September 22, 2017

Users of Lexington – Fayette Urban County Engineering Standard Drawings

Re: Standard Drawings 2017

Attached is the latest edition of the LFUCG Standard Drawings for construction of storm, sanitary sewers, streets and roads in Lexington – Fayette County. These drawings supersede any and all Standard Drawings previously issued by the Division of Engineering.

These drawings become effective as of September 22, 2017 and any projects dedicated to public use after the above date must comply with or contain references to these Standard Drawings or revisions thereof where applicable.

Questions or comments should be directed to:

Urban County Engineer
Division of Engineering
Fourth Floor
101 E. Vine Street
Lexington, KY 40507
859-258-3410

Sincerely,

W. Douglas Burton, P.E.
Urban County Engineer

WDB;MHF
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**Silt & Erosion Control:**

See Chapter 11 of LFUCG Stormwater Manual for Approved Design Details
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TYPE "B" MANHOLE – NON-CIRCULAR WALLS, CAST-IN-PLACE CONCRETE

ALTERNATE-22'-50'

22'-50' DEFLECTION ANGLE

ALTERNATE-50'-68'

50'-68' DEFLECTION ANGLE

CONCRETE WALLS

DEFLECTION ANGLES BETWEEN 22' & 90'

LEXYINGTON – FAYETTE URBAN COUNTY GOVERNMENT
CIRCULAR AND NON-CIRCULAR WALLS
(TYPE "A" & TYPE "B")

STANDARD 4'-0" DIA. & 5'-0"
CIRCULAR WALLS
(TYPE "A")

STANDARD CIRCULAR MANHOLE – 6'-0" DIAMETER & LARGER
TYPE "A"
AND NON-CIRCULAR WALL MANHOLE – ALL SIZES
TYPE "B"

LEXINGTON – FAYETTE URBAN COUNTY GOVERNMENT
4'-0" DIA.
SHALLOW MANHOLES

MARK NO | SIZE | LENGTH | TYPE
-------|------|--------|------
 1     | 1   | 4     | STR
 7     | 3   | 4'-0" | "    
 3     | "   | 4'-0" | "    
 4     | 2   | 2'-0" | "    
 5     | 3   | 1'-0" | "    
 6     | 2.5| 1'-0" | "    

NOTES:
1. FOR PIPE SIZES 15" TO 24".
2. 9" O.C. SPACING EACH WAY.
3. 8" THICK SLAB.
4. 4'-10" O.D.
5. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
6. CIRCULAR REBAR MAY BE USED OR MARK 6 BARS AS SHOWN.

SIDE VIEW

5'-0" DIA.
SHALLOW MANHOLES

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

NOTES:
1. FOR PIPE SIZES 21" TO 33".
2. 9" O.C. SPACING EACH WAY.
3. 8" THICK SLAB.
4. 6'-0" O.D.
5. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
6. CIRCULAR REBAR MAY BE USED OR MARK 6 BARS AS SHOWN.

SIDE VIEW

NOTE:
SLAB OUTER DIAMETER TO VARY WITH MANHOLE WALL THICKNESS TO COMPLETELY COVER MANHOLE WALLS.
6'-0" DIA.

STANDARD MANHOLES

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.

SIDE VIEW

6'-0" DIA.

SHALLOW MANHOLES

NOTES:
1. FOR PIPE SIZES 15" to 36".
2. 6" O.C. SPACING EACH WAY.
3. 8" THICK SLAB.
4. 7'-2" O.D.
5. 2" MIN STEEL REINFORCEMENT COVER ALL FACES.

SIDE VIEW

SPECIAL BAR BENDS

NOTE:
SLAB OUTER DIAMETER TO VARY WITH MANHOLE WALL THICKNESS, TO COMPLETELY COVER MANHOLE WALLS.
**7'-0" DIA. STANDARD MANHOLES**

**NOTES:**
1. FOR PIPE SIZES 15" TO 60".
2. 6" O.C. SPACING EACH WAY.
3. 12" THICK SLAB.
4. 8'-4" O.D.
5. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.

**SIDE VIEW**

**SPECIAL BAR BENDS**

**LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT**

**7'-0" DIA. SHALLOW MANHOLES**

**NOTES:**
1. FOR PIPE SIZES 15" TO 36".
2. 9" O.C. SPACING EACH WAY.
3. 10" THICK SLAB.
4. 8'-4" O.D.
5. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.

**SIDE VIEW**

**STORM SEWER MANHOLE CIRCULAR SLABS 7'-0" DIAMETER**

**NOTE:** SLAB OUTSIDE DIAMETER TO VARY WITH MANHOLE WALL THICKNESS. COVER MANHOLE WALLS.
### STANDARD MANHOLE

- **Diameter:** 8'-0"
- **Type:** (Table below)

### SHALLOW MANHOLE

- **Diameter:** 8'-0"
- **Type:** (Table below)

### Notes:

1. For Pipe Sizes: 15" to 60".
2. 6" O.C. spacing each way.
3. 12" thick slab.
4. 9'-6" O.D.
5. 2" MIN. STEEL REINFORCEMENT cover all faces.

### SPECIAL BAR BENDS

- **Type A**
- **Type B**

### SIDE VIEW

- Dimensions shown:
  - 9"
  - 8'-0"

### DIVISION OF ENGINEERING

- **Lexington - Fayette Urban County Government**

### STORM SEWER

- MANHOLE CIRCULAR SLABS
- 8'-0" DIAMETER

- **Type:** (Table below)

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### NOTE:

SLAB OUTER DIAMETER TO VARY WITH MANHOLE WALL THICKNESS, TO COMPLETELY COVER MANHOLE WALLS.
SPECIAL BAR BENDS

MARK NO. SIZE LENGTH TYPE
1 1 1 6 8 - 0 4
2 2 2 6 - 0 STR
3 2 2 4 + 8 4
4 2 2 3 - 4 4

MARK NO. SIZE LENGTH TYPE
5 4 4 4 4 STR
6 2 2 4 12 STR

MARK NO. SIZE LENGTH TYPE
1 1 1 6 8 - 0 4
2 2 2 6 - 0 STR
3 2 2 4 + 8 4
4 2 2 3 - 4 4

MARK NO. SIZE LENGTH TYPE
5 4 4 4 4 STR
6 2 2 4 12 STR

MARK NO. SIZE LENGTH TYPE
6 10 4 12 STR

NOTES:
1. PROVIDE 2" x 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.
SPECIAL BAR BENDS

TOP SLAB
4'-0" OPENING

VERT. SECTION

BOTTOM SLAB

MARK NO. SIZE LENGTH TYPE
1  1  1  6  1/2-6  A
2  1  1  6  1/2-6  A
3  1  1  6  1/2-6  A
4  1  1  6  1/2-6  A
5  3  3  6  1/2-6  A
6  3  3  6  1/2-6  A
7  3  3  6  1/2-6  A
8  3  3  6  1/2-6  A
9  7  7  0-10  B

MARK NO. SIZE LENGTH TYPE
10  16  4  7-0  STR

MARK NO. SIZE LENGTH TYPE
11  16  4  7-0  STR
12  16  4  7-0  STR
13  16  4  7-0  STR
14  16  4  7-0  STR

MARK NO. SIZE LENGTH TYPE
15  16  4  7-0  STR
16  16  4  7-0  STR
17  16  4  7-0  STR
18  16  4  7-0  STR

MARK NO. SIZE LENGTH TYPE
19  16  4  7-0  STR
20  16  4  7-0  STR
21  16  4  7-0  STR
22  16  4  7-0  STR

NOTES:
1. PROVIDE 2" x 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN THE TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
**TOP SLAB**

**VERT. SECTION**

**BOTTOM SLAB**

**HORIZ. SECTION**

**SPECIAL BAR BENDS**

**MARK NO. | SIZE | LENGTH | TYPE**

| 1 | 11 | 6 | STR |
| 2 | 10 | 5 | STR |
| 3 | 7 | 3 | STR |

**(MARK NO. | SIZE | LENGTH | TYPE**

| 4 | 8 | 3 | STR |
| 5 | 9 | 3 | STR |

**MARK NO. | SIZE | LENGTH | TYPE**

| 13 | 13 | 13 | STR |
| 5 | 14 | 14 | STR |
| 7 | 14 | 14 | STR |

**NOTES:**

1. PROVIDE 2" X 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.

2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.

3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STO. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STO. DWGS. 102 & 103.

4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

---

LEXINGTON -- FAYETTE URBAN COUNTY GOVERNMENT
SPECIAL BAR BENDS

TOP SLAB
4'-0" OPENING

VERT. SECTION
8'-4"

BOTTOM SLAB

MARK NO. SIZE LENGTH TYPE
1 6 12'-10" STR.
2 12 5 2'-10" STR.
3 4 5 2'-0" STR.
4 4 5 2'-0" STR.
5 4 5 2'-0" STR.
6 6 5 0'-10" STR.

MARK NO. SIZE LENGTH TYPE
8 11 7'-0" STR.
12 X (HEIGHT OF WALL (INCH)/10)

Rounded up to the next whole number.

HORIZ. SECTION

MARK NO. SIZE LENGTH TYPE
9 20 4 18'-2" STR.

MARK NO. SIZE LENGTH TYPE
14 WK 9.5-#4 @ 15'-0" C 14'

14 WK 9.5-#4 @ 15'-0" C 14'

8" TYP.

NOTES:

1. PROVIDE 2" X 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.

2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.

3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STOPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.

4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
**SPECIAL BAR BENDS**

**TOP SLAB**

4'-0" OPENING

**VERT. SECTION**

7'-8"

**BOTTOM SLAB**

5'-8"

**HORIZ. SECTION**

5'-8"

---

### MARK NO. SIZE LENGTH TYPE

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<tr>
<td>6</td>
<td>5/32</td>
<td>0'-0&quot;</td>
<td>SIK</td>
</tr>
</tbody>
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---

**NOTES:**

1. PROVIDE 2" x 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.

2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.

3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101, FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.

4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

---

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT

---

DIVISION OF ENGINEERING

REINFORCEMENT DETAIL

5" NON-CIRCULAR M.H.
15" TO 20" DEPTH
12" WALLS, 12" SLAB

LEXINGTON
SPECIAL BAR BENDS

VERT. SECTION

MARK NO. SIZE LENGTH TYPE
1 11 6 9-4" STR.
2 4 5 5-5" STR.
3 18 5 8-0" L

5' x 5' OPENING

MARK NO. SIZE LENGTH TYPE
4 14 11 B-0" STR.

WIDTH VARES 6" TO 9"

MK 6.8 - #4 @ 12" O.C.

BOTTOM SLAB

MARK NO. SIZE LENGTH TYPE
5 20 1 9-0" STR.

TOP SLAB

MARK NO. SIZE LENGTH TYPE
6 5.6 - #4 @ 15" O.C.

HORIZ. SECTION

MARK NO. SIZE LENGTH TYPE
7 2 4 15-3" STR.

NOTES:
1. PROVIDE 2" X 4" KEYS FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101. FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT

DIVISION OF ENGINEERING

REINFORCEMENT DETAIL
1. 2' NON-ROUND M.H. LESS THAN 10' DEPTH.
2. 8' WALLS, 10' SLAB.
SPECIAL BAR BENDS

TYPE A

VERT. SECTION

BOTTOM SLAB

HORIZ. SECTION

MARK NO. | SIZE | LENGTH | TYPE
---------|------|--------|------
MK 9.6-#4 | 15" | O.C. | STR
MK 9.6-#4 | 15" | O.C. | STR
MK 9.6-#4 | 15" | O.C. | STR
MARK NO. | SIZE | LENGTH | TYPE
---------|------|--------|------
MK 10.8-#4 | 120" | O.C. | STR
MARK NO. | SIZE | LENGTH | TYPE
---------|------|--------|------
12-1/4 | 12 | 6-1/4 | STR
MARK NO. | SIZE | LENGTH | TYPE
---------|------|--------|------
12-1/4 | 12 | 6-1/4 | STR

NOTES:

1. PROVIDE 2" x 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101 FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
SPECIAL BAR BENDS

**TOP SLAB**
4'0" OPENING

**VERT. SECTION**

**BOTTOM SLAB**

**HORIZ. SECTION**

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**MARKS:**
- **MK10.6-440-157.6"**: ROUNDED UP TO THE NEXT WHOLE NUMBER
- **MK10.6-440-157.6"**: WALL HEIGHT (INCH)/10

**NOTES:**
1. PROVIDE 2" X 4" KEY FOR ALL CONSTRUCTION JOINTS WHEN MANHOLE IS CAST IN PLACE.
2. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.
3. THIS MANHOLE IS INTENDED FOR PIPE AS INDICATED ON STD. DWG. 101. FOR MANHOLE STEPS AND OTHER DETAILS NOT SHOWN ON THIS SHEET, SEE STD. DWGS. 102 & 103.
4. DEPTHS INDICATED IN TITLE ARE MEASURED FROM SURFACE TO M.H. INVERT.

**LEXINGTON**
LEXINGTON – FAYETTE URBAN COUNTY GOVERNMENT
1. 6:1 Slopes are with reference to ditch grade.
2. When a box inlet is placed in a sag, omit the earth dike and longitudinal slope of the grate, and provide a concrete apron on each side of the inlet.
3. Rate of increase or decrease 0.36 cu. yd. per foot in height.
4. Deduct approximately 0.1 cu. yd. of concrete per pipe.
5. Compact this volume with D.G.A. base or equivalent.
6. Steps are required for depths greater than 4' refer to Std. Dwg. 103.
ISOMETRIC 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 THROUGH, ONLY STRAIGHT THROUGH CONNECTIONS ARE ALLOWED.

SECTION E-E

SECTION F-F

TOP OF BENCH IF PIPE DOES NOT EXTEND THROUGH INLET

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
**BILL OF REINFORCEMENT**

<table>
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<tr>
<th>BAR</th>
<th>ST</th>
<th>FT</th>
<th>IN</th>
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<th>LOCATION</th>
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<tr>
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</tr>
<tr>
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<td>10</td>
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*All of bars required for G+(-1'-0") add or deduct # A3 & # A4 for each 1'-0" increase or decrease in H.

**BAR TYPES**

1. **TYPE 1**
2. **TYPE 2**
3. **TYPE 3**
4. **TYPE 4**
5. **TYPE 5**

**NOTES:**
1. CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSION STRENGTH OF 3500 PSI.
2. STEEL REINFORCEMENT SHALL BE A #4, F135, GRD 60. ALL EXPOSED EDGES SHALL BE SMOOTHED UNLESS OTHERWISE SHOWN.
3. THIS DRAWING DEPICTS A CURB BOX INLET IN A GRADE SITUATION FOR CURB BOX BOX IN SAG SITUATIONS DETAILS SHALL BE MODIFIED AS INDICATED IN DETAIL I-A.
4. THE STANDARD OPENING LENGTH IS 10'-0" AS DETAILED HERE. THIS LENGTH MAY BE INCREASED OR DECREASED BASED ON INCRIMINATE ANALYSIS AND APPROVAL BY THE ENGINEER. PLACEMENT OF CURB BOX MANTAIN THE SAME MAXIMUM SPACING SHOWN ON THIS DRAWING.
5. MAXIMUM 10" FOR APPLICATIONS OF THIS DRAWING SHALL BE 10 FEET.
6. FIELD BEND OR CUT BARS A2, A4, AND A5 AS NECESSARY WHERE PIPES PENETRATE CHAMBER WALLS.
7. FOR CURB BOX INLET IN CURVE WITH CURB RADIUS OF LESS THAN 25', LONGITUDINAL BARS A5 & A10 SHALL BE SHOP FABRICATED IN-RHET.
# Bill of Reinforcement

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<tr>
<td>B7</td>
<td>14 H+1-10&quot;</td>
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**Notes:**

1. Concrete shall have a minimum 28 day compressive strength of 3500 PSI.
2. All exposed edges shall be beveled unless otherwise shown.
3. The standard opening length is 10'-0" as detailed. Here, this length may be increased or decreased based on structural analysis and approval by the Lexington-Fayette Urban County Government Engineer. Modification to the opening length will require modification of length 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.

---

**Diagram Details:**

- **GRADE**
- **SAG**
- **ISOMETRIC VIEW**

**Notes:**

AFFIX CIRCULAR MARKER TO THE TOP OF THE INLET BOX, PER MANUFACTURER'S RECOMMENDATIONS. 4" DIAMETER STAINLESS STEEL STAMPED DISK WITH SHERIFF ENAMELED BLUE BACKGROUND, LOGO OF SHERIFF JUMPING OVER WAVES WITH TEXT ON PERIMETER "STORM DRAIN, DRAINS TO STREAM", ALMTEK INDUSTRIES OR APPROVED EQUAL.

**Division of Engineering**

**Curb Box Inlet Type "B"**

- 5'x5' Box
- 18"-24" Pipes

**Lexington - Fayette Urban County Government**
BILL OF REINFORCEMENT

BAR TYPES

NOTES:
1. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMpressive STRENGTH OF 3500 PSI.
2. ALL EXPOSED EDGES SHALL BE ALCOHOL WETTED WITH A PAPER TOWEL OR SIMILAR MATERIAL.
3. 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'.
4. THE STANDARD OPENING LENGTH IS 10'-0" AS DETAILED HERE. THIS LENGTH MAY BE INCREASED OR DECREASED BASED ON ENGINEERING ANALYSIS AND APPROVAL OF THE AUTHORIZED ENGINEER. MODIFICATION OF LENGTH OF CURB C16 & C10 AND INCREASE OR DECREASE IN NUMBER OF BARS C16 & C10 MAINTAINING THE SAME MAXIMUM SPACING SHOWN ON THIS DRAWING.
5. MAXIMUM 4" FOR APPLICATION OF THIS DRAWING SHALL BE 5 FEET.
6. FIELD BEND OR CUT BARS C3, C5, C6 & C7 AS NECESSARY WHERE PIPES PENEtrate CHAMBER WALLS.
7. FOR CURB BOX INLET IN CURVE WITH CURB RADIUS OF LESS THAN 2X CURB, CONGRUENTAL BArs C16, C11 & C12 SHALL BE SHIP-FABRICATION RADIALLY.

LEXINGTON – FAYETTE URBAN COUNTY GOVERNMENT
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 WALLS. EXTERIOR HOE ROLL WALLS SHALL HAVE A 12" MIN. LAP AT CORNERS.
3. ALL EXPOSED FLATWORK SHALL HAVE A HAND FLOAT 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 2" TAP INTO BOTTOM SLAB WITH 3" CLEARANCE FROM EXTERIOR BOTTOM.
6. LEFT 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 GRADE OR EQUIVALENT.
9. TOP OF CURB SECTION SHALL BE CAST WITH "DUMP NO WASTE DRAINS TO STREAM".

SECTION C-C

SECTION D-D

DUMP NO WASTE DRAINS TO STREAM

FLOW

ISOMETRIC VIEW

GRATE DETAIL

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
1. Spring box inlet type "A" may be used when fill over top is less than 10'.
   - 2", 15", or 18" diameter pipe outlet (see pipe sections for size and type).
2. Mortar around pipe to prevent seepage.
3. Steel reinforcement placed 6" on centers.

Steel reinforcement: 13 lbs
Class LA concrete: 1.54 cu. yds.

**Bill of Reinforcement**

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<thead>
<tr>
<th>MARK</th>
<th>QUANTITY</th>
<th>SIZE</th>
<th>LENGTH</th>
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</thead>
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<tr>
<td>C</td>
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**Location Description**

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TYPICAL ILLUSTRATIONS FOR CASTINGS

1. CHAIN SHACKLE, OR COLD SAWN OF AN APPROVED TYPE.
2. PROOF COIL CHAIN OF SUFFICIENT LENGTH TO ALLOW REMOVAL AND DISPLACEMENT OF GRATE, 18" MIN.
3. 1" X 6" EYE BOLT, NUT, AND WASHER.
4. HEX HEAD CAP SCREW (GRADE 2), NUT AND WASHERS. LENGTH DETERMINED BY THICKNESS OF FRAME OR GRATE.
5. DIAL HOLE FOR CAP SCREW. recessed THREADS ON CAP SCREW TO PREVENT REMOVAL OF NUT.
6. EYE BOLT (LENGTH DETERMINED BY THE FRAME DIMENSION).
7. ALL EYE BOLTS SHALL HAVE A CONTINUOUS OR SQUARED EYE.
8. ALL HARDWARE SHALL BE GALVANIZED AND OF COMMERCIAL QUALITY AND SHALL BE APPROVED BY THE ENGINEER.
9. THE COST OF THE COMPLETE SECURITY DEVICE, INSTALLED, SHALL BE INDEMNIFIED TO THE COST OF THE STRUCTURE.
10. THE DESIGNS SHOWN ARE ACCEPTABLE; HOWEVER, ARE SUBJECT TO CHANGE IF APPROVED IN WRITING BY THE ENGINEER.

TYPICAL ILLUSTRATIONS FOR STRUCTURAL STEEL UNITS
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/50 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" unless ditch shall have approval from the engineer. Stone shall be well grasped so that openings between larger stones are filled with smaller stones.
NOTES:

1. BEDDING MATERIAL SHOULD NOT BE SMALLER THAN KNOX NO. 2 COARSE
   AGGREGATE STONE. THE REQUIREMENTS FOR KNOX NO. 2 COARSE
   AGGREGATE STONE ARE AS FOLLOWS:

<table>
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<th>SIEVE SIZE</th>
<th>PERCENT PASSING</th>
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<tr>
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2. BEDDING SHOULD BE AT LEAST THREE INCHES AND SPREAD UNIFORMLY.

3. ELASTIC 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 PER-
      CENT OR LESS BY WEIGHT OF FINE PARTICLES (LESS THAN 0.074 mm):

      1) 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. 200
      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:

<table>
<thead>
<tr>
<th>VELOCITY (FEET/SECOND)</th>
<th>STONE DIAMETER (INCHES)</th>
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<tbody>
<tr>
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<tr>
<td>6</td>
<td>2.5</td>
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<td>10</td>
<td>3</td>
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</table>
ANSCH LS IS REQUIRED WHEN LINING IS PLACED ON 5% GRADE OR GREATER.

NOTES:
1. SECURE THE LACING WIRE AT THE CORNER OF THE BASKET BY LOOSING AND TWISTING. CONTINUE LACING THROUGHOUT WITH DOUBLE LOOPS AT APPROXIMATELY 1 INCH INTERVALS. EACH UNIT SHALL CONSIST OF LININGS SUPPLIED IN WIDTHS OF 6" X 6" AS SHOWN AND LENGTHS IN MULTIPLES OF 6" X 6".
2. AGGREGATE ESTIMATED ON THE BASIS OF 0.375 TONS PER SQ. YD.
3. MATTRESS SHALL BE MANUFACTURED FROM WIRE WITH A MINIMUM TENSALE STRENGTH OF 65,000 PSI.
4. STONE SIZE PER MANUFACTURER SPECIFICATIONS.
NOTES:
1. USE "CLASS A" CONCRETE THROUGHOUT.

2. CONSTRUCTION FINISHING AND CURING SHALL BE THE SAME AS REQUIRED FOR CONCRETE SIDEWALKS (USE-WHITE COMPOUNDS).

3. IF THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT IN THE MIDDLE OF THE PAVED DITCH 6" X 6" X 6" X 6" X 6" X 6" X 6" X 6" ANCHOR 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 DRIP 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.
## Notes:
1. The height of the footer shall be 18” for soil and 12” in rock.
2. All exposed edges to be chamfered.
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°.

### Headwall Dimensions

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<thead>
<tr>
<th>Headwall Type</th>
<th>Dia. of Pipe</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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<td>1’-4”</td>
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<tr>
<td><strong>Raised</strong></td>
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<td>1’-8”</td>
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<td>5’-9”</td>
<td>4’-3”</td>
<td>11’-3”</td>
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</table>

### ISOMETRIC VIEW

- **Soil Slope:**
- **See Notes (4) & (5)**
**HEADWALL DIMENSIONS**

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<th>HEADWALL TYPE</th>
<th>A</th>
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<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
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<tr>
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<tr>
<td>18&quot; Diameter Pipe</td>
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<td>3&quot;-6&quot;</td>
<td>6&quot;-10&quot;</td>
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</tbody>
</table>

**NOTES:**

1. **HEIGHT OF FOOTER SHALL BE 18" FOR SOIL AND 12" IN ROCK.**
2. **ALL EXPOSED EDGES TO BE CHAMFERED.**
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 "H" IS GREATER THAN 30°."
**Sheet Note:**

1. **SOLID CONCRETE BOTTOM REQUIRED.**

**Notes:**

1. **Volume displaced by barrel of pipe has been computed using inside diameter of pipe.**
2. **Curb line fence is required on all headwalls when vertical face of pipe is greater than 30°.**

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<tr>
<th>Dimensions</th>
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<tr>
<td>30&quot;</td>
<td>H 10'-2&quot; 9'-3&quot; 9'-4&quot; 9'-5&quot; 9'-6&quot;</td>
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</table>

C.Y. Concrete

Heads: 2.96 3.53 4.72 6.03 8.79

**Division of Engineering**

**U-Type Headwalls**

*Lexington - Fayette Urban County Government*
Sheet Notes:
1. 6 #4 x 1 1/2" Dowels
2. 4 #4 x 12" Dimension minus 4"
3. Slope shall be marked as Headwall when slope is skewed and/or normal slope varies from 1:1.

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. Distance between wings shall be closed in direction of flow equal to slope of pipe, but not to exceed 1%. Front face of headwall shall remain vertical.
5. Chain link fence is required on all headwalls when vertical face is greater than 60°.
6. All exposed edges are to have 45° chamfer.
7. Skewed pipe requires special design.

Lexington - Fayette Urban County Government

Division of Engineering
Pipe Culvert Headwalls
0° Skew
15”-27” Circular Pipe
1. **APPLIES TO 66" DIAMETER AND GREATER (CIRCULAR PIPE)**
2. **SEE SHEETS 2, 3, AND 4 OF CURRENT STD. DWG. 154 FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT.**
3. **DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE UNLESS OTHERWISE NOTED.**
4. **ENCIRCLED LETTERS INDICATE STEEL BAR LOCATIONS.**
5. **BARS **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 SHOULDERS 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 HEADWALLS AND ENDS OF WINGS SHALL REMAIN VERTICAL.**
11. **FENCE AND OR HANDRAIL IS REQUIRED FOR ALL HEADWALLS, SEE STD. DWG. 30B.**
12. **ALL EXPOSED EDGES ARE TO HAVE 1/4" CHAMFER.**
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**CU YLD CONC HEAD WALLS**
- 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

**CUB YLD CONC HEAD WALLS**
- 0.281
- 0.363
- 0.430
- 0.496
- 0.583
- 0.687
- 1.320
- 1.571
- 1.815
- 2.043
- 2.451
- 2.753
- 3.050
- 3.379

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LEXINGTON — FAYETTE URBAN COUNTY GOVERNMENT
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**NOTES:**

1. NUMBER OF BARS IN ONE HEADWALL
2. DIMENSIONS ARE OUT TO OUT OF BARS
3. ALL BARS ARE STRAIGHT EXCEPT AS SHOWN BELOW

**BENT BAR SHAPES**

- 1-4" (30-60°)
- 3-6" (60-120°)
- 5-8" (120-180°)

**BARS**

- 1-4" (30-60°)
- 3-6" (60-120°)
- 5-8" (120-180°)

**LEXINGTON — FAYETTE URBAN COUNTY GOVERNMENT**
DIMENSIONS AND QUANTITIES

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NOTES:

1. ALL VOLUMES ARE IN CUBIC YARDS FOR TWO HEADWALLS. VOLUME REPLACED BY BAGGAGE OF PIPE HAS BEEN COMPUTED USING DRY DIAMETER OF PIPE. NO DEDUCTION HAS BEEN MADE FOR REVELED EDGES.

2. WHERE HEADWALLS ARE LOCATED AT THE EDGE OF THE SHOULDER THE SHEEPE HEADWALLS SHALL BE PARALLEL TO THE EDGE OF SHOULDER.

3. WHERE A RAISED HEADWALL IS USED ON THE OUTLET END OF THE PIPE, THE TOPS OF BOTH WALLS SHALL BE AT THE SAME ELEVATION.

A. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE ELEVATION IS GREATER THAN 55°.

SECTION A-A

LEXINGTON DIVISION OF ENGINEERING

18"-24" DOUBLE & TRIPLE PIPE CULVERT HEADWALLS AT 0° SKEW

Lexington - Fayette Urban County Government
NOTES:

1. SEE SHEETS 2 AND 3 OF CURRENT STD. DWG. 159 FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT.

2. ENCLOSED LETTERS (.), INDICATE STEEL BAR LOCATIONS.

3. BARS (C), (D), (E) ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.

4. BARS (Y) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.

5. BARS (C) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.

6. HEADWALLS LOCATED AT THE EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.

7. ABRENS BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE AND ENDS OF WINGS SHALL REMAIN VERTICAL.

8. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.

9. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICALE 2'-0" IS GREATER THAN 35'-0" SEE STD. DWG. 3600.
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**CLASS I & II CONC.**

**LBS. STEEL**

**Sheet 2 of 3**

**LEXINGTON**

**DIVISION OF ENGINEERING**

**DIMENSIONS AND QUANTITIES**

**DOUBLE & TRIPLE HEADWALLS — CIRCULAR PIPE**

**0" SKW**

**LEXINGTON — FAYETTE URBAN COUNTY GOVERNMENT**
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**

- **K**
- **1'-6"**

- **BARS (E)**
- **K**
- **6"**

- **BARS (F)**
- **K**
- **1'-8"**

- **BARS (H)**
- **K**
- **1'-3"**

- **BARS (V)**

---

**LEXINGTON**

**DIVISION OF ENGINEERING**

**BILL OF REINFORCEMENT**

**10'-48" DOUBLE & TRIPLE HEADWALLS - CIRCULAR PIPE**

**U SKREW**

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**LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT**
**PLAN VIEW OF STRUCTURE LOCATIONS**

- **Condition No. 1:** 6° skew
- **Condition No. 2:** 15° to 30° skew
- **Condition No. 3:** Greater than 30° skew

**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. L is concrete pipe wall thickness.

**DETAIL SHOWING LOCATION OF SLOTS FOR GRATES**
- A, B for 2 grates
- A, B, C for 3 grates
- A, B, C, D for 4 grates

**DIMENSIONS**

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<th>R</th>
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**No. 4 Reinforcement Bars**

- Number-Length and Weight
- LBS

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NOTES:
1. EQUALLY SPACE BARS NO. 3.
2. SIZE OF GRATE EITHER 2'-0" OR 3'-0".
3. SHEET FOR 2'-0" GRATE, 7" FOR 3'-0" GRATE.
4. ALL COMPONENTS ARE 1" x 2" STRUCTURAL STEEL BARS.
5. SEE STD. DWG. 162.
6. Secure grate to structure with chain splice, see STD. DWG. 126.
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 1/4" 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.
NOTES:

1. NO. 5 STEEL BARS SHALL BE USED THROUGHOUT ON 12" CENTERS EXCEPT ON BARRING WHERE HORIZONTAL AND VERTICAL STEEL WILL BE ON 6" CENTERS.

2. WEIGHT OF WALL SHALL BE DETERMINED BY THE AMOUNT OF FILL BEHIND PIPE.

3. TOP OF WALL SHALL BE 18" ABOVE TOP O.D. OF PIPE.

4. TOP OF END SILL SHALL BE LEVEL WITH CENTERLINE OF PIPE.

5. TOP OF BILLET SHALL BE LEVEL WITH CROWN OF PIPE, AND THE BOTTOM SHALL BE LEVEL WITH CENTERLINE OF PIPE.

6. 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 COMPOUND OF CLASS III CHANNEL LINING.

7. CHANNEL LINING ON SLOPES BEHIND BARRING WITH CLASS III CHANNEL LINING.

8. CHANNEL LINING ON SLOPES AT WINGWALL AND TO DOWNSTREAM END OF CHANNEL.

9. ALL VERTICAL OR SLOPED EXPOSED SURFACES SHALL HAVE A RUBBED FINISH.

10. ALL EXPOSED FLATWORK SHALL HAVE A HANDPLASTED AND BROOMED FINISH.

11. ALL EXPOSED EDGES SHALL HAVE A RUBBED FINISH.

12. ALL STEEL SHALL HAVE A 2" MINIMUM CLEARANCE TO THE CONCRETE FACE ON THE BACKFILL SIDE OF THE STRUCTURE.

13. ALL CHAIN LINK FENCES IS REQUIRED ON ALL HEADWALLS WHEN THE VERTICAL FACE IS GREATER THAN 30°.

14. ALL LARGER BARRING SHALL HAVE A SPECIAL DESIGN STILLING BASIN.

15. ALL LATERAL REINFORCING BARS IN BARRING SHALL HAVE SUFFICIENT ANCHORAGE LENGTH IN SIDEWALLS.
RETAINING WALL

CASE 1

H: GREATER THAN 12' - 0"

H: GREATER THAN 2:1

CASE 2

NO TOP FILL

CASE 3

H: GREATER THAN 2:1

SPECIAL DESIGNS REQUIRED

END AREA

VOLUME

CASE 1 OR 2

H

B

SQ. FT.

C.Y./L.F.

2' - 6"

1' - 3"

2.8125

0.1042

3 - 6"

1' - 6"

3.7500

0.1389

3' - 6"

1' - 9"

4.8125

0.1782

4 - 6"

2' - 0"

6.0000

0.2222

4' - 6"

2' - 3"

7.3125

0.2708

5' - 6"

2' - 6"

8.7500

0.3241

5' - 0"

3' - 0"

10.3125

0.3819

6' - 0"

3' - 3"

12.0000

0.4444

6' - 6"

3' - 6"

13.8125

0.5116

7' - 0"

3' - 9"

15.7500

0.5833

7' - 6"

3' - 9"

17.8125

0.6597

8' - 0"

4' - 0"

20.0000

0.7407

8' - 6"

4' - 3"

22.3125

0.8264

9' - 0"

4' - 6"

24.7500

0.9187

9' - 6"

4' - 9"

27.3125

1.0116

CASE 3

10' - 0"

5' - 0"

30.0000

1.1111

10' - 6"

5' - 6"

32.8125

1.2153

11' - 0"

6' - 0"

35.7500

1.3241

11' - 6"

6' - 9"

38.8125

1.4375

12' - 0"

6' - 0"

40.0000

1.5556

CASE 2

10' - 0"

6' - 0"

35.0000

1.2963

10' - 6"

6' - 3"

38.0825

1.4097

11' - 0"

6' - 6"

41.2500

1.5278

11' - 6"

6' - 9"

44.5825

1.6505

12' - 0"

7' - 0"

48.0000

1.7778

NOTES:

1. THE RETAINING WALL DEPICTED ON THIS DRAWING SHALL BE USED WHEN THE HEIGHT (H) AND DIMENSION OF THE WALL IS 2' - 6" TO 12' - 0" PROVIDED THE FILL COMPROMISES WITH THE FOLLOWING CONDITIONS:
   - CASE 1 - TOP OF FILL IS LEVEL WITH TOP OF WALL.
   - CASE 2 - WALL IS SURCHARGED WITH DEAD LOAD.
   - FILL SLOPES OF 2:1 OR LESS.

2. AREAS AND VOLUMES HAVE BEEN COMPUTED WITHOUT ACCOUNTING FOR REVELED EDGES OR PIPE DRAINS. WHEN A RETAINING WALL VARIATES IN HEIGHT, THE PRISMoidal FORMULA SHALL BE USED IN COMPUTING VOLUMES.

3. GRAVITY TYPE RETAINING WALLS SHALL BE CONSTRUCTED OF CLASS 4 CONCRETE.

4. TRANSVERSE EXPANSION JOINTS 1/2 INCH IN WIDTH SHALL BE PLACED AT INTERVALS OF NOT OVER 10 FEET THROUGHOUT THE LENGTH OF RETAINING WALLS AND EXPANSION JOINT MATERIAL BE PLACED THEREIN. ALL EXPOSED EDGES SHALL BE REVELED 1/2" "IN THE WALLS SHALL BE SURCHARGED EXCEPT IN SPECIAL CASES WHERE SPECIAL DRAWINGS WILL BE FURNISHED.

SHEET NOTES:

SPECIAL DESIGNS SHALL BE REQUIRED WHEN ANY ONE OF THE FOLLOWING CONDITIONS EXIST:

[1] WALL HEIGHT IS GREATER THAN 12' - 0" (CASE 1 OR CASE 2 - FILL).


[4] MINIMUM VALUE FOR FIRM SOIL IS 2' - 0".

[5] BATTER: H = 1/2" TO LESS THAN 6' - 0" (VERTICAL).
   H = 6' - 0" TO LESS THAN 10' - 0" (1:1)
   H = 10' - 0" TO 12' - 0" (2:1)
MAGNETIC MARKER TAPE

ZONE 5

ZONE 4

ZONE 1

12" MIN.

6" MIN.

12" MAX.

6" MIN.

12" MAX.

CONTRACTOR TO PROVIDE ADEQUATE MEANS TO PREVENT FLOATING OF PIPE BEFORE INSTALLING CRADLE

PRECAST CONCRETE BLOCK OR BRICK REINFORCEMENT TO EXCEED 6" SPACING

CONCRETE CLASS "A"

STANDARD CONCRETE ENCASEMENT
(NOTE: AS REQUIRED BY DESIGN)

PIECE LAID IN ROCK OR SOIL TRENCH

PIPE BACKFILL DESCRIPTIONS

<table>
<thead>
<tr>
<th>ZONE 1</th>
<th>NO. 9 STONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZONE 2</td>
<td>NO. 9 OR NO. 57 STONE</td>
</tr>
<tr>
<td>ZONE 3</td>
<td>COMPACTED DCA</td>
</tr>
<tr>
<td>ZONE 4</td>
<td>CONSOLIDATED SOIL (NO ROCK GREATER THAN 6&quot; DIAMETER) NO. 9, OR NO. 57 STONE</td>
</tr>
<tr>
<td>ZONE 5</td>
<td>12&quot; MAX. TOPSOIL, NO ROCK ALLOWED</td>
</tr>
</tbody>
</table>

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.
**CONCRETE PAVEMENT**

12" ROADWAY SURFACE

SAWED JOINTS

NEAT CUT AND SQUARED EDGES WITH TACK COAT

NEW CONCRETE

EXISTING PAVEMENT & SUBBASE, VARYING DEPTH

TACK COAT

MAGNETIC MARKER TAPE

UNDISTURBED EARTH

**BITUMINOUS PAVEMENT**

12" JOINT SEAL, SEE NOTE 2

12" KYTC 2" BITUMINOUS SURFACE MAX

12" MIN

12" MIN

12" MAX

12" MAX

6" MIN

6" MIN

NOTE:

1. REPLACE CONCRETE PAVEMENT WITH NEW CONCRETE PAVEMENT TO MINIMUM OR EXISTING THICKNESS, WHICHER IS GREATER.

2. SEAL PERIMETER OF CUT PAVEMENT WITH CRACK SEALANT THAT MEETS ASTM D6690, TYPE 2.

3. MAGNETIC MARKER TAPE FOR SANITARY SEWER ONLY.

**PIPE BACKFILL DESCRIPTIONS**

<table>
<thead>
<tr>
<th>ZONE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZONE 1</td>
<td>NO. 9 STONE</td>
</tr>
<tr>
<td>ZONE 2</td>
<td>NO. 9 OR NO. 57 STONE</td>
</tr>
<tr>
<td>ZONE 3</td>
<td>COMPACTED DGA</td>
</tr>
<tr>
<td>ZONE 4</td>
<td>CONSOLIDATED SOIL (NO ROCK EXCEPT THOSE 1&quot; MAX)</td>
</tr>
<tr>
<td>ZONE 5</td>
<td>12&quot; MAX TOPSOIL, NO ROCK ALLOWED</td>
</tr>
</tbody>
</table>

LEXINGTON — FAYETTE URBAN COUNTY GOVERNMENT
CONCRETE PAVEMENT

- ROADWAY SURFACE
- SAWED JOINTS
- NEW CONCRETE

- FLOWABLE FILM
- ZONE 1
- 6" MIN.
- 12" MAX.
- 12" MAX.
- 6" MIN.

- VARES
- UNDISTURBED EARTH

BITUMINOUS PAVEMENT

- JOINT SEAL
- SEE NOTE 3
- SAWED JOINTS

- COMPACTED BITUMENT SURFACE
- NEW CONCRETE

- FLOWABLE FILM
- ZONE 1
- 6" MIN.
- 12" MAX.
- 12" MAX.
- 6" MIN.

- TACK COAT
- EXISTING PAVEMENT & SUBBASE, VARYING DEPTH

PIECE 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 62 DIAMETER) NO. 9 OR NO. 57 STONE |
| ZONE 5 | 12" MAX. TOPSOIL NO ROCK ALLOWED |

NOTES:

1. FLOWABLE FILM PER KYTC SPECIFICATION 501.03.03 FROM STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION CURRENT EDITION.

2. REPLACE CONCRETE PAVEMENT WITH NEW CONCRETE PAVEMENT 6" MINIMUM OR EXISTING THICKNESS, WHICHEVER IS GREATER.

3. SEAL PERIMETER OF CUT PAVEMENT WITH CRACK SEALANT THAT MEETS ASTM D6890, TYPE 2.
CONCRETE PAVEMENT

EXISTING PAVEMENT THICKNESS VARIES

ROADWAY SURFACE

-12" MIN.

SAWED JOINTS

8 INCHES MIN.
NEW CONCRETE
SEE NOTES 1 & 2

BACKFILL DETERMINED
BY "D" = DEPTH

NO. 9 CRUSHED AGGREGATE
BEDDING (OR AS SPECIFIED)
BY UTILITY

WHERE D IS LESS THAN 5.0 FEET TOTAL DEPTH
OF BRUSH, NO. 9 CRUSHED AGGREGATE
SHALL BE USED.

WHERE D IS EQUAL TO OR MORE THAN 5.0 FEET
TOTAL DEPTH OF BRUSH, FLOWABLE FILL
MATERIAL SHALL BE USED. SEE NOTES 4 & 5.

NOTES:

1. PER KYTC SPECIFICATION 601.03.03.A) CLASS A FROM STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.

2. REPLACE CONCRETE PAVEMENT WITH NEW CONCRETE PAVEMENT.

3. SEAL PERIMETER OF CUT PAVEMENT WITH CRACK SEALANT THAT MEETS ASTM D6690, TYPE 2.

4. FLOWABLE FILL TO BE PROPORTIONED PER KYTC SPECIFICATION 601.03.03.B1) FROM STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.

5. UTILITY DESIGNERS AND CONTRACTORS SHALL ACCOUNT FOR AND PROVIDE ANY SUITABLE MEANS TO PREVENT PIPE/CONDUIT FLOATATION.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT

BITUMINOUS PAVEMENT

EXISTING PAVEMENT THICKNESS VARIES

JOINT SEAL.
SEE NOTE 3

KYTC 2" BITUMINOUS surface mix

SAWED JOINTS

8 INCHES MIN.
NEW CONCRETE
THICKNESS

BACKFILL DETERMINED
BY "D" = DEPTH

TACK COAT

NO. 9 CRUSHED AGGREGATE
BEDDING (OR AS SPECIFIED)
BY UTILITY

L E X I N G T O N - F A Y E T T E U R B A N C O U N T Y G O V E R N M E N T
# Table of Maximum Allowable Fill Heights (Live Load Not Included)

<table>
<thead>
<tr>
<th>Diameter (Inches)</th>
<th>Ductile Iron Pipe</th>
<th>Polyvinyl Chloride (PVC) Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class 50*</td>
<td>SDR-35</td>
</tr>
<tr>
<td></td>
<td>Maximum Depth of Cover (Feet)</td>
<td>Maximum Depth of Cover (Feet)</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>12</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>14</td>
<td>20</td>
<td>15</td>
</tr>
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<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>20</td>
<td>15</td>
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<td>18</td>
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<td>21</td>
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<td>18</td>
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<tr>
<td>24</td>
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<td>27</td>
<td>17</td>
<td>20</td>
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<tr>
<td>30</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>36</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>42</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>48</td>
<td>13</td>
<td>20</td>
</tr>
</tbody>
</table>

* Lightest Class of Ductile Iron Pipe

Notes:
1. Depth is based on laying condition utilizing 10% to 20% excavated soil fill from a minimum below pipe to a plane level with the top of the pipe and as 10 to 12' No. 3 Dr. Steel 10' edge of trench.
2. Weight of soil and rock cover mix is assumed to be approximately 120 lbs/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 pipe, ground level, and fill heights for actual brand of pipe proposed.
5. Special trenching details and procedures should be used where fill heights are higher than those shown in table.
6. Installations requiring a depth greater than 20' must be approved by the engineer.

---

**Lexington - Fayette Urban County Government**

**Lexington Division of Engineering**

**Sanitary Sewer Pipe Types & Maximum Allowable Fill Heights**

<table>
<thead>
<tr>
<th>Standard Drawing No.</th>
<th>204</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval</td>
<td></td>
</tr>
<tr>
<td>Work Court Engineer</td>
<td></td>
</tr>
<tr>
<td>Submitter</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td></td>
</tr>
</tbody>
</table>
MANHOLE BASE MAY BE EITHER ROUND OR SQUARE

SECTION A-A
(Pipe with top half removed or paved invert)

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 RING CONCRETE SEAL AND AN INNER SEAL OF NON-SHRINK GROUT.

2. COAT OUTSIDE OF ADJUSTING RINGS WITH SEMI-FRIED ASPHALT (SHRINK PROOFING COMPOUND APPLIED) BY BRUSH OR SPRAY.

3. WATER STOP SHOUL DBE PROVIDED FOR INFLTS AND OUTLTS OF EVERY MANHOLE DESIGNED FOR TYPE A 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.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
SECTION A–A

MANHOLE BASE MAY BE EITHER ROUND OR SQUARE

SECTION B–B

NOTES:

1. ALL BASE JOINTS BETWEEN BASE AND BARGE BETWEEN 4'-0" AND 5'-0"
   SHOULD BE MADE WITH ADHESIVE PLUGS.

2. MANHOLE BASES SHALL BE PLACED 6" ABOVE GRADE.

3. WATER STOPS SHOULD BE PROVIDED FOR INLETS AND OUTLETS OF DRAIN MANHOLE DESIGNED FOR USE FOR DRAINAGE AND WITH EXPANSIVE GROUT.

4. NO REINFORCEMENT NECESSARY IN BOTTOM SLAB AT MANHOLE BASE EXCEPT AT MANHOLE BASE INCREASED TO 12" MIN.

5. A DRAIN SHOULDN'T BE MADE TO DRAIN MANHOLE BASE INTO MANHOLE CLEARLY生机。

6. MANHOLE STEPS SHALL BE ALIGNED WITH STRAIGHT EDGE OR CONFORM TO DRAIN MANHOLE CLEARLY.

7. PIPES SHALL NOTEnter THE CONE SECTIONS.

8. MANHOLE MUST PASS VACUUM TEST PER ASTM C-1244 PRIOR TO ACCEPTANCE.

LEXINGTON — FAYETTE URBAN COUNTY GOVERNMENT
SECTION A-A

NOTES:
1. ALL BARREL CUTS BETWEEN BASE AND BARREL BETWEEN BASE AND TOP BETWEEN TOP AND ADJUSTING RINGS. BETWEEN ADJUSTING RINGS AND FRAME SHALL HAVE ONE OUTER MORTAR SEAL AND AN INNER SEAL OF NONSHRINK CEMENT.
2. COAT OUTSIDE OF ADJUSTING RINGS WITH SEMI-FRATED ASBESTOS-RAG PROOFING 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 EXPANSION Joints. See Std. Fig. 213.
4. BOLUTIONING NEEDED IN BOTTOM SLAB AT DEPTHS UP TO 12 AT SPACING 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. MANHOLE 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 OUTLET PIPE.
9. DO NOT USE IN CASES WHERE THE DROP IS 2'-0" OR LESS.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT

TYPICAL PRECAST CONCRETE DROP MANHOLE
FOR PIPES UP TO 36"

DIVISION OF ENGINEERING

STANDARD DRAWING NO. 212

APPROVED: 2017

CONSTRUCTION NO. 2017
NOTES:
1. Lift rings to be cut before adding the next ring or top.
2. Coat outside and in between adjusting rings with semi-dried asphalt deteriorating compound applied in brush or spray.
3. Grade rings with non-parallel surfaces may be used to adjust casting to sloped surface.
4. Concrete class C 3000 psi at 28 days, and in accordance with ASTM C 476, or approved equal.
5. No more than 2 grade rings may be used at one location and the maximum height of all rings used shall not exceed 12 inches.
6. Apply mastic between all joints.

<table>
<thead>
<tr>
<th>GRADE RING WIDTH CHART</th>
<th>WEIGHT</th>
<th>LBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>3&quot;</td>
<td>210</td>
<td></td>
</tr>
<tr>
<td>4&quot;</td>
<td>279</td>
<td></td>
</tr>
<tr>
<td>6&quot;</td>
<td>419</td>
<td></td>
</tr>
<tr>
<td>8&quot;</td>
<td>560</td>
<td></td>
</tr>
<tr>
<td>12&quot;</td>
<td>730</td>
<td></td>
</tr>
</tbody>
</table>
GENERAL NOTES

1. SHALLOW MANHOLE TYPE CONSTRUCTION SHOWN ON SHEET NO. 216 MAY BE USED FOR ALL MANHOLES UP TO 9 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 MANHOLE SHALL BE SPECIALLY DESIGNED WITH REGARD TO LAYER 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 WFI TO CHANNELS AND SHALL HAVE SMOOTH FLOAT AND BRUSH FINISH.
7. CHANNEL SURFACE OF MANHOLE FROM INFANT TO OUTLET SHALL HAVE SMOOTH FLOAT FINISH.
8. ELEVATIONS OF PIPES IN MANHOLES SHALL BE SUCH THAT THE TOP OF ALL INFUENT PIPES WILL BE AT AN ELEVATION 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 INFUENTS, 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 (DOCHOUSE 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 ENCASMENT, ETC. SHOWN IN THESE DETAILS SHALL BE CLASS "A".
3. CONCRETE MANHOLE BARREL CONSTRUCTION SHALL CONFORM TO ASTM C-476 OR ITS LATEST REVISION.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
CIRCULAR MANHOLE NOTES:

1. The angle between any two pipes (e.g., angle 15° or 18°) must be greater than the sum of the partial angles, refer to separate standard drawings for table of minimum partial angle 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 manhole tee shall be no more than 80° for pipes up to 24" in diameter; the maximum deflection angle for 27" to 56" 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 18" and 24" pipes is 86°. The table indicates that for a 24" diameter manhole, the minimum partial angle for an 18" pipe is 45° and for a 30" pipe is 50°. The sum of the partial angles is 95°, which is less than the 85°. Therefore, a 30"-D manhole diameter is acceptable.

TABLE OF MINIMUM PARTIAL ANGLES FOR SANITARY MANHOLES

<table>
<thead>
<tr>
<th>MANHOLE SIZE</th>
<th>4°-0&quot;</th>
<th>5°-0&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>15°</td>
<td>30°</td>
<td>2°-3°</td>
</tr>
<tr>
<td>18°</td>
<td>35°</td>
<td>2°-3°</td>
</tr>
<tr>
<td>24°</td>
<td>39°</td>
<td>2°-2°</td>
</tr>
<tr>
<td>27°</td>
<td>45°</td>
<td>2°-0°</td>
</tr>
<tr>
<td>30°</td>
<td>50°</td>
<td>1°-11°</td>
</tr>
</tbody>
</table>

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
SET FRAME CASTING IN FULL MORTAR
TO ENSURE WATER-TIGHT MANHOLE FRAME
AND LID — SEE APPLICABLE STANDARD
DRAWING

NOTE:
MANHOLE FRAME & LID ASSEMBLY SHALL HAVE A
MINIMUM LID WEIGHT OF 120 LBS. AND A TOTAL
MINIMUM FRAME & LID WEIGHT OF 300 LBS. WITH
GUT STAND IN ACCORDANCE WITH ASTM A-48
CLASS 33 SPEC.

COVER DETAIL

FRAME DETAIL
**Frame Detail**

- **Position Hole**
- **Positioning Hole**

**Sanitary Sewer, Kentucky**

**Cover Detail**

**Watertight Detail**

**NOTE:**

- Manhole frame & lid assembly shall be Neenah FR-19.18-10 or approved equal, have a minimum lid weight of 150 lbs., and a total minimum frame & lid weight of 550 lbs. with all steel in accordance with ASTM A-36 Class 30 spec. or higher.
LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT

NOTES:

SEWER PIPE FROM HOUSE TO CLEANOUT MUST BE IN ACCORDANCE WITH STATE PLUMBING CODE AND LPFGO TECHNICAL 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.

RENEW TO STD. DWG. 231 FOR DETAILS OF HOUSE LATERAL FOR GREATER THAN 6" DEEP SEWER IN SOIL AND ROCK EXCAVATION.

RENEW TO STD. DWG. 232 FOR DETAILS OF HOUSE LATERAL FOR SHALLOW SEWER IN SOIL OR ROCK.

G:\ENGDATA\Standard Drawings 2017\SD234.dwg, 9/19/2017 3:33:52 PM, AutoCAD PDF (Web and Mobile).pc3
CREEK CROSSING DETAIL FOR SOIL CREEKBED

- CREEK GRAVEL (OR NO. 2's)
- #9 STONE
- 3000 PSI CONCRETE CAP
- M.J. DUCTILE IRON CARRIER PIPE OR PVC CARRIER PIPE IN STEEL CASING PIPE

CREEK CROSSING DETAIL FOR ROCK CREEKBED

- #9 STONE
- UNDISTURBED ROCK
- 3000 PSI CONCRETE CAP
- PIPE D.D.

NOTES:

1. A WATERSTOP SHALL BE PROVIDED IN THE UPSTREAM END OF THE DOWNSTREAM MANHOLE.
2. PIPE IN BE MALT TO BE WHEN DEPTH IS LESS THAN 4 FT.
3. UNDISTURBED ROCK MANDATORY 
4. FIX PIPE IN BE MALT TO THE CREEK CROSSING DETAIL THEY CONNECTIONS TO THE CREEK BED ENCOUNTERED.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
G:\ENGDATA\Standard Drawings 2017\SD250.dwg, 9/19/2017 3:41:57 PM, AutoCAD PDF (Web and Mobile).pc3

TOP VIEW

SECTION

GENERAL NOTES:
1. THIS STRUCTURE IS TO BE ACCESSIBLE FOR MAINTENANCE OR INSPECTION WITH COVERS AND CLEANOUTS BROUGHT TO GRADE.
2. DESIGN CRITERIA SHALL BE HS-20 LOADING.
3. FLOW TO THE INTERCEPTOR SHALL EXCLUDE SANITARY SEWER AND SURFACE DRAINAGE.
4. DESIGN AND CAPACITY OF GREASE INTERCEPTOR TO BE CERTIFIED BY ENGINEER IN ACCORDANCE WITH KENTUCKY STATE PLUMBING CODE AND HANDBOOK FOR CAPACITY OF THE DIVISION OF WATER QUALITY PRIOR TO CONSTRUCTION.
5. MULTIPLE COMPARTMENT INTERCEPTORS ARE ACCEPTABLE.
6. THE MINIMUM CAPACITY OF INTERCEPTORS IS 1000 GALLONS.
7. PIPES CLEANOUT TEE SHALL BE THE SAME SIZE AS THE PIPE AND BE WITHIN 6 OF THE CLEANOUT INTERCEPTOR ON THE OUTLET LINE. THE INLET LINE CLEANOUT IS OPTIONAL.
8. MANUFACTURER WILL PROVIDE GREASE TRAP WITH TWO(2) ACCESS POINTS AS SHOWN. PLUMBING CONTRACTOR TO INSTALL FIXTURES AS SHOWN.
9. DIAMETER OF PIPE IN GREASE INTERCEPTOR SHALL BE THE SAME DIAMETER AS THE INLET LATERAL PIPE.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
REMOVE PORTION OF EXISTING MANHOLE & REPLACE WITH WATER-PROOF NON-SHRINK GROUT OR MORTAR AND A WATERTIGHT GASKET

FLEXIBLE ACID RESISTANT NEOPRENE GASKET WATERSTOP

REMOVE PORTION OF EXISTING CONCRETE BENCH, FINISH FLOW LINE SURFACE SMOOTH

EXISTING MANHOLE

EXISTING SEWER

NEW SEWER PIPE

1" MIN (TYP)

FLEXIBLE ACID RESISTANT NEOPRENE GASKET WATERSTOP

REMOVE PORTION OF EXISTING MANHOLE & REPLACE WITH WATER-PROOF NON-SHRINK GROUT OR MORTAR AND A WATERTIGHT GASKET

ALL HOLES CUT INTO SEWER MANHOLES SHALL BE CORE DRILLED.

SEWER CONNECTION TO EXISTING MANHOLE
***PENDING LAND SUBDIVISION REGULATIONS UPDATE***

NOTES:
1. SLOPES AND DRAINAGE DITCHES OUTSIDE THE R.O.W. SHALL BE APPROVED BY THE ENGINEER.
2. THE APPLICATIONS AND USES OF THE ABOVE TYPICAL SECTIONS SHALL BE IN ACCORDANCE WITH THE LEXINGTON LAND SUBDIVISION REGULATIONS; ARTICLE 6.
3. PARKING RESTRICTED TO ONE SIDE OF ROADWAY.

LEXINGTON — FAYETTE URBAN COUNTY GOVERNMENT

DISTRIBUTED TO:

- Department of Public Works
- Department of Planning
- Department of Development
- Department of Natural Resources
- Department of Transportation
- Department of Health
- Department of Education
- Municipalities
- Neighborhood Associations
- Development Companies
- Contractors
- Homeowners
- Developers
- Builders
- Architects
- Engineers
- Surveyors
- Contractors
- Subcontractors
- Suppliers
- Public

***PENDING LAND SUBDIVISION REGULATIONS UPDATE***
NOTES:
1. CONCRETE SHALL BE KDOT CLASS "A".
2. SAWED CONTRACTION JOINTS SHALL BE CONSTRUCTED EVERY 20 FEET WITH A MINIMUM DEPTH OF 3". IN ACCORDANCE WITH KDOT STANDARD SPECIFICATION.
3. FULL-DEPTH EXPANSION JOINTS SHALL BE CONSTRUCTED AT ALL BREAKS IN ALIGNMENT, AT CONTACT WITH NEW OR EXISTING CONCRETE AT ALL DRAINAGE INLETS, AT THE BEGINNING AND ENDING POINTS OF CURVES, AND NOT TO EXCEED 30' MAXIMUM SPACING FOR SHR-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).
INTEGRAL CURB, TYPE 1

NOTES:

1. CONCRETE SHALL BE KDOT CLASS IV.
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).

FINISH GRADE
UTILITY STRIP OR SIDEWALK
PAVEMENT SLOPE

HEADER CURB

VARIES (4' TYP.)
6' 5" FT. SLOPE 5/8" TOOLED GROOVE
PAVEMENT SLOPE

INTEGRAL CURB, TYPE 2

6" 3"
1' 6"

TIE BAR
18"

LONGITUDINAL CONST. JOINT
PAVEMENT SLOPE
NO. 4 BAR 2"-3" MIN. LONG AT 2"-6" O.C.

CONC. PAVMT

MONOLITHIC CURB AND SIDEWALK

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
SIDEWALK/CURB AND GUTTER

NOTES:

1. CONCRETE SIDEWALKS AND WALKWAYS SHALL BE CONSTRUCTED ON A TIGHTLY DENSIFIED Silt Sub Grade AND SHALL BE FOUR AND ONE HALF FEET WIDE. CONCRETE SHALL MEET THE REQUIREMENTS FOR CLASS "A" AND SHALL BE COATED WITH WHITE PIGMENTED CURING COMPOUND TYPE 2, ALL AS SPECIFIED IN KYTC SPECIFICATION, SECTION B23502.

2. FULL DEPTH EXPANSION JOINTS SHALL BE PLACED AT CONTACT WITH NEW OR EXISTING CONCRETE. EXISTING CONCRETE SHALL BE ERoded, BURIED, OR COVERED, AND NOT TO EXCEED MAXIMUM SPACING FOR SHEET FORM APPLICATION AND 12" FOR HAND PLACED EXPANSION MATERIAL SHALL BE 1/2" ASPHALTIC MATERIAL OR APPROVED EQUAL MEETING KYTC 007-04-03.

3. CONTROL JOINTS SHALL BE PLACED AT INTERVALS EQUIVALENT TO THE SIDEWALK WIDTH, WITH A DEPTH OF 1/4 OF THE SIDEWALK THICKNESS.

4. THE SIDEWALKS SHALL BE PLACED ADJACENT TO THE STREET RIGHT-OF-WAY TOWARD CURB SHALL BE ONE QUARTER (1/4) OF AN INCH TO THE FIRST CONSTRUCTION IN EXISTING NEIGHBORHOODS AND REQUIRE THE CONTRACTOR TO MATCH EXISTING CURB AND SEPARATE WIDTH UNLESS SPECIFIED OTHERWISE BY THE DIVISION OF ENGINEERING.

5. SIDEWALK DETAILS FOR ANY CUTS MADE FOR UTILITY WIRE REPLACEMENT SHALL BE FULL PANEL MATCHING THE ORIGINAL DIMENSIONS.

SHEET NOTES:

1. NORMAL SIDEWALK WIDTH SHALL BE 4' UNLESS CHANGE IS AUTHORIZED BY URBAN COUNTY ENGINEER'S OFFICE.

2. DISTANCE WILL VARY WITH ROAD CROSS-SECTION.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
1. Inlet locations will vary, dependent on crosswalk and ramp location.

2. The ramp shall be constructed of Class A concrete and shall use cast-in-place replaceable tactile warning tile, such as ADA Solutions, Inc., access tile tactile systems.

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 Lexson Engineers.

6. Maximum cross slope of sidewalk 1/4": 12.

7. Sidewalk repair for any cuts made for utility work replacement shall be full panel matching the original dimensions.

Sheet notes:

1. Maximum ramp slope 1" : 12.

2. Expansion joint at back of curbline and sidewalk line full depth.

3. No bump permitted.

4. Slope varies uniformly to a maximum of 1" : 12 at gutter line.

5. Maximum cross slope of landing 1/4" : 12 in all directions.

6. Maximum longitudinal slope 1/2": 12 or along the centerline grade of the adjacent roadway.

Lexington - Fayette Urban County Government

Lexington, KY 40502

Division of Engineering

Standard Drawing No. 304

Approval: 11/21/2017

Sponsor: 

Prepared: 

Checked: 

Drawn: 

Printed: 

Scale: 

Instructors Notes:
### Maximum Allowable Apron and Driveway Widths

<table>
<thead>
<tr>
<th>Classification</th>
<th>Driveway Width</th>
<th>Standard Apron</th>
<th>Alternate Apron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Residential</td>
<td>30'</td>
<td>5' Straight Flare=40' Curb Cut</td>
<td>10' Radial Flare=50' Curb Cut</td>
</tr>
<tr>
<td>Commercial Loading</td>
<td>30'</td>
<td>15' Straight Flare=60' Curb Cut</td>
<td>20' Radial Flare=70' Curb Cut</td>
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<tr>
<td>Industrial</td>
<td>40'</td>
<td>20' Straight Flare=80' Curb Cut</td>
<td>25' Radial Flare=90' Curb Cut</td>
</tr>
</tbody>
</table>

### Section A-A
- Curb depressed full width of flares.
- Top of curb: 2""}

### Section B-B
- Top of curb: 2""}

### Section D-D
- Expansion Joint
- Driveway: 6'"}

### Section C-C
- Front of sidewalk elevation determined by adding 6" across utility strip from top of curb. If using tip and another tip to determine elevation at front of sidewalk.

### Notes:
1. Provide a sawed joint along center line of apron.
2. Maximum cross slope on sidewalk shall not exceed 1:12.
3. Maximum slope on apron shall not exceed 1:12.
4. No catch basins will be put in aprons.
5. All expansion joints shall be full depth.

---

Lexington - Fayette Urban County Government
ALL POSTS SHALL BE SET IN CONCRETE TO THE DIMENSIONS AS INDICATED ON THIS DRAWING.

- **1.** O.D. AT 2.27 I.B. PER L.F. OR ROLL FORMED SECTION AT 1.35 L.B. PER L.F.
- **2.** BRACE TO BE REQUIRED AROUND ALL UTILITY INSTALLATIONS AND AT OTHER LOCATIONS DESIGNATED BY THE ENGINEER.
- **3.** 6' HIGH FENCE SHALL HAVE 3' FABRIC HEIGHT. 9' HIGH FENCE SHALL HAVE 6' FABRIC HEIGHT. 10' HIGH FENCE SHALL HAVE 9' FABRIC HEIGHT. HIGH FENCE SHALL HAVE 9' FABRIC HEIGHT. 12' HIGH FENCE SHALL HAVE 11' FABRIC HEIGHT.
- **4.** BRACE AND如何看待的Steel With CABINET CARBAGE ROLLS POSTS, CAPS, AND SOCKET-TYPE BOLTS. END CONNECTIONS SHALL BE GALVANIZED MILLED HEAVY OR OTHER TYPE AS DEEMED BY THE ENGINEER. THEY SHALL BE DESIGNED IN A MANNER TO EXCLUDE MOISTURE FROM INSIDE POSTS AND RAILS.
- **5.** O.D. DEPICTED FOR TUBULAR POSTS IS NOMINAL — ASTM A-120 SHALL GOVERN.
- **6.** CHAIN LINK FENCE FABRIC SHALL BE 0.148 INCH NOMINAL DIAMETER (NO.9 GAGE) WIRE WOVEN IN A 3-INCH MESH.

---

**LEGEND—ALTERNATES**

<table>
<thead>
<tr>
<th>TUBULAR</th>
<th>ROLL FORMED</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>3.65#/L.F.</td>
</tr>
<tr>
<td>2&quot; O.D.</td>
<td>2.72#/L.F.</td>
</tr>
<tr>
<td>3.5已经了解到*</td>
<td>3.5X3.5*</td>
</tr>
<tr>
<td>2.250&quot; H COL.</td>
<td>3.25#/L.F.</td>
</tr>
<tr>
<td>2.250&quot; L COL.</td>
<td>1.625#/L.F.</td>
</tr>
<tr>
<td>0.375&quot; TRUSS ROD &amp; TIGHTENER</td>
<td>0.375&quot; TRUSS ROD &amp; TIGHTENER</td>
</tr>
<tr>
<td>APPROVED CAPS</td>
<td>NOT REQUIRED</td>
</tr>
<tr>
<td>1.250&quot;X1.625&quot;</td>
<td>1.53#/L.F.</td>
</tr>
<tr>
<td>1.250&quot;X1.625&quot;</td>
<td>1.35#/L.F.</td>
</tr>
<tr>
<td>FLAT STRETCHER BAR</td>
<td>NOT REQUIRED</td>
</tr>
<tr>
<td>BARRED WIRE</td>
<td>BARRED WIRE</td>
</tr>
<tr>
<td>BARRED WIRE ARMS</td>
<td>BARRED WIRE ARMS</td>
</tr>
</tbody>
</table>

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**LEXINGTON — FAYETTE URBAN COUNTY GOVERNMENT**
VEHICULAR GATE (3'-6' HIGH FENCE)

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 DUTY STEEL CORNERS SECURELY WELDED TO ENSURE RIGIDITY, RESISTANCE TO COLLISIONS, AND EXTREMELY WEATHER-RESISTANT, NOT TO RUST OR WEAKEN AS A RESULT OF WEATHERING.
3. ALL WELDED JOINTS SHALL BE CLEANED AND PAINTED WITH TWO (2) COATS OF ALUMINUM PAINT.
4. 3' HIGH GATES SHALL HAVE 1' FABRIC HEIGHT. 4' HIGH GATES SHALL HAVE 2' FABRIC HEIGHT. 5' HIGH GATES SHALL HAVE 3' FABRIC HEIGHT. 6' HIGH GATES SHALL HAVE 4' FABRIC HEIGHT. 7' HIGH GATES SHALL HAVE 5' FABRIC HEIGHT. 8' HIGH GATES SHALL HAVE 6' FABRIC HEIGHT. 9' HIGH GATES SHALL HAVE 7' FABRIC HEIGHT. 10' HIGH GATES SHALL HAVE 8' 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 "A" 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.
10. 6' TO 13' WIDTH FOR SINGLE GATE OR 12' TO 26' WIDTH FOR DOUBLE GATE.
11. 4' TO 6' WIDTH

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
NOTES:

1. POSTS ARE TO BE DRIVEN 2'-6" INTO GROUND AND TOPS CUT AT AN ANGLE TO DRAIN WATER.

2. FENCE SHALL BE PAINTED BLACK (5 IS WHITE WITH PAINT AND COMPOSITION RATE AS APPROVED BY THE ENGINEER).

3. HARDWOODS APPROVED ARE RED OAK, WHITE OAK, AND POPLAR.
RIGHT-OF-WAY FENCE

NOTES:

1. WOVEN-WIRE USED FABRIC IN RIGHT-OF-WAY FENCE SHALL BE EITHER
   ALUMINUM-COATED STEEL NO. 1047-6-9 OR ZINC-COATED STEEL NO. 1047-6-9.
2. ALL FENCE FITTINGS SHALL COMPLY WITH ASTM F 626.
3. O.D. DEPICTED FOR TUBULAR POSTS IS NOMINAL - ASTM F 1083 SHALL GOVERN.
4. STUDED 2" 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.

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT
NOTES:
1. ON INTERMEDIATE PULL POST ASSEMBLIES, BRACE WIRES SHALL BE REQUIRED FOR BOTH DIRECTIONS.
2. WOVEN-WIRE FABRIC USED IN RIGHT-OF-WAY FENCE SHALL BE EITHER ALUMINUM-COATED STEEL NO. 1047-8-9 OR ZINC-COATED STEEL NO. 1047-6-9.
**LEXINGTON — FAYETTE URBAN COUNTY GOVERNMENT**

**Vehicle Gate**

**Pedestrian Gate**

**Notes:**

**Basis of Payment:**

The contract unit price for woven wire gates shall be:

1. Feet wide single vehicular woven wire gate
2. Feet wide double vehicular woven wire gate
3. Feet wide pedestrian woven wire gate

**Construction Requirements:**

Fabric tie wires shall be spaced 12 inches on centers. The contractor is not to order gates until these 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.

D.D. diameter for tubular posts is nominal - ASTM E 1035 small gauge.

Gates shall have heavy pressed steel corners securely riveted or shall be machine notched and electrically welded so as to be rigid and watertight. All riveted joints shall be cleaned and painted with two (2) coats of aluminum paint.

**General:**

- 6” to 13” width for single gate and 12” to 28” width for double gate.
- 4” to 6” width.

**Division of Engineering**

**Woven Wire Gates**
TOP RAIL FOR RETAINING WALLS

SECTION

1. Handrails shall be DN 40 Schedule 40 Aluminum Pipe in accordance with ASTM-B221 or B210 Alloy 6061-T6.
2. Square bars shall be DN 40 Schedule Aluminum in accordance with ASTM-B221 or B210 Alloy 6061-T6.
3. All metal to be powder coated black in accordance with AAMA 2605.
4. Grout posts to concrete - see post setting detail this sheet.
5. Anchor posts in cored or formed holes.
6. Aluminum surfaces, such as exposed ends, in contact with concrete, grout, or dissimilar metals shall be protected with a coat of bituminous paint.
NOTES:
1. SLOPES AND DRAINAGE DITCHES OUTSIDE THE R/W SHALL BE
   APPROVED BY THE ENGINEER.
2. DRAINAGE DITCH SIDE SLOPES SHALL BE 2:1 MAXIMUM.
NOTES:
1. ALL SAW-CUTS SHALL BE NEAT AND STRAIGHT.
2. IMMEDIATELY BEFORE LAYING NEW BITUMINOUS COURSES, ALL SAW-CUTS SHALL BE CROWNED. COATING WITH A BITUMINOUS TACK COAT IS REQUIRED.
3. EDGE KEY SHALL NOT BE REQUIRED IF BOTH EXISTING AND NEW PAVEMENT ARE TO RECEIVE AN OVERLAY AS PART OF THIS CONTRACT.
4. SEAL PERIMETER OF CUT PAVEMENT WITH TRACK SEALANT THAT MEETS ASTM D4969, TYPE 2.

SECTION A-A
LONGITUDINAL EDGE KEY

SECTION B-B
TRANSVERSE EDGE KEY
**TYPICAL SECTION**

**CASE 1**
- Bituminous Surface
- Bituminous Base
- 6" Filtered Fabric
- Fill Material
- 6" Perforated Pipe

**CASE 2**
- Bituminous Surface
- Bituminous Base
- 6" Filtered Fabric
- Fill Material
- Perforated Pipe

**TYPICAL SUBGRADE DRAINAGE LOCATIONS**

**CASE 1**
- Sag Vertical Curve
- Top of Curb
- Roadway Surface

**CASE 2**
- Non-Perforated Pipe Cross Drain

**NOTES:**
1. Subgrade drainage as depicted is intended for use with the surface 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. A minimum 12 gauge perforated pipe in catch basin at an elevation which provides positive drainage (may require additional openings in catch basin wall).
4. Backfill to consist of No. 78, A-3 or coarse aggregate or material shall be placed 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.

**LEXINGTON**
**FAYETTE URBAN COUNTY GOVERNMENT**

**DIVISION OF ENGINEERING**

**PERFORATED PIPE**
**SUBGRADE DRAINAGE**
**ALONG ROADWAY**

**STANDARD DRAWING NO.**
320-1

**APPROVAL:**

**LAYOUT:**

**ISSUED:**

**REVISED:**

**NOTE:**

- Perforated pipe cross drain
- Original ground line
- Section A-A
- Section B-B
- Section C-C
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 the island and leading to the curb inlet shall be 6" diameter.
**Detail for Transverse Underdrain**

**CUT TO FILL CONDITION**

**EXISTING GROUND**

**PROFILE**

**SEE DETAIL 1**

- 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 gravel permeable if possible. Exact locations to be determined by the engineer on construction.**

**2. Brenching and underdrain shall be required at all transitions from rock cuts. 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 2**

**Detail for Longitudinal Underdrains**

**Section A-A**

Possible additional locations of perforated pipe as determined by the engineer.

Outlet underdrains shall be located at

Backfill material (No. 78,8, 9M coarse aggregate or natural sand)

2" or 6" perforated pipe

0.6" pipe

2' Min.

1' Min.

**Lexington**

Division of Engineering

Perforated Pipe Underdrains

Standard Drawing No. 322

Approved:

Urban County Engineer

## Sheet Notes:

1. Limits of first bench
2. Backfill material

## Note:

- All perforated and non-perforated pipe shall comply with ASTM & R 29 specifications.
NOTES:

THIS SIGN SHALL BE:

1. FURNISHED AND ERECTED BY THE CONTRACTOR AT THE CONTRACTOR’S EXPENSE, IN ADDITION TO THE NORMAL WARNING AND REGULATORY SIGNS.

2. OF GOOD QUALITY EXTERIOR PLYWOOD OR OTHER APPROVED MATERIAL.

3. PAINTED WITH SOLID BLUE LETTERS ON A WHITE BACKGROUND.

4. UPDATED AS NEEDED TO INDICATE THE APPROPRIATE MAYOR’S NAME.

5. FRAMED AND BRACED SO AS TO REMAIN VERTICAL AND PLAINLY VISIBLE TO THE TRAVELING PUBLIC.

6. ERECTED PRIOR TO STARTING CONSTRUCTION WORK.

7. ERECTED AT EACH END OF THE PROJECT AT LOCATIONS DIRECTED BY THE ENGINEER AND AT OTHER LOCATIONS SPECIFIED ON THE PLANS OR IN THE PROPOSAL.

8. KEPT CLEAN AND IN GOOD CONDITION FOR THE DURATION OF THE CONSTRUCTION AS DIRECTED BY THE ENGINEER.

9. THE COST SHOWN APPLIES ONLY TO THE PORTION OF PROJECT UNDER CONSTRUCTION IN A CONTINUOUS SECTION. IN THE EVENT THE PROJECT CONSISTS OF MORE THAN ONE CONTINUOUS SECTION THE COST SHOWN SHALL BE FOR THE PARTICULAR SECTION WHERE WORK IS IN PROGRESS.

10. NOT TO BE USED ON FEDERAL AID TRANSPORTATION PROJECTS.