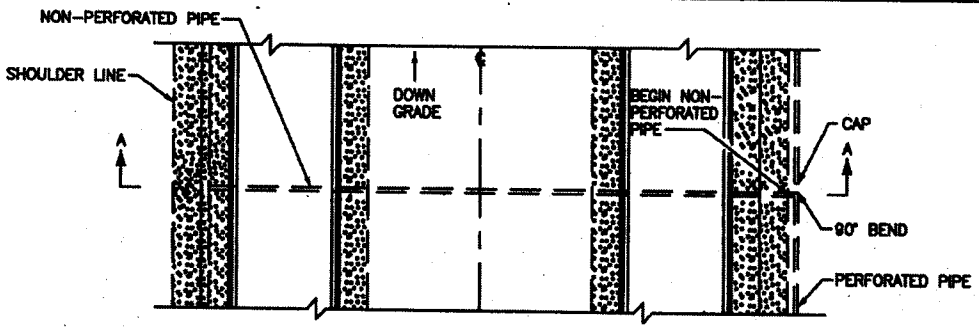
PERFORATED PIPE FOR SUBGRADE DRAINAGE

STANDARD DRAWING NO. 321

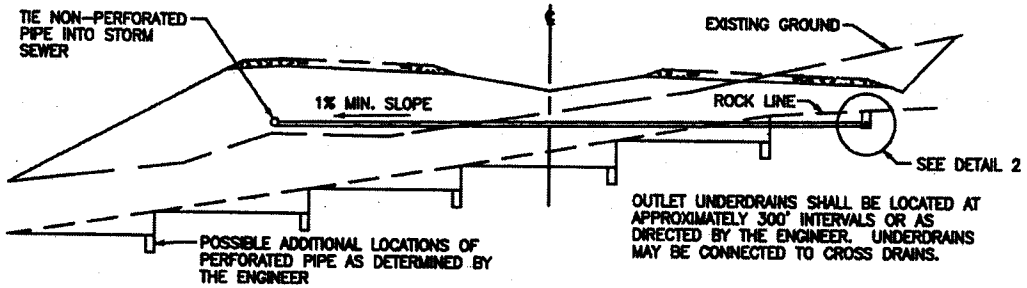
APPROVED: 5/1/08

TYPICAL SUBGRADE DRAINAGE LOCATIONS

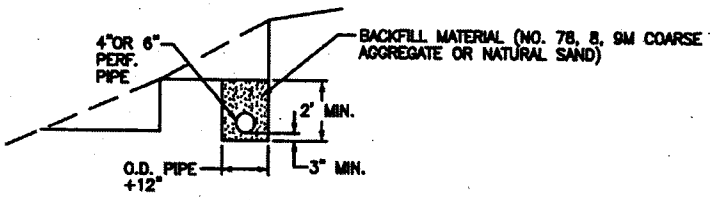
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



PLAN VIEW



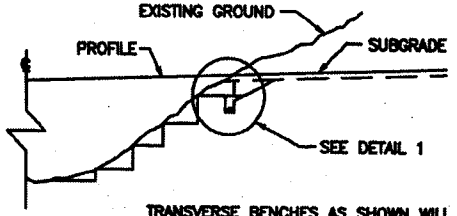
SECTION A-A



DETAIL 2

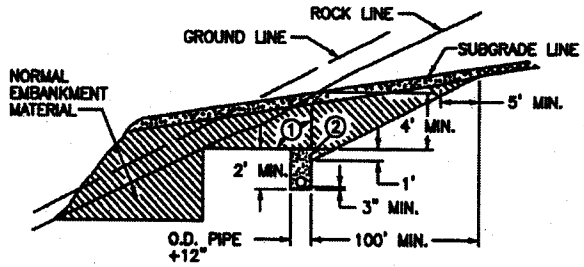
DETAIL FOR LONGITUDINAL UNDERDRAINS

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.

NO.	DATE	REVISION DESCRIPTION	BY

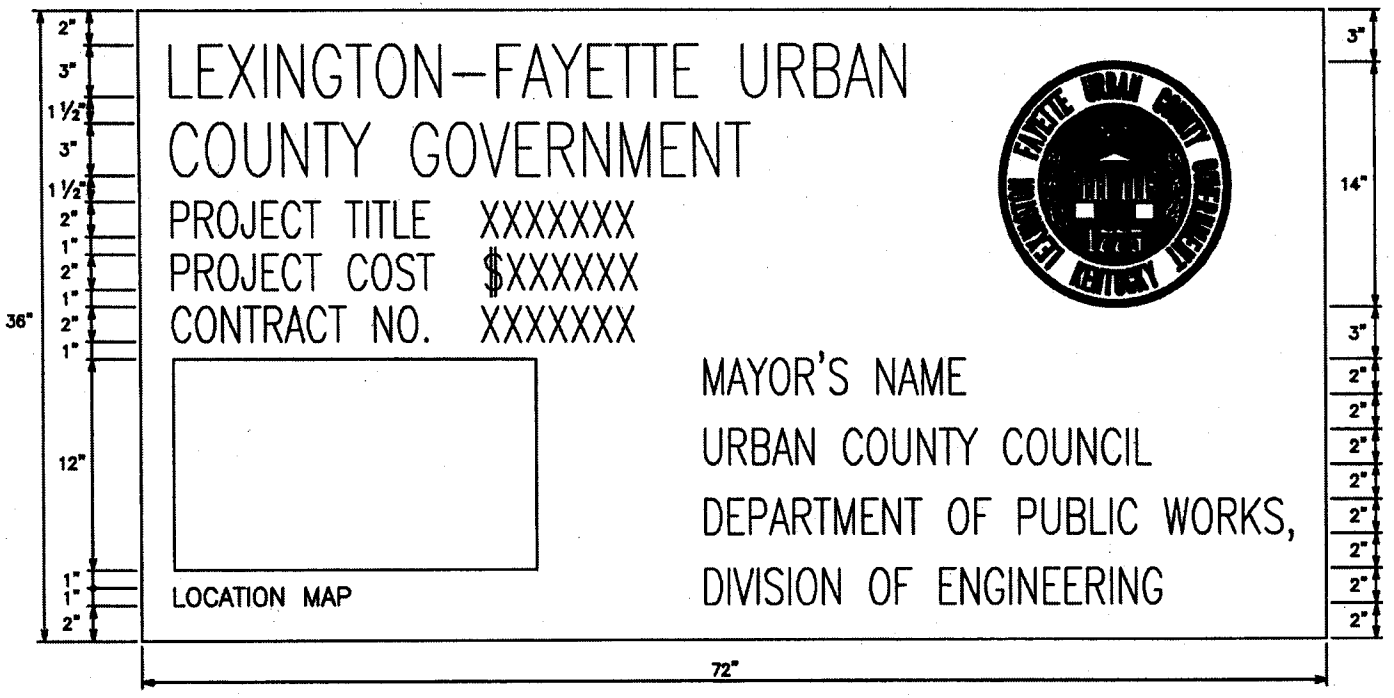
DIVISION OF ENGINEERING

PERFORATED PIPE UNDERDRAINS

STANDARD DRAWING NO. 322

APPROVED 5/1/07

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

PUBLIC IMPROVEMENT SIGN

STANDARD DRAWING NO. 323

APPROVED: [signature] DATE 5/1/08

URBAN COUNTY ENGINEER

COMMISSIONER [signature] DATE 5/1/08

APPENDIX B

Lexington-Fayette Urban County Government
Erosion and Sediment Control Standard Drawings

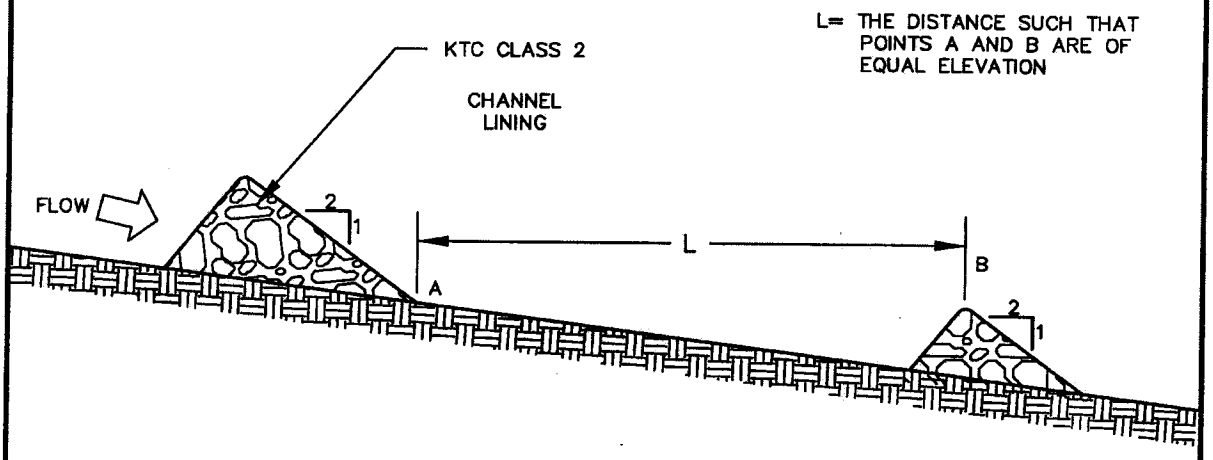
Lexington-Fayette Urban County Government
Erosion and Sediment Control Standard Drawings
Table of Contents

STORMWATER MANUAL

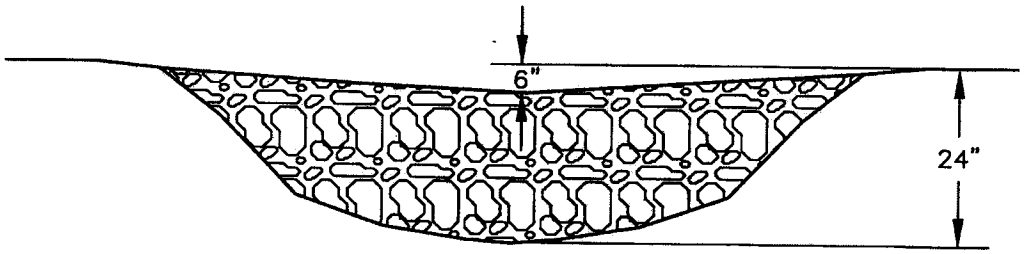
FIGURE 11–16

ROCK CHECK DAM

(EFFECTIVE DATE 8/29/11)



LONGITUDINAL SECTION SHOWING SPACING BETWEEN CHECK DAMS



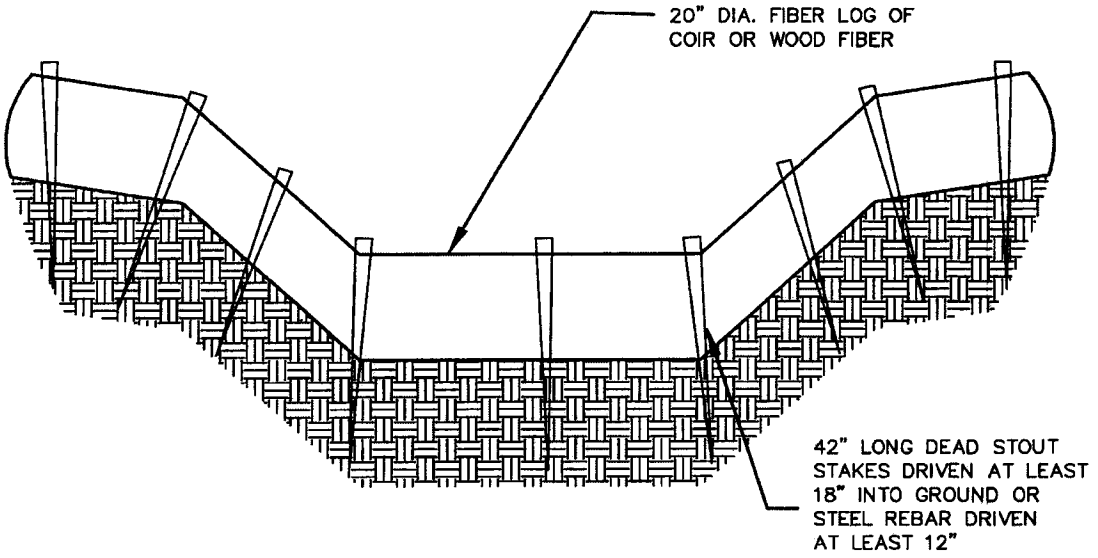
SECTION ACROSS CHANNEL

STORMWATER MANUAL

FIGURE 11–17

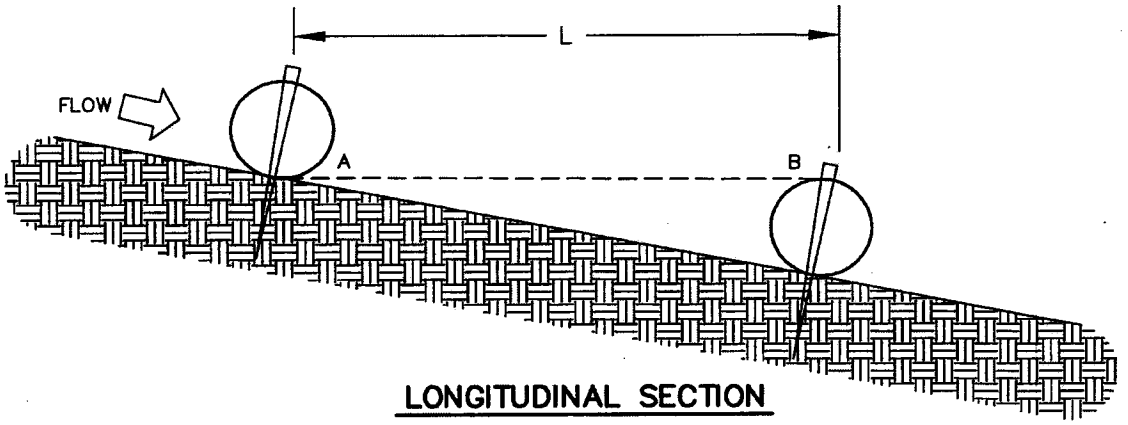
FIBER LOG CHECK DAM

(EFFECTIVE DATE 8/29/11)



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

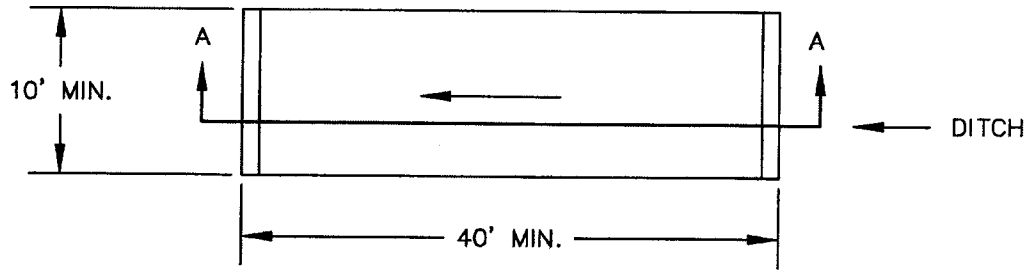
L = DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION

STORMWATER MANUAL

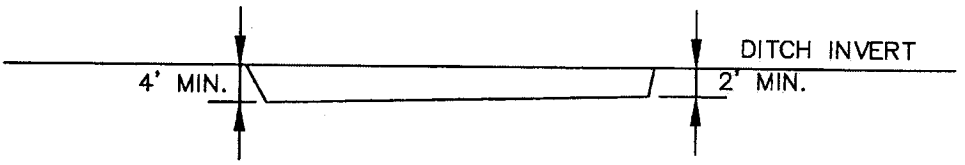
FIGURE 11–18

SEDIMENT TRAP

(EFFECTIVE DATE 8/29/11)



PLAN VIEW



SECTION A–A

NOTES:

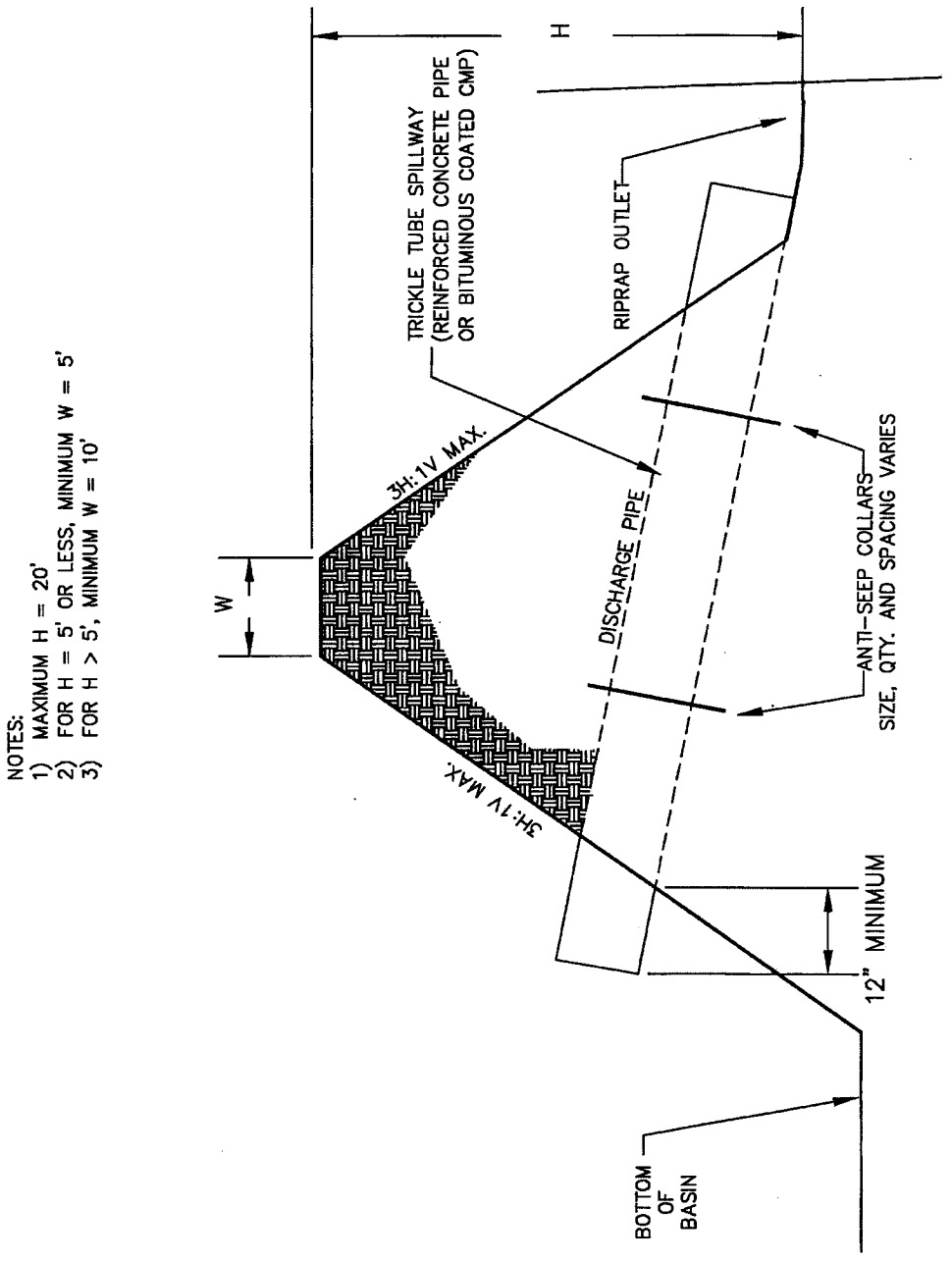
1) THE SIZE, SHAPE AND LOCATION OF TRAP MAY BE ADJUSTED FROM THAT SHOWN IN THE CONSTRUCTION PLANS, AS DIRECTED BY THE ENGINEER.
2) THE SEDIMENT TRAP MAY BE CONSTRUCTED AS DIRECTED BY THE ENGINEER AS LONG AS THE AREA AND DEPTH IS AT LEAST AS THAT INDICATED ON THE PLANS.
3) SEDIMENT TRAP SHALL BE CONSTRUCTED 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.

STORMWATER MANUAL

FIGURE 11–20

SEDIMENT POND PRINCIPAL SPILLWAY DETAIL

(EFFECTIVE DATE 8/29/11)

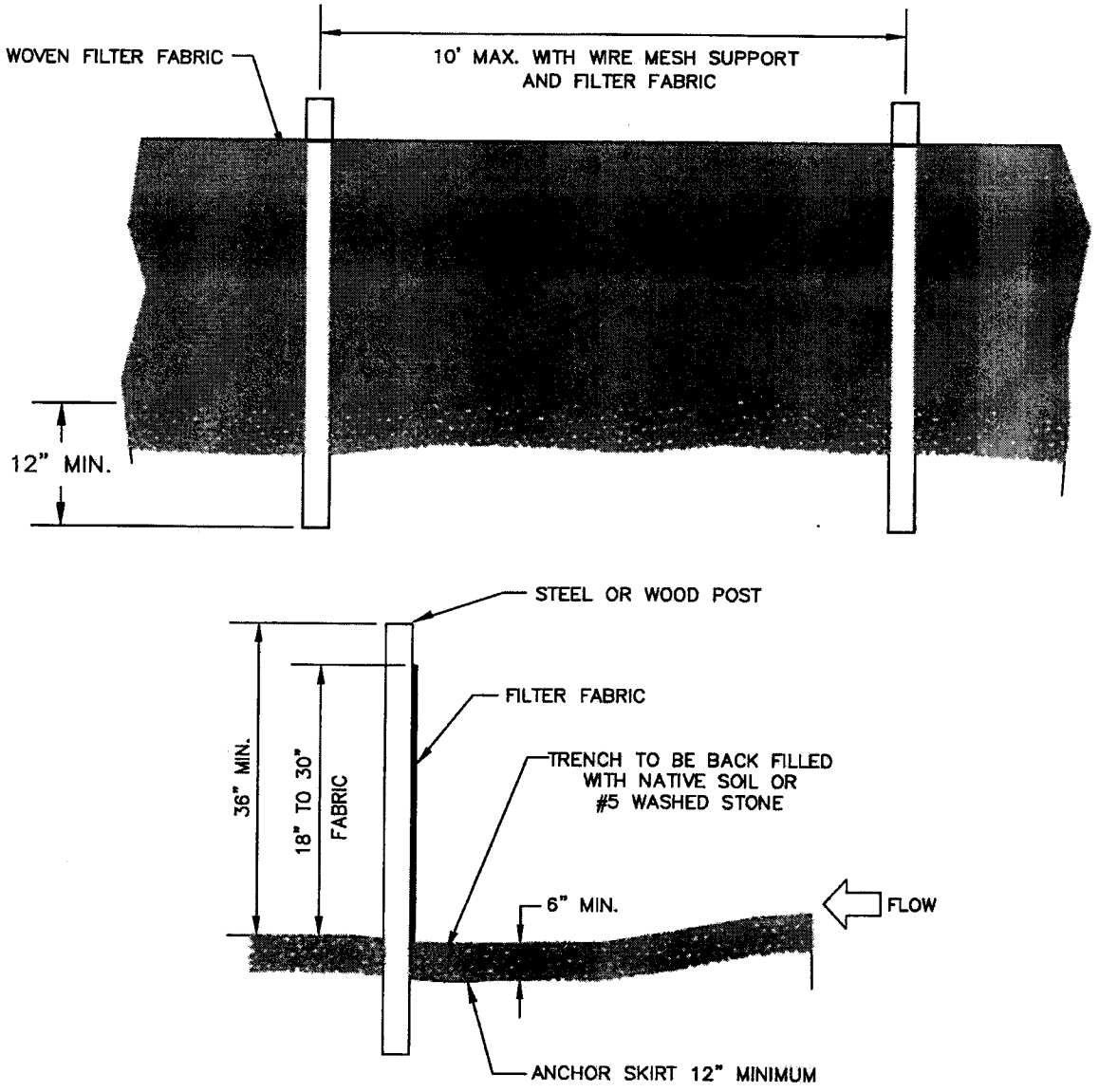


STORMWATER MANUAL

FIGURE 11-21

TEMPORARY SILT FENCE

(EFFECTIVE DATE 8/29/11)



STORMWATER MANUAL

FIGURE 11–22

TEMPORARY SILT FENCE
GENERAL NOTES

(EFFECTIVE DATE 8/29/11)

GENERAL NOTES

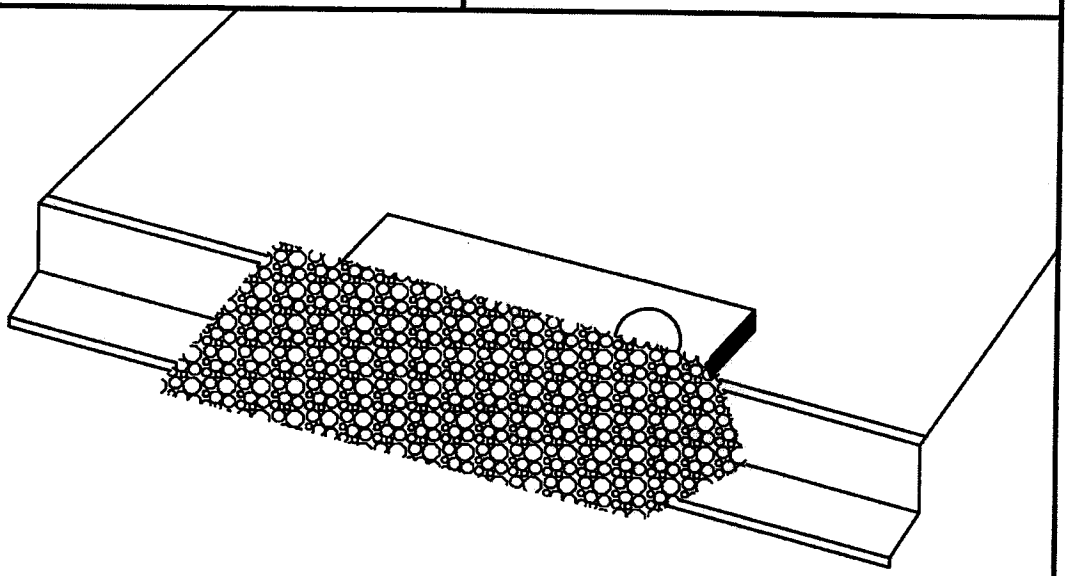
1. FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL AND CUT TO THE LENGTH OF THE BARRIER. WHEN JOINTS CANNOT BE AVOIDED, FILTER FABRIC SHALL BE SPLICED TOGETHER ONLY AT A POST WITH 3 FOOT MIN. OVERLAP, AND SECURELY SEALED.
2. POSTS SHALL BE SPACED AT 6 FOOT INTERVALS IN AREAS OF RAPID RUNOFF.
3. 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.

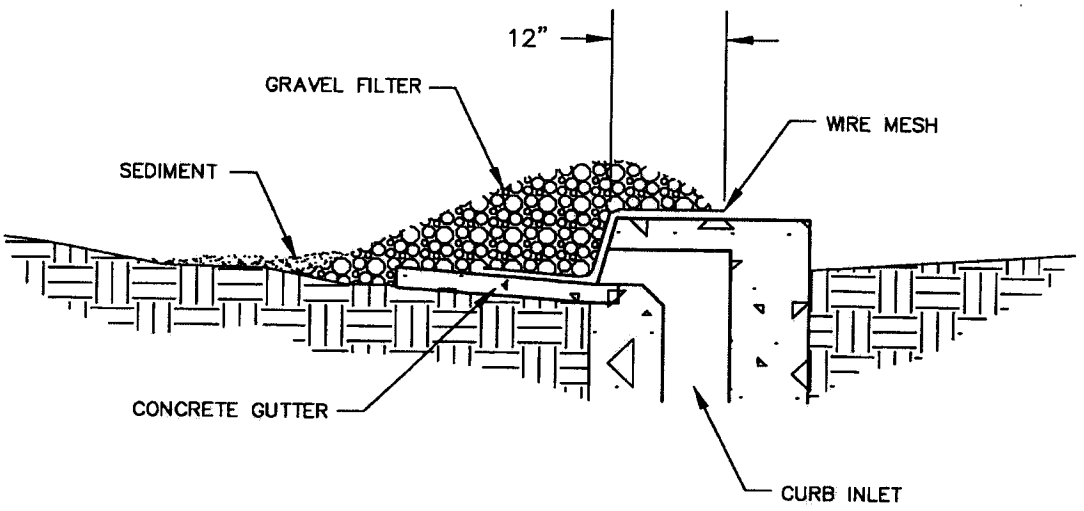
STORMWATER MANUAL

FIGURE 11–24

GRAVEL CURB INLET SEDIMENT FILTER

(EFFECTIVE DATE 8/29/11)



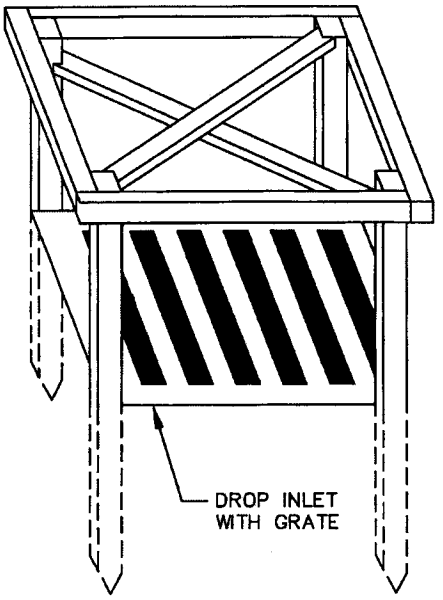


STORMWATER MANUAL

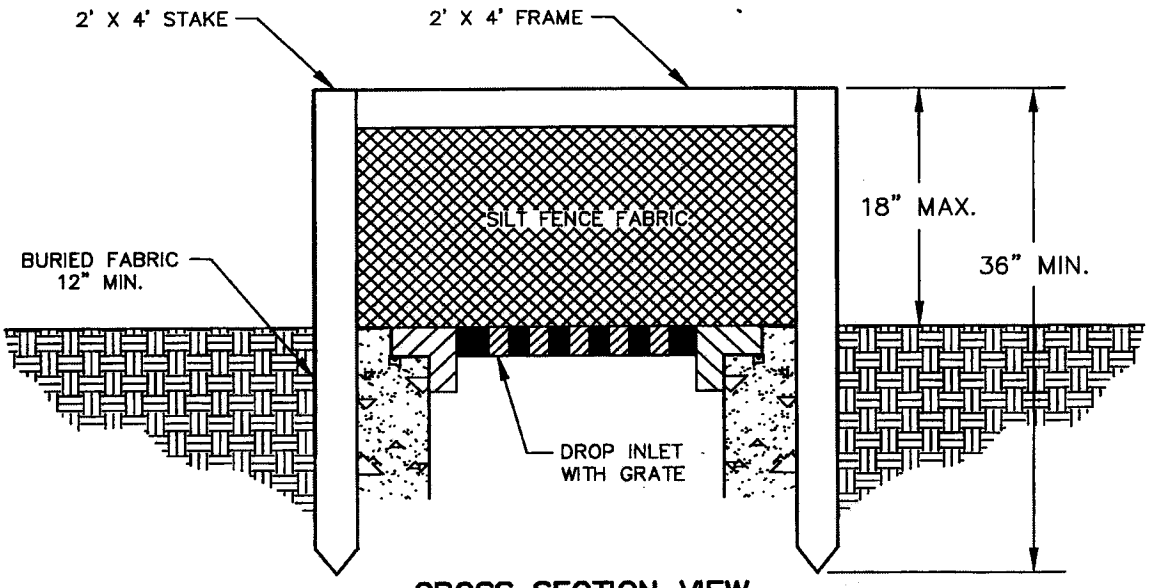
FIGURE 11–23

DROP INLET PROTECTION
USING SILT FENCE

(EFFECTIVE DATE 8/29/11)



ISOMETRIC VIEW OF
2 X 4 WOOD FRAME



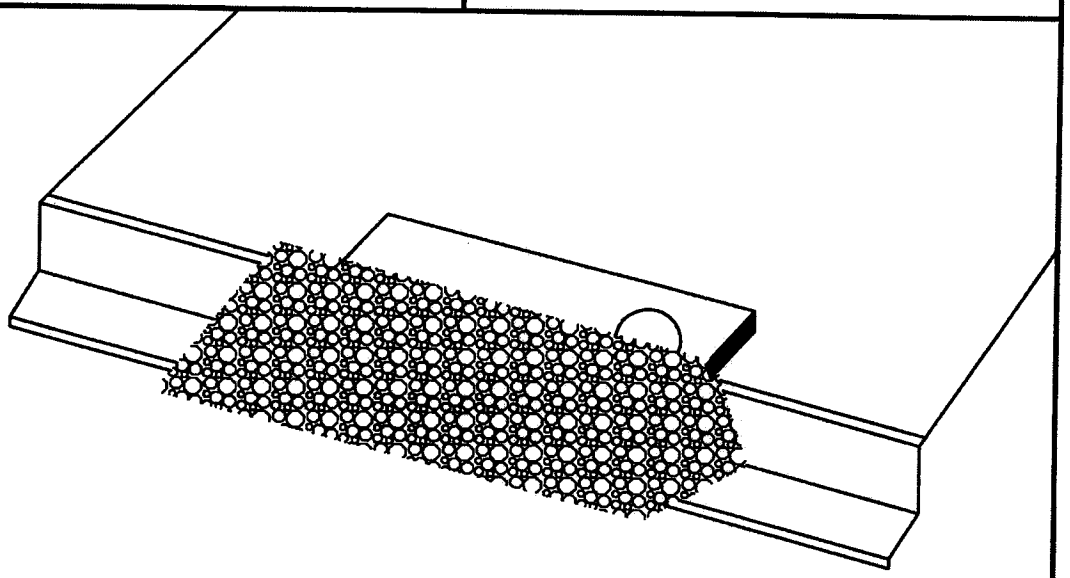
CROSS SECTION VIEW

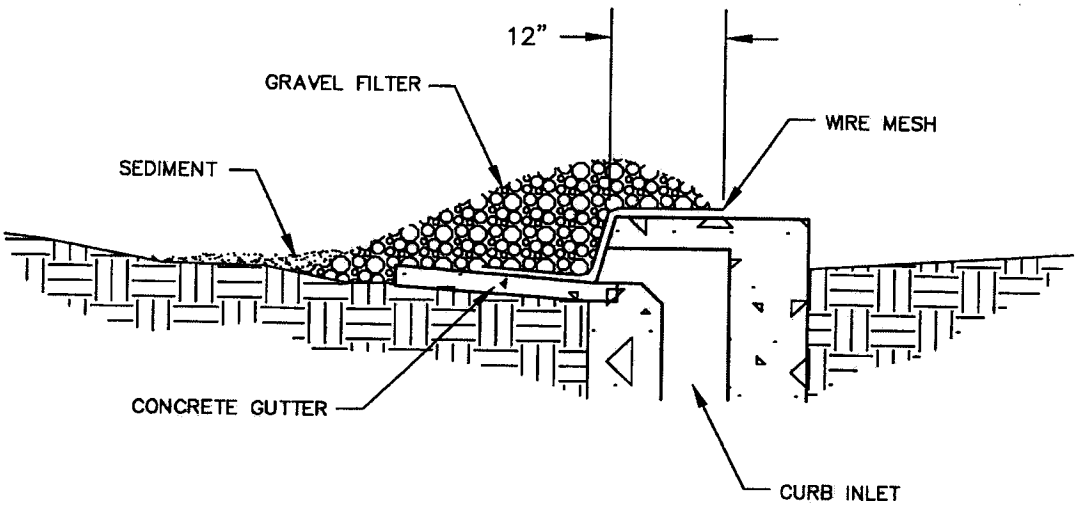
STORMWATER MANUAL

FIGURE 11–24

GRAVEL CURB INLET SEDIMENT FILTER

(EFFECTIVE DATE 8/29/11)



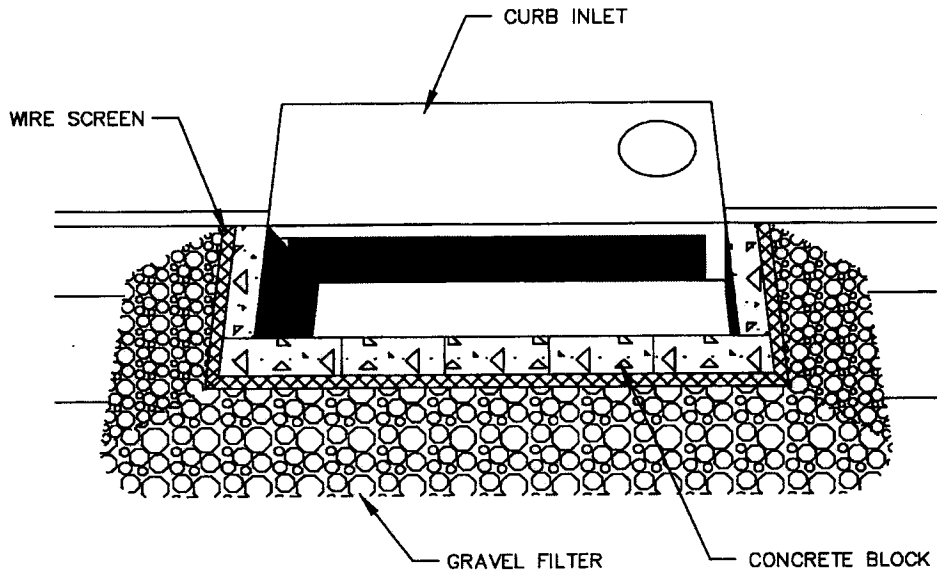


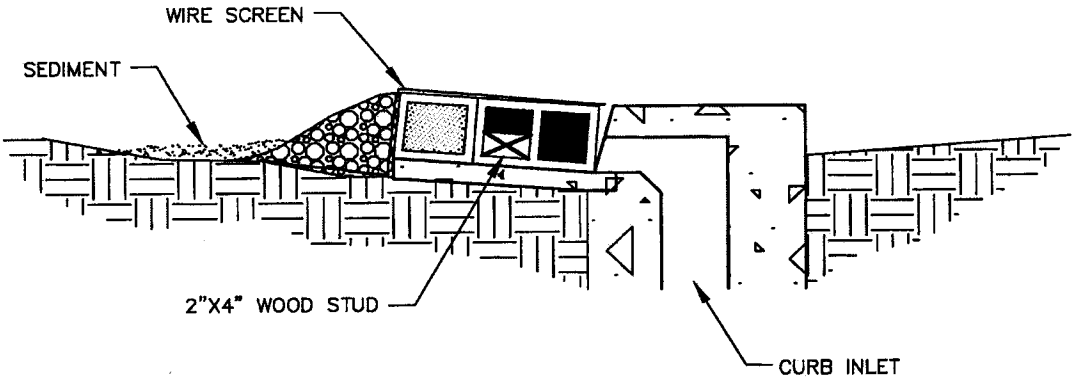
STORMWATER MANUAL

FIGURE 11-25

BLOCK AND GRAVEL CURB INLET SEDIMENT FILTER

(EFFECTIVE DATE 8/29/11)

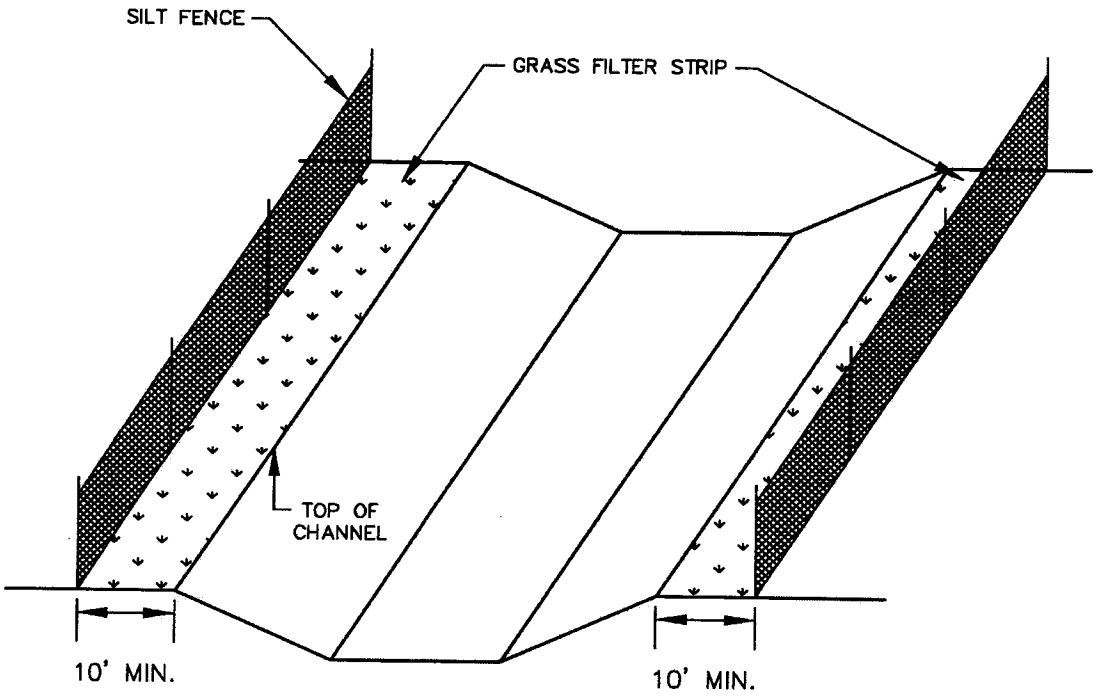




STORMWATER MANUAL

FIGURE 11-26
FILTER STRIP FOR
CONSTRUCTED CHANNEL

(EFFECTIVE DATE 8/29/11)

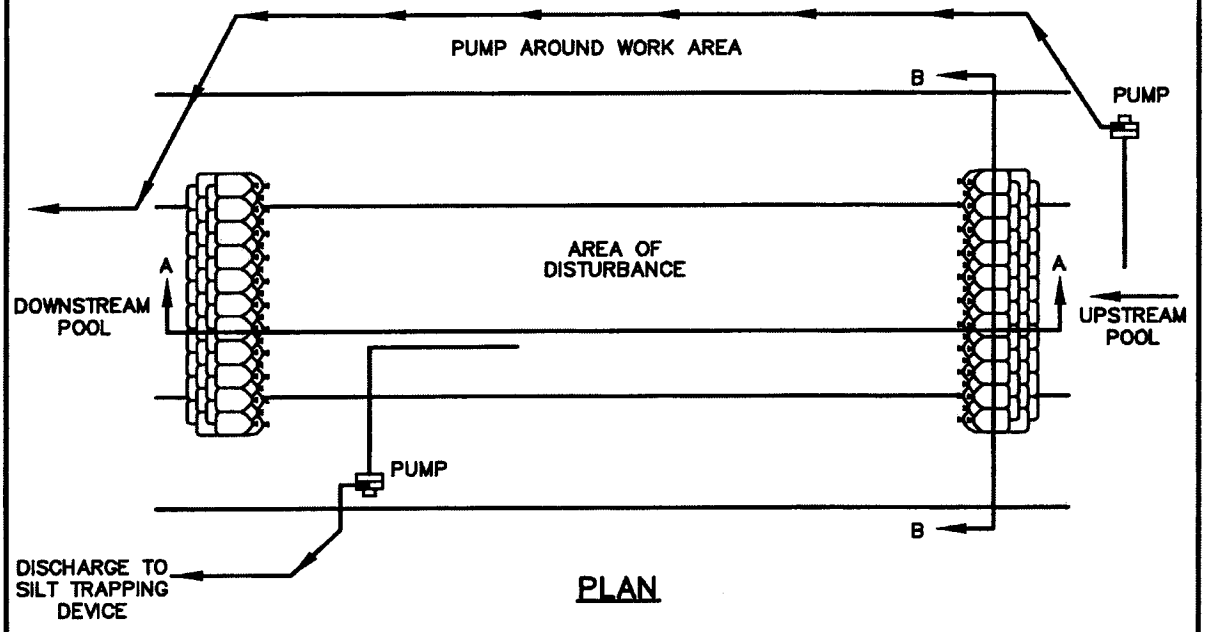


STORMWATER MANUAL

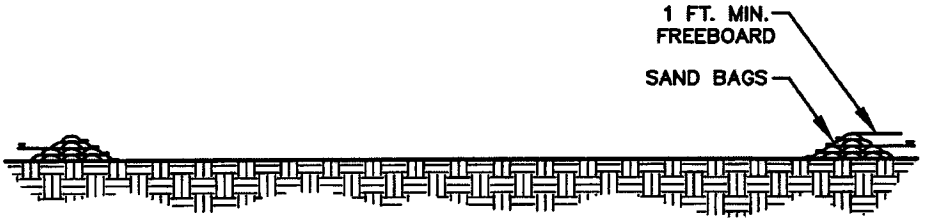
FIGURE 11-27

PUMP-AROUND FLOW DIVERSION

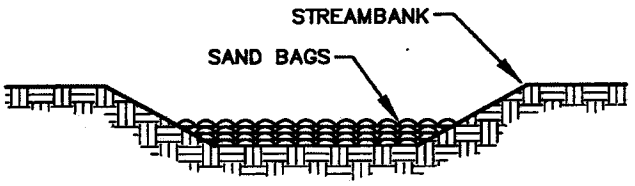
(EFFECTIVE DATE 8/29/11)



PLAN



SECTION A-A



SECTION B-B

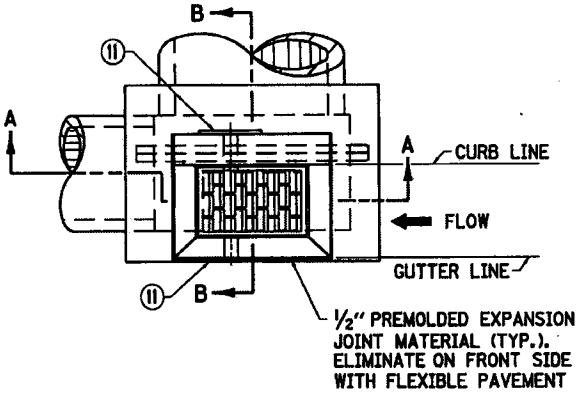
APPENDIX C

Kentucky Department of Highways
Standard Drawings

Kentucky Department of Highways - Standard Drawings
Table of Contents

All Kentucky Department of Highways Standard Drawings may be viewed on the Kentucky Transportation Cabinet web site:

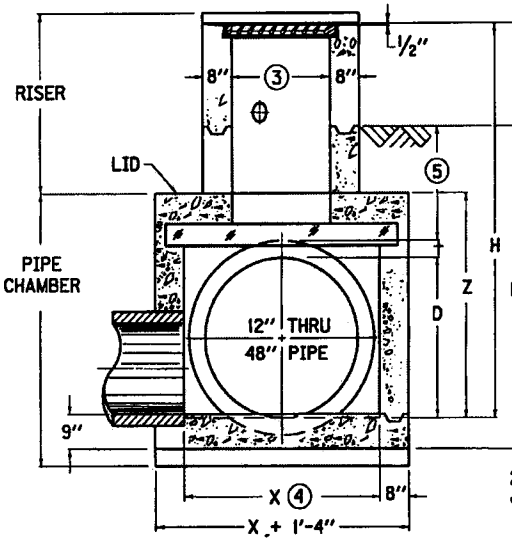
http://transportation.ky.gov/highway-design/pages/2012-standard-drawings.aspx
or http://tinyurl.com/nylln8y



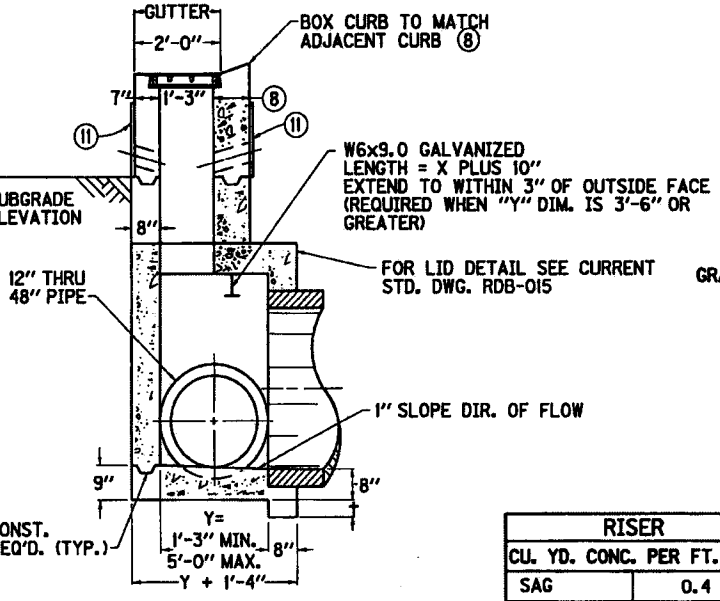
PLAN VIEW

NOTES

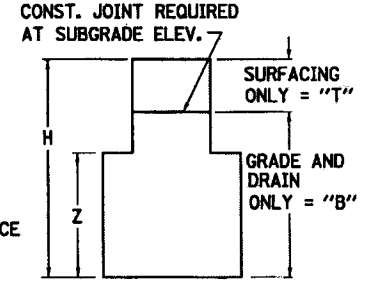
1. BOX INLET SHALL BE CONSTRUCTED IN TWO PHASES (BOTTOM AND TOP) AND MAY BE CONSTRUCTED IN A SAG VERTICAL CURVE OR ON GRADE.
   BID ITEM: DROP BOX INLET TYPE 13 (△) (✱)
   (△) = "S" (SAG CONDITION)
   (△) = "G" (GRADE CONDITION)
   (✱) = "T" (TOP PHASE)
   (✱) = "B" (BOTTOM PHASE)
   WITH NO "T" OR "B" SUFFIX A COMPLETE INLET IS REQUIRED.
2. FOR ILLUSTRATION PURPOSES THIS DRAWING DEPICTS A BOX LOCATED ON A GRADE CONDITION. SEE CURRENT STD. DWG. RDB-014, FOR DETAILS OF SAG AND GRADE CONDITIONS.
3. DIMENSION VARIES DEPENDING UPON LOCATION OF BOX; GRADE CONDITION = 2'-3", SAG CONDITION = 4'-11".
4. GRADE CONDITION: X = 2'-3" MIN. TO 5'-0" MAX., SAG CONDITION: X = 4'-11".
5. 2'-0" DESIRED COVER, 1'-0" MINIMUM COVER OVER PIPE AND/OR LID.
6. "t" IS CONCRETE PIPE WALL THICKNESS OR METAL CORRUGATION DEPTH.
7. ALL WALLS AND SLABS ARE 8" THICK UNLESS OTHERWISE SHOWN.
8. THICKNESS = CURB WIDTH + 2" (MINIMUM WIDTH 8" WITHOUT CURB). INLET MAY BE CONSTRUCTED WITH OR WITHOUT A CURB. THE CURB ON THE BOX SHALL BE CONSTRUCTED TO MATCH THE ADJOINING CURB WITH THE SAME CONSTRUCTION AND MATERIAL DETAILS (SEE CURRENT STD. DWG. RPM-100). THIS DRAWING DEPICTS A LIP CURB APPLICATION.
9. THE TOP PHASE SHALL BE CAST AFTER THE ADJOINING CURB AND GUTTER HAVE BEEN CAST.
10. SEE CURRENT STD. DWG. RDB-014, 015, 016, 018 AND RDB-019 FOR FRAME AND GRATE DETAIL, STEEL PATTERN, DIMENSIONS AND QUANTITIES.
11. FABRIC WRAPPED BACKFILL DRAIN, (ONE PER WEEP HOLE).
12. THIS GRATE IS BICYCLE FRIENDLY.



SECTION A-A



SECTION B-B



CONSTRUCTION SEQUENCE FOR GRADE & DRAIN AND/OR SURFACING

RISER	
CU. YD. CONC. PER FT. HT.	
SAG	0.4
GRADE	0.2

USE WITH CUR. STD. DWGS.: RDB-014, 015, 016, 017, 018, AND RDB-019

KENTUCKY DEPARTMENT OF HIGHWAYS

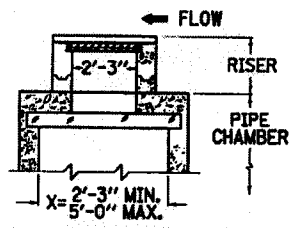
DROP BOX INLET TYPE 13

(DETAIL SHEET)

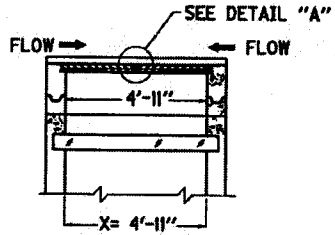
STANDARD DRAWING NO. RDB-013-06

SUBMITTED: DIRECTOR DIVISION OF DESIGN — DATE 11-21-07

APPROVED: STATE HIGHWAY ENGINEER — DATE 11-21-07



GRADE CONDITION
(1 GRATE & 1 FRAME REQ'D.)

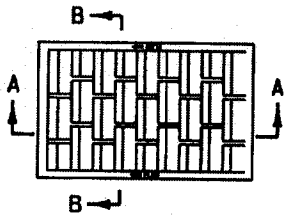


SAG CONDITION
(2 GRATES & 2 FRAMES REQ'D.)

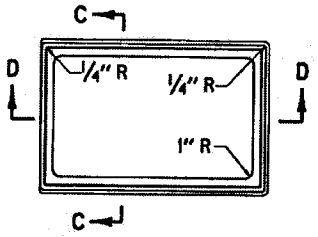
NOTES

1. ALL FILLETS AND ROUNDS SHALL BE 1/8" R.
2. THE FRAME AND GRATE SHALL BE MANUFACTURED OF CAST GRAY IRON CONFORMING TO ASTM A-48 CLASS 35B.

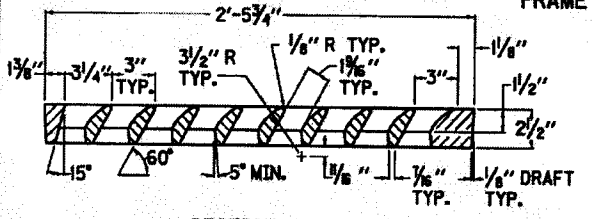
APPROX. WEIGHT	
1 GRATE	160 LBS.
1 FRAME	70 LBS.



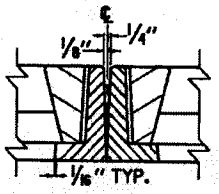
GRATE PLAN VIEW



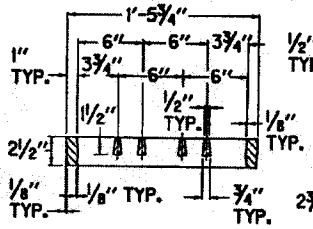
FRAME PLAN VIEW



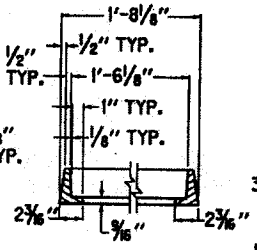
SECTION A-A



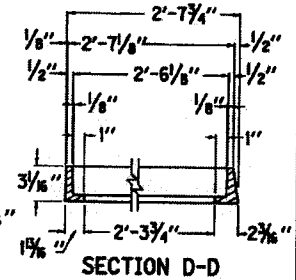
DETAIL "A"



SECTION B-B



SECTION C-C

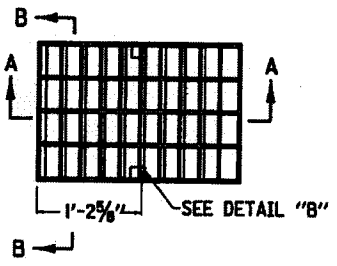


SECTION D-D

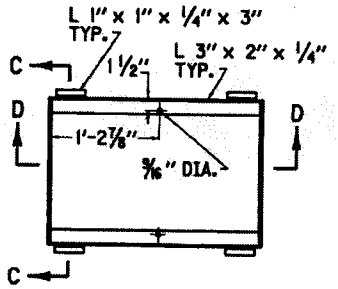
GRAY IRON CASTING

NOTES

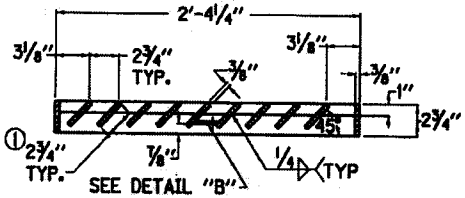
① THE 2 3/4" BAR SHALL BE NOTCHED TO RECEIVE THE 1" BAR.
② THE FRAME AND GRATE SHALL BE ASSEMBLED WITH 2 (TWO) 1/2" X 2 1/4" STAINLESS HEX HEAD BOLTS AND NUTS (COMMERICAL QUALITY).
③ ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A-36.



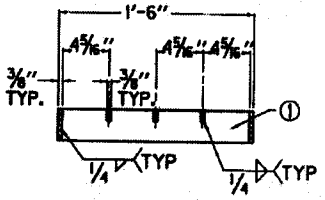
GRATE PLAN VIEW



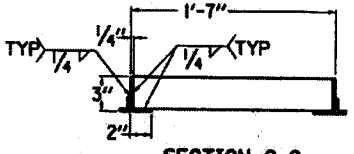
FRAME PLAN VIEW



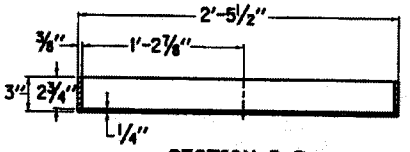
SECTION A-A



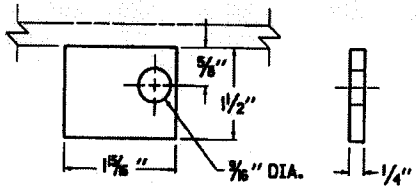
SECTION B-B



SECTION C-C



SECTION D-D



DETAIL "B"

③ STR. STEEL WTS.		
1 GRATE	TOTAL	1 FRAME
82 LBS.	126 LBS.	44 LBS.

STRUCTURAL STEEL

USE WITH CUR. STD. DWGS. RDB-013, 015, 016, 017, 018, AND RDB-019 OR RDB-030, 031, 032, 033, 034 AND RDB-035

KENTUCKY DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 13 AND TYPE 16
(FRAME AND GRATE DETAILS)

STANDARD DRAWING NO. RDB-014-05

SUBMITTED [signature] DIRECTOR DIVISION OF WORK 12-1-99 DATE

APPROVED [signature] STATE HIGHWAY ENGINEER 12-1-99 DATE

REINFORCEMENT STEEL FOR 8" LID

(GRADE CONDITION)

SIZE		NO. 5 STEEL BARS								
		BAR s		BAR †		BAR u		BAR v		
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	LBS.
2'-3"	1'-3"	--	--	--	--	--	--	--	--	7
	2'-0"	4	3'-0"	8	3'-3"	--	--	10	1'-0"	57
	2'-6"		3'-6"	10					1'-6"	71
	3'-0"		4'-0"	12					2'-0"	85
	3'-6"		4'-6"	14					2'-6"	99
	4'-0"		5'-0"	16					3'-0"	113
	4'-6"		5'-6"	18					3'-6"	127
	5'-0"		6'-0"	20					4'-0"	142
2'-6"	1'-3"	8	2'-3"	4	3'-6"	--	--	--	--	40
	2'-0"		3'-0"	8				8	1'-0"	70
	2'-6"		3'-6"	10					1'-6"	85
	3'-0"		4'-0"	12					2'-0"	101
	3'-6"		4'-6"	14					2'-6"	116
	4'-0"		5'-0"	16					3'-0"	132
	4'-6"		5'-6"	18					3'-6"	148
	5'-0"		6'-0"	20					4'-0"	163
3'-0"	1'-3"	8	2'-3"	4	4'-0"	--	--	--	--	42
	2'-0"		3'-0"	8				10	1'-0"	76
	2'-6"		3'-6"	10					1'-6"	94
	3'-0"		4'-0"	12					2'-0"	111
	3'-6"		4'-6"	14					2'-6"	129
	4'-0"		5'-0"	16					3'-0"	147
	4'-6"		5'-6"	18					3'-6"	164
	5'-0"		6'-0"	20					4'-0"	182
3'-6"	1'-3"	12	2'-3"	4	4'-6"	12	0'-11"	--	--	65
	2'-0"		3'-0"	8				8	1'-0"	102
	2'-6"		3'-6"	10					1'-6"	122
	3'-0"		4'-0"	12					2'-0"	142
	3'-6"		4'-6"	14					2'-6"	161
	4'-0"		5'-0"	16					3'-0"	181
	4'-6"		5'-6"	18					3'-6"	201
	5'-0"		6'-0"	20					4'-0"	221
4'-0"	1'-3"	12	2'-3"	4	5'-0"	12	1'-2"	--	--	71
	2'-0"		3'-0"	8				10	1'-0"	111
	2'-6"		3'-6"	10					1'-6"	133
	3'-0"		4'-0"	12					2'-0"	155
	3'-6"		4'-6"	14					2'-6"	177
	4'-0"		5'-0"	16					3'-0"	199
	4'-6"		5'-6"	18					3'-6"	221
	5'-0"		6'-0"	20					4'-0"	243
4'-6"	1'-3"	16	2'-3"	4	5'-6"	12	1'-5"	--	--	85
	2'-0"		3'-0"	8				8	1'-0"	129
	2'-6"		3'-6"	10					1'-6"	153
	3'-0"		4'-0"	12					2'-0"	177
	3'-6"		4'-6"	14					2'-6"	201
	4'-0"		5'-0"	16					3'-0"	225
	4'-6"		5'-6"	18					3'-6"	249
	5'-0"		6'-0"	20					4'-0"	273

(GRADE CONDITION)

SIZE		NO. 5 STEEL BARS								
		BAR s		BAR †		BAR u		BAR v		
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	LBS.
5'-0"	1'-3"	16	2'-3"	4	6'-0"	12	1'-8"	--	--	90
	2'-0"		3'-0"	8				10	1'-0"	138
	2'-6"		3'-6"	10					1'-6"	164
	3'-0"		4'-0"	12					2'-0"	191
	3'-6"		4'-6"	14					2'-6"	217
	4'-0"		5'-0"	16					3'-0"	243
	4'-6"		5'-6"	18					3'-6"	269
	5'-0"		6'-0"	20					4'-0"	295

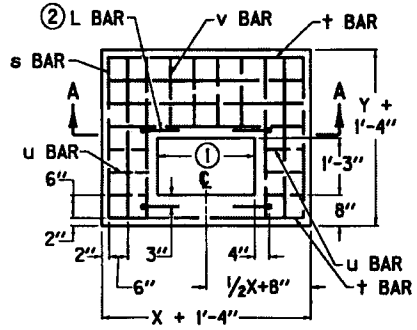
REINFORCEMENT STEEL FOR 8" LID

(SAG CONDITION)

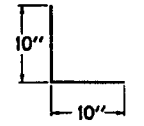
SIZE		NO. 5 STEEL BARS								
		BAR s		BAR †		BAR u		BAR v		
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	LBS.
4'-11"	1'-3"	--	--	--	--	--	--	--	--	7
	2'-0"	4	3'-0"	8	5'-11"	--	--	22	1'-0"	92
	2'-6"		3'-6"	10					1'-6"	118
	3'-0"		4'-0"	12					2'-0"	144
	3'-6"		4'-6"	14					2'-6"	169
	4'-0"		5'-0"	16					3'-0"	195
	4'-6"		5'-6"	18					3'-6"	221
	5'-0"		6'-0"	20					4'-0"	247

NOTES:

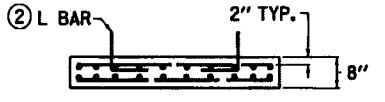
1. DIMENSION VARIES DEPENDING UPON LOCATION OF BOX : GRADE CONDITION= 2'-3" SAG CONDITION= 4'-11"
2. IN ADDITION TO THE CHARTED STEEL, FOUR L BARS ARE REQUIRED IN THE LID AND ARE INCLUDED IN THE TOTALS.
3. CONCRETE QUANTITIES FOR LID ARE INCLUDED ON " DIMENSIONS AND ESTIMATE OF QUANTITIES FOR D.B.I. TYPE 13" . SEE CUR. STD. DWGS. RDB-016 AND RDB-017.
4. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM THE OUTSIDE FACE UNLESS OTHERWISE SHOWN.



PLAN VIEW OF 8" LID



L BAR DETAIL



SECTION A-A

USE WITH CUR. STD. DWGS.: RDB-013, 014, 016, 017, 018, AND RDB-019

KENTUCKY DEPARTMENT OF HIGHWAYS

DROP BOX INLET TYPE 13

(DETAIL & BAR CHART FOR LID)

STANDARD DRAWING NO. RDB-015-03

SUBMITTED _____ 12-1-99 DATE

APPROVED _____ 12-1-99 DATE

DIMENSIONS AND ESTIMATE OF QUANTITIES
(PIPE CHAMBER-GRADE CONDITION)

INLET SIZE ④			MAX. PIPE DIA.	PIPE LOCATION	Z ①	CONCRETE	
NO. ⑥	X	Y				CU. YD. ①②	Q ③
1	2'-3"	1'-3"	12"	X OR Y	2'-2"	0.8	0.2
2			15"	X	2'-5"		
3		2'-0"		X OR Y		1.0	0.3
4		1'-3"	18"	X	2'-9"	0.9	0.2
5		2'-0"		X OR Y		1.1	0.3
6		1'-3"	21"	X	3'-0"	1.0	0.2
7		2'-0"				1.2	0.3
8		2'-6"		X OR Y		1.3	
9			24"	Y	3'-3"	1.4	
10	2'-6"	1'-3"		X		1.1	
11		2'-0"				1.3	
12		2'-6"		X OR Y		1.5	
13	2'-3"	3'-0"	27"	Y	3'-6"	1.6	
14	2'-6"					1.7	
15	3'-0"	1'-3"		X		1.3	
16		2'-0"				1.6	
17		2'-6"				1.7	
18		3'-0"		X OR Y		1.9	0.4
19	2'-3"	3'-6"	30"	Y	4'-1"	2.0	0.3
20	2'-6"					2.1	0.4
21	3'-0"					2.3	
22	3'-6"	1'-3"		X	3'-10"	1.5	0.3
23		2'-0"				1.8	
24		2'-6"				2.0	0.4
25		3'-0"				2.2	
26		3'-6"		X OR Y	4'-1"	2.5	
27	2'-3"		33"	Y	4'-4"	2.1	0.3
28	2'-6"					2.2	0.4
29	3'-0"					2.4	
30	3'-6"	1'-3"		X	4'-1"	1.6	0.3
31		2'-0"				1.9	
32		2'-6"				2.1	0.4
33		3'-0"				2.3	
34		3'-6"		X OR Y	4'-4"	2.6	
35	2'-3"	4'-0"	36"	Y	4'-7"	2.4	0.4
36	2'-6"					2.5	
37	3'-0"					2.7	
38	3'-6"					3.0	
39	4'-0"	1'-3"		X	4'-4"	1.8	0.3
40		2'-0"				2.2	0.4
41		2'-6"				2.4	
42		3'-0"				2.6	
43		3'-6"			4'-7"	3.0	
44		4'-0"		X OR Y		3.2	0.5
45	2'-3"	4'-6"	42"	Y	5'-2"	2.8	0.4
46	2'-6"					2.9	
47	3'-0"	4'-6"	42"	Y	5'-2"	3.2	0.4
48	3'-6"					3.4	0.5
49	4'-0"					3.7	
50	4'-6"	1'-3"		X	4'-11"	2.2	0.3
51		2'-0"				2.6	0.4
52		2'-6"				2.8	
53		3'-0"				3.1	
54		3'-6"			5'-2"	3.4	0.5
55		4'-0"				3.7	
56		4'-6"		X OR Y		4.0	
57	2'-3"	5'-0"	48"	Y	5'-8"	3.2	0.4
58	2'-6"					3.3	
59	3'-0"					3.6	0.5
60	3'-6"					3.9	
61	4'-0"					4.2	
62	4'-6"					4.5	
63	5'-0"	1'-3"		X	5'-5"	2.5	0.4
64		2'-0"				3.0	
65		2'-6"				3.2	
66		3'-0"				3.5	0.5
67		3'-6"			5'-8"	3.9	
68		4'-0"				4.2	
69		4'-6"				4.5	
70		5'-0"		X OR Y		4.8	0.6

REFERENCE CHART

DIA. OF PIPE	D.B.I. TYPE 13		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON "X" SIDE OF INLET	PIPE ON "Y" SIDE OF INLET	CUBIC YARDS
0	2'-3"	1'-3"	----
12"			0.1
15"-18"		2'-0"	
21"		2'-6"	
24"	2'-6"		
27"	3'-0"	3'-0"	0.2
30"-33"	3'-6"	3'-6"	
36"	4'-0"	4'-0"	0.3
42"	4'-6"	4'-6"	0.4
48"	5'-0"	5'-0"	0.5

NOTES

① BASED ON Z AS EQUAL TO D++1'-0" WHEN "Y" DIMENSION IS LESS THAN 3'-6". BASED ON Z AS EQUAL TO D++1'-3" WHEN "Y" DIMENSION IS 3'-6" OR GREATER.

② SEE REFERENCE CHART FOR QUANTITIES TO DEDUCT FOR PIPE.

③ Q = CU. YD. PER FOOT INCREASE OR DECREASE WHEN Z VARIES.

④ SEE CURRENT STD. DWGS. RDB-013 AND RDB-014 FOR DIMENSIONS.

5. SEE CUR. STD. DWG. RDB-018 AND RDB-019 FOR STEEL REINFORCEMENT IN PIPE CHAMBER AND RISER WHEN H = 8'-0" OR GREATER.

⑥ INLET IS SHOWN ON PLANS AS "DROP BOX INLET TYPE 13". FOLLOWING THIS IS A NUMBER AND A BOX HEIGHT. USE THIS NUMBER WITH THIS CHART.

7. SEE CURRENT STD. DWG. RDB-017 FOR DIMENSIONS AND ESTIMATE OF QUANTITIES WHEN BOXES ARE LOCATED IN A SAG CONDITION.

USE WITH CUR. STD. DWGS. RDB-013, 014, 015, 017, 018, AND RDB-019

KENTUCKY DEPARTMENT OF HIGHWAYS

DROP BOX INLET TYPE 13
(PIPE CHAMBER-GRADE CONDTN.)

STANDARD DRAWING NO. RDB-016-02

SUBMITTED _____ 12-1-99 DATE

APPROVED _____ 12-1-99 DATE

DIMENSIONS AND ESTIMATE OF QUANTITIES
(PIPE CHAMBER-SAG CONDITION)

INLET SIZE ④			MAX. PIPE DIA.	PIPE LOCATION	Z ①	CONCRETE	
NO. ⑥	X	Y				CU. YD. ①②	Q ③
71	4'-11"	1'-3"	12"	X OR Y	2'-2"	1.2	0.4
72			15"	X	2'-5"	1.3	
73		2'-0"		X OR Y		1.6	
74		1'-3"	18"	X	2'-9"	1.4	
75		2'-0"		X OR Y		1.8	
76		1'-3"	21"	X	3'-0"	1.5	
77		2'-0"				1.9	
78		2'-6"		X OR Y		2.1	
79		1'-3"	24"	X	3'-3"	1.6	
80		2'-0"				2.0	
81		2'-6"		X OR Y		2.2	
82		1'-3"	27"	X	3'-6"	1.7	
83		2'-0"				2.1	
84		2'-6"				2.3	
85		3'-0"		X OR Y		2.5	0.5
86		1'-3"	30"	X	3'-10"	1.8	0.4
87		2'-0"				2.2	
88		2'-6"				2.4	
89		3'-0"				2.7	0.5
90		3'-6"		X OR Y	4'-1"	3.0	
91		1'-3"	33"	X		1.9	0.4
92		2'-0"				2.3	
93		2'-6"				2.5	
94		3'-0"				2.8	0.5
95		3'-6"		X OR Y		3.2	
96		1'-3"	36"	X	4'-4"	2.0	0.4
97		2'-0"				2.4	
98		2'-6"				2.7	
99		3'-0"				2.9	0.5
100		3'-6"			4'-7"	3.3	
101		4'-0"		X OR Y		3.5	
102		1'-3"	42"	X	4'-11"	2.2	0.4
103		2'-0"				2.6	
104		2'-6"				2.9	
105		3'-0"				3.2	0.5
106		3'-6"			5'-2"	3.6	
107		4'-0"				3.8	
108		4'-6"		X OR Y		4.1	
109		1'-3"	48"	X	5'-5"	2.4	0.4
110		2'-0"				2.8	
111		2'-6"				3.1	
112		3'-0"				3.4	0.5
113		3'-6"			5'-8"	3.8	
114		4'-0"				4.1	
115		4'-6"				4.4	
116		5'-0"		X OR Y		4.6	0.6

REFERENCE CHART

DIA. OF PIPE	D.B.I. TYPE 13		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON "X" SIDE OF INLET	PIPE ON "Y" SIDE OF INLET	CUBIC YARDS
0	4'-11"	1'-3"	----
12"			0.1
15"-18"		2'-0"	
21"		2'-6"	
24"			
27"		3'-0"	0.2
30"-33"		3'-6"	
36"		4'-0"	0.3
42"		4'-6"	0.4
48"		5'-0"	0.5

NOTES

① BASED ON Z AS EQUAL TO D+†+1'-0" WHEN "Y" DIMENSION IS LESS THAN 3'-6". BASED ON Z AS EQUAL TO D+†+1'-3" WHEN "Y" DIMENSION IS 3'-6" OR GREATER.

② SEE REFERENCE CHART FOR QUANTITIES TO DEDUCT FOR PIPE .

③ Q = CU. YD. PER FOOT INCREASE OR DECREASE WHEN Z VARIES .

④ SEE CURRENT STD. DWGS. RDB-013 AND RDB-014 FOR DIMENSIONS.

5. SEE CUR. STD. DWG. RDB-018 AND RDB-019 FOR STEEL REINFORCEMENT IN PIPE CHAMBER AND RISER WHEN H = 8'-0" OR GREATER .

⑥ INLET IS SHOWN ON PLANS AS "DROP BOX INLET TYPE 13". FOLLOWING THIS IS A NUMBER AND A BOX HEIGHT. USE THIS NUMBER WITH THIS CHART .

7. SEE CURRENT STD. DWG. RDB-016 FOR DIMENSIONS AND ESTIMATE OF QUANTITIES WHEN BOXES ARE LOCATED IN A GRADE CONDITION.

USE WITH CUR. STD. DWGS. RDB-013, 014, 015, 016, 018, AND RDB-019

KENTUCKY DEPARTMENT OF HIGHWAYS

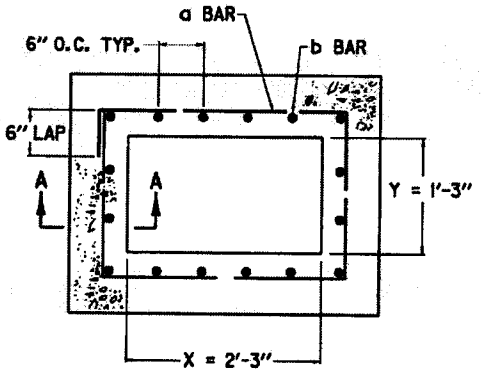
DROP BOX INLET TYPE 13
(PIPE CHAMBER-SAG CONDITION)

STANDARD DRAWING NO. RDB-017-02

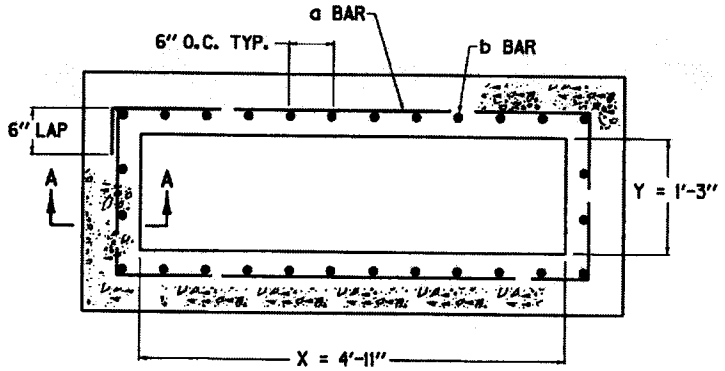
SUBMITTED _____ DIRECTOR, DIVISION OF BRIDGES — DATE 12-1-99

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 12-1-99

ADDITIONAL STEEL REINFORCEMENT REQUIREMENTS
(RISER, H = 8'-0" TO 15'-0", GRADE AND SAG CONDITION)

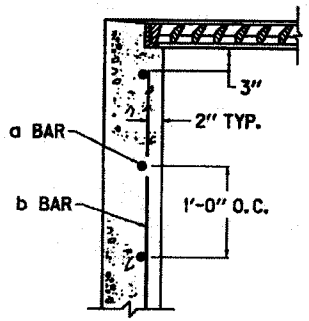


GRADE CONDITION



SAG CONDITION

NOTES
1. STEEL REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM THE FACE UNLESS OTHERWISE SHOWN.
2. ALL STEEL REINFORCEMENT SHALL BE NO. 5 BARS.



SECTION A-A

APPROXIMATE RISER QUANTITIES PER ONE FOOT IN HEIGHT

CONDITION	SIZE X	SIZE Y	BAR a QTY.	BAR a LIN. FT.	BAR b QTY.	BAR b LIN. FT.	LBS STEEL
GRADE	2'-3"	1'-3"	3	9'-3"	16	1'-0"	26
SAG	4'-11"		3	14'-7"	28		44

USE WITH CUR. STD. DWGS. RDB-013, 014, 015, 016, 017, AND RDB-019

KENTUCKY DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 13
(ADDITIONAL STEEL - RISER)

STANDARD DRAWING NO. RDB-018-03

SUBMITTED _____ DATE 12-1-99

APPROVED _____ DATE 12-1-99

① ADDITIONAL STEEL REINFORCEMENT REQUIRMENTS
(PIPE CHAMBER, H = 8' TO 15', GRADE CONDITION)

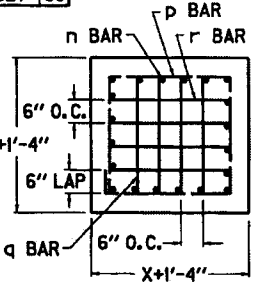
SIZE ②		NO. 5 STEEL BARS									
		③ BAR n		④ BAR p		BAR q		BAR r		LBS. ⑤	
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
2'-3"	1'-3"	16	6'-0"	6	9'-3"	4	1'-9"	3	2'-9"	174	26
	2'-0"	20			10'-9"		2'-6"	4		214	32
	2'-6"	22			11'-9"		3'-0"	5		238	35
	3'-0"	24			12'-9"		3'-6"	6		262	38
	3'-6"	26			13'-9"		4'-0"	7		286	41
	4'-0"	28			14'-9"		4'-6"	8		309	45
	4'-6"	30			15'-9"		5'-0"	9		333	48
	5'-0"	32			16'-9"		5'-6"	10		357	51
2'-6"	1'-3"	20	6'-0"	6	9'-9"	5	1'-9"	3	3'-0"	205	31
	2'-0"	22			11'-3"		2'-6"	4		234	35
	2'-6"	24			12'-3"		3'-0"	5		258	38
	3'-0"	26			13'-3"		3'-6"	6		283	41
	3'-6"	28			14'-3"		4'-0"	7		307	44
	4'-0"	30			15'-3"		4'-6"	8		332	47
	4'-6"	32			16'-3"		5'-0"	9		356	50
	5'-0"	34			17'-3"		5'-6"	10		381	53
3'-0"	1'-3"	22	6'-0"	6	10'-9"	6	1'-9"	3	3'-6"	227	34
	2'-0"	24			12'-3"		2'-6"	4		257	38
	2'-6"	26			13'-3"		3'-0"	5		283	41
	3'-0"	28			14'-3"		3'-6"	6		308	44
	3'-6"	30			15'-3"		4'-0"	7		334	47
	4'-0"	32			16'-3"		4'-6"	8		359	50
	4'-6"	34			17'-3"		5'-0"	9		385	53
	5'-0"	36			18'-3"		5'-6"	10		410	57
3'-6"	1'-3"	24	6'-0"	6	11'-9"	7	1'-9"	3	4'-0"	249	37
	2'-0"	26			13'-3"		2'-6"	4		281	41
	2'-6"	28			14'-3"		3'-0"	5		307	44
	3'-0"	30			15'-3"		3'-6"	6		334	47
	3'-6"	32			16'-3"		4'-0"	7		360	50
	4'-0"	34			17'-3"		4'-6"	8		387	53
	4'-6"	36			18'-3"		5'-0"	9		414	57
	5'-0"	38			19'-3"		5'-6"	10		440	60
4'-0"	1'-3"	26	6'-0"	6	12'-9"	8	1'-9"	3	4'-6"	271	40
	2'-0"	28			14'-3"		2'-6"	4		304	44
	2'-6"	30			15'-3"		3'-0"	5		332	47
	3'-0"	32			16'-3"		3'-6"	6		359	50
	3'-6"	34			17'-3"		4'-0"	7		387	53
	4'-0"	36			18'-3"		4'-6"	8		415	57
	4'-6"	38			19'-3"		5'-0"	9		442	60
	5'-0"	40			20'-3"		5'-6"	10		470	63
4'-6"	1'-3"	28	6'-0"	6	13'-9"	9	1'-9"	3	5'-0"	293	44
	2'-0"	30			15'-3"		2'-6"	4		328	47
	2'-6"	32			16'-3"		3'-0"	5		356	50
	3'-0"	34			17'-3"		3'-6"	6		385	53
	3'-6"	36			18'-3"		4'-0"	7		414	57
	4'-0"	38			19'-3"		4'-6"	8		442	60
	4'-6"	40			20'-3"		5'-0"	9		471	63
	5'-0"	42			21'-3"		5'-6"	10		500	66

SIZE ②		NO. 5 STEEL BARS									
		③ BAR n		④ BAR p		BAR q		BAR r		LBS. ⑤	
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
5'-0"	1'-3"	30	6'-0"	6	14'-9"	10	1'-9"	3	5'-6"	316	47
	2'-0"	32			16'-3"		2'-6"	4		351	50
	2'-6"	34			17'-3"		3'-0"	5		381	53
	3'-0"	36			18'-3"		3'-6"	6		410	57
	3'-6"	38			19'-3"		4'-0"	7		440	60
	4'-0"	40			20'-3"		4'-6"	8		470	63
	4'-6"	42			21'-3"		5'-0"	9		500	66
	5'-0"	44			22'-3"		5'-6"	10		529	69

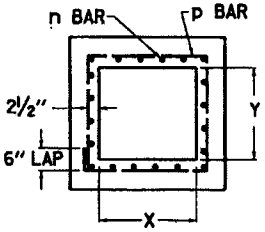
① ADDITIONAL STEEL REINFORCEMENT REQUIRMENTS
(PIPE CHAMBER, H = 8' TO 15', SAG CONDITION)

SIZE ②		NO. 5 STEEL BARS									
		③ BAR n		④ BAR p		BAR q		BAR r		LBS. ⑤	
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
4'-11"	1'-3"	28	6'-0"	6	14'-7"	10	1'-9"	3	5'-5"	302	44
	2'-0"	32			16'-1"		2'-6"	4		350	50
	2'-6"	34			17'-1"		3'-0"	5		379	53
	3'-0"	36			18'-1"		3'-6"	6		409	56
	3'-6"	38			19'-1"		4'-0"	7		438	60
	4'-0"	40			20'-1"		4'-6"	8		468	63
	4'-6"	42			21'-1"		5'-0"	9		498	66
	5'-0"	44			22'-1"		5'-6"	10		527	69

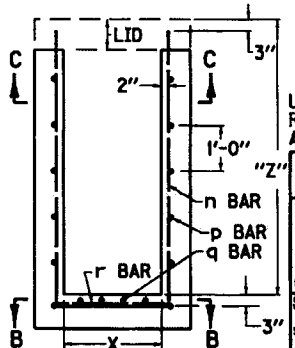
NOTES
① BASED ON "Z" AS EQUAL TO 6'-0".
② SEE CURRENT. STD. DWG. RDB-013 AND RDB-014 FOR LOCATION AND DIMENSIONS.
③ LENGTH OF n BAR IS ALWAYS SAME AS "Z" DIMENSION.
④ ADD OR SUBTRACT ONE p BAR PER EVEN FOOT VARIANCE FROM 6'-0" Z.
⑤ NO DEDUCTIONS HAVE BEEN MADE FOR PIPE.
⑥ ADD OR SUBTRACT LBS. STEEL PER FOOT VARIANCE FROM 6'-0" Z.
7. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM THE FACE UNLESS OTHERWISE SHOWN.



SECTION B-B



SECTION C-C



SECTION A-A

USE WITH CUR. STD. DWGS.: RDB-013, 014, 015, 016, 017, AND RDB-018

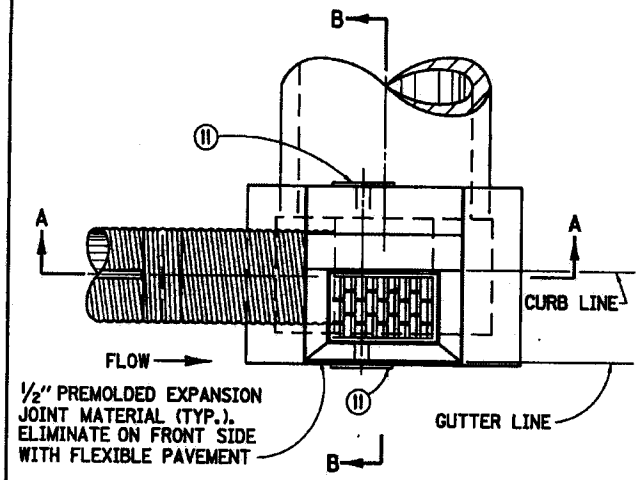
KENTUCKY DEPARTMENT OF HIGHWAYS

DROP BOX INLET TYPE 13
(ADDITIONAL STEEL - CHAMBER)

STANDARD DRAWING NO. RDB-019-03

SUBMITTED _____ DATE 12-1-99

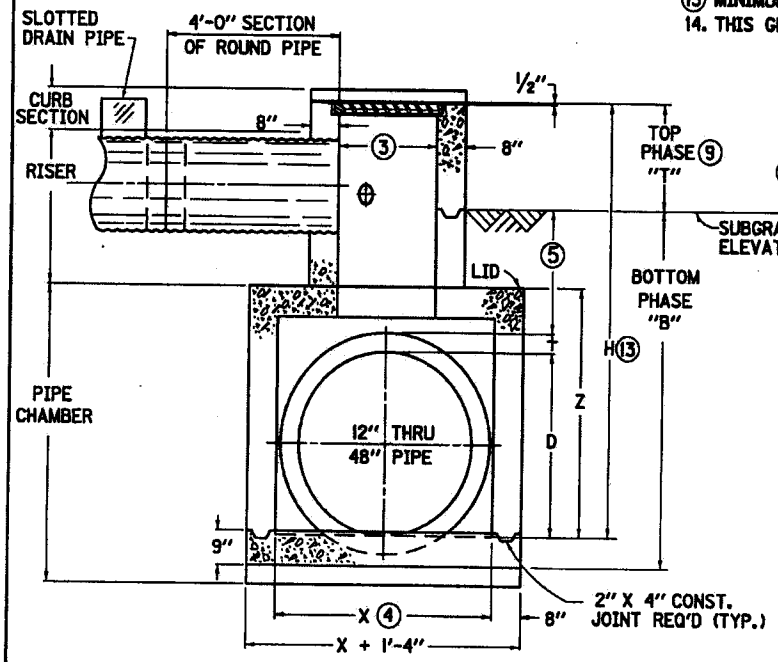
APPROVED _____ DATE 12-1-99



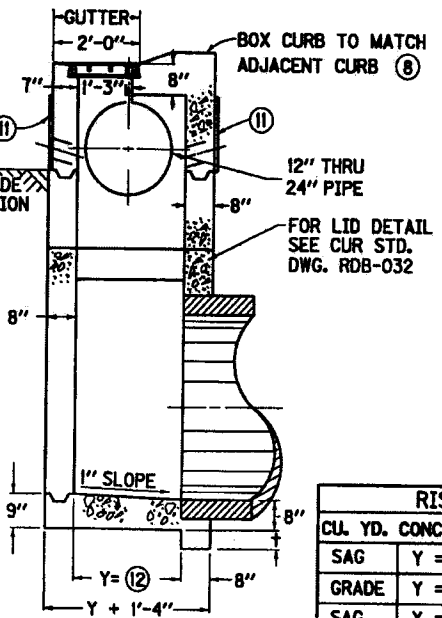
PLAN VIEW

NOTES

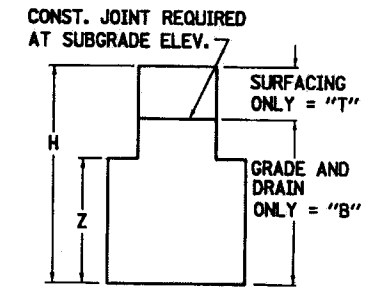
1. BOX INLET MAY BE CONSTRUCTED IN TWO PHASES (BOTTOM AND TOP) AND MAY BE CONSTRUCTED IN A SAG VERTICAL CURVE OR ON GRADE.
   BID ITEM: DROP BOX INLET TYPE 16(Δ) (⑨⑩)
   (Δ) = "S" (SAG CONDITION)
   (Δ) = "G" (GRADE CONDITION)
   (⑨⑩) = "T" (TOP PHASE)
   (⑨⑩) = "B" (BOTTOM PHASE)
   WITH NO "T" OR "B" SUFFIX A COMPLETE INLET IS REQUIRED.
2. FOR ILLUSTRATION PURPOSES THIS DRAWING DEPICTS A BOX LOCATED ON A GRADE CONDITION. SEE CURRENT STD. DWG. RDB-014 , FOR DETAILS OF SAG AND GRADE CONDITIONS.
3. DIMENSION VARIES DEPENDING UPON LOCATION OF BOX: GRADE CONDITION = 2'-3", SAG CONDITION = 4'-11".
4. GRADE CONDITION: X = 2'-3" MIN. TO 5'-0" MAX. , SAG CONDITION: X=4'-11".
5. 2'-0" DESIRED COVER, 1'-0" MIN. COVER OVER PIPE AND/OR LID.
6. "t" IS CONCRETE PIPE WALL THICKNESS OR METAL CORRUGATION DEPTH.
7. ALL WALLS AND SLABS ARE 8" THICK UNLESS OTHERWISE SHOWN.
8. THE CURB ON THE BOX SHALL BE CONSTRUCTED TO MATCH THE ADJOINING CURB WITH THE SAME CONSTRUCTION AND MATERIAL DETAILS (SEE CURRENT STD. DWG. RPM-100). THIS DRAWING DEPICTS A LIP CURB APPLICATION.
9. THE TOP PHASE SHALL BE CAST AFTER THE ADJOINING CURB AND GUTTER HAVE BEEN CAST.
10. SEE CURRENT STD. DWG. RDB-014 FOR FRAME AND GRATE DETAIL. SEE CUR. STD. DWG. RDB-031 FOR STEEL PATTERN. SEE CUR. STD. DWG. RDB-033 FOR DIMENSIONS AND QUANTITIES.
11. FABRIC WRAPPED BACKFILL DRAIN, (ONE PER WEEP HOLE).
12. 2'-0" FOR 12", 15", AND 18" OR 2'-6" FOR 24" SLOTTED DRAIN PIPE.
13. MINIMUM HEIGHT FOR LONGITUDINAL PIPE SHALL BE H = 11" + INSIDE DIAMETER OF PIPE.
14. THIS GRATE IS BICYCLE FRIENDLY.



SECTION A-A



SECTION B-B



CONSTRUCTION SEQUENCE FOR GRADE & DRAIN AND/OR SURFACING

USE WITH CUR. STD. DWGS.: RDI-200, RDB-014, RDB-031, RDB-032 , RDB-033, RDB-034, RDB-035

RISER		
CU. YD. CONC. PER FT. HT.		
SAG	Y = 2'-0"	0.4
GRADE	Y = 2'-0"	0.3
SAG	Y = 2'-6"	0.4
GRADE	Y = 2'-6"	0.3

KENTUCKY DEPARTMENT OF HIGHWAYS

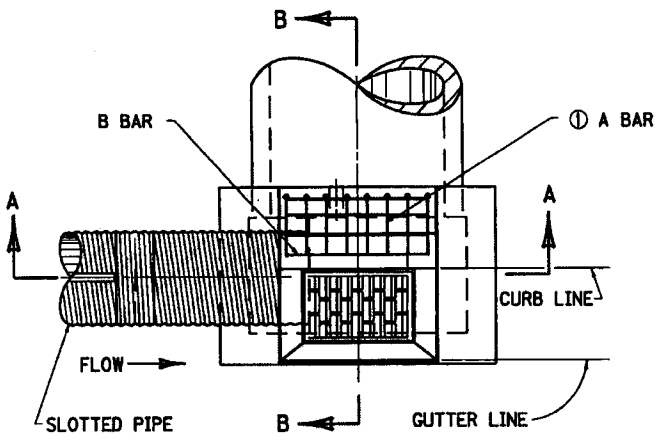
DROP BOX INLET TYPE 16

(DETAIL SHEET)

STANDARD DRAWING NO. RDB-030-03

SUBMITTED [signature] 11-21-07

APPROVED [signature] 11-21-07



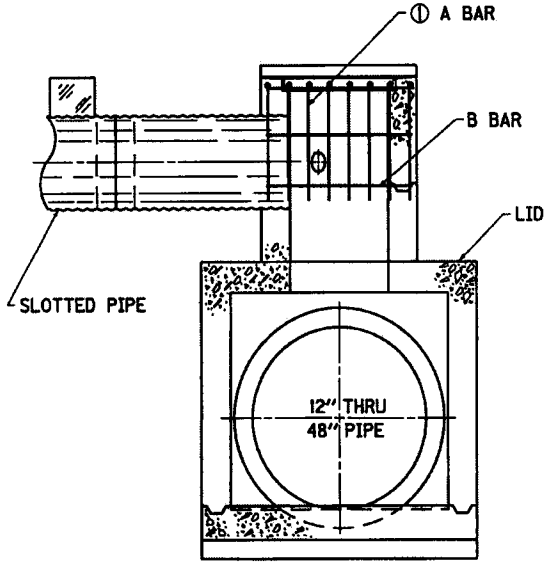
PLAN VIEW

NOTES

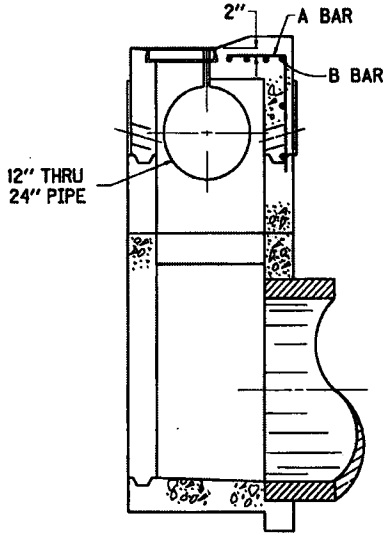
① SLOTTED PIPE SIZE DENOTES WHICH A BAR TO USE, SEE STEEL CHART THIS DRAWING.
2. SEE CUR. STD. DWG. RDB-032 FOR LID REINFORCEMENT.
3. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM THE OUTSIDE FACE UNLESS OTHERWISE SHOWN.
4. SPACE A BARS APPROXIMATELY 6" CENTER TO CENTER.
5. SPACE B BARS AS SHOWN.

STEEL REINFORCEMENT CHART

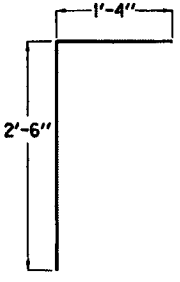
NO. 5 BAR	SLOTTED PIPE SIZE	CONDITION	QTY.	LGTH.	TOTAL LBS
A BAR	12" THRU 18"	GRADE	8	2'-7"	22
B BAR			6	3'-3"	20
A BAR		SAGE	13	2'-7"	35
B BAR			6	5'-11"	37
A BAR	24"	GRADE	8	3'-10"	32
B BAR			6	3'-3"	20
A BAR		SAGE	13	3'-10"	52
B BAR			6	5'-11"	37



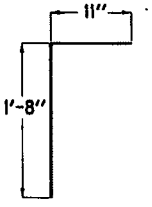
SECTION A-A



SECTION B-B



A BAR DETAIL
24" PIPE



A BAR DETAIL
12" - 18" PIPE

USE WITH CUR. STD. DWGS.: RDI-200, RDB-014, RDB-030, RDB-032, RDB-033, RDB-034, RDB-035

KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 16
(STEEL SHEET)

STANDARD DRAWING NO. RDB-031-03

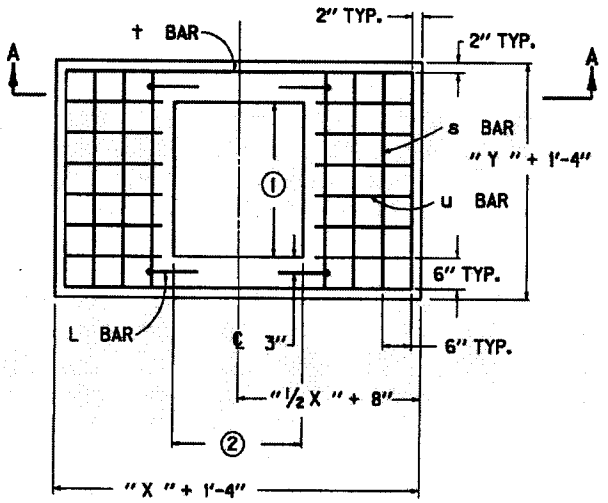
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE 12-1-99

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE 12-1-99

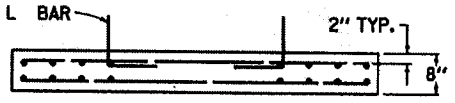
REINFORCEMENT STEEL FOR 8" LID

(GRADE CONDITION)

SIZE		NO. 5 STEEL BARS						
		BAR s		BAR †		BAR u		
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	LBS.
2'-3"	2'-0"	4	3'-0"	4	3'-3"	---	---	33
	2'-6"		3'-6"			---	---	35
2'-6"	2'-0"	8	3'-0"		3'-6"	---	---	47
	2'-6"		3'-6"			---	---	51
3'-0"	2'-0"		3'-0"		4'-0"	---	---	49
	2'-6"		3'-6"			---	---	53
3'-6"	2'-0"	12	3'-0"		4'-6"	20	0'-11"	82
	2'-6"		3'-6"			24		89
4'-0"	2'-0"		3'-0"		5'-0"	20	1'-2"	86
	2'-6"		3'-6"			24		101
4'-6"	2'-0"	16	3'-0"		5'-6"	20	1'-5"	110
	2'-6"		3'-6"			24		124
5'-0"	2'-0"		3'-0"		6'-0"	20	1'-8"	117
	2'-6"		3'-6"			24		132



DETAIL OF 8" LID
PLAN VIEW

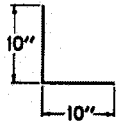


SECTION A-A

NOTES

① 2'-0" FOR 12", 15", AND 18" OR 2'-6" FOR 24" SLOTTED DRAIN PIPE.
② DIMENSION VARIES DEPENDING UPON LOCATION OF BOX :
GRADE CONDITION = 2'-3"
SAG CONDITION = 4'-11"

3. IN ADDITION TO THE CHARTED STEEL, FOUR L BARS ARE REQUIRED IN THE LID AND ARE INCLUDED IN THE TOTALS.
4. CONCRETE QUANTITIES FOR LID ARE INCLUDED ON " DIMENSIONS AND ESTIMATE OF QUANTITIES FOR D.B.I. TYPE 16". SEE CUR. STD. DWG. RDB-033
5. LID REINFORCING STEEL NOT REQUIRED IN SAG LOCATION.
6. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM THE OUTSIDE FACE UNLESS OTHERWISE SHOWN.



L BAR DETAIL

USE WITH CUR. STD. DWGS.:
RDI-200, RDB-014, RDB-030, RDB-031, RDB-033, RDB-034, RDB-035

KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 16

(DETAIL & BAR CHART FOR LID)

STANDARD DRAWING NO. RDB-032-03

SUBMITTED _____ DATE 12-1-99

APPROVED _____ DATE 12-1-99

DIMENSIONS AND ESTIMATE OF QUANTITIES
(GRADE CONDITION)

INLET SIZE ④			MAX. PIPE DIA.	LOCATION	Z ①	CONCRETE	
NO. ⑥	X	Y				CU. YD. ①②	Q ③
1	2'-3"	2'-0"	12"	X OR Y	2'-2"	0.9	0.3
2			15"		2'-5"	1.0	
3			18"		2'-9"	1.1	
4			21"	X	3'-0"		
5		2'-6"		X OR Y		1.3	
6			24"	Y	3'-3"		
7	2'-6"	2'-0"		X			
8		2'-6"		X OR Y		1.4	
9	3'-0"	2'-0"	27"	X	3'-6"	1.5	
10		2'-6"				1.7	
11	3'-6"	2'-0"	30"		3'-10"	1.8	
12		2'-6"				2.0	0.4
13		2'-0"	33"		4'-1"	1.9	0.3
14		2'-6"				2.0	0.4
15	4'-0"	2'-0"	36"		4'-4"	2.1	
16		2'-6"				2.3	
17	4'-6"	2'-0"	42"		4'-11"	2.5	
18		2'-6"				2.7	
19	5'-0"	2'-0"	48"		5'-5"	2.9	
20		2'-6"				3.2	

DIMENSIONS AND ESTIMATE OF QUANTITIES
(SAG CONDITION)

INLET SIZE ④			MAX. PIPE DIA.	LOCATION	Z ①	CONCRETE	
NO. ⑥	X	Y				CU. YD. ①②	Q ③
21	4'-11"	2'-0"	12"	X OR Y	2'-2"	1.4	0.4
22			15"		2'-5"	1.5	
23			18"		2'-9"	1.7	
24			21"	X	3'-0"	1.8	
25		2'-6"		X OR Y		1.9	
26		2'-0"	24"	X	3'-3"		
27		2'-6"		X OR Y		2.0	
28		2'-0"	27"	X	3'-6"		
29		2'-6"				2.1	
30		2'-0"	30"		3'-10"		
31		2'-6"				2.3	
32		2'-0"	33"		4'-1"	2.2	
33		2'-6"				2.4	
34		2'-0"	36"		4'-4"	2.3	
35		2'-6"				2.5	
36		2'-0"	42"		4'-11"		
37		2'-6"				2.8	
38		2'-0"	48"		5'-5"		
39		2'-6"				3.0	

NOTES

① BASED ON Z AS EQUAL TO D+t+12" .
② SEE REFERENCE CHART FOR QUANTITIES TO DEDUCT FOR PIPE .
③ Q = CU. YD. PER FOOT INCREASE OR DECREASE WHEN Z VARIES .
④ SEE CUR. STD. DWG. RDB-030 FOR DIMENSIONS.
5. SEE CUR. STD. DWG. RDB-034 AND RDB-035 FOR STEEL REINFORCEMENT IN PIPE CHAMBER AND RISER WHEN H = 8'-0" OR GREATER .
⑥ INLET IS SHOWN ON PLANS AS "DROP BOX INLET TYPE 16". FOLLOWING THIS IS A NUMBER AND A BOX HEIGHT. USE THIS NUMBER WITH THIS CHART .

REFERENCE CHART
(GRADE CONDITION)

DIA. OF PIPE	D.B.I. TYPE 16		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON "X" SIDE OF INLET	PIPE ON "Y" SIDE OF INLET	CUBIC YARDS
0	2'-3"	2'-0"	----
12"			0.1
15"-18"			
21"		2'-6"	
24"	2'-6"		
27"	3'-0"	----	0.2
30"-33"	3'-6"		
36"	4'-0"		0.3
42"	4'-6"		0.4
48"	5'-0"		0.5

REFERENCE CHART
(SAG CONDITION)

DIA. OF PIPE	D.B.I. TYPE 16		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON "X" SIDE OF INLET	PIPE ON "Y" SIDE OF INLET	CUBIC YARDS
0	4'-11"	2'-0"	----
12"			0.1
15"-18"			
21"		2'-6"	
24"			
27"		----	0.2
30"-33"			
36"			0.3
42"			0.4
48"			0.5

USE WITH CUR. STD. DWGS.: RDI-200, RDB-014, RDB-030, RDB-031, RDB-032, RDB-034, RDB-035

KENTUCKY DEPARTMENT OF HIGHWAYS

DROP BOX INLET TYPE 16

(DIMENSIONS & ESTIMATE OF QUANTITIES)

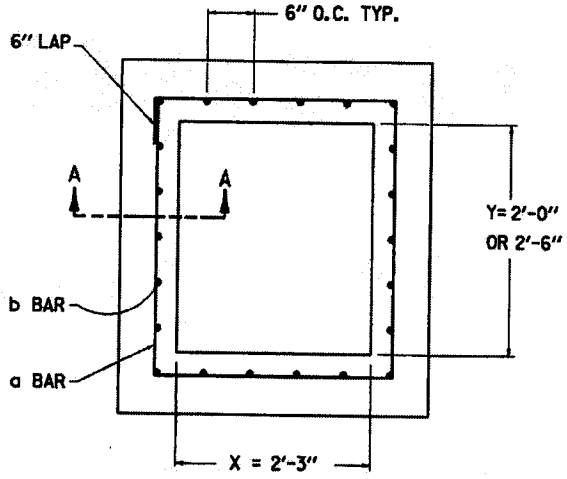
STANDARD DRAWING NO. RDB-033-02

SUBMITTED _____ DIVISION DIRECTOR OF DESIGN 12-1-99 DATE

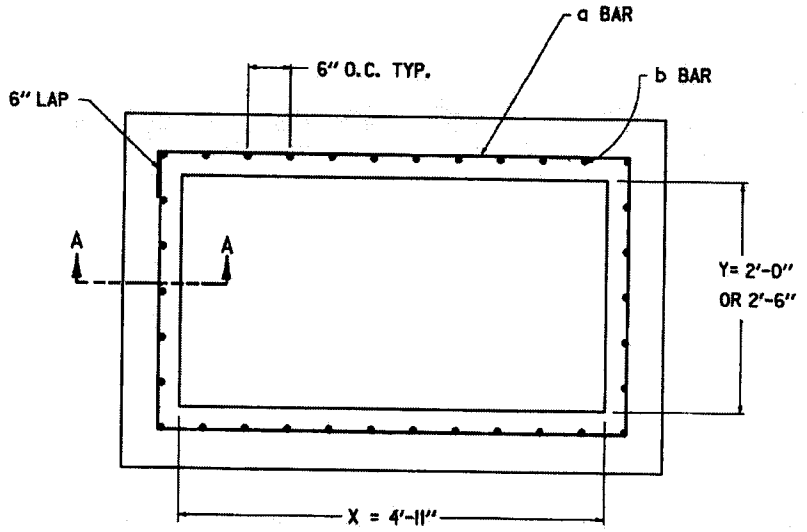
APPROVED _____ STATE HIGHWAY ENGINEER 12-1-99 DATE

ADDITIONAL STEEL REINFORCEMENT REQUIREMENTS

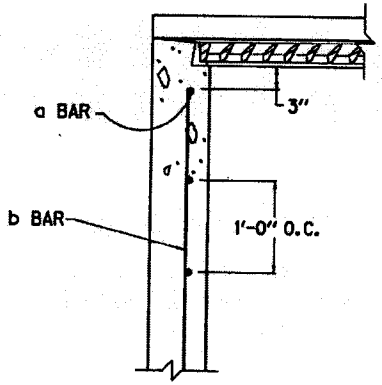
(RISER, H = 8'-0" TO 15'-0", GRADE AND SAG CONDITION)



GRADE CONDITION



SAG CONDITION



SECTION A-A

APPROXIMATE RISER QUANTITIES PER FOOT IN HEIGHT-NO. 5 BARS							
COND-ITION	SIZE		BAR a		BAR b		LBS STEEL
	X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	
GRADE	2'-3"	2'-0"	1	10'-9"	20	1'-0"	32
		2'-6"	1	11'-6"	22		35
SAG	4'-11"	2'-0"	1	16'-1"	32		50
		2'-6"	1	17'-1"	34		53

USE WITH CUR. STD. DWGS.: RDI-200, RDB-014, RDB-030, RDB-031, RDB-032, RDB-033, RDB-035

KENTUCKY DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 16
(ADDITIONAL STEEL- RISER)

STANDARD DRAWING NO. RDB-034-03

SUBMITTED [signature] DIRECTOR DIVISION OF DESIGN 12-1-99 DATE

APPROVED [signature] STATE HIGHWAY ENGINEER 12-1-99 DATE

① ADDITIONAL STEEL REINFORCEMENT FOR PIPE CHAMBER
(H = 8' TO 15', GRADE CONDITION)

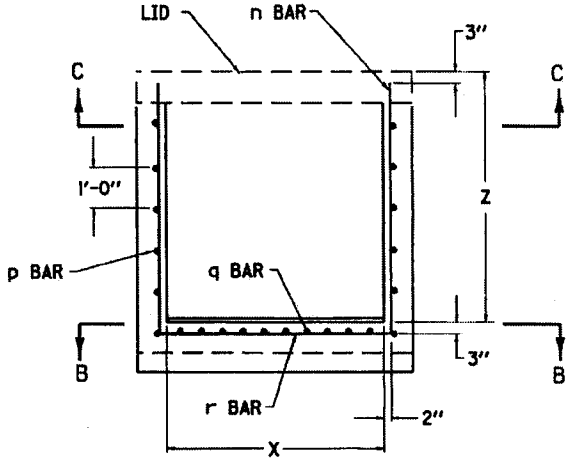
SIZE ②		NO. 5 STEEL BARS									
X	Y	BAR n ③		BAR p ④		BAR q		BAR r		LBS. ⑤	
		QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
2'-3"	2'-0"	20	6'-0"	6	10'-9"	4	2'-6"	4	2'-9"	214	32
	2'-6"	22			11'-9"		3'-0"	5		238	35
2'-6"	2'-0"				11'-3"	5	2'-6"	4	3'-0"	234	
	2'-6"	24			12'-3"		3'-0"	5		258	38
3'-0"	2'-0"					6	2'-6"	4	3'-6"	257	
	2'-6"	26			13'-3"		3'-0"	5		283	41
3'-6"	2'-0"					7	2'-6"	4	4'-0"	281	
	2'-6"	28			14'-3"		3'-0"	5		307	44
4'-0"	2'-0"					8	2'-6"	4	4'-6"	304	
	2'-6"	30			15'-3"		3'-0"	5		332	47
4'-6"	2'-0"					9	2'-6"	4	5'-0"	328	
	2'-6"	32			16'-3"		3'-0"	5		356	50
5'-0"	2'-0"					10	2'-6"	4	5'-6"	351	
	2'-6"	34			17'-3"		3'-0"	5		381	53

① ADDITIONAL STEEL REINFORCEMENT FOR PIPE CHAMBER
(H = 8' TO 15', SAG CONDITION)

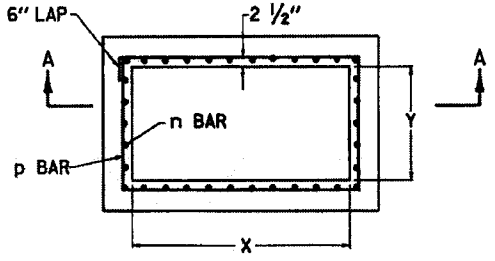
SIZE ②		NO. 5 STEEL BARS									
X	Y	BAR n ③		BAR p ④		BAR q		BAR r		LBS. ⑤	
		QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
4'-11"	2'-0"	32	6'-0"	6	16'-1"	10	2'-6"	4	5'-5"	350	50
	2'-6"	34			17'-1"		3'-0"	5		379	53

NOTES

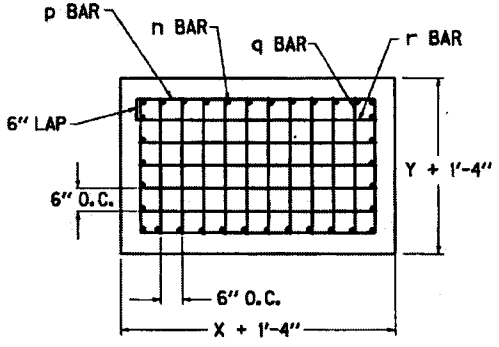
1. BASED ON "Z" AS EQUAL TO 6'-0".
2. SEE CUR. STD. DWG. RDB-030 FOR LOCATION AND DIMENSIONS.
3. LENGTH OF n BAR IS ALWAYS SAME AS "Z" DIMENSION.
4. ADD OR SUBTRACT ONE p BAR PER EVEN FOOT VARIANCE FROM 6'-0" Z .
5. NO DEDUCTIONS HAVE BEEN MADE FOR PIPE .
6. ADD OR SUBTRACT LBS. STEEL PER FT. VARIANCE FROM 6'-0" Z .
7. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM THE FACE UNLESS OTHERWISE SHOWN .



SECTION A-A



SECTION C-C



SECTION B-B

USE WITH CUR. STD. DWGS.: RDI-200, RDB-014, RDB-030, RDB-031, RDB-032, RDB-033, RDB-034

KENTUCKY DEPARTMENT OF HIGHWAYS

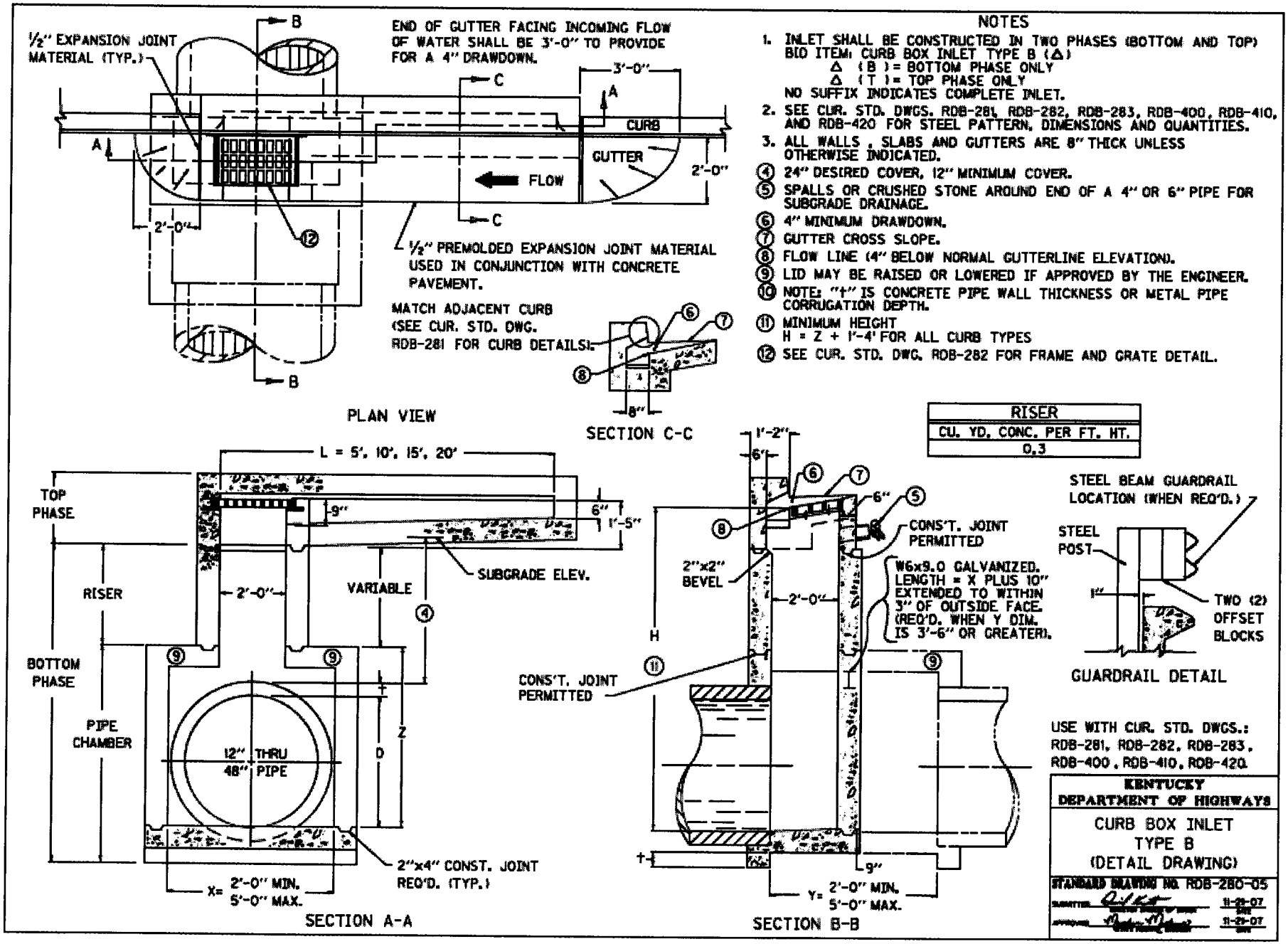
DROP BOX INLET TYPE 16

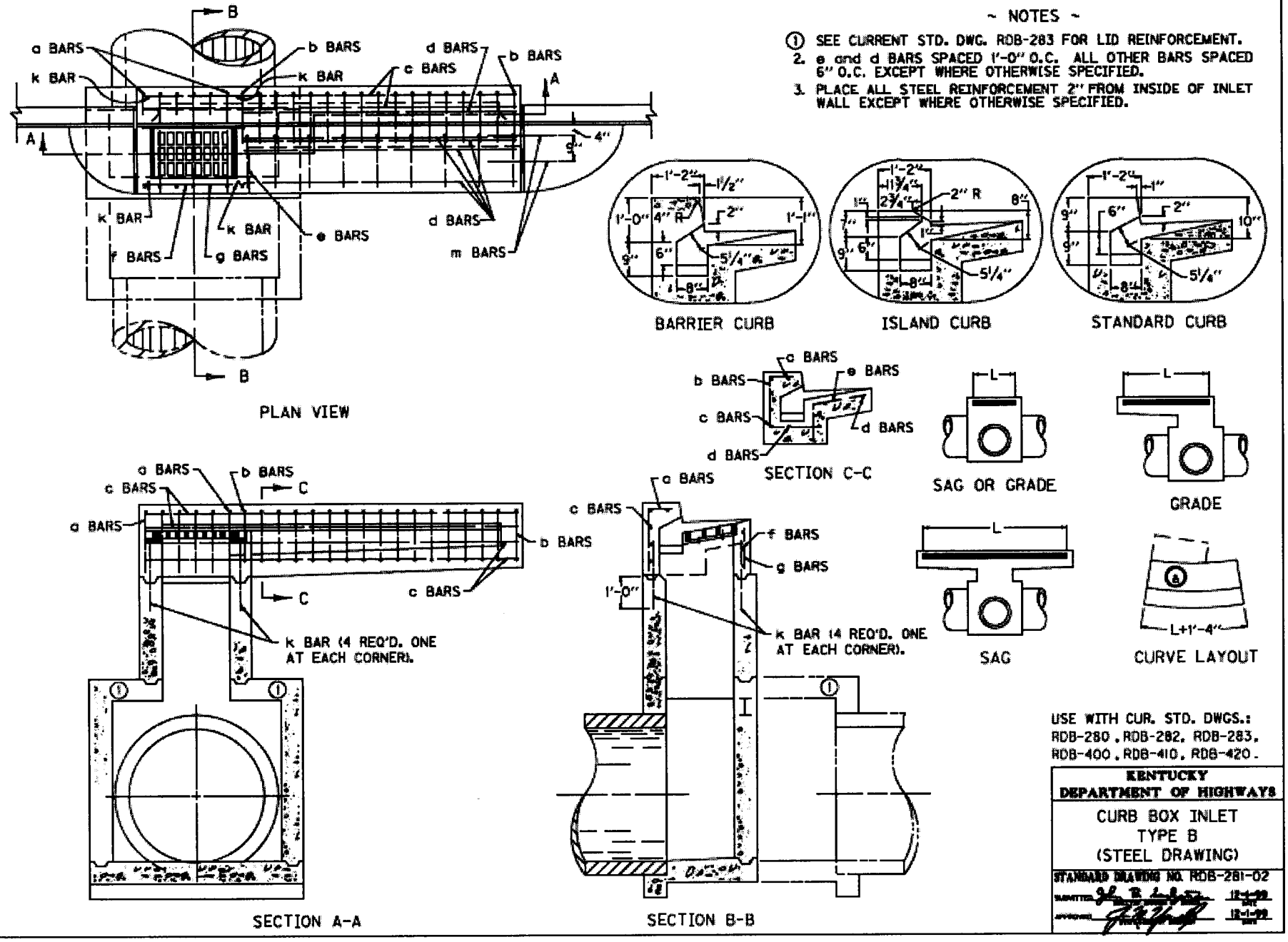
(ADDITIONAL STEEL- CHAMBER)

STANDARD DRAWING NO. RDB-035-03

SUBMITTED _____ DIVISION DIRECTOR OF DESIGN _____ 12-1-99 DATE

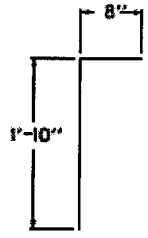
APPROVED _____ STATE HIGHWAY ENGINEER _____ 12-1-99 DATE


½" EXPANSION JOINT MATERIAL (TYP.)
END OF GUTTER FACING INCOMING FLOW OF WATER SHALL BE 3'-0" TO PROVIDE FOR A 4" DRAWDOWN.
3'-0"
CURB
GUTTER
2'-0"
FLOW
2'-0"
½" PREMOLDED EXPANSION JOINT MATERIAL USED IN CONJUNCTION WITH CONCRETE PAVEMENT.
MATCH ADJACENT CURB (SEE CUR. STD. DWG. RDB-281 FOR CURB DETAILS).
8"
PLAN VIEW
SECTION C-C
NOTES
1. INLET SHALL BE CONSTRUCTED IN TWO PHASES (BOTTOM AND TOP)
BID ITEM: CURB BOX INLET TYPE B (Δ)
Δ (B) = BOTTOM PHASE ONLY
Δ (T) = TOP PHASE ONLY
NO SUFFIX INDICATES COMPLETE INLET.
2. SEE CUR. STD. DWGS. RDB-281, RDB-282, RDB-283, RDB-400, RDB-410, AND RDB-420 FOR STEEL PATTERN, DIMENSIONS AND QUANTITIES.
3. ALL WALLS, SLABS AND GUTTERS ARE 8" THICK UNLESS OTHERWISE INDICATED.
④ 24" DESIRED COVER, 12" MINIMUM COVER.
⑤ SPALLS OR CRUSHED STONE AROUND END OF A 4" OR 6" PIPE FOR SUBGRADE DRAINAGE.
⑥ 4" MINIMUM DRAWDOWN.
⑦ GUTTER CROSS SLOPE.
⑧ FLOW LINE (4" BELOW NORMAL GUTTERLINE ELEVATION).
⑨ LID MAY BE RAISED OR LOWERED IF APPROVED BY THE ENGINEER.
⑩ NOTE: "t" IS CONCRETE PIPE WALL THICKNESS OR METAL PIPE CORRUGATION DEPTH.
⑪ MINIMUM HEIGHT
H = Z + 1'-4' FOR ALL CURB TYPES
⑫ SEE CUR. STD. DWG. RDB-282 FOR FRAME AND GRATE DETAIL.
RISER
CU. YD. CONC. PER FT. HT.
0.3
L = 5', 10', 15', 20'
TOP PHASE
9"
6"
1'-5"
SUBGRADE ELEV.
RISER
2'-0"
VARIABLE
④
BOTTOM PHASE
PIPE CHAMBER
12" THRU 48" PIPE
D
Z
t
2"x4" CONST. JOINT REQ'D. (TYP.)
X= 2'-0" MIN. 5'-0" MAX.
SECTION A-A
1'-2"
6"
⑥
⑦
6"
⑤
⑧
CONS'T. JOINT PERMITTED
2"x2" BEVEL
2'-0"
W6x9.0 GALVANIZED. LENGTH = X PLUS 10" EXTENDED TO WITHIN 3" OF OUTSIDE FACE. (REQ'D. WHEN Y DIM. IS 3'-6" OR GREATER).
H
⑪
CONS'T. JOINT PERMITTED
⑨
t
9"
Y= 2'-0" MIN. 5'-0" MAX.
SECTION B-B
STEEL BEAM GUARDRAIL LOCATION (WHEN REQ'D.)
STEEL POST
1"
TWO (2) OFFSET BLOCKS
GUARDRAIL DETAIL
USE WITH CUR. STD. DWGS.: RDB-281, RDB-282, RDB-283, RDB-400, RDB-410, RDB-420.
KENTUCKY DEPARTMENT OF HIGHWAYS
CURB BOX INLET TYPE B (DETAIL DRAWING)
STANDARD DRAWING NO. RDB-280-05
11-29-07
11-29-07

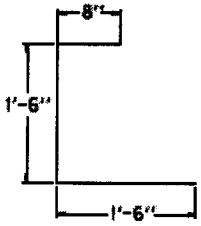

~ NOTES ~
1. SEE CURRENT STD. DWG. RDB-283 FOR LID REINFORCEMENT.
2. e and d BARS SPACED 1'-0" O.C. ALL OTHER BARS SPACED 6" O.C. EXCEPT WHERE OTHERWISE SPECIFIED.
3. PLACE ALL STEEL REINFORCEMENT 2" FROM INSIDE OF INLET WALL EXCEPT WHERE OTHERWISE SPECIFIED.
a BARS
b BARS
c BARS
d BARS
e BARS
f BARS
g BARS
k BAR
m BARS
PLAN VIEW
BARRIER CURB
ISLAND CURB
STANDARD CURB
SECTION C-C
SAG OR GRADE
GRADE
SAG
CURVE LAYOUT
k BAR (4 REQ'D. ONE AT EACH CORNER).
SECTION A-A
SECTION B-B
USE WITH CUR. STD. DWGS.:
RDB-280, RDB-282, RDB-283,
RDB-400, RDB-410, RDB-420.
KENTUCKY DEPARTMENT OF HIGHWAYS
CURB BOX INLET
TYPE B
(STEEL DRAWING)
STANDARD DRAWING NO. RDB-281-02

DIMENSIONS AND ESTIMATE OF QUANTITIES (TOP PHASE)

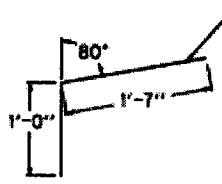
② SIZE NO.		THROAT "L"	CONC.	NO. 5 STEEL BARS																				
				BAR a		BAR b		BAR c		BAR d ④		BAR d ⑤		BAR e		BAR f		BAR g		BAR k ①		BAR m		LBS.
GRADE	SAG	FT.	CU. YD.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	
1	5	5'-0"	0.8	6	2'-6"	7	3'-7"	5	6'-0"	5	3'-0"	10	1'-6"	4	2'-7"	3	3'-0"	7	1'-2"	4	2'-0"	4	2'-0"	127
2	6	10'-0"	1.5			17			11'-0"		8'-0"		4'-0"	10										233
3	7	15'-0"	2.1			27			16'-0"		13'-0"		6'-6"	14										333
4	8	20'-0"	2.8			37			21'-0"		18'-0"		9'-0"	20										439



a BAR



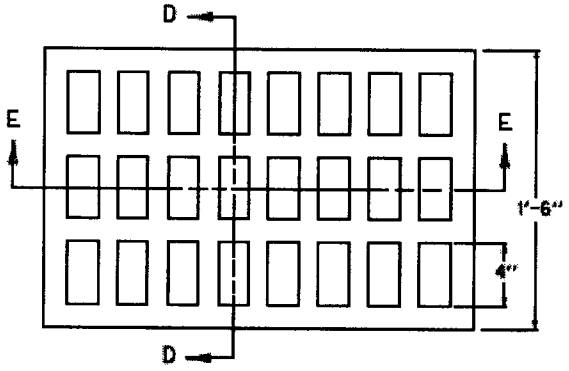
b BAR



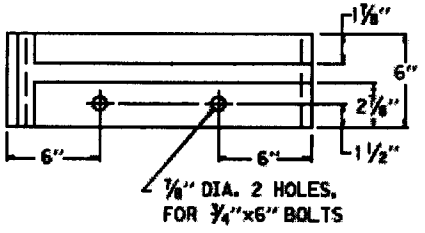
e BAR

~NOTES~

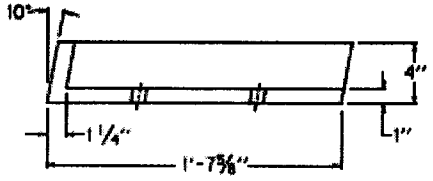
① USE k BARS ONLY IN CONJUNCTION WITH THE RISER.
② INLETS ARE SHOWN ON PLANS AS "CURB BOX INLET TYPE B". FOLLOWING THIS ON THE PLANS ARE TWO NUMBERS AND A BOX HEIGHT. USE SECOND NUMBER WITH THIS CHART.
3. MANUFACTURES' DRAFT WILL BE ACCEPTED ON ALL CASTINGS.
④ THIS SET OF d BARS ARE TO BE USED ONLY WHEN THE BOX INLET IS BUILT ON GRADE.
⑤ THIS SET OF d BARS ARE TO BE USED ONLY WHEN THE BOX INLET IS BUILT IN A SAG.
6. c, d, f, g, k, AND m BARS ARE ALL STRAIGHT BARS.
7. THE ENGINEER MAY REQUIRE ADDITIONAL REINFORCEMENT, TO ELIMINATE SETTLEMENT OF ADJOINING SIDEWALK WHEN APPLICABLE. THIS WORK SHALL BE INCIDENTAL TO THE COST OF THE CURB BOX.



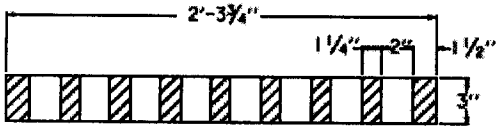
GRATE PLAN VIEW



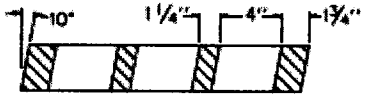
FRAME PLAN VIEW
(LEFT HALF)



FRAME ELEVATION



SECTION E-E



SECTION D-D

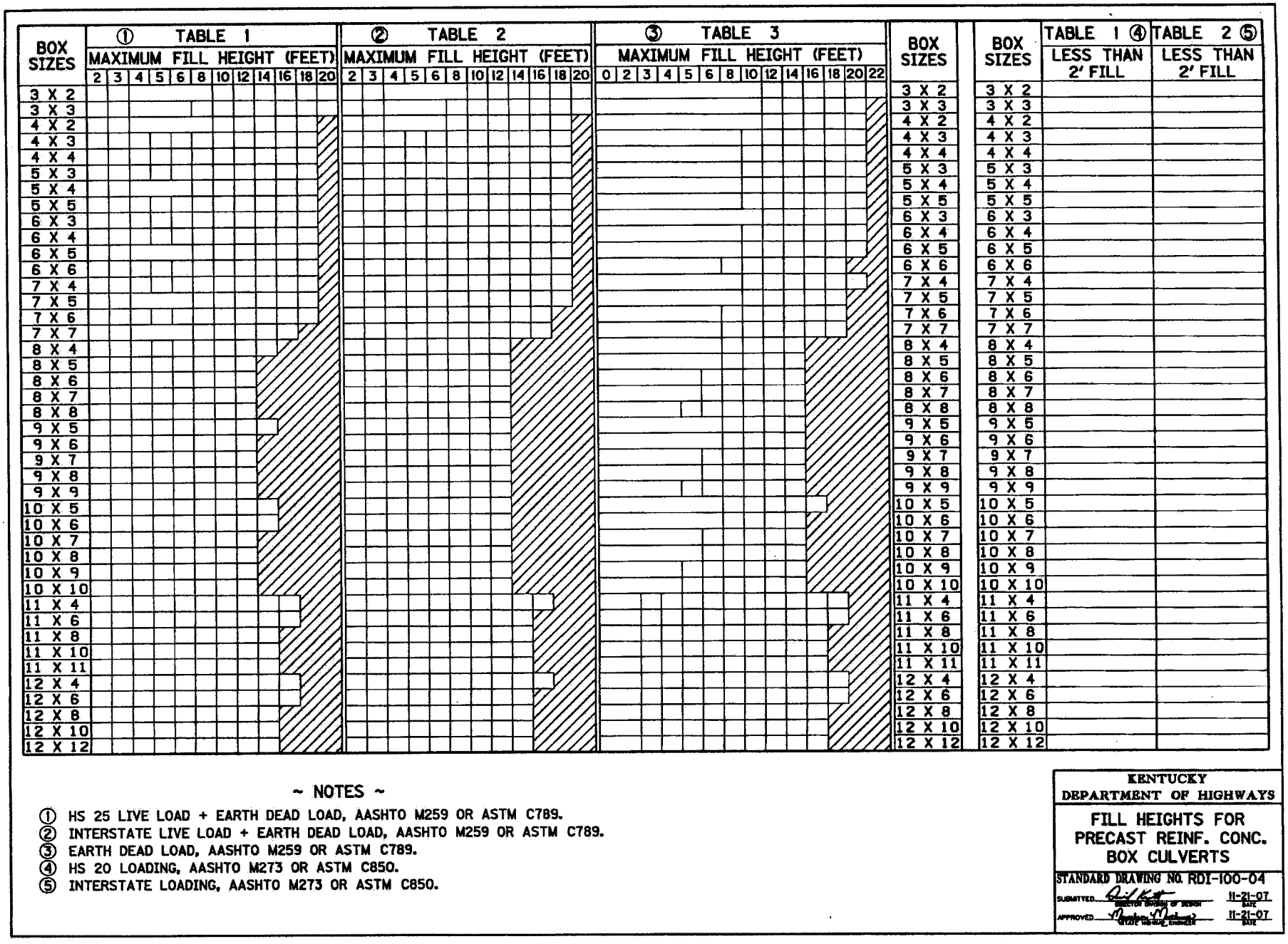
USE WITH CUR. STD. DWGS.
RDB-280, RDB-281, RDB-283
RDB-400, RDB-410, RDB-420

KENTUCKY
DEPARTMENT OF HIGHWAYS

CURB BOX INLET
TYPE B
(TOP PHASE TABLES)

STANDARD DRAWING NO. RDB-282-03

DIRECTOR — DATE 12-1-99
APPROVED — DATE 12-1-99



~ NOTES ~

① HS 25 LIVE LOAD + EARTH DEAD LOAD, AASHTO M259 OR ASTM C789.
② INTERSTATE LIVE LOAD + EARTH DEAD LOAD, AASHTO M259 OR ASTM C789.
③ EARTH DEAD LOAD, AASHTO M259 OR ASTM C789.
④ HS 20 LOADING, AASHTO M273 OR ASTM C850.
⑤ INTERSTATE LOADING, AASHTO M273 OR ASTM C850.

KENTUCKY
DEPARTMENT OF HIGHWAYS

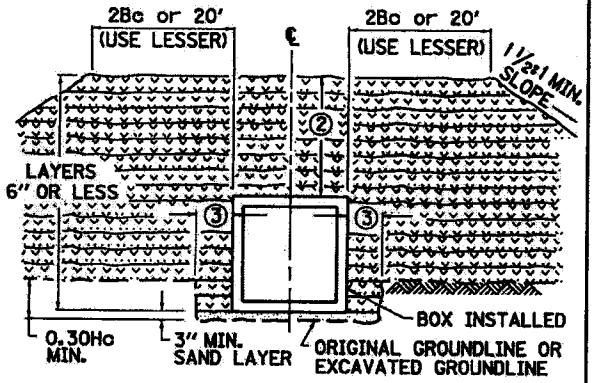
FILL HEIGHTS FOR PRECAST REINF. CONC. BOX CULVERTS

STANDARD DRAWING NO. RDI-100-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 11-21-07 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 11-21-07 DATE

POSITIVE PROJECTION



a. IF ROCK FOUNDATION IS ENCOUNTERED, GO TO PARTS b. AND c. OF STEP 3 ZERO PROJECTION AND THEN PROCEED WITH PARTS b. AND a. OF THIS STEP .

b. UNIFORMLY COMPACT SAND IN TRENCH WITH APPROXIMATELY 3" OF SAND BELOW BOTTOM OF BOX. LEVEL COMPACTED SAND WITH A TEMPLATE TO INSURE UNIFORM SUPPORT THROUGHOUT ENTIRE WIDTH AND LENGTH .

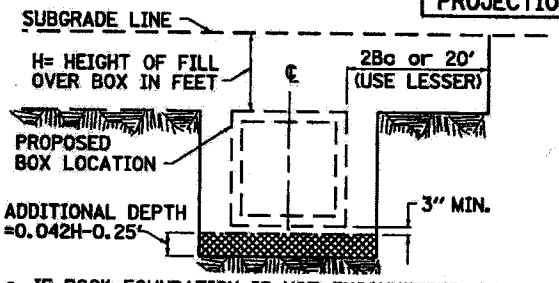
c. COMPACT SELECTED FINE SOIL TO ELEVATION ② IN LAYERS 6" OR LESS TO MEET SAME DENSITY REQUIREMENTS SPECIFIED FOR ADJACENT EMBANKMENT .

② 48" REQUIRED, IF FILL HEIGHT PERMITS .

③ 0.3 Bc OR 1'-0" (USE MAX.)

ROCK FOUNDATION DETAILS

STEP 3 ZERO PROJECTION

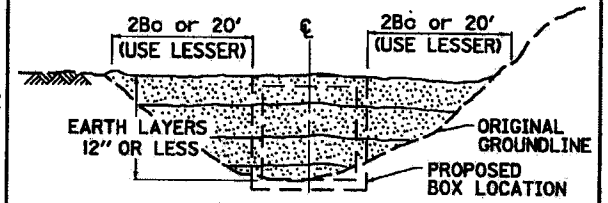


a. IF ROCK FOUNDATION IS NOT ENCOUNTERED, GO DIRECTLY TO STEP 4.

b. IF ROCK FOUNDATION IS ENCOUNTERED, EXCAVATE ADDITIONAL TRENCH DEPTH USING FORMULA GIVEN. THIS ADDITIONAL DEPTH SHALL ALWAYS BE AT LEAST 0.75' AND WILL NOT BE REQUIRED TO BE MORE THAN 0.75HC-0.25', REGARDLESS OF ABOVE FORMULA RESULT.

c. BACKFILL ADDITIONAL EXCAVATED AREA WITH EARTH CUSHION OF FIRMLY COMPACTED FINE SOILS IN LAYERS 6" OR LESS.

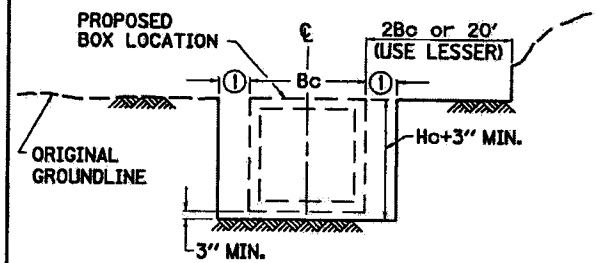
STEP 1 ZERO PROJECTION



a. IF ORIGINAL GROUNDLINE IS AT OR ABOVE THE TOP OF PROPOSED BOX FOR WIDTH OF 2Bc OR 20' (WHICHEVER IS LESS) ON EACH SIDE OF THE BOX, GO DIRECTLY TO STEP 2.

b. IF ORIGINAL GROUNDLINE IS BELOW THE TOP OF PROPOSED BOX, COMPACT EMBANKMENT IN LAYERS 12" OR LESS TO ELEVATION AND WIDTH SHOWN. MEET DENSITY REQUIREMENTS FOR ADJACENT EMBANKMENT.

STEP 2 ZERO PROJECTION

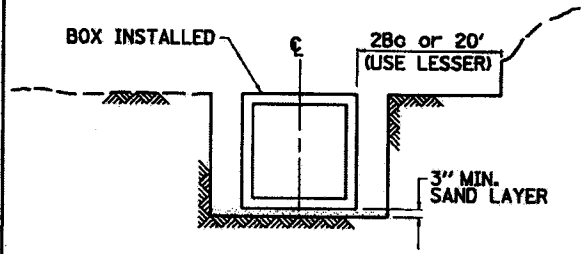


a. EXCAVATE TO TOP OF PROPOSED BOX A WIDTH OF 2Bc OR 20' (USE LESSER) ON EACH SIDE OF BOX.

b. EXCAVATE TRENCH TO WIDTH AND DEPTH SHOWN.

① AT LEAST 12", BUT NOT MORE THAN 15".

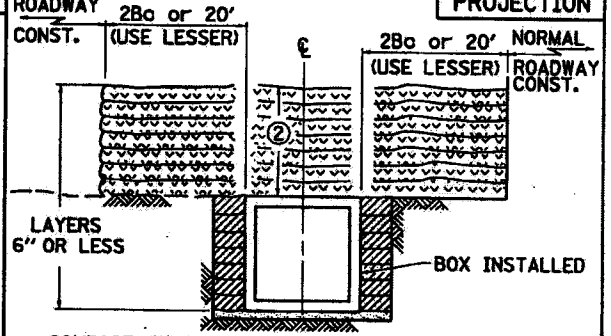
STEP 4 ZERO PROJECTION



a. UNIFORMLY COMPACT SAND IN TRENCH WITH APPROXIMATELY 3" OF SAND BELOW BOTTOM OF BOX. LEVEL COMPACTED SAND WITH A TEMPLATE TO INSURE UNIFORM SUPPORT THROUGHOUT ENTIRE WIDTH AND LENGTH.

b. INSTALL BOX AT CORRECT ALIGNMENT AND ELEVATION. RECOMPACT ANY LOOSE SAND DISTURBED DURING INSTALLATION.

STEP 5 ZERO PROJECTION



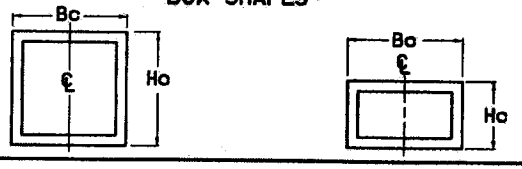
a. COMPACT SELECTED FINE SOIL, NATURAL SAND, OR NO. 10 COARSE AGGREGATE IN LAYERS 6" OR LESS TO TOP OF THE BOX. THEN COMPACT SELECTED FINE SOIL TO ELEVATION ② ABOVE TOP OF BOX. MEET DENSITY REQUIREMENTS FOR ADJACENT EMBANKMENT.

b. PROCEED WITH NORMAL ROADWAY CONSTRUCTION.

② 48" REQUIRED, IF FILL HEIGHT PERMITS.

NOTE: THE CONTRACTOR HAS THE OPTION TO, EITHER BED AND BACKFILL THE PRECAST BOX IN POSITIVE PROJECTION AS DESCRIBED ABOVE, OR MAY BED AND BACKFILL TO ZERO PROJECTION AS DETAILED AND DESCRIBED IN STEPS 1 THRU 5. IN EITHER CASE PARTS b. AND a. OF STEP 3 ZERO PROJECTION MUST BE PERFORMED IN THE EVENT ROCK FOUNDATION IS ENCOUNTERED.

~BOX SHAPES~



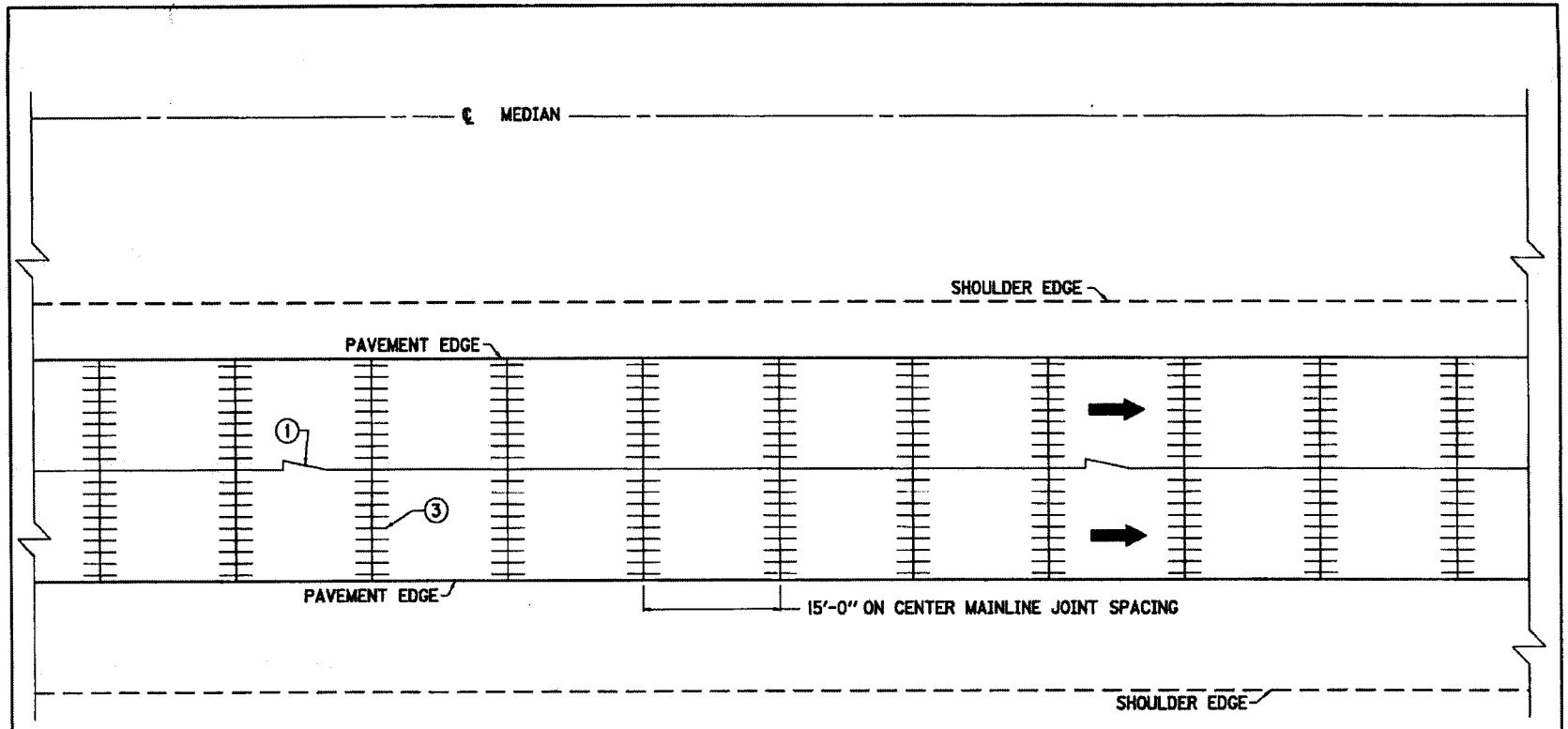
KENTUCKY
DEPARTMENT OF HIGHWAYS

BEDDING FOR PRECAST BOX CULVERTS, SEWERS, STORM DRAINS, AND THEIR COMBINATIONS

STANDARD DRAWING NO. RDI-120-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-1-99 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-1-99 DATE



PLAN VIEW

NOTES

JOINTS

TRANSVERSE CONTRACTION JOINTS SHALL BE SPACED 15'-0" ON CENTER AND SAWED TO A MINIMUM DEPTH OF ONE THIRD OF THE PAVEMENT THICKNESS (T/3) OR 4" WHICHEVER IS LESS. ALL TRANSVERSE CONTRACTION AND TRANSVERSE EXPANSION JOINTS SHALL REQUIRE LOAD TRANSFER ASSEMBLIES AS DETAILED ON THE PLANS OR STANDARD DRAWINGS.

JOINT SPACING AND TYPE, AT BRIDGE ENDS, SHALL BE REQUIRED AS SHOWN ON THE PLANS OR CURRENT STANDARD DRAWING RPS-010.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 501.03.17.

①③ SEE CURRENT STANDARD DRAWING RPS-010 FOR JOINT SYMBOLS AND DETAILS.

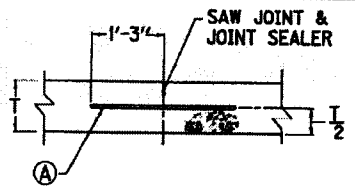
KENTUCKY
DEPARTMENT OF HIGHWAYS

JOINTED PLAIN
CONCRETE PAVEMENT

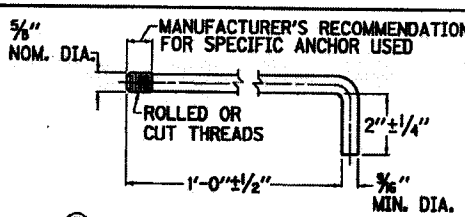
STANDARD DRAWING NO. RPN-015-04

SUBMITTED _____ 12-2-02 DATE

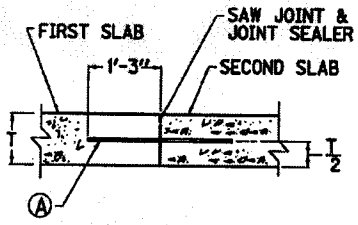
APPROVED _____ 12-2-02 DATE



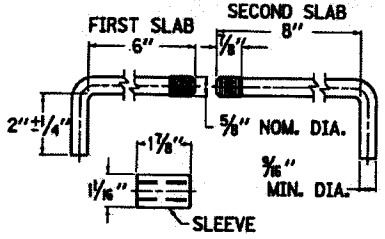
① LONGITUDINAL SAWED JOINT



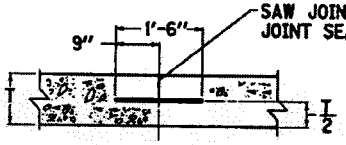
Ⓑ HOOK BOLT FOR USE WITH EXPANSION ANCHOR
(SEE STANDARD SPECIFICATIONS FOR BASIS OF PAYMENT)



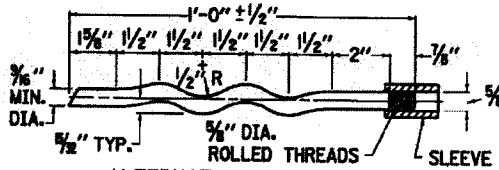
② LONGITUDINAL SAWED CONSTRUCTION JOINT



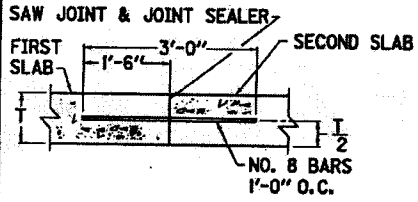
ALTERNATE 1
HOOK BOLTS FOR
CONSTRUCTION JOINTS



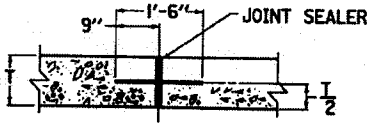
③ TRANSVERSE SAWED CONTRACTION JOINT



ALTERNATE 2 (FIRST SLAB)
DEFORMED ANCHOR BOLT
(TO BE USED WITH 8" HOOK BOLT)



④ TRANSVERSE SAWED CONSTRUCTION JOINT



⑤ TRANSVERSE EXPANSION JOINT

5/8" PLASTIC INSERT

JOINT SYMBOLS

- ① LONGITUDINAL SAWED JOINT
- ② LONGITUDINAL SAWED CONSTRUCTION JOINT
- ③ TRANSVERSE SAWED CONTRACTION JOINT
- ④ TRANSVERSE SAWED CONSTRUCTION JOINT (1'-0" MIN.)
- ⑤ TRANSVERSE EXPANSION JOINT
- 1a LONGITUDINAL SAWED JOINT (WITHOUT TIE BARS)
- 2a LONGITUDINAL SAWED CONSTRUCTION JOINT (WITHOUT TIE BARS)
- 3a TRANSVERSE SAWED CONTRACTION JOINT (WITHOUT LOAD TRANSFER ASSEMBLY)
- 4a TRANSVERSE SAWED CONSTRUCTION JOINT (WITHOUT TIE BARS)
- 5a 1/2" TRANSVERSE EXPANSION JOINT (WITHOUT LOAD TRANSFER ASSEMBLY)

NOTES

LONGITUDINAL JOINTS SHALL BE USED WHEN SHOWN ON THE TYPICAL SECTION, AND STANDARD DRAWINGS AND SHALL BE CONSTRUCTED AS SHOWN ON THIS DRAWING.

LONGITUDINAL CONSTRUCTION JOINTS BETWEEN ADJOINING SLABS, AND PAVED IN SEPARATE OPERATIONS SHALL USE HOOK-BOLTS OR TIE BARS AND BE CONSTRUCTED AS SHOWN ON THIS DRAWING.

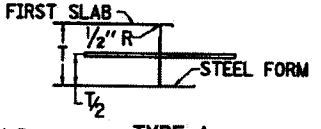
IN LIEU OF THE DEFORMED TIE BARS THE CONTRACTOR SHALL BE PERMITTED TO USE EITHER ALT. 1 OR ALT. 2 HOOK BOLT AS DETAILED.

SLIP-FORM PAVEMENT

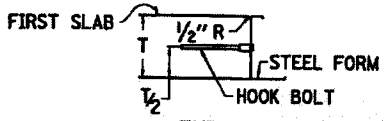
④ DEFORMED TIE BARS USED IN TRANSVERSE CONSTRUCTION JOINTS SHALL BE NO CLOSER THAN 6" TO THE PAVEMENT EDGE OR ANY LONGITUDINAL JOINT.

Ⓐ NO. 5 DEFORMED TIE BAR 2'-6" LONG PLACED 1'-8" ON CENTER AND PLACED 1'-8" MINIMUM FROM ANY TRANSVERSE JOINT.

Ⓑ EXPANSION ANCHOR FOR BOLT SIZE INDICATED SHALL BE BETHLEHEM MINE ROOF EXPANSION TYPE WITH K-1 SHELL , PHILLIPS RED HEAD ANCHOR, CHICAGO EXPANSION BOLT CO. - SPECIAL FLUSH SELF DRILLING ANCHOR , OR APPROVED TYPE. INSTALLATION SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION. HOOK BOLTS WITH EXPANSION ANCHORS ATTACHED SHALL NOT BE LESS THAN 14" IN LENGTH. HOOK BOLTS WITH EXPANSION ANCHORS SHALL BE SPACED 5'-0" O.C.



TYPE A



TYPE B

METHODS OF FORMING CONSTRUCTION JOINTS WHEN FORMS ARE USED

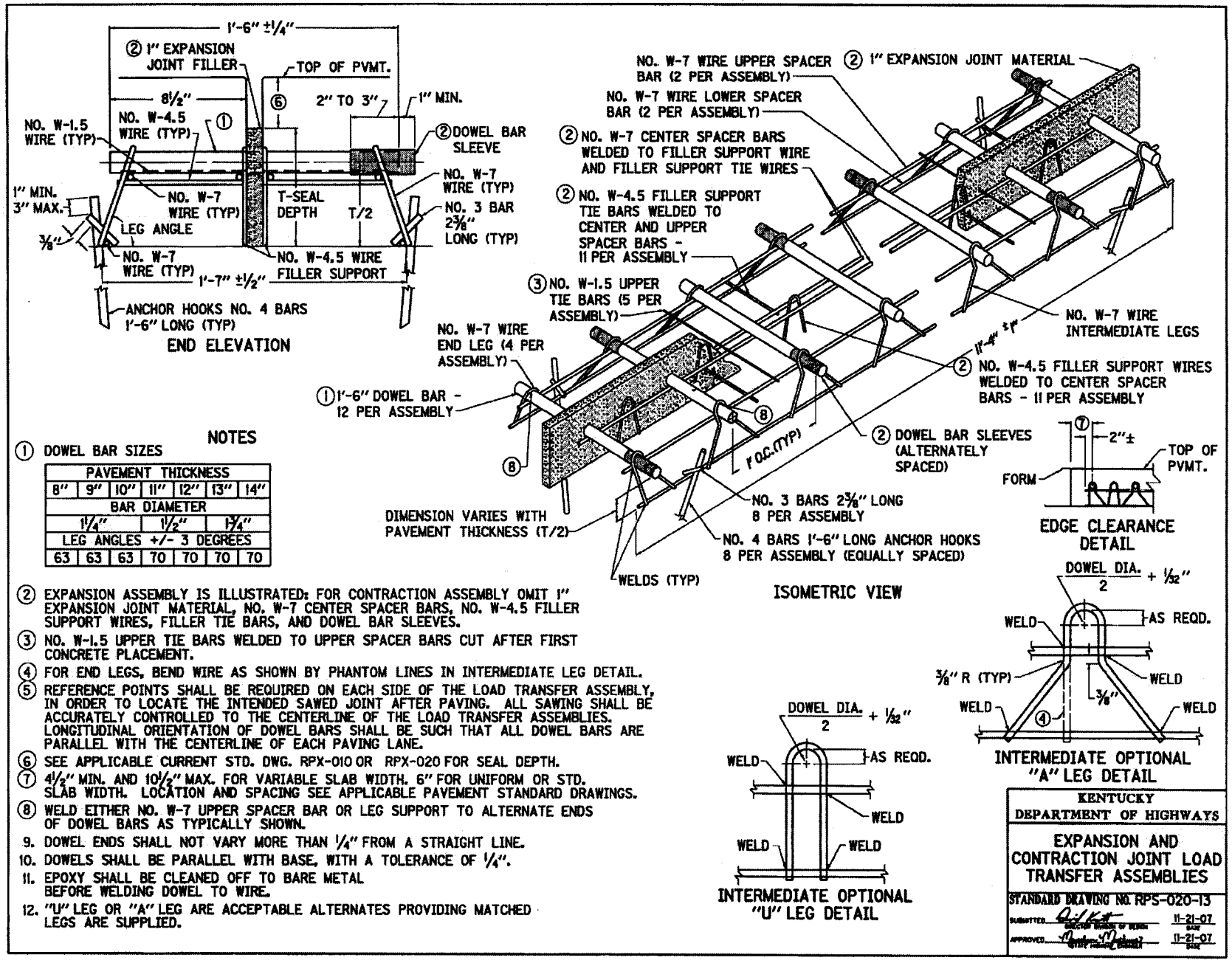
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE PAVEMENT JOINT DETAILS

STANDARD DRAWING NO. RPS-010-10

SUBMITTED _____ 12-2-02 DATE

APPROVED _____ 12-2-02 DATE



NOTES

① DOWEL BAR SIZES

PAVEMENT THICKNESS						
8"	9"	10"	11"	12"	13"	14"
BAR DIAMETER						
1¼"			1½"		1¾"	
LEG ANGLES +/- 3 DEGREES						
63	63	63	70	70	70	70

② EXPANSION ASSEMBLY IS ILLUSTRATED: FOR CONTRACTION ASSEMBLY OMIT 1" EXPANSION JOINT MATERIAL, NO. W-7 CENTER SPACER BARS, NO. W-4.5 FILLER SUPPORT WIRES, FILLER TIE BARS, AND DOWEL BAR SLEEVES.

③ NO. W-1.5 UPPER TIE BARS WELDED TO UPPER SPACER BARS CUT AFTER FIRST CONCRETE PLACEMENT.

④ FOR END LEGS, BEND WIRE AS SHOWN BY PHANTOM LINES IN INTERMEDIATE LEG DETAIL.

⑤ REFERENCE POINTS SHALL BE REQUIRED ON EACH SIDE OF THE LOAD TRANSFER ASSEMBLY, IN ORDER TO LOCATE THE INTENDED SAWED JOINT AFTER PAVING. ALL SAWING SHALL BE ACCURATELY CONTROLLED TO THE CENTERLINE OF THE LOAD TRANSFER ASSEMBLIES. LONGITUDINAL ORIENTATION OF DOWEL BARS SHALL BE SUCH THAT ALL DOWEL BARS ARE PARALLEL WITH THE CENTERLINE OF EACH PAVING LANE.

⑥ SEE APPLICABLE CURRENT STD. DWG. RPX-010 OR RPX-020 FOR SEAL DEPTH.

⑦ 4½" MIN. AND 10½" MAX. FOR VARIABLE SLAB WIDTH. 6" FOR UNIFORM OR STD. SLAB WIDTH. LOCATION AND SPACING SEE APPLICABLE PAVEMENT STANDARD DRAWINGS.

⑧ WELD EITHER NO. W-7 UPPER SPACER BAR OR LEG SUPPORT TO ALTERNATE ENDS OF DOWEL BARS AS TYPICALLY SHOWN.

9. DOWEL ENDS SHALL NOT VARY MORE THAN ¼" FROM A STRAIGHT LINE.

10. DOWELS SHALL BE PARALLEL WITH BASE, WITH A TOLERANCE OF ¼".

11. EPOXY SHALL BE CLEANED OFF TO BARE METAL BEFORE WELDING DOWEL TO WIRE.

12. "U" LEG OR "A" LEG ARE ACCEPTABLE ALTERNATES PROVIDING MATCHED LEGS ARE SUPPLIED.

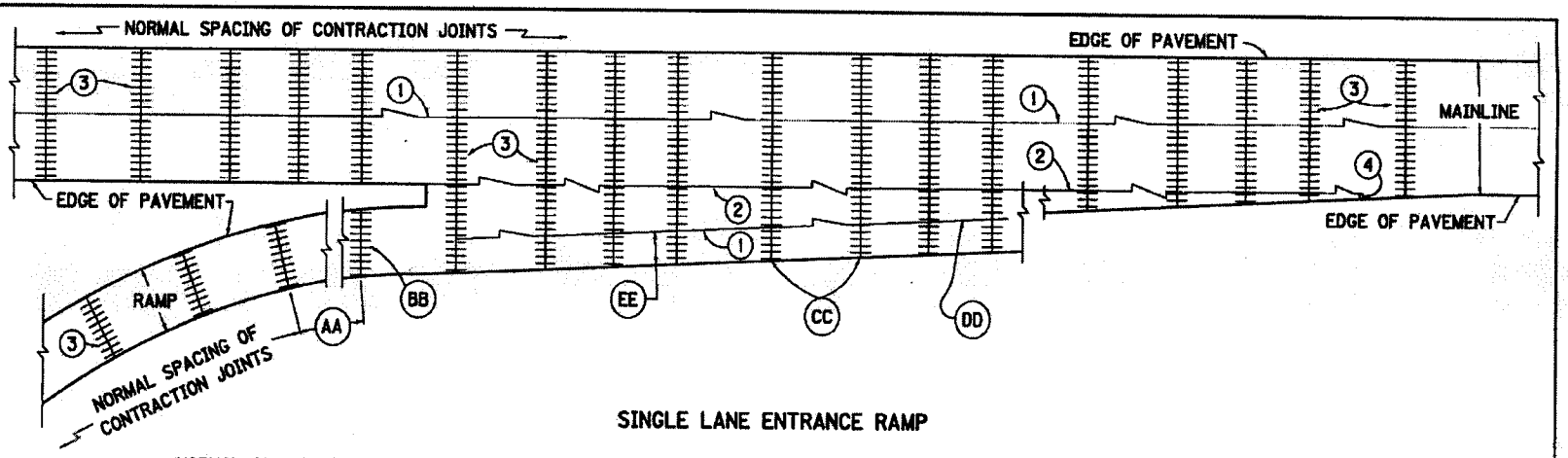
KENTUCKY DEPARTMENT OF HIGHWAYS

EXPANSION AND CONTRACTION JOINT LOAD TRANSFER ASSEMBLIES

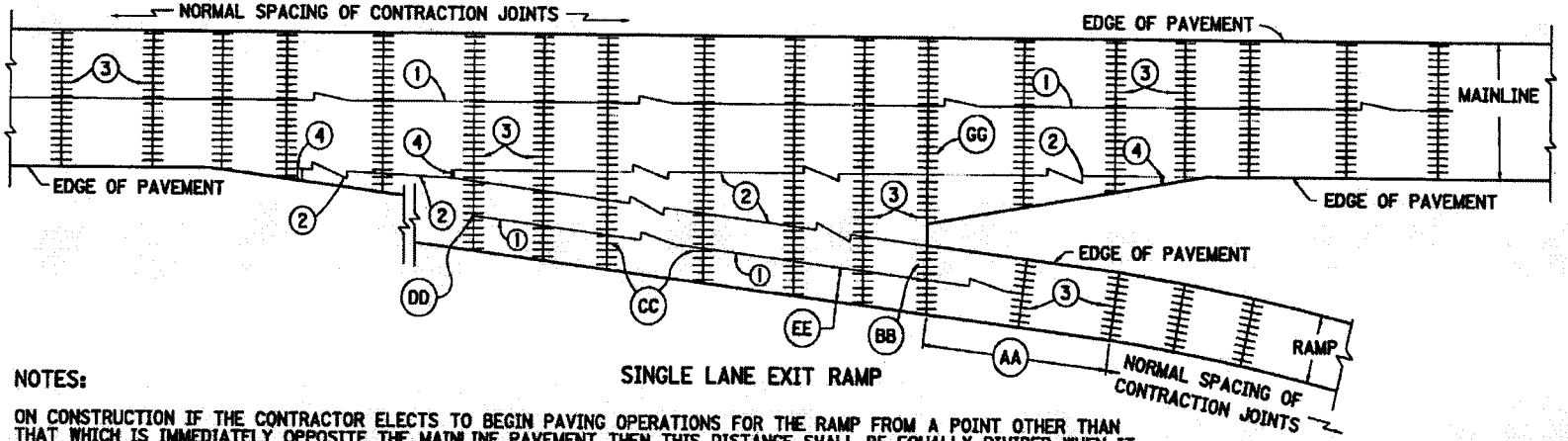
STANDARD DRAWING NO. RPS-020-13

SUBMITTED: DIRECTOR DIVISION OF DESIGN — DATE: 11-21-07

APPROVED: STATE HIGHWAY ENGINEER — DATE: 11-21-07



SINGLE LANE ENTRANCE RAMP



SINGLE LANE EXIT RAMP

NOTES:

(AA) ON CONSTRUCTION IF THE CONTRACTOR ELECTS TO BEGIN PAVING OPERATIONS FOR THE RAMP FROM A POINT OTHER THAN THAT WHICH IS IMMEDIATELY OPPOSITE THE MAINLINE PAVEMENT THEN THIS DISTANCE SHALL BE EQUALLY DIVIDED WHEN IT BECOMES GREATER THAN 20 FEET AND LESS THAN 40 FEET.

(BB) THIS CONTRACTION JOINT IN THE RAMP SHALL ALWAYS BE OPPOSITE THE CONTRACTION JOINT IN THE MAINLINE PAVEMENT.

(CC) ALL CONTRACTION JOINTS IN THE RAMP IMMEDIATELY OPPOSITE THE MAINLINE PAVEMENT SHALL BE A CONTINUATION OF THE JOINTS IN THE MAINLINE PAVEMENT.

(DD) LONGITUDINAL SAWED JOINT SHALL END AT THE NEAREST CONTRACTION JOINT, WHERE THE OVERALL WIDTH OF THE RAMP IS A MAXIMUM OF 16 FEET.

(EE) THIS DISTANCE SHALL BE EQUAL TO ½ THE NORMAL RAMP SECTION.

FF. LONGITUDINAL SAWED JOINTS AT CENTERLINE SHALL BE REQUIRED FOR ALL RAMPS AND LOOP WIDTHS GREATER THAN 16 FEET.

(GG) THIS CONTRACTION JOINT SHALL ALWAYS BE PLACED OPPOSITE THE NOSE OF THE RAMP. THE TWO CONTRACTION JOINTS IMMEDIATELY PRECEEDING THIS JOINT, DEPENDING ON THE DIRECTION OF PAVING OPERATIONS, SHALL BE EQUALLY DIVIDED, PROVIDED THE SPACING DOES NOT EXCEED THE NORMAL SPACING. SHOULD SPACING BE GREATER THAN NORMAL, AN EXTRA JOINT SHALL BE ADDED AND THE DISTANCE EQUALLY DIVIDED. THE JOINT IMMEDIATELY FOLLOWING THE JOINT THAT IS PLACED OPPOSITE THE RAMP NOSE SHALL BE NORMALLY SPACED.

HH. SEE CURRENT STANDARD DRAWING RPS-010 FOR JOINT SYMBOLS AND DETAILS.

II. NORMAL SPACING OF CONTRACTION JOINTS INDICATED ON THIS DRAWING ARE TO BE IN ACCORDANCE WITH SPACING INDICATED ON CURRENT STANDARD DRAWING RPN-015.

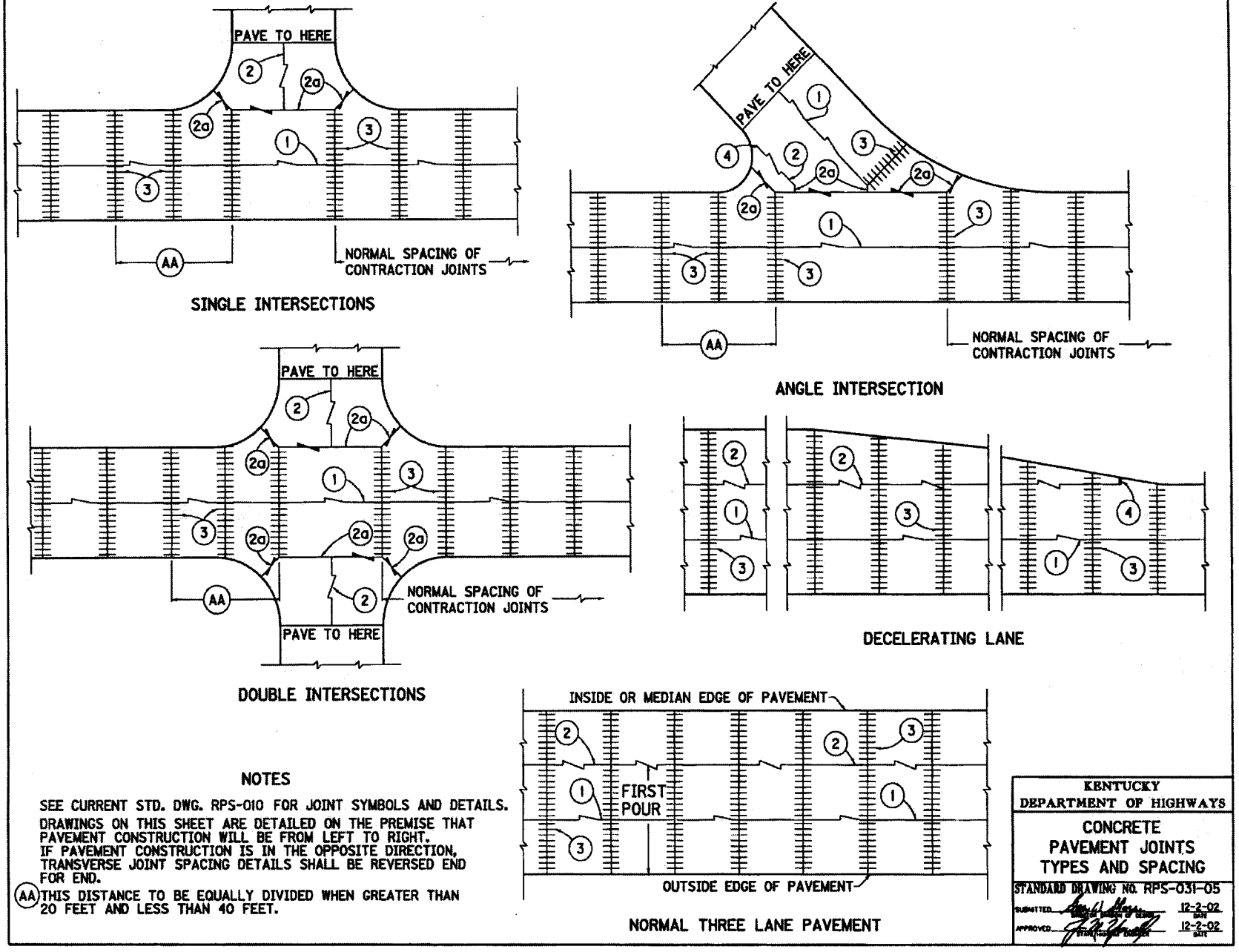
KENTUCKY
DEPARTMENT OF HIGHWAYS

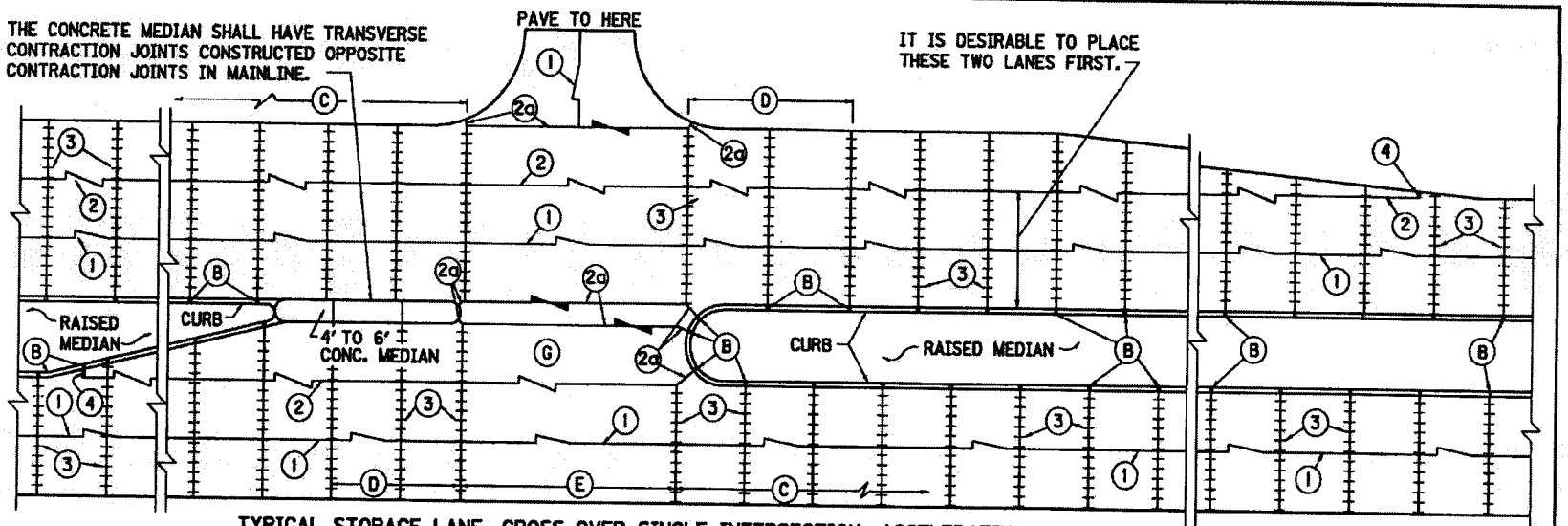
CONCRETE
PAVEMENT JOINTS
TYPES AND SPACING

STANDARD DRAWING NO. RPS-030-05

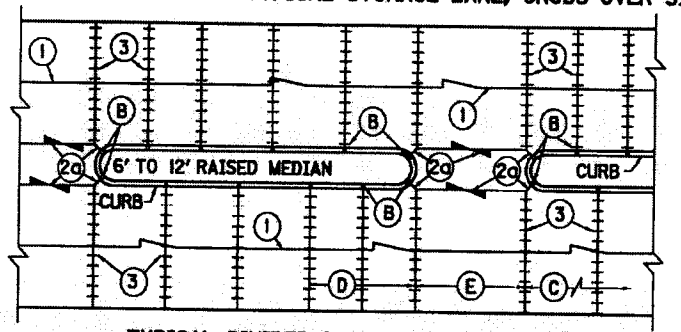
SUBMITTED 12-2-02 DATE

APPROVED 12-2-02 DATE

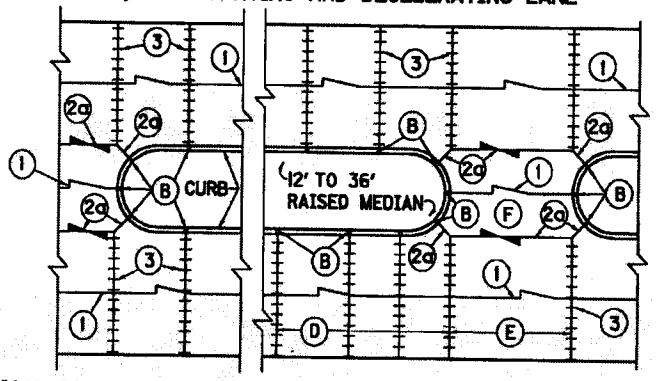

PAVE TO HERE
2
2a
2a
1
3
3
AA
NORMAL SPACING OF CONTRACTION JOINTS
SINGLE INTERSECTIONS
PAVE TO HERE
1
4
2
2a
3
2a
2a
1
3
3
3
AA
NORMAL SPACING OF CONTRACTION JOINTS
ANGLE INTERSECTION
PAVE TO HERE
2
2a
2a
1
3
3
2a
2a
2a
AA
2
NORMAL SPACING OF CONTRACTION JOINTS
PAVE TO HERE
DOUBLE INTERSECTIONS
2
2
1
3
3
4
1
3
DECELERATING LANE
INSIDE OR MEDIAN EDGE OF PAVEMENT
2
2
3
1
FIRST POUR
1
3
OUTSIDE EDGE OF PAVEMENT
NORMAL THREE LANE PAVEMENT
NOTES
SEE CURRENT STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAILS.
DRAWINGS ON THIS SHEET ARE DETAILED ON THE PREMISE THAT PAVEMENT CONSTRUCTION WILL BE FROM LEFT TO RIGHT. IF PAVEMENT CONSTRUCTION IS IN THE OPPOSITE DIRECTION, TRANSVERSE JOINT SPACING DETAILS SHALL BE REVERSED END FOR END.
(AA) THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20 FEET AND LESS THAN 40 FEET.
KENTUCKY DEPARTMENT OF HIGHWAYS
CONCRETE PAVEMENT JOINTS TYPES AND SPACING
STANDARD DRAWING NO. RPS-031-05
SUBMITTED
12-2-02
DATE
APPROVED
12-2-02
DATE



TYPICAL STORAGE LANE, CROSS-OVER SINGLE INTERSECTION, ACCELERATING AND DECELERATING LANE



TYPICAL DIVIDED PAVEMENT WITH NARROW RAISED MEDIAN AND CROSS-OVER



TYPICAL DIVIDED PAVEMENT WITH WIDE RAISED MEDIAN AND CROSS-OVER

NOTES:

SEE CURRENT STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAIL.

ALL INTEGRAL CURBS CONSTRUCTED WITH CONCRETE BASE OR PAVEMENT SHALL HAVE JOINTS COINCIDING WITH THE TRANSVERSE JOINTS AND OTHER JOINTS SHOWN ON THIS STANDARD DRAWING. THE JOINTS SHALL BE FILLED WITH ½" PREMOLDED EXPANSION JOINT FILLER, CUT TO THE REQUIRED SECTION.

(B) ½" EXPANSION JOINT FILLER.

(C) NORMAL SPACING OF CONTRACTION JOINTS 15'-0" ON CENTER.

(D) THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20 FEET AND LESS THAN 40 FEET.

(E) NO CONTRACTION JOINT REQUIRED WHEN DISTANCE LESS THAN NORMAL SPACING OF JOINTS. EQUALLY DIVIDED WHEN DISTANCE IS GREATER THAN 20 FEET AND LESS THAN 40 FEET.

(F) A LONGITUDINAL SAWED JOINT SHALL BE CONSTRUCTED IN THE CROSS-OVER WHEN THE WIDTH OF CROSS-OVER BECOMES GREATER THAN 16 FEET AND LESS THAN 24 FEET. WHEN WIDTH BECOMES GREATER THAN 24 FEET A LONGITUDINAL SAWED AND LONGITUDINAL CONSTRUCTION JOINT SHALL BE CONSTRUCTED IN THE CROSS-OVER.

(G) SHOULD THE CROSS-OVER LENGTH BECOME GREATER THAN NORMAL SPACING OF CONTRACTION JOINTS A TRANSVERSE CONTRACTION JOINT SHALL BE PLACED IN THE CROSS-OVER OPPOSITE THE CONTRACTION JOINTS IN THE MAINLINE.

USE WITH CUR. STD. DWG. RPS-010

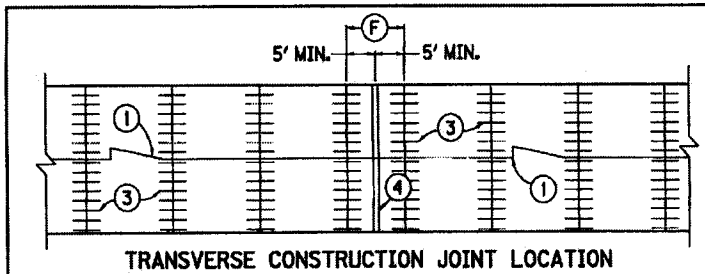
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

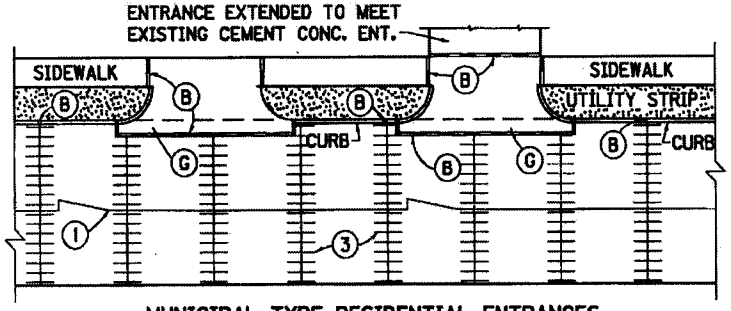
STANDARD DRAWING NO. RPS-032-05

SUBMITTED _____ 12-2-02 DATE

APPROVED _____ 12-2-02 DATE



TRANSVERSE CONSTRUCTION JOINT LOCATION

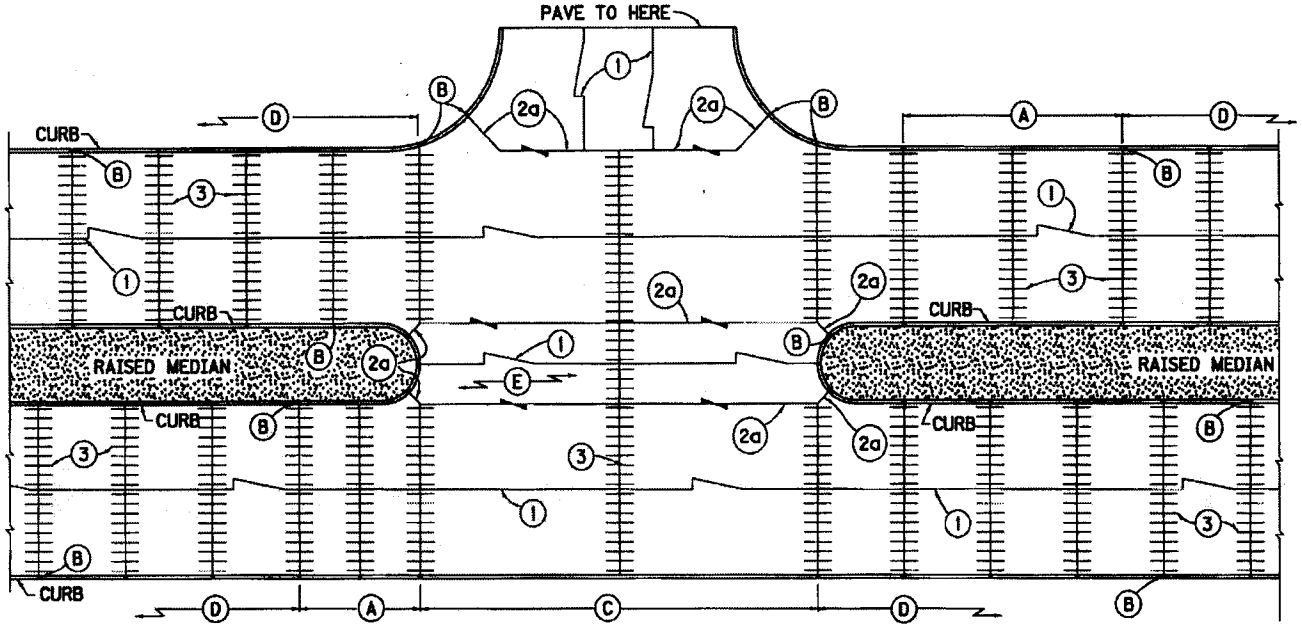


MUNICIPAL TYPE RESIDENTIAL ENTRANCES

NOTES

1. SEE CURRENT STANDARD DRAWING RPS-010 FOR JOINT SYMBOLS AND DETAILS.
2. THE INSTALLATION OF LONGITUDINAL SAWED AND CONSTRUCTION JOINTS IN TURNOUTS SHALL DEPEND ON WIDTH OF TURNOUT WITH THE RULE THAT 16 FEET SHALL BE MAXIMUM POUR WITHOUT CONSTRUCTION OF A LONGITUDINAL JOINT.
3. ALL INTEGRAL CURBS CONSTRUCTED WITH CONCRETE BASE OR PAVEMENT SHALL HAVE JOINTS COINCIDING WITH THE TRANSVERSE JOINTS AND OTHER JOINTS SHOWN ON THIS STANDARD DRAWING. THE JOINTS SHALL BE FILLED WITH ½" PREMOLDED EXPANSION JOINT FILLER, CUT TO REQUIRED SECTION.

Ⓐ THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20' AND LESS THAN 40'.
Ⓑ ½" EXPANSION JOINT FILLER.
Ⓒ THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20' AND LESS THAN 40'. NO TRANSVERSE JOINT WILL BE REQUIRED IF DISTANCE IS LESS THAN NORMAL SPACING OF JOINTS.
Ⓓ NORMAL SPACING OF CONTRACTION JOINTS.
Ⓔ EQUALLY DIVIDE AND CONSTRUCT LONGITUDINAL SAWED JOINT WHEN WIDTH OF CROSSOVER BECOMES GREATER THAN 16' AND LESS THAN 24'. WHEN WIDTH BECOMES GREATER THAN 24', A LONGITUDINAL SAWED AND LONGITUDINAL CONSTRUCTION JOINT SHALL BE CONSTRUCTED IN THE CROSSOVER.
Ⓕ NORMAL SPACING OF TRANSVERSE CONTRACTION JOINTS.
Ⓖ SEE CURRENT STD. DWG. RPM-150 OR RPM-152 , AS APPLICABLE FOR MORE DETAIL.



TYPICAL DIVIDED LANE WITH CROSSOVER AND CURB

USE WITH CUR. STD. DWG. RPS-010

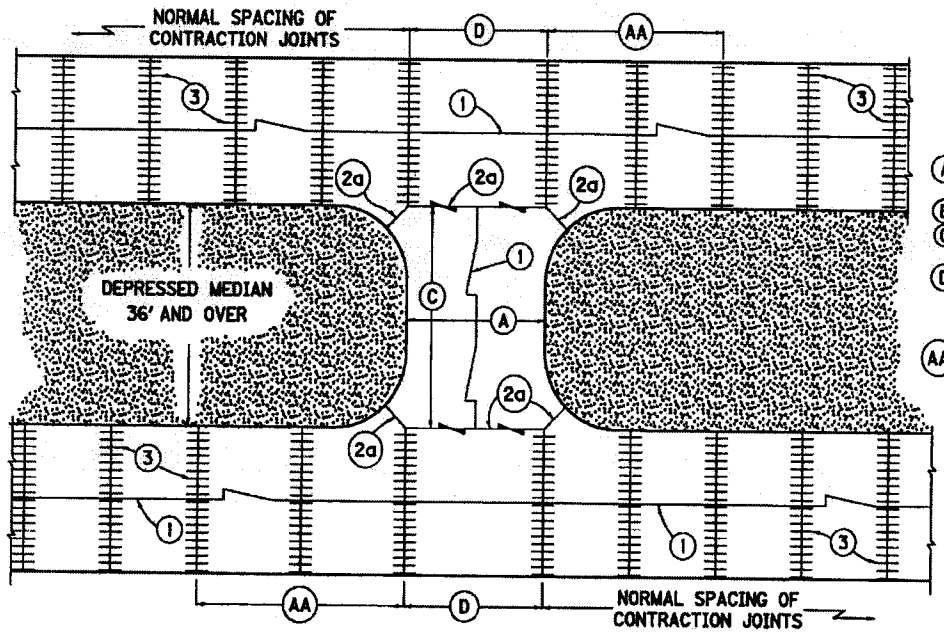
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

STANDARD DRAWING NO. RPS-033-06

SUBMITTED 12-2-02 DATE

APPROVED 12-2-02 DATE



TYPICAL DIVIDED PAVEMENT WITH DEPRESSED MEDIAN AND CROSSOVER

NOTES

ALL INTEGRAL CURBS CONSTRUCTED WITH CONCRETE BASE OR PAVEMENT SHALL HAVE JOINTS COINCIDING WITH THE TRANSVERSE JOINTS AND OTHER JOINTS SHOWN ON THIS STANDARD DRAWING. THE JOINTS SHALL BE FILLED WITH ½" PREMOLDED EXPANSION JOINT FILLER, CUT TO THE REQUIRED SECTION.

SEE CURRENT STANDARD DRAWING RPS-010 FOR JOINT SYMBOLS AND DETAILS.

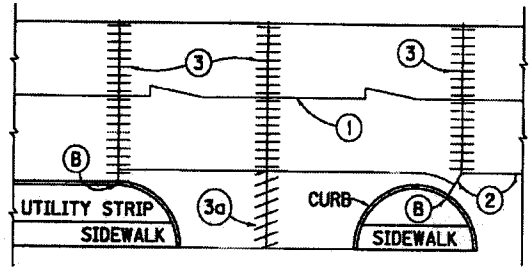
(A) EQUALLY DIVIDE AND CONSTRUCT LONGITUDINAL SAWED JOINT WHEN DISTANCE BECOMES GREATER THAN 16 FEET.

(B) ½" EXPANSION JOINT FILLER.

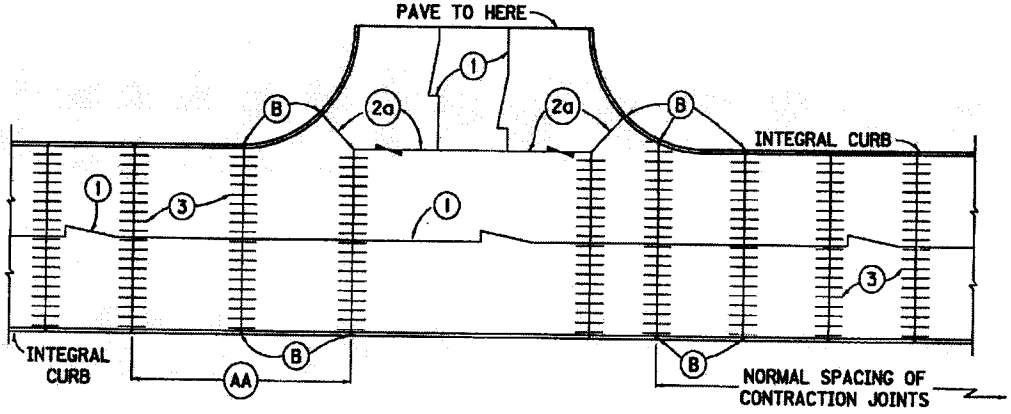
(C) TRANSVERSE CONTRACTION JOINT REQUIRED ONLY WHEN DISTANCE IN EXCESS OF NORMAL SPACING OF CONTRACTION JOINTS.

(D) NO CONTRACTION JOINTS REQUIRED BETWEEN THESE TWO CONTRACTION JOINTS WHEN DISTANCE IS LESS THAN NORMAL SPACING OF JOINTS. EQUALLY DIVIDE WHEN DISTANCE IS GREATER THAN 20 FEET AND LESS THAN 40 FEET.

(AA) THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20 FEET AND LESS THAN 40 FEET.



COMMERCIAL ENTRANCE



CEMENT CONCRETE BASE WITH INTEGRAL CURB

USE WITH CUR. STD. DWG. RPS-010

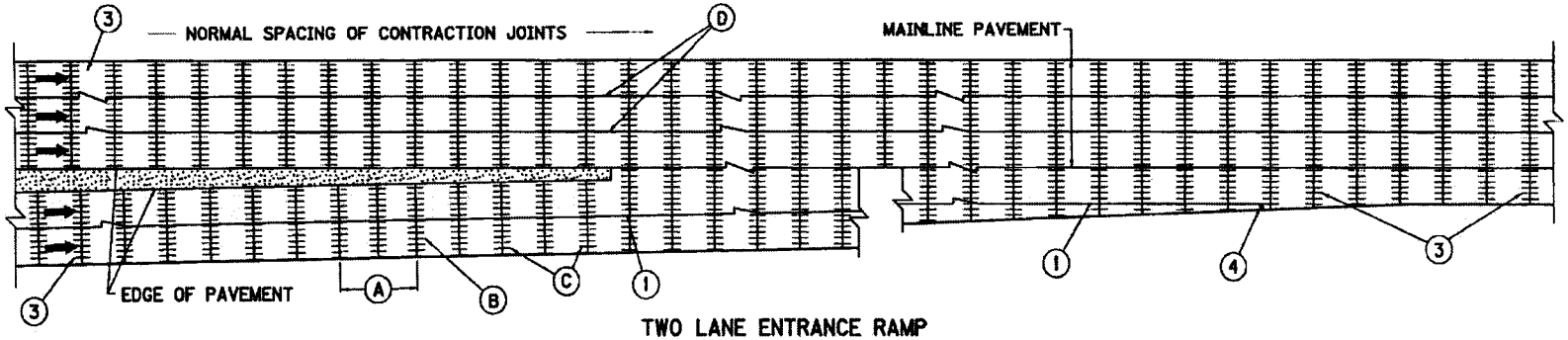
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

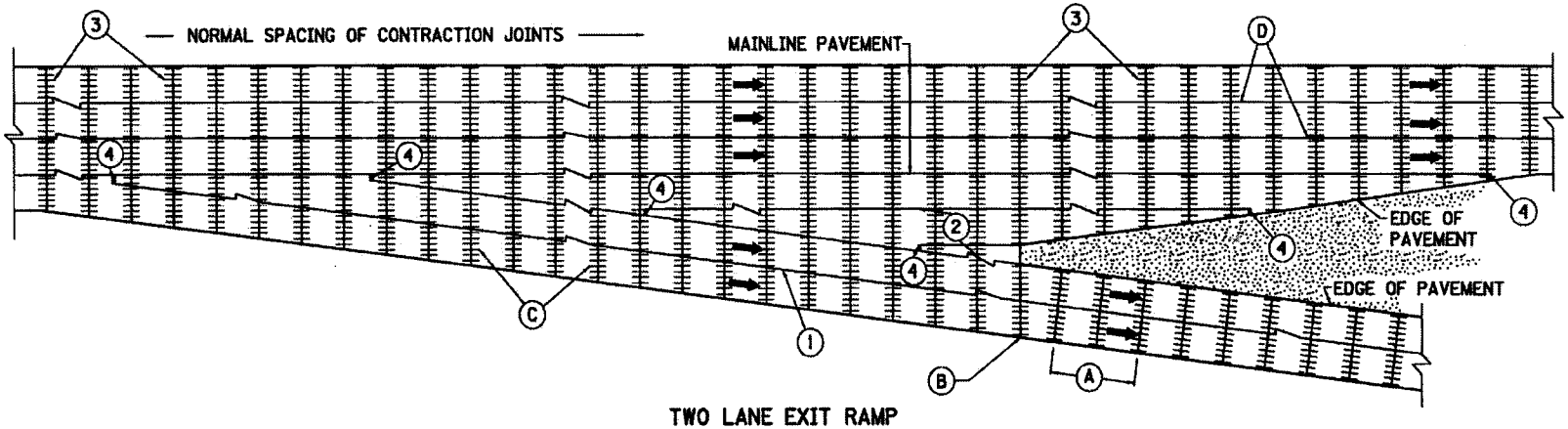
STANDARD DRAWING NO. RPS-034-06

SUBMITTED _____ 12-2-02 DATE

APPROVED _____ 12-2-02 DATE



TWO LANE ENTRANCE RAMP



TWO LANE EXIT RAMP

NOTES

NORMAL SPACING OF CONTRACTION JOINTS INDICATED ON THIS DRAWING ARE TO BE IN ACCORDANCE WITH SPACING INDICATED ON CURRENT STANDARD DRAWING RPN-015 .

(A) ON CONSTRUCTION IF THE CONTRACTOR ELECTS TO BEGIN PAVING OPERATIONS FOR THE RAMP FROM A POINT OTHER THAN WHICH IS IMMEDIATELY OPPOSITE THE MAINLINE PAVEMENT, THIS DISTANCE SHALL BE EQUALLY DIVIDED WHEN IT BECOMES GREATER THAN 20 FEET AND LESS THAN 40 FEET.

(B) THIS CONTRACTION JOINT IN THE RAMP SHALL ALWAYS BE OPPOSITE THE CONTRACTION JOINT IN THE MAINLINE PAVEMENT.

(C) ALL CONTRACTION JOINTS IN THE RAMP IMMEDIATELY OPPOSITE THE MAINLINE PAVEMENT SHALL BE A CONTINUATION OF THE JOINTS IN THE MAINLINE PAVEMENT.

(D) SEE TYPICAL SECTIONS FOR SPECIFIC TYPE OF LONGITUDINAL JOINT.
SEE CURRENT STANDARD DRAWING RPS-010 FOR JOINT SYMBOL AND DETAIL.

USE WITH CUR. STD. DWG.
RPS-010

KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE
PAVEMENT JOINTS
TYPES AND SPACING

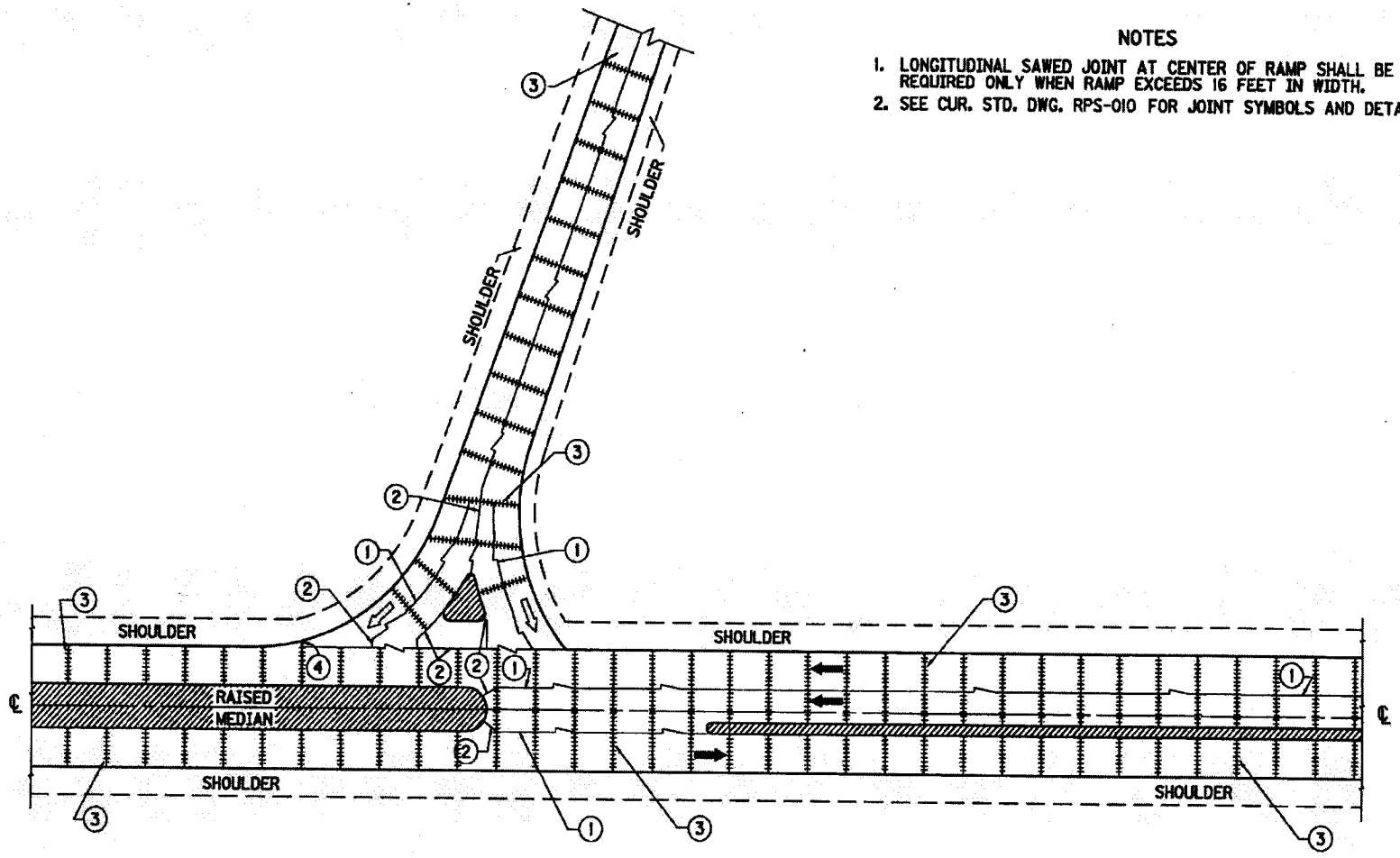
STANDARD DRAWING NO. RPS-035-05

SUBMITTED _____ 12-2-02
DATE

APPROVED _____ 12-2-02
DATE

NOTES

1. LONGITUDINAL SAWED JOINT AT CENTER OF RAMP SHALL BE REQUIRED ONLY WHEN RAMP EXCEEDS 16 FEET IN WIDTH.
2. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAIL.



INTERCHANGE RAMP DETAIL
ENTRANCE TO MINOR TWO LANE ROAD

USE WITH CUR. STD. DWG. RPS-010

KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE
PAVEMENT JOINTS
TYPES AND SPACING

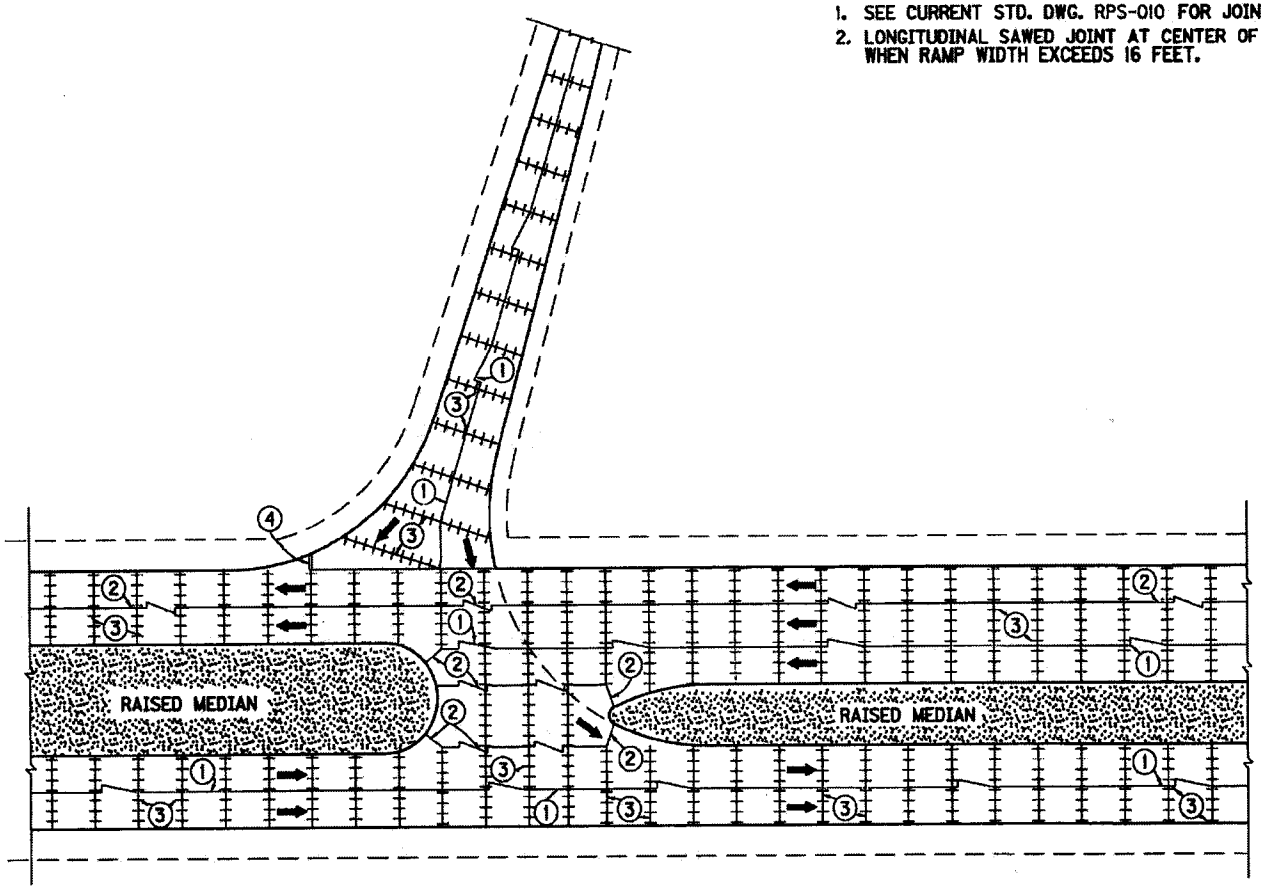
STANDARD DRAWING NO. RPS-036-05

SUBMITTED 12-2-02
DATE

APPROVED 12-2-02
DATE

NOTES

1. SEE CURRENT STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAIL.
2. LONGITUDINAL SAWED JOINT AT CENTER OF RAMP SHALL BE REQUIRED ONLY WHEN RAMP WIDTH EXCEEDS 16 FEET.



INTERCHANGE RAMP DETAIL
ENTRANCE TO MINOR FOUR LANE ROAD

USE WITH CUR. STD. DWG. RPS-010

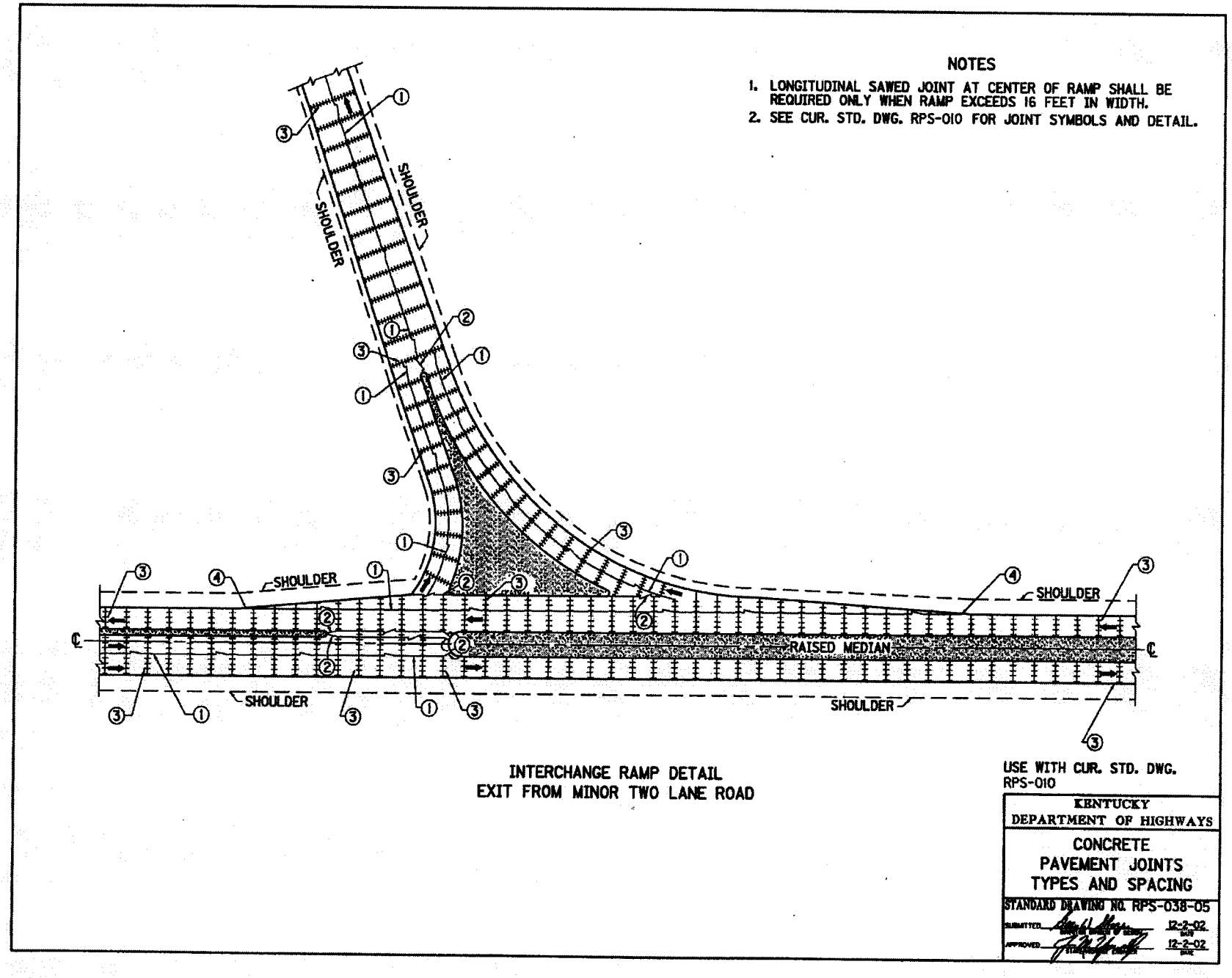
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE
PAVEMENT JOINTS
TYPES AND SPACING

STANDARD DRAWING NO. RPS-037-05

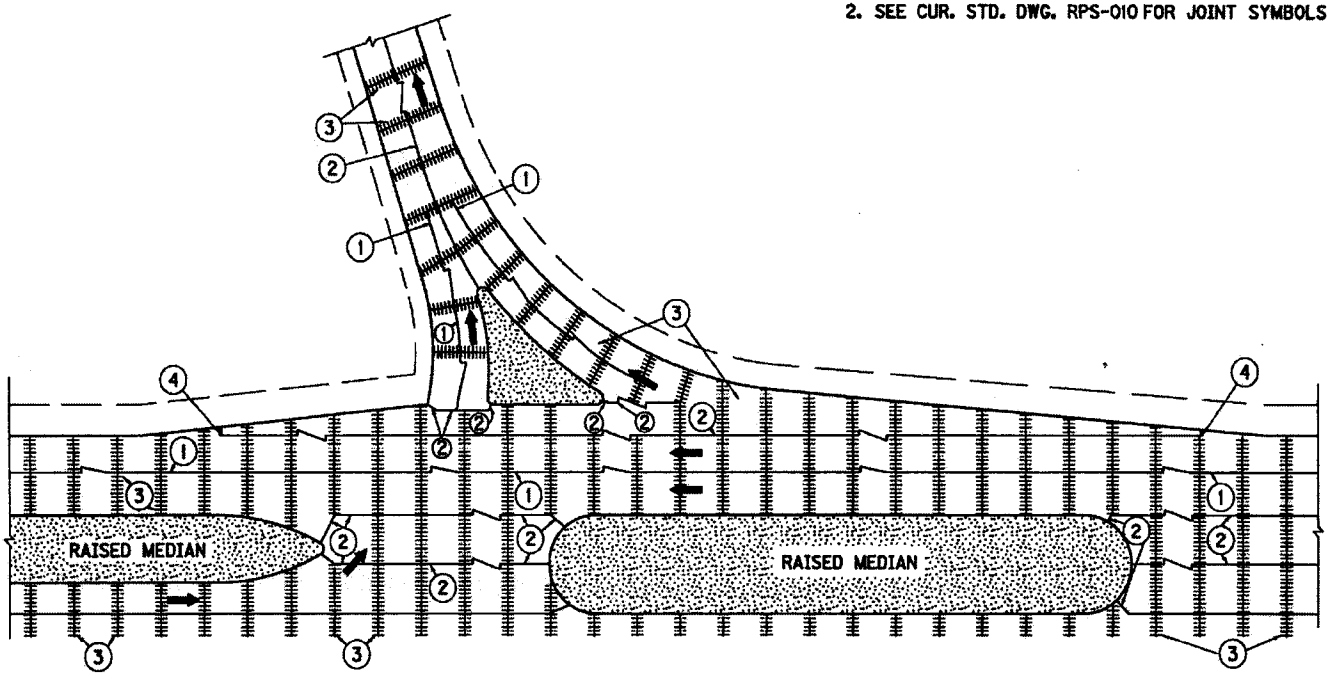
SUBMITTED _____ 12-2-02 DATE

APPROVED _____ 12-2-02 DATE


NOTES
1. LONGITUDINAL SAWED JOINT AT CENTER OF RAMP SHALL BE REQUIRED ONLY WHEN RAMP EXCEEDS 16 FEET IN WIDTH.
2. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAIL.
SHOULDER
SHOULDER
SHOULDER
SHOULDER
SHOULDER
SHOULDER
RAISED MEDIAN
INTERCHANGE RAMP DETAIL
EXIT FROM MINOR TWO LANE ROAD
USE WITH CUR. STD. DWG. RPS-010
KENTUCKY DEPARTMENT OF HIGHWAYS
CONCRETE PAVEMENT JOINTS TYPES AND SPACING
STANDARD DRAWING NO. RPS-038-05
12-2-02
12-2-02

NOTES

1. LONGITUDINAL SAWED JOINT AT CENTER OF RAMP SHALL BE REQUIRED ONLY WHEN RAMP EXCEEDS 16 FEET IN WIDTH.
2. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAIL.



INTERCHANGE RAMP DETAIL
EXIT FROM MINOR FOUR LANE ROAD

USE WITH CUR. STD. DWG.
RPS-010

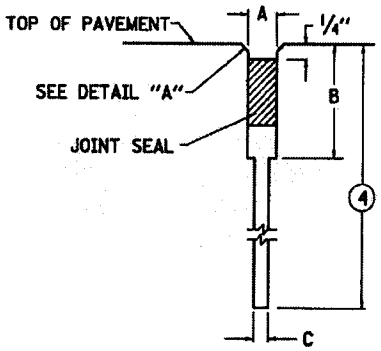
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE
PAVEMENT JOINTS
TYPES AND SPACING

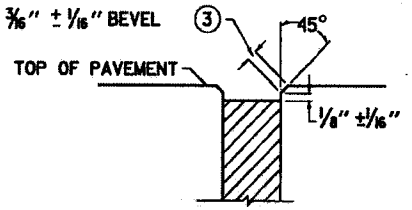
STANDARD DRAWING NO. RPS-039-05

SUBMITTED _____ 12-2-02 DATE

APPROVED _____ 12-2-02 DATE



JOINT SHAPE FOR
TRANSVERSE SAWED CONTRACTION JOINT



DETAIL "A"

JOINT SPACING	DIMENSIONS A	B	C	SEAL WIDTH UNCOMPRESSED
15'-0"	3/8"	2"	1/8" TO 3/8"	11/16"
25'-0"	1/2"	2"	1/8" TO 1/2"	1"
50'-0"	5/8"	2"	1/8" TO 5/8"	1 1/4"

- NOTES -

PAYMENT FOR ALL WORK SHALL BE INCIDENTAL TO THE UNIT PRICE BID PER SQ. YD. OF PAVEMENT.

TOLERANCES ON ALL JOINT WIDTH DIMENSIONS PLUS OR MINUS 1/16".

INSTALLATION OF PREFORMED POLYCHLOROPRENE SEALS (NEOPRENE) SHALL BE IN ACCORDANCE WITH ARTICLE 501.03.18 OF THE CURRENT STANDARD SPECIFICATIONS, EXCEPT TRANSVERSE EXPANSION JOINTS SHALL RECEIVE PREFORMED SEALS IN ACCORDANCE WITH THIS DRAWING .

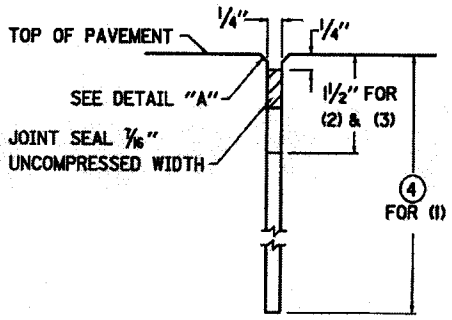
(1) THE REMAINING JOINT SHALL BE IN ACCORDANCE WITH CURRENT STD. DWG. RPS-010 AND RPS-020.

(2) ALL LONGITUDINAL AND TRANSVERSE SAWED CONSTRUCTION JOINTS SHALL BE CUT TO THE DEPTH SHOWN AND SHALL BE SEALED WITH HOT POURED ELASTIC JOINT SEAL.

(3) THESE EDGES SHALL BE BEVELED USING A CUTTING OR GRINDING DEVICE .

(4) JOINT DEPTH IS T/3 OR 4" WHICHEVER IS LESS.

T = PAVEMENT THICKNESS

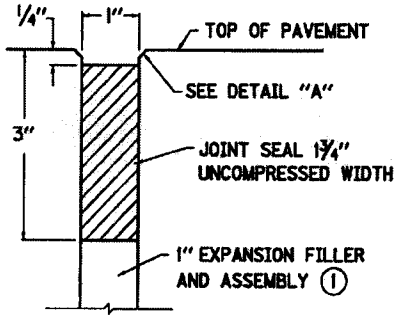


JOINT SHAPE FOR

(1) LONGITUDINAL SAWED JOINT (TIED)

(2) LONGITUDINAL SAWED CONSTRUCTION JOINT (TIED) (2)

(3) TRANSVERSE SAWED CONSTRUCTION JOINT (TIED) (2)



JOINT SHAPE FOR
TRANSVERSE EXPANSION JOINT

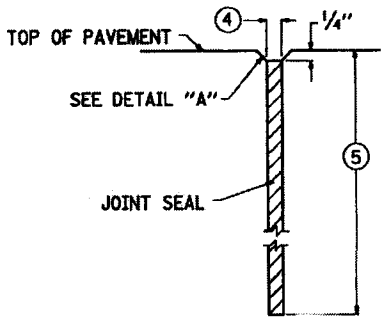
KENTUCKY
DEPARTMENT OF HIGHWAYS

PREFORMED COMPRESSION JOINT SEAL FOR CONCRETE PAVEMENT

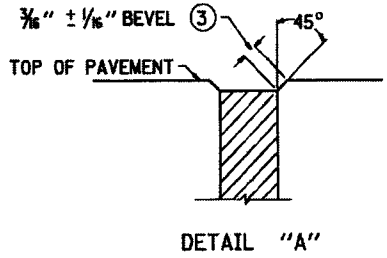
STANDARD DRAWING NO. RPX-010-04

SUBMITTED 12-2-02 DATE

APPROVED 12-2-02 DATE



JOINT SHAPE FOR
TRANSVERSE SAWED CONTRACTION JOINT



DETAIL "A"

- NOTES -

PAYMENT FOR ALL WORK SHALL BE INCIDENTAL TO THE UNIT PRICE BID PER SQ. YD. OF PAVEMENT.

① THE REMAINING JOINT SHALL BE IN ACCORDANCE WITH CURRENT STD. DWG. RPS-010 AND RPS-020.

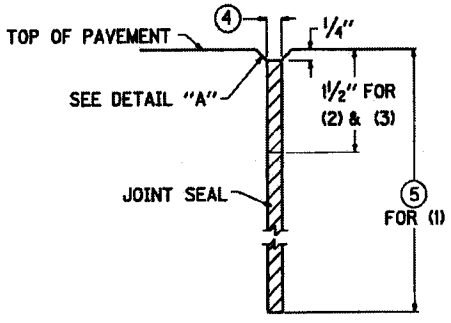
2. ALL LONGITUDINAL AND TRANSVERSE SAWED JOINTS SHALL BE CUT TO THE DEPTH SHOWN AND SHALL BE SEALED WITH HOT POURED ELASTIC JOINT SEAL.

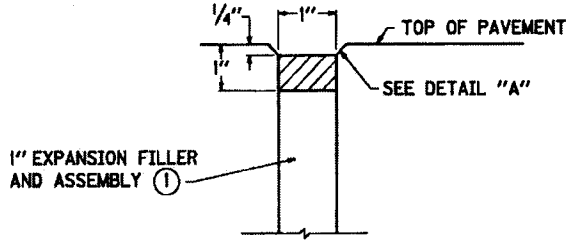
③ THESE EDGES SHALL BE BEVELED USING A CUTTING OR GRINDING DEVICE .

④ 1/8" MIN. - 1/4" MAX.

⑤ JOINT DEPTH IS T/3 OR 4" WHICHEVER IS LESS.

T = PAVEMENT THICKNESS





JOINT SHAPE FOR
TRANSVERSE EXPANSION JOINT

(1) LONGITUDINAL SAWED JOINT (TIED)

(2) LONGITUDINAL SAWED CONSTRUCTION JOINT (TIED)

(3) TRANSVERSE SAWED CONSTRUCTION JOINT (TIED)

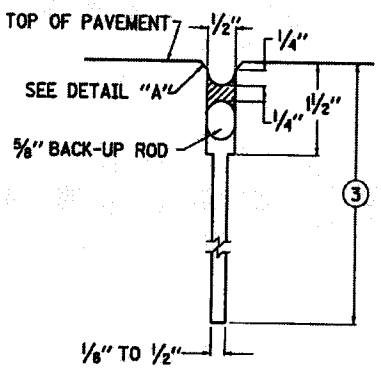
KENTUCKY
DEPARTMENT OF HIGHWAYS

HOT-POURED ELASTIC
JOINT SEALS FOR
CONCRETE PAVEMENT

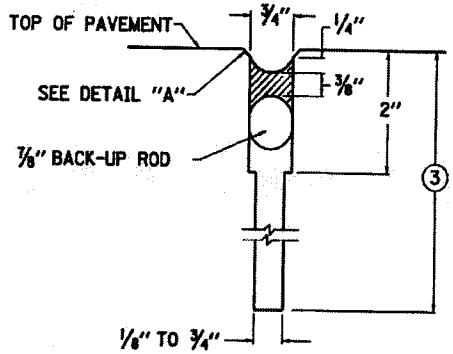
STANDARD DRAWING NO. RPX-015-03

SUBMITTED _____ 12-2-02 DATE

APPROVED _____ 12-2-02 DATE



JOINT SHAPE FOR
TRANSVERSE SAWED CONTRACTION JOINT
(WHEN SLAB LENGTH DOES NOT EXCEED 25'-0")



JOINT SHAPE FOR
TRANSVERSE SAWED CONTRACTION JOINT
(WHEN SLAB LENGTH EXCEEDS 25'-0")

- NOTES -

T = PAVEMENT THICKNESS.

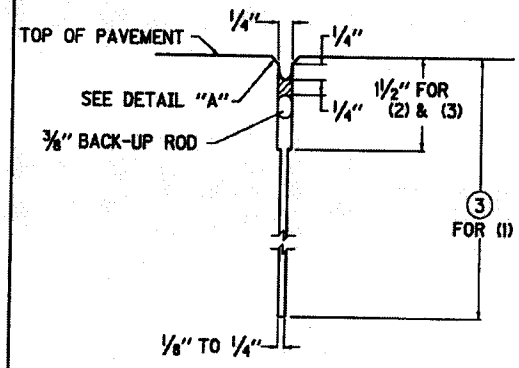
PAYMENT FOR WORK SHALL BE INCIDENTAL TO THE UNIT PRICE PER SQ. YD. OF PAVEMENT.

(1) THE REMAINING JOINT SHALL BE IN IN ACCORDANCE WITH CURRENT STD. DWGS. RPS-020 AND RPS-010.

(2) THESE EDGES SHALL BE BEVELED USING A CUTTING OR GRINDING DEVICE.

JOINT TOLERANCES : SAW CUT DEPTH -0" TO + 1/2"
SAW CUT WIDTH -0" TO + 1/16"
SEAL BEAD THICKNESS -0" TO + 1/8"

(3) JOINT DEPTH IS T/3 OR 4" WHICHEVER IS LESS.

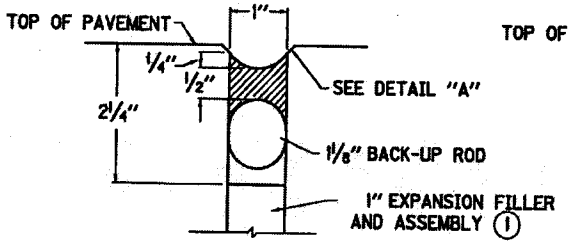


JOINT SHAPE FOR

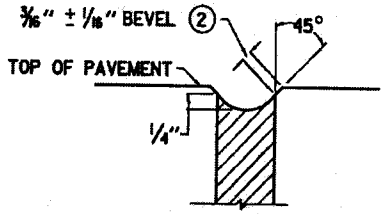
(1) LONGITUDINAL SAWED JOINT (TIED)

(2) LONGITUDINAL SAWED CONSTRUCTION JOINT (TIED)

(3) TRANSVERSE SAWED CONSTRUCTION JOINT (TIED)



JOINT SHAPE FOR
TRANSVERSE EXPANSION JOINT



DETAIL "A"

KENTUCKY
DEPARTMENT OF HIGHWAYS

SILICONE RUBBER SEALS
FOR
CONCRETE PAVEMENT

STANDARD DRAWING NO. RPX-020-05

SUBMITTED _____ 12-2-02 DATE

APPROVED _____ 12-2-02 DATE

POST-BID INSERT

Bid Tabulation

Bid Opening 08/24/14
New Unit Prices Effective 10/09/14

2014 Construction Unit Price Contract
Bid Opening: 2:00 PM Local Time, August 25, 2014

Bid Tabulation - Bid No. 107-2014
Effective October 9, 2014.

Lexington-Fayette Urban County Government

#	Item	Unit	ASL Excavating Inc	Bluegrass Contracting Corp.	L-M Asphalt Partners Ltd., dba ATS Construction	Sensabaugh Design and Construction LLC	The Allen Company	Todd Johnson Contracting	Tom Chestnut Excavation and Construction LLC	Woodall Construction Co.	ZKB Services LLC
			Unit Price								
1	Excavation	CY	14.50	15.00	11.50	11.50	17.35	15.00	12.00	12.00	75.00
2	Embankment	CY	16.00	15.00	11.50	13.00	19.45	30.00	12.00	12.00	~~no bid~~
3	Rock Excavation (Mechanical)	CY	37.25	250.00	200.00	300.00	270.00	150.00	200.00	175.00	65.00
4	Remove Portland Cement Concrete Pavement	SY	28.50	25.00	25.00	14.00	41.25	80.00	10.00	10.00	25.50
5	Remove Curb and Gutter	LF	8.00	7.00	6.00	11.00	16.25	60.00	8.00	5.00	11.50
6	Remove Sidewalk, Entrance Pavement	SY	10.30	12.00	11.00	10.50	29.00	80.00	11.00	10.00	22.50
7	Remove Bituminous Concrete Pavement	SY	7.00	6.00	8.00	6.50	11.50	80.00	11.00	5.00	25.50
8	Remove Pipes less than 24" - up to 8' deep	LF	12.00	15.00	15.00	11.00	21.80	110.00	12.00	10.00	60.00
9	Remove Pipes 30"- 48" - up to 8' deep	LF	18.00	20.00	20.00	16.00	29.00	110.00	16.00	13.00	68.00
10	Remove Fence	LF	3.00	5.00	4.50	8.00	5.00	15.00	5.00	5.00	2.25
11	Remove Headwalls and Inlet Structures	EA	700.00	600.00	600.00	450.00	815.00	1,000.00	600.00	450.00	750.00
12	Remove Tree (5" dia. to 12" dia.)	EA	250.00	500.00	380.00	300.00	550.00	~~no bid~~	500.00	300.00	225.00
13	Remove Tree (>12" dia. to 24" dia.)	EA	595.00	800.00	650.00	500.00	1,625.00	~~no bid~~	800.00	750.00	275.00
14	Remove Tree (>24" dia. to 36" dia.)	EA	1,300.00	1,200.00	1,100.00	1,000.00	2,375.00	~~no bid~~	1,200.00	975.00	325.00
15	Remove Tree (>36" dia. and up)	EA	2,500.00	2,500.00	1,800.00	1,200.00	3,000.00	~~no bid~~	1,500.00	1,100.00	425.00
16	Dense Graded Aggregate Base	TN	22.00	25.00	25.00	19.90	25.50	25.00	24.00	22.00	52.00
17	No. 2 Stone	TN	23.00	25.00	26.00	19.90	31.50	25.00	24.00	22.00	57.00
18	No. 9 Stone	TN	24.00	25.00	26.00	19.90	31.50	25.00	24.00	23.00	57.00
19	No. 57 Stone	TN	21.00	25.00	24.00	19.90	31.50	25.00	24.00	22.00	54.00
20	Steel Reinforcement for Concrete	LB	1.20	2.00	2.00	2.00	2.50	5.00	2.00	5.00	6.00
21	Unfinished Concrete less than 10 CY	CY	140.00	180.00	165.00	180.00	215.00	150.00	150.00	175.00	35.00
22	Unfinished Concrete more than 10 CY	CY	135.00	180.00	155.00	180.00	210.00	150.00	150.00	150.00	35.50
23	Formed Class A Concrete less than 10 CY	CY	800.00	750.00	775.00	440.00	1,200.00	850.00	600.00	400.00	41.50
24	Formed Class A Concrete more than 10 CY	CY	590.00	650.00	675.00	440.00	1,100.00	650.00	600.00	400.00	42.50
25	4-1/2" Concrete Sidewalk	SY	38.00	50.00	38.00	34.50	44.50	~~no bid~~	50.00	32.00	35.90
26	6" Concrete Sidewalk	SY	45.00	60.00	46.00	45.00	54.00	~~no bid~~	54.00	35.00	36.75
27	6" Concrete Entrance Pavement	SY	61.00	60.00	50.00	45.00	65.00	~~no bid~~	54.00	42.00	38.50

#	Item	Unit	ASL Excavating Inc	Bluegrass Contracting Corp.	L-M Asphalt Partners Ltd., dba ATS Construction	Sensabaugh Design and Construction LLC	The Allen Company	Todd Johnson Contracting	Tom Chestnut Excavation and Construction LLC	Woodall Construction Co.	ZKB Services LLC
			Unit Price								
28	Sidewalk Ramp	SY	102.00	60.00	72.00	70.00	82.00	~~no bid~~	54.00	70.00	91.00
29	Header Curb	LF	30.00	20.00	25.00	19.80	31.75	~~no bid~~	22.00	20.00	23.00
30	Curb and Gutter, Type 1	LF	21.50	20.00	20.00	19.80	26.00	~~no bid~~	22.00	20.00	21.00
31	Curb and Gutter, Type 4	LF	25.00	20.00	20.00	19.80	26.00	~~no bid~~	24.00	20.00	21.00
32	Bituminous Pavement Milling and Texturing	TN	30.85	50.00	34.00	38.00	55.00	~~no bid~~	100.00	50.00	~~no bid~~
33	Bituminous Base	TN	60.35	85.00	78.60	80.00	87.50	~~no bid~~	125.00	95.00	~~no bid~~
34	Class I, Bituminous Surface less than 50 tons	TN	73.65	105.00	86.75	85.00	136.50	~~no bid~~	140.00	120.00	~~no bid~~
35	Class I, Bituminous Surface greater than 50 tons	TN	66.15	92.50	92.25	79.00	93.00	~~no bid~~	125.00	95.00	~~no bid~~
36	Bituminous Material for Tack	TN	600.00	850.00	750.00	500.00	800.00	~~no bid~~	575.00	700.00	~~no bid~~
37	Type A Surface Inlet	EA	4,000.00	2,000.00	2,400.00	2,400.00	3,550.00	2,875.00	2,000.00	2,000.00	750.00
38	Type B Surface Inlet	EA	3,800.00	2,000.00	2,400.00	2,400.00	3,550.00	2,700.00	2,000.00	2,000.00	950.00
39	Curb Box Inlet Type A	EA	4,200.00	3,200.00	3,400.00	2,600.00	4,200.00	3,648.00	2,500.00	2,700.00	1,150.00
40	Curb Box Inlet Type B	EA	3,975.00	3,200.00	3,500.00	2,900.00	4,200.00	3,640.00	2,600.00	2,800.00	1,450.00
41	Curb Box Inlet Type C	EA	3,700.00	3,200.00	3,700.00	2,600.00	4,200.00	~~no bid~~	2,800.00	3,000.00	1,850.00
42	Curb Box Inlet Type D	EA	2,850.00	2,500.00	2,900.00	2,800.00	3,125.00	2,273.00	2,800.00	3,000.00	2,101.00
43	Curb Box Inlet Type B (KDOH)	EA	3,900.00	3,300.00	3,600.00	2,800.00	4,200.00	3,010.00	2,800.00	3,600.00	2,250.00
44	Drop Box Inlet Type 13 (KDOH)	EA	2,750.00	3,300.00	2,600.00	2,800.00	4,385.00	3,200.00	3,000.00	5,200.00	2,300.00
45	Drop Box Inlet Type 16 (KDOH)	EA	3,000.00	3,300.00	2,700.00	2,600.00	3,245.00	2,324.70	3,000.00	5,200.00	2,650.00
46	Lex Storm Sewer Manhole (4' dia.) (0-8' No rock)	EA	3,000.00	2,800.00	2,300.00	2,000.00	2,475.00	2,699.00	2,500.00	2,000.00	950.00
47	Lex Storm Sewer Manhole (5' dia.) (0-8' No rock)	EA	5,000.00	3,200.00	2,900.00	2,600.00	3,510.00	3,202.00	3,500.00	2,800.00	1,125.00
48	Lex Storm Sewer Manhole (6' dia.) (0-8' No rock)	EA	6,000.00	4,200.00	4,200.00	2,900.00	6,100.00	4,575.00	4,500.00	3,600.00	1,350.00
49	Pipe Tie-in into Manhole or Curb Box Inlet	EA	800.00	750.00	600.00	600.00	775.00	1,575.00	800.00	600.00	~~no bid~~
50	15" RCP Storm Sewer (0-8' No rock)	LF	56.00	42.00	44.00	34.00	51.95	85.12	45.00	35.00	93.75
51	18" RCP Storm Sewer (0-8' No rock)	LF	66.00	47.00	47.00	39.00	55.00	87.16	45.00	40.00	100.00
52	24" RCP Storm Sewer (0-8' No rock)	LF	71.00	52.00	57.00	49.00	72.50	96.34	65.00	50.00	128.50
53	30" RCP Storm Sewer (0-8' No rock)	LF	87.00	67.00	74.00	55.00	82.00	110.75	75.00	68.00	168.25
54	36" RCP Storm Sewer (0-8' No rock)	LF	120.00	82.00	93.00	75.00	98.00	137.91	100.00	80.00	206.75
55	42" RCP Storm Sewer (0-8' No rock)	LF	130.00	112.00	120.00	110.00	119.00	169.45	130.00	115.00	243.78
56	48" RCP Storm Sewer (0-8' No rock)	LF	180.00	127.00	140.00	160.00	135.00	197.99	150.00	125.00	262.50
57	15" HDPE Storm Sewer (0-8' No rock)	LF	50.00	38.00	43.00	24.00	50.00	85.00	45.00	36.00	118.00

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			Unit Price								
58	18" HDPE Storm Sewer (0-8' No rock)	LF	54.50	40.00	46.00	32.00	53.00	91.00	50.00	38.00	128.00
59	24" HDPE Storm Sewer (0-8' No rock)	LF	60.00	50.00	56.00	42.00	70.00	104.00	60.00	40.00	181.25
60	30" HDPE Storm Sewer (0-8' No rock)	LF	82.00	60.00	73.00	50.00	81.00	118.00	70.00	50.00	218.25
61	36" HDPE Storm Sewer (0-8' No rock)	LF	105.00	75.00	92.00	55.00	92.00	122.56	85.00	60.00	250.00
62	15" PP Storm Sewer (0-8' No rock)	LF	52.00	38.00	45.00	28.00	45.00	85.12	no bid	no bid	118.75
63	18" PP Storm Sewer (0-8' No rock)	LF	56.50	40.00	49.00	30.00	50.00	87.16	no bid	no bid	140.50
64	24" PP Storm Sewer (0-8' No rock)	LF	62.50	50.00	59.00	38.00	60.00	96.34	no bid	no bid	183.50
65	30" PP Storm Sewer (0-8' No rock)	LF	85.00	60.00	75.00	48.00	72.00	101.57	no bid	no bid	218.75
66	36" PP Storm Sewer (0-8' No rock)	LF	108.00	75.00	95.00	49.00	85.00	122.56	no bid	no bid	250.00
67	15" Elliptical RCP Storm Sewer	LF	62.00	65.00	56.00	50.00	69.00	no bid	65.00	50.00	118.75
68	18" Elliptical RCP Storm Sewer	LF	72.00	70.00	64.00	55.00	85.00	no bid	75.00	55.00	145.75
69	24" Elliptical RCP Storm Sewer	LF	78.00	85.00	77.00	60.00	104.00	no bid	85.00	65.00	167.50
70	30" Elliptical RCP Storm Sewer	LF	93.00	100.00	88.00	70.00	137.00	no bid	110.00	85.00	181.50
71	36" Elliptical RCP Storm Sewer	LF	136.00	130.00	112.00	90.00	170.00	no bid	140.00	105.00	218.50
72	42" Elliptical RCP Storm Sewer	LF	145.00	150.00	140.00	110.00	202.00	no bid	160.00	135.00	250.00
73	48" Elliptical RCP Storm Sewer	LF	201.00	185.00	170.00	140.00	260.00	no bid	175.00	140.00	262.50
74	Internal Inspection of Sewer Pipe: CCTV	LF	no bid	5.00	12.00	2.00	2.50	no bid	no bid	8.00	no bid
75	15" Straight Headwall - Standard or Raised	EA	1,300.00	1,500.00	1,500.00	950.00	1,500.00	1,550.00	1,200.00	1,250.00	1,250.00
76	18" Straight Headwall - Standard or Raised	EA	1,400.00	1,600.00	1,600.00	1,100.00	1,500.00	1,650.00	1,500.00	1,900.00	1,500.00
77	24" Straight Headwall - Standard or Raised	EA	1,675.00	1,800.00	2,100.00	1,350.00	2,050.00	1,771.00	2,500.00	2,150.00	1,750.00
78	15" Pipe Culvert Headwall	EA	1,200.00	1,400.00	1,600.00	900.00	1,200.00	1,543.00	1,000.00	1,000.00	1,325.00
79	18" Pipe Culvert Headwall	EA	1,300.00	1,500.00	1,700.00	1,100.00	1,250.00	1,645.00	2,500.00	1,200.00	1,600.00
80	24" Pipe Culvert Headwall	EA	1,450.00	1,700.00	2,200.00	1,150.00	1,300.00	1,740.00	2,500.00	1,400.00	1,950.00
81	30" Pipe Culvert Headwall	EA	1,900.00	2,000.00	2,300.00	1,300.00	1,900.00	2,015.00	4,500.00	1,800.00	2,050.00
82	36" Pipe Culvert Headwall	EA	2,400.00	2,500.00	2,400.00	1,500.00	2,200.00	2,360.00	4,000.00	2,300.00	2,250.00
83	42" Pipe Culvert Headwall	EA	2,750.00	4,000.00	2,800.00	1,700.00	2,500.00	2,665.00	5,000.00	2,900.00	2,550.00
84	48" Pipe Culvert Headwall	EA	3,600.00	5,000.00	3,500.00	2,000.00	3,350.00	3,087.00	4,000.00	3,500.00	2,750.00
85	18" Sloped and Flared Box Inlet-Outlet	EA	2,250.00	1,800.00	2,600.00	2,600.00	2,150.00	2,160.00	2,800.00	2,500.00	2,250.00
86	24" Sloped and Flared Box Inlet-Outlet	EA	2,800.00	2,400.00	3,250.00	3,200.00	2,950.00	2,787.00	4,500.00	3,000.00	2,450.00
87	30" Sloped and Flared Box Inlet-Outlet	EA	4,100.00	3,000.00	4,000.00	4,200.00	4,600.00	2,075.00	6,500.00	4,000.00	2,650.00

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			Unit Price								
88	36" Sloped and Flared Box Inlet-Outlet	EA	5,800.00	3,800.00	4,600.00	6,500.00	5,900.00	4,221.00	8,000.00	6,000.00	2,850.00
89	15" Impact Stilling Basin	EA	1,500.00	2,000.00	2,100.00	1,850.00	2,870.00	~~no bid~~	2,200.00	1,800.00	~~no bid~~
90	18" Impact Stilling Basin	EA	1,600.00	2,100.00	2,300.00	1,950.00	3,085.00	3,801.00	2,200.00	2,000.00	~~no bid~~
91	24" Impact Stilling Basin	EA	2,000.00	2,300.00	2,550.00	2,200.00	4,000.00	3,901.00	3,000.00	2,200.00	~~no bid~~
92	30" Impact Stilling Basin	EA	2,700.00	2,500.00	2,800.00	2,900.00	5,250.00	~~no bid~~	3,000.00	2,400.00	~~no bid~~
93	36" Impact Stilling Basin	EA	3,350.00	3,000.00	3,200.00	6,500.00	6,545.00	7,995.00	3,000.00	2,800.00	~~no bid~~
94	48" Impact Stilling Basin	EA	4,200.00	3,500.00	3,800.00	7,200.00	8,000.00	8,140.00	4,000.00	3,100.00	~~no bid~~
95	Bottom Paved Ditch	SY	88.00	80.00	55.00	38.00	90.00	~~no bid~~	90.00	48.00	39.00
96	Aggregate Channel Lining for Slope Protection	TN	27.00	35.00	36.00	30.00	42.50	76.00	30.00	40.00	~~no bid~~
97	Seeding and Protection	SY	1.20	2.50	3.00	1.50	2.75	1.00	2.00	3.50	28.50
98	Sodding	SY	5.50	8.00	9.00	4.00	6.80	8.00	4.25	6.00	24.50
99	Gabion Mattress Channel Lining	CY	145.00	200.00	170.00	140.00	275.00	~~no bid~~	190.00	165.00	~~no bid~~
100	4" HDPE Perforated Pipe	LF	7.00	10.00	15.00	5.00	15.00	20.00	5.00	6.00	7.50
101	6" HDPE Perforated Pipe	LF	9.00	12.00	16.00	7.00	15.00	37.00	8.00	12.00	9.50
102	4" PVC Pipe	LF	20.00	20.00	24.00	11.00	27.00	62.00	15.00	18.00	7.00
103	6" PVC Pipe	LF	23.00	25.00	26.00	13.50	32.00	64.21	16.00	25.00	9.00
104	8" PVC Sanitary Sewer (0-8' No Rock)	LF	30.00	65.00	36.00	24.00	34.10	71.37	25.00	28.00	11.00
105	10" PVC Sanitary Sewer (0-8' No Rock)	LF	36.00	75.00	41.00	27.00	35.60	82.90	35.00	30.00	13.00
106	12" PVC Sanitary Sewer (0-8' No Rock)	LF	46.00	80.00	50.00	30.00	40.55	93.50	39.00	33.00	15.00
107	15" PVC Sanitary Sewer (0-8' No Rock)	LF	54.00	85.00	52.00	33.00	50.20	101.14	45.00	40.00	17.00
108	18" PVC Sanitary Sewer (0-8' No Rock)	LF	68.00	90.00	58.00	38.00	80.00	120.00	55.00	50.00	19.00
109	8" Ductile Iron Sewer Pipe (0-8' No Rock)	LF	68.00	80.00	55.00	40.00	50.00	121.41	~~no bid~~	48.00	~~no bid~~
110	10" Ductile Iron Sewer Pipe (0-8' No Rock)	LF	74.00	85.00	58.00	50.00	59.50	147.51	~~no bid~~	55.00	~~no bid~~
111	12" Ductile Iron Sewer Pipe (0-8' No Rock)	LF	78.00	90.00	67.00	60.00	64.00	169.30	~~no bid~~	80.00	~~no bid~~
112	14" Ductile Iron Sewer Pipe (0-8' No Rock)	LF	110.00	95.00	75.00	70.00	92.00	183.09	~~no bid~~	95.00	~~no bid~~
113	Sanitary Sewer By-Pass Pumping	DAY	2,500.00	1,000.00	2,500.00	1,600.00	750.00	1,550.00	~~no bid~~	2,350.00	~~no bid~~
114	Two Way Sewer Service Cleanout	EA	750.00	500.00	650.00	300.00	375.00	674.85	~~no bid~~	560.00	~~no bid~~
115	4"x 8" Sanitary Sewer Tee & up to 6' of lateral pipe	EA	550.00	100.00	65.00	75.00	105.00	629.85	~~no bid~~	500.00	~~no bid~~
116	6"x 8" Sanitary Sewer Tee& up to 6' of lateral pipe	EA	600.00	105.00	80.00	90.00	115.00	679.85	~~no bid~~	600.00	~~no bid~~
117	Lex Sanitary Sewer Manhole (4' dia.) (0-8' No rock)	EA	3,000.00	2,400.00	2,400.00	2,000.00	2,600.00	2,654.00	~~no bid~~	2,000.00	~~no bid~~

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			Unit Price								
118	Lex Sanitary Sewer Manhole (5' dia.) (0-8' No rock)	EA	4,500.00	3,000.00	3,200.00	3,000.00	3,500.00	3,967.00	no bid	3,600.00	no bid
119	Lex Sanitary Sewer Manhole (6' dia.) (0-8' No rock)	EA	6,500.00	5,500.00	5,100.00	4,800.00	5,850.00	4,763.00	no bid	5,700.00	no bid
120	Manhole-Additional vertical depth > 8' (4' dia.)	VF	160.00	175.00	160.00	500.00	300.00	307.00	no bid	175.00	no bid
121	Manhole-Additional vertical depth > 8' (5' dia.)	VF	220.00	275.00	200.00	600.00	400.00	356.00	no bid	225.00	no bid
122	Manhole-Additional vertical depth > 8' (6' dia.)	VF	250.00	450.00	240.00	700.00	450.00	468.00	no bid	350.00	no bid
123	Manhole-Additional for adjustable frame and cover	EA	1,250.00	1,000.00	1,000.00	400.00	1,600.00	500.00	no bid	900.00	no bid
124	Woven Wire Fence 4' height	LF	8.00	15.00	12.50	10.00	20.00	38.00	10.00	10.00	4.25
125	Chain Link Fence 4' height	LF	19.50	25.00	23.00	15.00	35.00	80.00	14.00	12.00	6.25
126	Privacy Fence	LF	36.00	50.00	50.00	25.00	85.00	85.00	28.00	30.00	19.50
127	Backhoe (small) with Operator	HR	88.00	85.00	95.00	65.00	115.50	85.00	85.00	100.00	75.00
128	Dump Truck (single axle) with driver	HR	77.50	75.00	80.00	60.00	75.00	70.00	75.00	75.00	75.00
129	Dump Truck (tri-axle) with driver	HR	90.00	90.00	90.00	80.00	80.00	88.00	80.00	85.00	95.00
130	Jackhammer with Operator	HR	75.00	65.00	75.00	80.00	75.00	80.00	80.00	85.00	45.00
131	Skid Loader with Operator	HR	85.00	75.00	90.00	60.00	75.00	80.00	80.00	125.00	65.00
132	Check Dam	TN	32.00	50.00	35.00	30.00	50.00	500.00	55.00	43.00	no bid
133	Sediment Trap	CY	32.00	75.00	45.00	13.00	50.00	500.00	60.00	20.00	no bid
134	Sediment Pond	CY	36.00	60.00	45.00	13.00	40.00	1,500.00	35.00	20.00	no bid
135	Silt Fence	LF	2.60	5.00	3.25	3.00	3.50	3.00	5.00	500.00	3.75
136	Storm Drain Inlet Protection	EA	160.00	350.00	325.00	150.00	275.00	150.00	250.00	250.00	6.75
137	Filter Strip	SY	7.00	30.00	no bid	7.00	19.50	110.00	15.00	15.00	7.00
138	Stream Crossing	EA	3,500.00	7,500.00	8,500.00	3,000.00	5,000.00	6,600.00	3,800.00	8,000.00	no bid
139	Pump-Around Flow Diversion	DAY	2,500.00	600.00	225.00	600.00	2,400.00	450.00	1,200.00	3,000.00	no bid
140	Construction Dewatering	DAY	70.00	600.00	125.00	600.00	2,400.00	450.00	1,200.00	3,000.00	no bid
141	Geotextile Construction Type I	SY	1.80	4.00	2.00	2.70	5.25	5.80	9.00	6.00	5.00
142	Geotextile Construction Type II	SY	1.86	4.00	2.10	1.80	5.25	5.60	40.00	6.00	7.00
143	Geotextile Construction Type III	SY	1.90	4.00	2.00	1.50	5.25	5.50	8.00	6.00	9.00
144	Geotextile Construction Type IV	SY	1.92	4.00	2.10	2.40	5.25	5.10	8.00	12.00	11.00
145	Edge Key	LF	6.50	10.00	10.00	6.00	16.25	no bid	10.00	10.00	4.00
146	Pipe Plugging for Pipes less than or equal to 24"	EA	750.00	300.00	260.00	300.00	450.00	600.00	600.00	1,500.00	no bid
147	Pipe Plugging for Pipes 30"- 48"	EA	900.00	800.00	525.00	500.00	750.00	750.00	800.00	1,800.00	no bid

			ASL Excavating Inc	Bluegrass Contracting Corp.	L-M Asphalt Partners Ltd., dba ATS Construction	Sensabaugh Design and Construction LLC	The Allen Company	Todd Johnson Contracting	Tom Chestnut Excavation and Construction LLC	Woodall Construction Co.	ZKB Services LLC
#	Item	Unit	Unit Price								
148	Flowable Fill	CY	132.00	150.00	160.00	150.00	175.00	150.00	140.00	200.00	no bid
149	Fiber Reinforced PCC Pavement	CY	no bid	300.00	350.00	275.00	300.00	no bid	50.00	275.00	47.50
150	Single Block Masonry Retaining Wall	SF	no bid	30.00	32.00	20.00	26.00	125.00	35.00	30.00	12.50
151	Degradable Erosion Control Mat	SY	1.20	10.00	9.00	7.00	no bid	10.60	8.00	8.00	8.00
152	Turf Reinforcement Mat	SY	5.75	15.00	9.00	7.00	9.25	15.60	10.00	8.00	8.50
153	Project Sign	EA	750.00	800.00	800.00	600.00	550.00	450.00	1,000.00	600.00	475.00
154	Steel W Beam Guardrail and End Treatments	LF	no bid	no bid	no bid	50.00	54.00	no bid	36.00	130.00	53.50
155	Articulating Concrete Block	SY	no bid	315.00	no bid	500.00	no bid	no bid	800.00	80.00	14.50
156	Reinf Conc Pipe Crack Repairs and Manhole Rehab	LF	no bid	no bid	no bid	400.00	no bid	307.00	no bid	50.00	19.50
157	Saw cutting	LF	3.00	6.00	5.00	2.00	2.35	3.00	2.75	5.00	3.75
158	Precast Reinforced Concrete Box Culvert 3' X 2'	LF	no bid	600.00	335.00	350.00	375.00	1,540.00	1,500.00	575.00	62.00
159	Precast Reinforced Concrete Box Culvert 3' X 3'	LF	no bid	800.00	360.00	400.00	405.00	1,620.00	1,500.00	600.00	72.50
160	Precast Reinforced Concrete Box Culvert 4' X 2'	LF	435.00	800.00	365.00	420.00	435.00	1,580.00	1,500.00	650.00	84.50
161	Precast Reinforced Concrete Box Culvert 4' X 3'	LF	515.00	900.00	375.00	450.00	460.00	1,840.00	1,500.00	800.00	88.50
162	Detectable Warning Surface Tile-Overlay	SF	75.00	100.00	42.00	45.00	97.00	no bid	no bid	600.00	6.25
163	Detectable Warning Surface Tile-Imbedded	SF	60.00	100.00	42.00	60.00	375.00	no bid	350.00	600.00	8.25
164	Bulb-out: Gutter Cover	LF	no bid	no bid	175.00	28.00	no bid	no bid	no bid	no bid	24.50
165	Bulb-out: Asphalt Repair	SF	no bid	100.00	400.00	30.00	no bid	no bid	no bid	no bid	no bid
166	Grader with Operator	HR	170.00	130.00	185.00	95.00	140.00	150.00	100.00	175.00	195.00
167	Roller/Compactor with Operator	HR	94.00	90.00	165.00	65.00	115.00	85.00	100.00	175.00	175.00
168	Topsoil Placement	CY	26.00	150.00	30.00	60.00	22.50	35.00	20.00	30.00	49.00