Lexington Fayette Urban County
Government
Department of Public Works and Development

Standard Drawings 2008

Marwan A. Rayan, P.E.
Urban County Engineer
May 2008

Mayor Jim Newberry

LEXINGTON - FAYETTE URBAN COUNTY GOVERNMENT

Division of Engineering

May 1, 2008

Users of Lexington-Fayette Urban County Engineering Standard Drawings

Re: Standard Drawings 2008

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

These drawings become effective as of May 1, 2008 and any project 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,

Marwan A. Rayan, P.E.
Urban County Engineer

MAR:RAB:AFG

C: File

08.1000.106.StandDrw

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
STANDARD DRAWINGS 2008
TABLE OF CONTENTS

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
STANDARD DRAWINGS 2008
TABLE OF CONTENTS

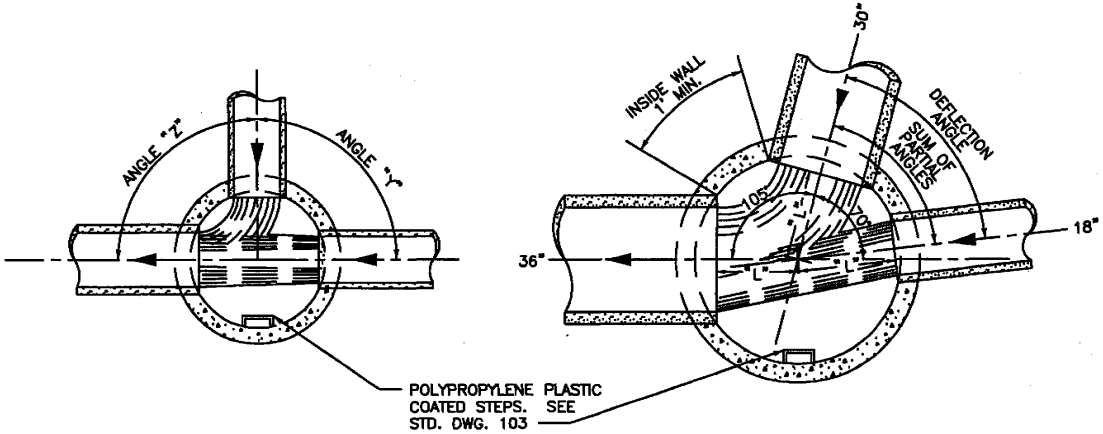
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
STANDARD DRAWINGS 2008
TABLE OF CONTENTS

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
STANDARD DRAWINGS 2008
TABLE OF CONTENTS

MANHOLES - STORM DRAINAGE

TABLE I
OF
MINIMUM PARTIAL ANGLE

PIPE SIZE	MANHOLE SIZE 4'-0" P. ANGLE	4'-0" L. DIST.	5'-0" P. ANGLE	5'-0" L. DIST.	6'-0" P. ANGLE	6'-0" L. DIST.	7'-0" P. ANGLE	7'-0" L. DIST.	8'-0" P. ANGLE	8'-0" L. DIST.
15"	38°	1'-10"	30°	2'-4"	25°	2'-11"	22°	3'-5"	19°	3'-11"
18"	43°	1'-9"	34°	2'-4"	28°	2'-10"	24°	3'-4"	21°	3'-11"
24"	53°	1'-7"	41°	2'-2"	34°	2'-9"	29°	3'-3"	25°	3'-10"
27"	—	—	45°	2'-1"	37°	2'-8"	32°	3'-3"	28°	3'-9"
30"	—	—	49°	2'-0"	40°	2'-7"	34°	3'-2"	30°	3'-8"
33"	—	—	54°	1'-10"	44°	2'-6"	37°	3'-1"	37°	3'-8"
36"	—	—	—	—	47°	2'-4"	40°	3'-0"	34°	3'-7"
42"	—	—	—	—	55°	2'-1"	46°	2'-9"	39°	3'-5"
48"	—	—	—	—	63°	1'-9"	52°	2'-6"	44°	3'-2"
54"	—	—	—	—	—	—	59°	2'-3"	50°	2'-11"
60"	—	—	—	—	—	—	67°	1'-10"	56°	2'-8"



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

GENERAL NOTES:

1. ALL DIMENSIONS ARE BASED ON SIZE OF LARGEST PIPE IN MANHOLE.
2. MANHOLES FOR PIPE LARGER THAN 60" SHALL BE SPECIALLY DESIGNED.
3. IN CASES WHERE DEFLECTION ANGLES EXCEED MAXIMUM SHOWN 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.

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

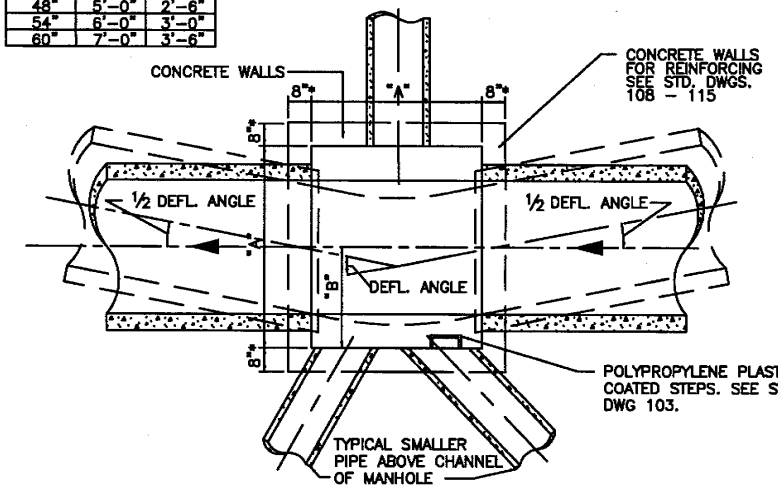
STORM SEWER
MANHOLE TYPE "A"–
CIRCULAR WALLS

STANDARD DRAWING NO. 100

APPROVED: [signature] DATE 5/1/08
URBAN COUNTY ENGINEER

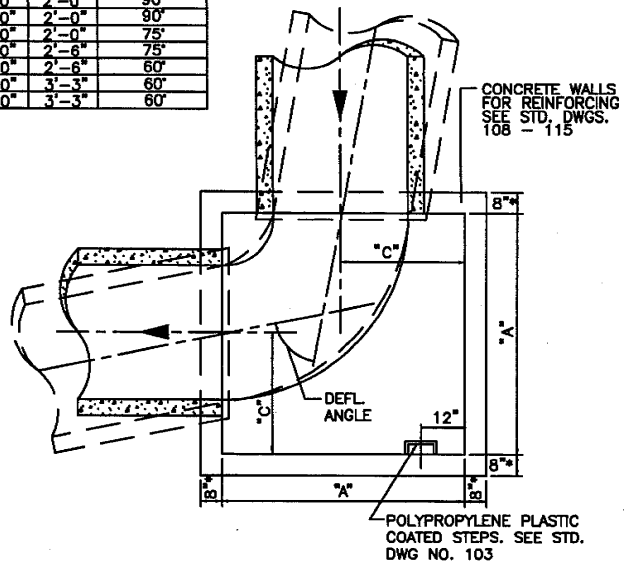
[signature] DATE 5/1/08
COMMISSIONER

PIPE SIZE	DIM. "A"	DIM. "B"
12"	5'-0"	2'-6"
15"-42"	5'-0"	2'-6"
48"	5'-0"	2'-6"
54"	6'-0"	3'-0"
60"	7'-0"	3'-6"



0°-22° DEFLECTION ANGLE

PIPE SIZE	DIM. "A"	DIM. "C"	MAXIMUM DEFL. ANGLE
12"	5'-0"	2'-0"	90°
15"-33"	5'-0"	2'-0"	90°
36"	5'-0"	2'-0"	75°
42"	6'-0"	2'-6"	75°
48"	6'-0"	2'-6"	60°
54"	7'-0"	3'-3"	60°
60"	7'-0"	3'-3"	60°



GREATER THAN 68° DEFLECTION ANGLE

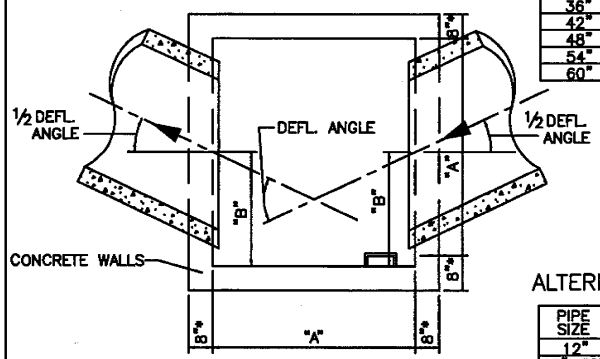
* WALL THICKNESS FOR MANHOLES

DEPTH TO INV.	A=5'-0"	A=6'-0"	A=7'-0"
UP TO 10'	8"	8"	8"
10' TO 15'	8"	8"	10"
15' TO 20'	8"	10"	10"

TYPE "B" MANHOLE - NON-CIRCULAR WALLS, CAST-IN-PLACE CONCRETE

ALTERNATE-22°-50°

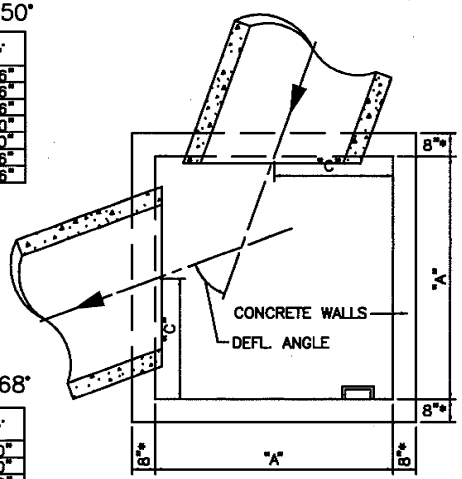
PIPE SIZE	DIM. "A"	DIM. "B"
12"	5'-0"	2'-6"
15"-33"	5'-0"	2'-6"
36"	5'-0"	2'-6"
42"	6'-0"	3'-0"
48"	6'-0"	3'-0"
54"	7'-0"	3'-6"
60"	7'-0"	3'-6"



22°-50° DEFLECTION ANGLE

ALTERNATE-50°-68°

PIPE SIZE	DIM. "A"	DIM. "C"
12"	5'-0"	2'-0"
15"-33"	5'-0"	2'-0"
36"	5'-0"	2'-0"
42"	6'-0"	2'-6"
48"	6'-0"	2'-6"
54"	7'-0"	3'-3"
60"	7'-0"	3'-3"



50°-90° DEFLECTION ANGLE

NOTES:

1. ALL DIMENSIONS ARE BASED ON SIZE OF LARGEST PIPE IN MANHOLE.
2. MANHOLES FOR PIPE LARGER THAN 60" SHALL BE SPECIALLY DESIGNED.
3. PIPES SHALL ENTER MANHOLE WALLS, NOT CORNERS. ALLOW 2" MINIMUM TO INSIDE CORNER FOR WALL CUT.
4. IN CASES WHERE DEFLECTION ANGLES EXCEED MAXIMUM SHOWN IN TABLES, MANHOLE SHALL BE SPECIALLY DESIGNED.
5. BOTTOM SLAB OF MANHOLES SHALL BE SPECIALLY DESIGNED WITH REGARD TO AREA, THICKNESS, AND REINFORCING IN SITUATIONS WHERE HIGH WATER TABLE OR UNSTABLE SOIL CONDITIONS EXIST.
6. MANHOLE BENCH SHALL SLOPE AT LEAST 1" PER FT. FROM WALLS TO CHANNELS AND SHALL HAVE SMOOTH FLOAT AND BRUSH FINISH.
7. THE TOP OF ALL INFLUENT PIPES WILL BE AT AN ELEVATION EQUAL TO THE TOP OF THE EFFLUENT PIPE.
8. INFLUENT PIPES MAY ENTER MANHOLES AT AN ELEVATION ABOVE THE CHANNELS AS REQUIRED TO AVOID CONFLICT WITH LARGER PIPES IN THE MANHOLE.
9. THE MAXIMUM DEFLECTION ANGLE BETWEEN ANY INCOMING PIPE AND OUT GOING PIPE SHALL BE NO MORE THAN 90° FOR PIPES UP TO 24" IN DIAMETER. THE MAXIMUM DEFLECTION ANGLE FOR 27" TO 42" PIPES SHALL BE 75° AND FOR PIPES LARGER THAN 42" THE MAX. DEFLECTION ANGLE SHALL BE 60°.
10. FOR REINFORCING SEE STD. DWGS. 108 - 115.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

STORM SEWER MANHOLE TYPE "B"- NON-CIRCULAR WALLS

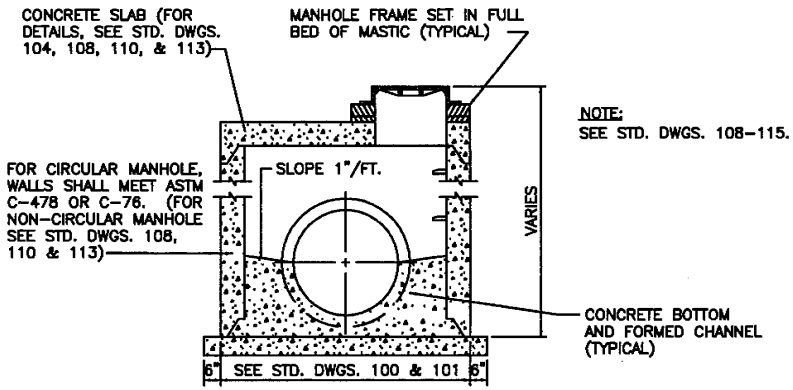
STANDARD DRAWING NO. 101

APPROVED _____ 5/1/08
URBAN COUNTY ENGINEER DATE

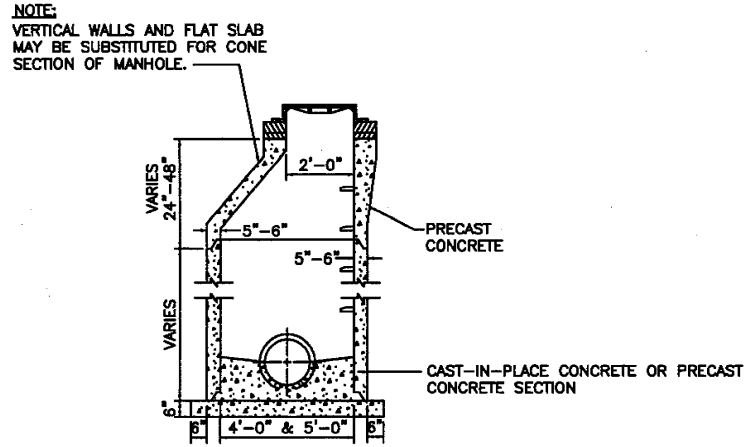
_____ 5/1/08
COMMISSIONER DATE

TYPE "B" MANHOLE FOR DEFLECTION ANGLES BETWEEN 22° & 90°

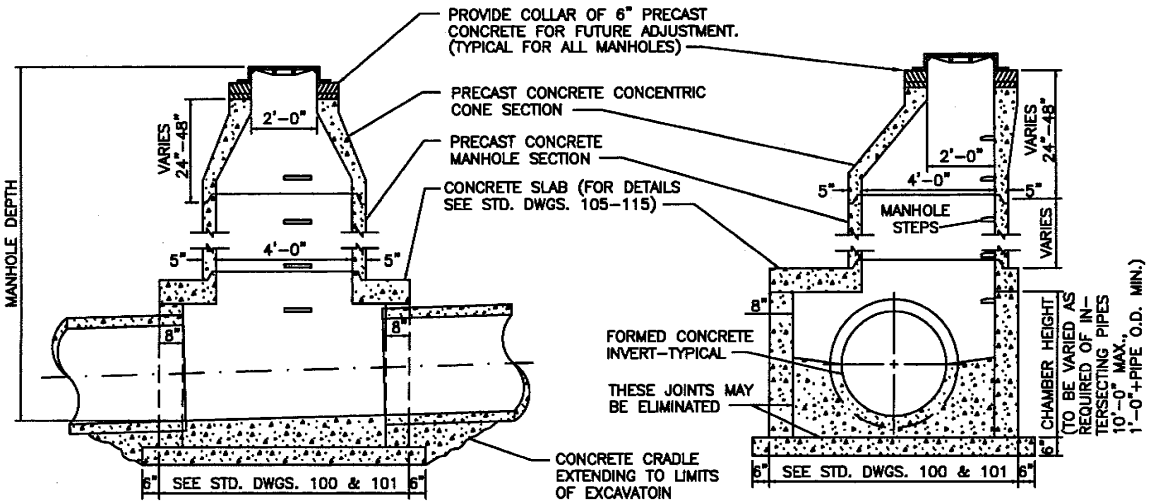
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



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.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

STORM SEWER MANHOLE DETAILS

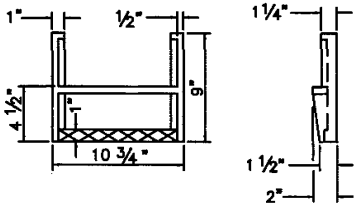
STANDARD DRAWING NO. 102

APPROVED _____ 5/1/08
URBAN COUNTY ENGINEER — DATE

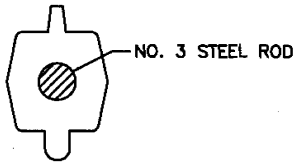
_____ 5/1/08
COMMISSIONER — DATE

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

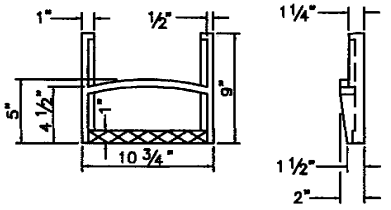
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



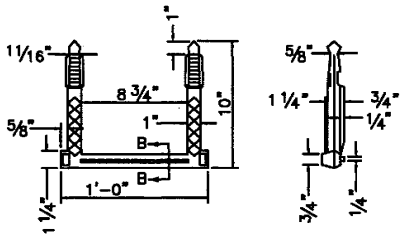
STEP TYPE NO. 1



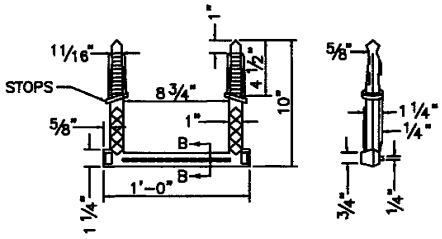
SECTION B–B



STEP TYPE NO. 2

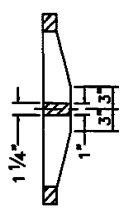


STEP TYPE NO. 3

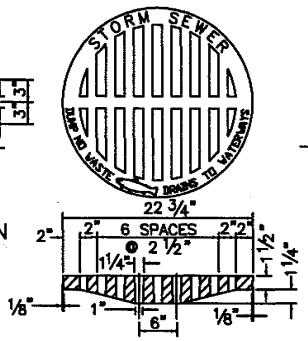


STEP TYPE NO. 4

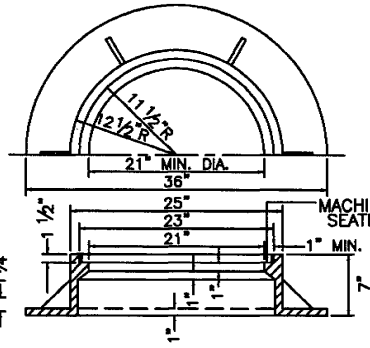
MANHOLE STEPS



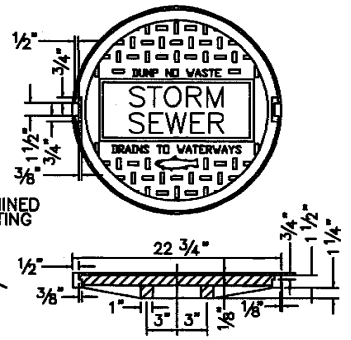
SECTION



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

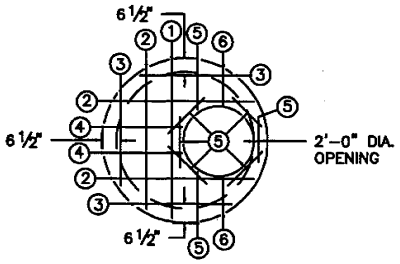
MANHOLE FRAMES, COVERS, & STEPS

STANDARD DRAWING NO. 103

APPROVAL

URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 5/1/08

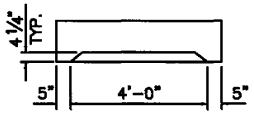


MARK	NO.	SIZE	LENGTH	TYPE
1	1	4	4'-5"	STR.
2	3	"	4'-0"	"
3	3	"	2'-8"	"
4	2	"	2'-0"	"
5	8	"	1'-6"	"
6	2	"	1'-0"	"

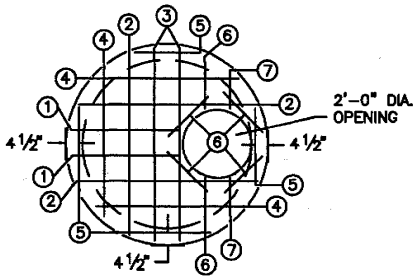
4'-0" DIA. SHALLOW MANHOLES

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

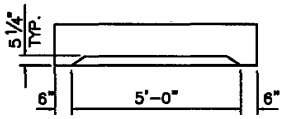


MARK	NO.	SIZE	LENGTH	TYPE
1	2	4	3'-2"	STR.
2	3	"	5'-3"	"
3	2	"	5'-8"	"
4	3	"	4'-2"	"
5	4	"	2'-2"	"
6	6	"	1'-6"	"
7	2	"	1'-0"	"

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.

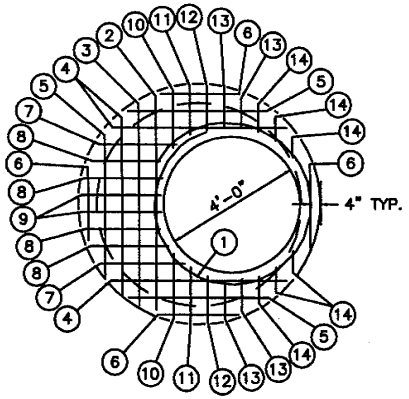
NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

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

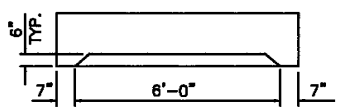
STANDARD DRAWING NO. 104

APPROVED
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08



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"	"

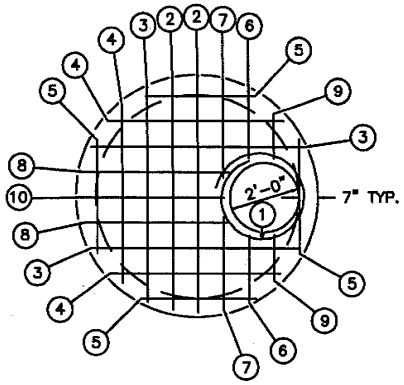
6'-0" DIA. STANDARD MANHOLES



SIDE VIEW

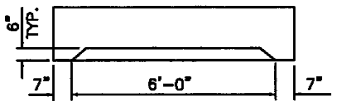
NOTES:

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

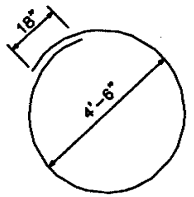


SIDE VIEW

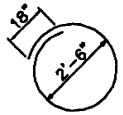
NOTES:

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

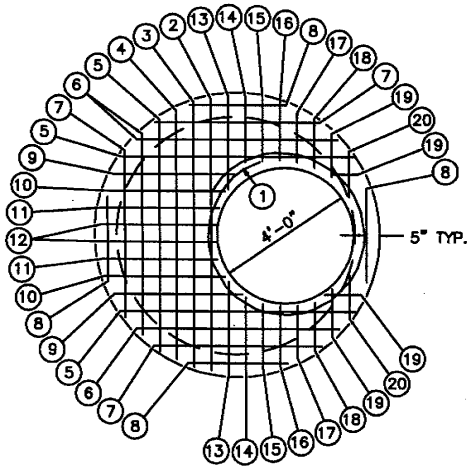
DIVISION OF ENGINEERING

STORM SEWER MANHOLE CIRCULAR SLABS 6'-0" DIAMETER

STANDARD DRAWING NO. 105

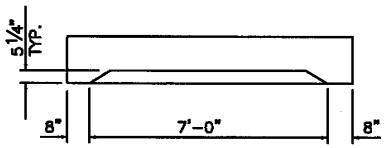
APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER



7'-0" DIA. STANDARD MANHOLES

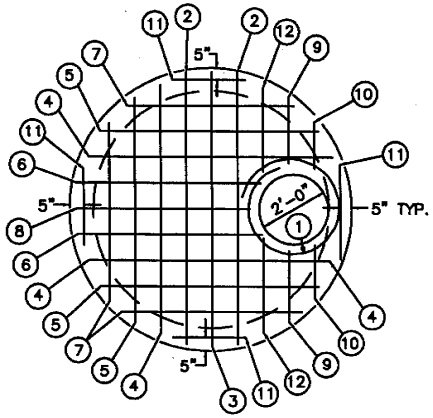
MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'-10"	A
2	1	6	7'-10"	STR.
3	1	"	7'-7"	"
4	1	"	7'-2"	"
5	3	"	6'-8"	"
6	3	"	5'-11"	"
7	3	"	4'-11"	"
8	4	"	3'-0"	"
9	2	"	3'-9"	"
10	2	"	3'-7"	"
11	2	"	3'-5"	"
12	2	"	3'-4"	"
13	2	"	2'-10"	"
14	2	"	2'-3"	"
15	2	"	1'-11"	"
16	2	"	1'-8"	"
17	2	"	1'-6"	"
18	2	"	1'-4"	"
19	4	"	1'-3"	"
20	2	"	1'-0"	"



SIDE VIEW

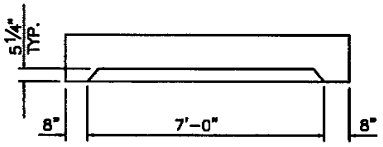
NOTES:

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.



7'-0" DIA. SHALLOW MANHOLES

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	9'-6"	A_1
2	2	5	7'-10"	STR.
3	1	"	8'-0"	"
4	3	"	7'-6"	"
5	3	"	6'-8"	"
6	2	"	5'-7"	"
7	3	"	5'-3"	"
8	1	"	5'-4"	"
9	2	"	2'-2"	"
10	2	"	1'-8"	"
11	4	"	2'-6"	"
12	2	"	3'-0"	"

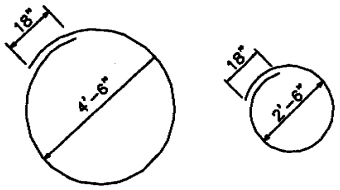


SIDE VIEW

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.

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

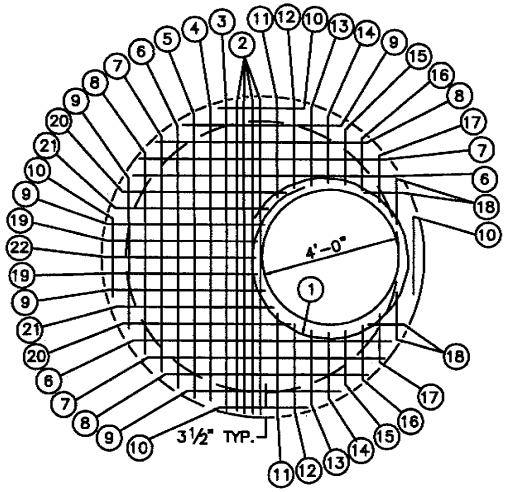
DIVISION OF ENGINEERING

STORM SEWER MANHOLE CIRCULAR SLABS 7'-0" DIAMETER

STANDARD DRAWING NO. 106

APPROVED 5/1/08
URBAN COUNTY ENGINEER DATE

5/1/08
COMMISSIONER DATE

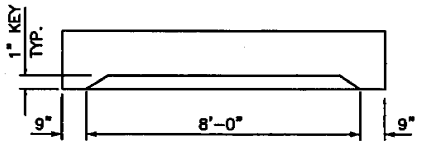


8'-0" DIA. STANDARD MANHOLE

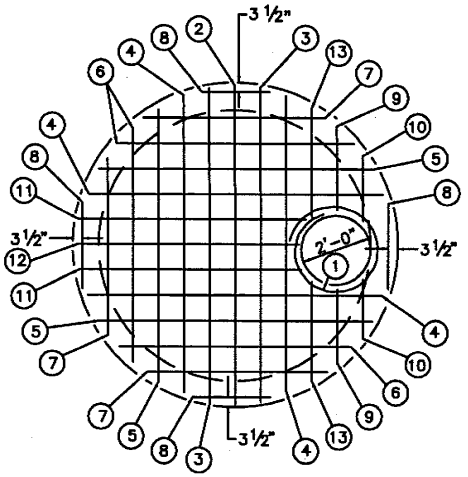
MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'-10"	A
2	4	6	9'-0"	STR.
3	1	"	8'-10"	"
4	1	"	8'-8"	"
5	1	"	8'-3"	"
6	3	"	7'-9"	"
7	3	"	7'-0"	"
8	3	"	6'-0"	"
9	5	"	4'-6"	"
10	4	"	3'-0"	"
11	2	"	3'-0"	"
12	2	"	2'-9"	"
13	2	"	2'-4"	"
14	2	"	2'-0"	"
15	2	"	1'-9"	"
16	2	"	1'-7"	"
17	2	"	1'-6"	"
18	4	"	1'-0"	"
19	2	"	4'-5"	"
20	2	"	5'-0"	"
21	2	"	4'-8"	"
22	1	"	4'-4"	"

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.



SIDE VIEW

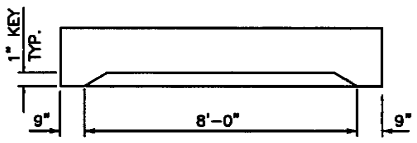


8'-0" DIA. SHALLOW MANHOLE

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	9'-6"	A_1
2	1	5	9'-3"	STR.
3	2	"	9'-0"	"
4	4	"	8'-9"	"
5	3	"	8'-0"	"
6	3	"	7'-0"	"
7	3	"	5'-5"	"
8	4	"	2'-9"	"
9	2	"	2'-3"	"
10	2	"	1'-9"	"
11	2	"	6'-6"	"
12	1	"	6'-2"	"
13	2	"	3'-3"	"

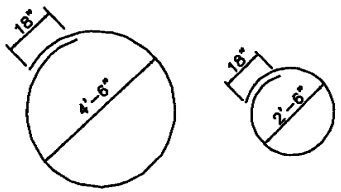
NOTES:

1. FOR PIPE SIZES 15" TO 60".
2. 9" O.C. SPACING EACH WAY.
3. 10" THICK SLAB.
4. 9'-6" O.D.
5. 2" MIN. STEEL REINFORCEMENT COVER ALL FACES.



SIDE VIEW

SPECIAL BAR BENDS



TYPE A TYPE A_1

NOTE:

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

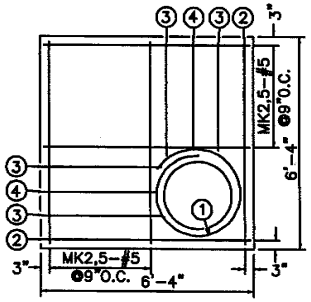
NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

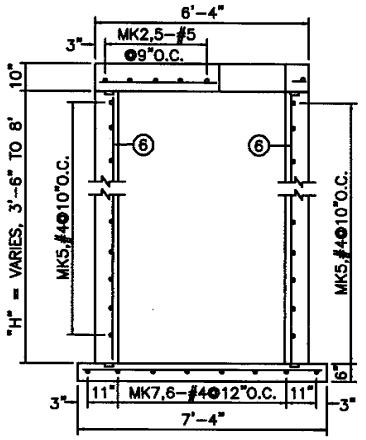
STORM SEWER
MANHOLE CIRCULAR SLABS
8'-0" DIAMETER

STANDARD DRAWING NO. 107

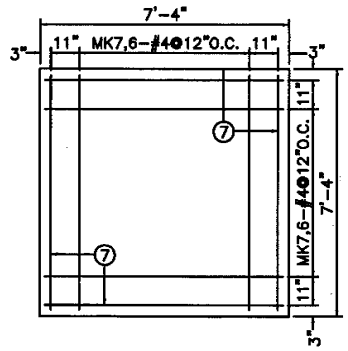
APPROVED
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08



TOP SLAB
2'–0" OPENING



VERT. SECTION



BOTTOM SLAB

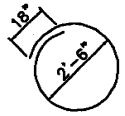
MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	9'–6"	A_1
2	12	5	6'–0"	STR.
3	4	5	3'–8"	"
4	2	5	3'–4"	"

MARK	NO.	SIZE	LENGTH	TYPE
5	*	4	6'–0"	STR.

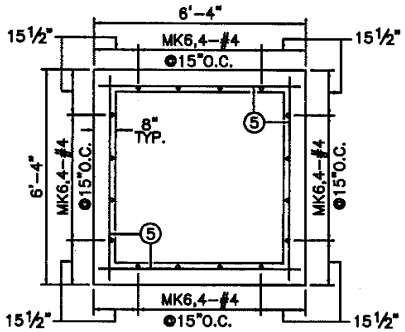
* 4 X (HEIGHT OF WALL (INCH)/10) (ROUNDED UP TO THE NEXT WHOLE NUMBER)

MARK	NO.	SIZE	LENGTH	TYPE
7	16	4	7'–0"	STR.

SPECIAL BAR BENDS



TYPE A_1



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
6	16	4	DIM. "H"–2"	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.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

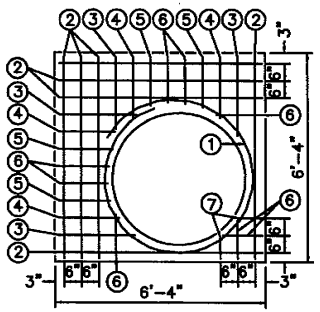
REINFORCEMENT DETAIL
5' NON–CIRCULAR M.H.
LESS THAN 10' DEPTH,
8" WALLS, 10" SLAB

STANDARD DRAWING NO. 108

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

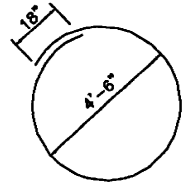
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



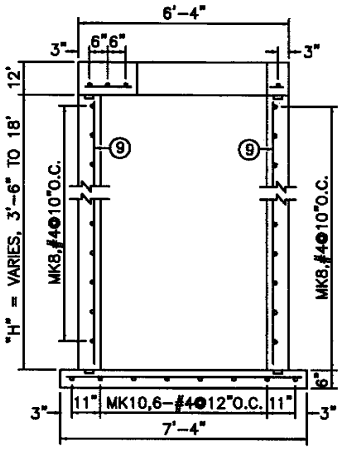
TOP SLAB
4'-0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'-10"	A
2	8	5	6'-0"	STR.
3	4	5	2'-4"	"
4	4	5	1'-9"	"
5	4	5	1'-5"	"
6	8	5	1'-4"	"
7	2	5	0'-10"	"

SPECIAL BAR BENDS



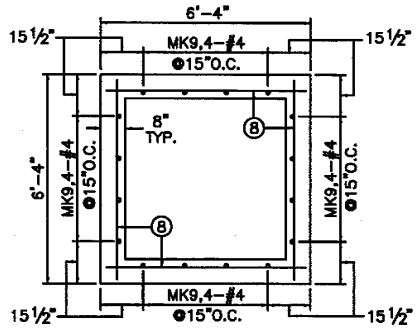
TYPE A



VERT. SECTION

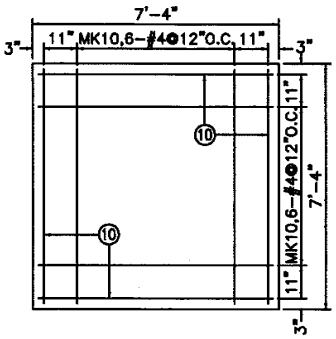
MARK	NO.	SIZE	LENGTH	TYPE
8	*	4	6'-0"	STR.

* 4 X (HEIGHT OF WALL (INCH)/10) (ROUNDED UP TO THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
9	16	4	DIM. "H"-2"	STR.



BOTTOM SLAB

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

NOTES:

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

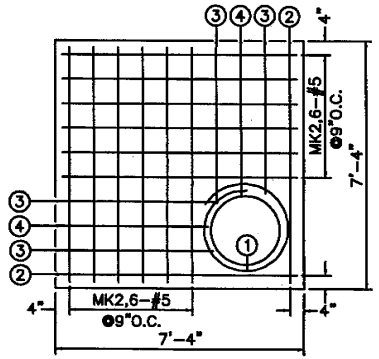
NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

REINFORCEMENT DETAIL
5' NON-CIRCULAR M.H.
7'-6" TO 20' DEPTH,
8" WALLS, 12" SLAB

STANDARD DRAWING NO. 109

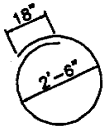
APPROVED
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08



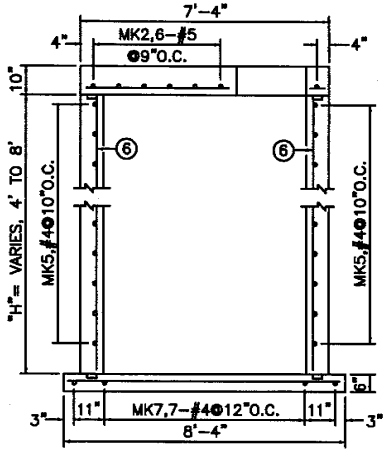
TOP SLAB
2'–0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	9'–6"	A_1
2	14	5	7'–0"	STR.
3	4	5	4'–8"	"
4	2	5	4'–4"	"

SPECIAL BAR BENDS



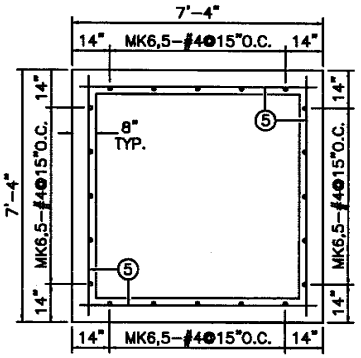
TYPE A_1



VERT. SECTION

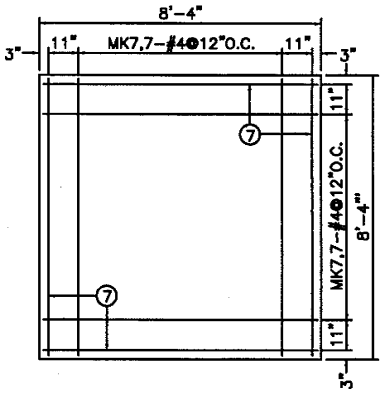
MARK	NO.	SIZE	LENGTH	TYPE
5	*	4	7'–0"	STR.

* 4 X (HEIGHT OF WALL (INCH)/10) (ROUNDED UP THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
6	20	4	DIM. "H"–2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
7	18	4	8'–0"	STR.

NOTES:

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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

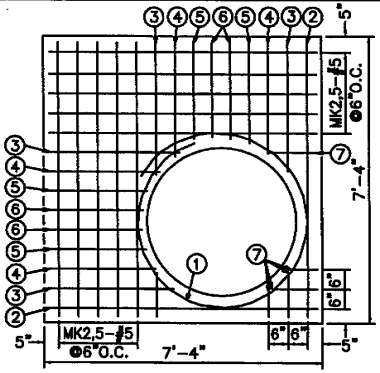
REINFORCEMENT DETAIL
6' NON–CIRCULAR M.H.
LESS THAN 10' DEPTH,
8" WALLS, 10" SLAB

STANDARD DRAWING NO. 110

APPROVED: 5/1/08
URBAN COUNTY ENGINEER — DATE

5/1/08
COMMISSIONER — DATE

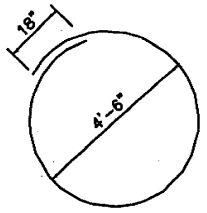
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



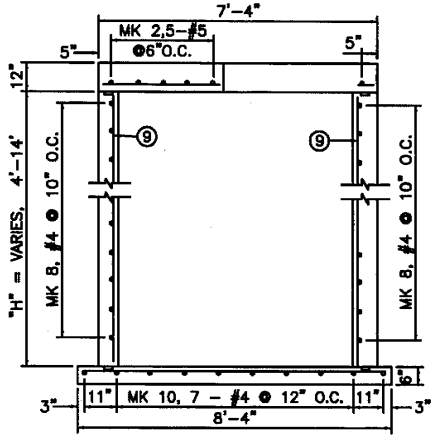
TOP SLAB
4'–0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'–10"	A
2	12	5	7'–10"	STR.
3	4	5	3'–4"	"
4	4	5	2'–9"	"
5	4	5	2'–5"	"
6	4	5	2'–4"	"
7	6	5	0'–10"	"

SPECIAL BAR BENDS



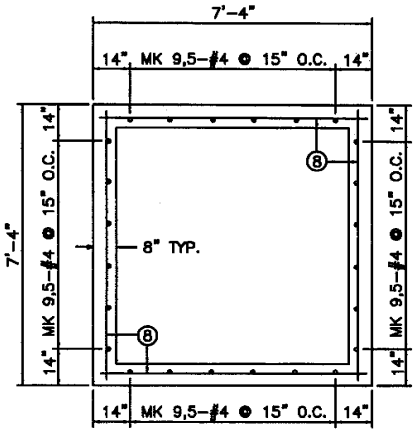
TYPE A



VERT. SECTION

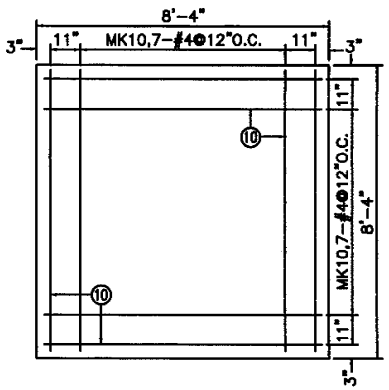
MARK	NO.	SIZE	LENGTH	TYPE
8	*	4	7'–0"	STR.

* 4 X (HEIGHT OF WALL (INCH)/10) (ROUNDED UP TO THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
9	20	4	DIM. "H"–2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
10	18	4	8'–0"	STR.

NOTES:

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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

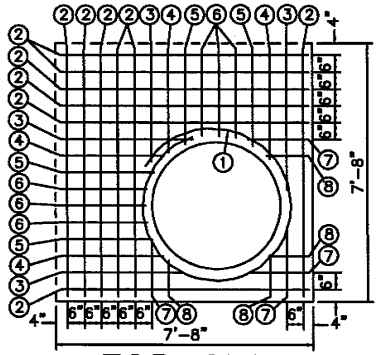
REINFORCEMENT DETAIL
6' NON–CIRCULAR M.H.
8' TO 15' DEPTH,
8" WALLS, 12" SLAB

STANDARD DRAWING NO. 111

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

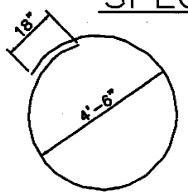
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



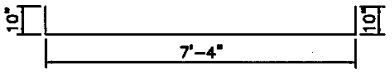
TOP SLAB
4'-0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'-10"	A
2	12	5	7'-4"	STR.
3	4	5	3'-3"	"
4	4	5	2'-9"	"
5	4	5	2'-7"	"
6	6	5	2'-6"	"
7	4	5	1'-2"	"
8	4	5	0'-10"	"

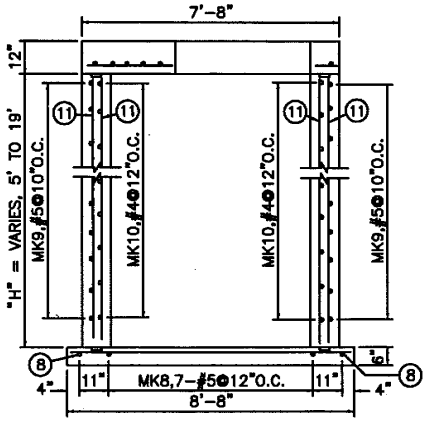
SPECIAL BAR BENDS



TYPE A



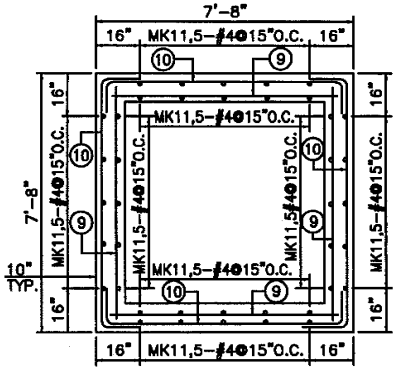
TYPE C



VERT. SECTION

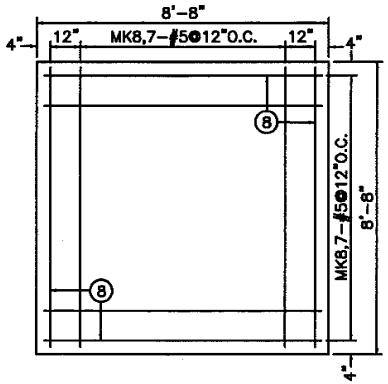
MARK	NO.	SIZE	LENGTH	TYPE
9	*1	5	7'-4"	STR.
10	*2	4	9'-0"	C

*1 4 X (WALL HEIGHT (INCH)/10)
*2 4 X (WALL HEIGHT (INCH)/12) (ROUNDED UP TO THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
11	40	4	DIM. "H"-2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
8	18	5	8'-4"	STR.

NOTES:

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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

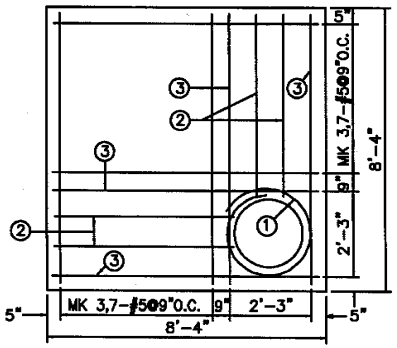
REINFORCEMENT DETAIL
6' NON-CIRCULAR M.H.
15' TO 20' DEPTH,
10" WALLS, 12" SLAB

STANDARD DRAWING NO. 112

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

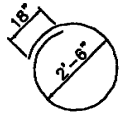
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



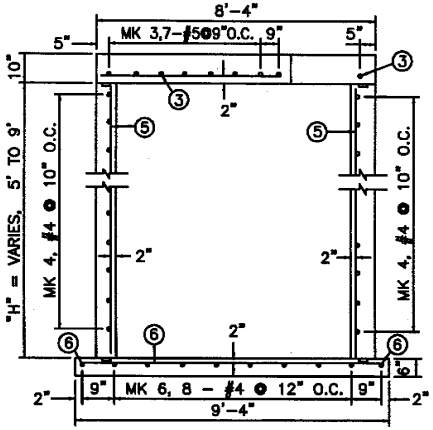
TOP SLAB
2'–0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	9'–6"	A_1
2	4	5	5'–5"	STR.
3	18	5	8'–0"	"

SPECIAL BAR BENDS



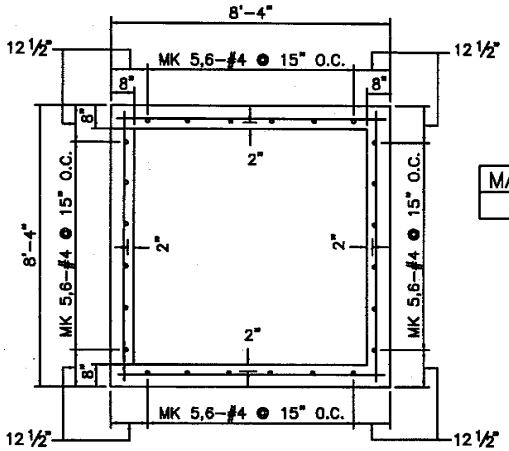
TYPE A_1



VERT. SECTION

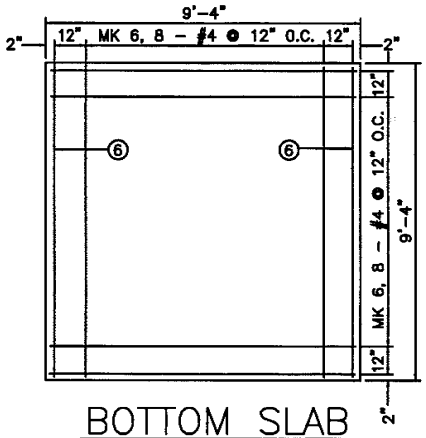
MARK	NO.	SIZE	LENGTH	TYPE
4	*	4	8'–0"	STR.

* 4 X (HEIGHT OF WALL) (INCH)/10 (ROUNDED TO THE NEXT WHOLE NUMBER.)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
5	24	4	DIM. "H"–2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
6	20	4	9'–0"	STR.

NOTES:

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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

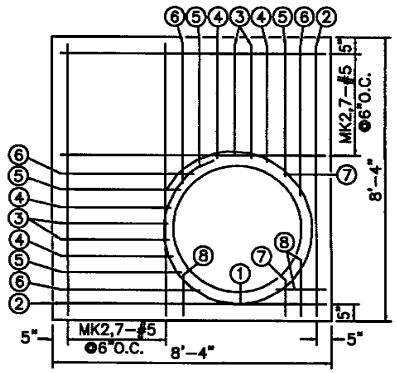
REINFORCEMENT DETAIL
7' NON–CIRCULAR M.H.
LESS THAN 10' DEPTH,
8" WALLS, 10" SLAB

STANDARD DRAWING NO. 113

APPROVED _____ 5/1/08
URBAN COUNTY ENGINEER DATE

_____ 5/1/08
COMMISSIONER DATE

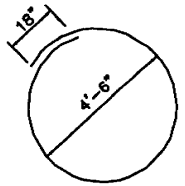
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



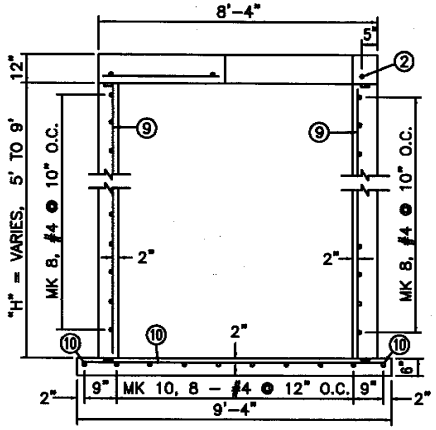
TOP SLAB
4'–0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'–10"	A
2	16	5	8'–0"	STR.
3	4	5	3'–4"	"
4	4	5	3'–5"	"
5	4	5	3'–9"	"
6	4	5	4'–4"	"
7	2	5	0'–10"	"
8	3	5	1'–4"	"

SPECIAL BAR BENDS



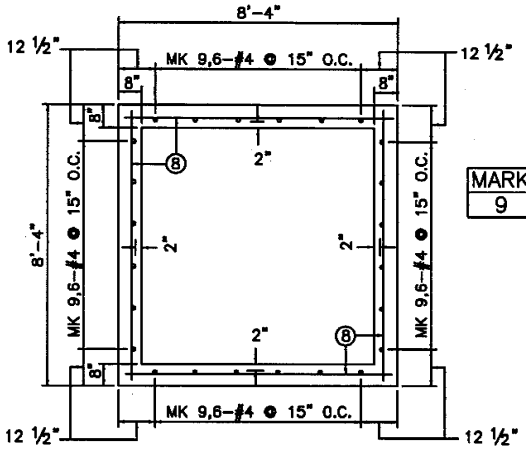
TYPE A



VERT. SECTION

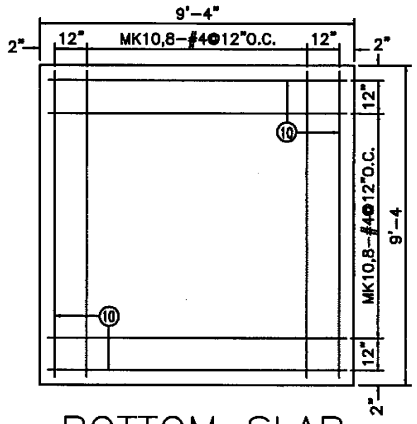
MARK	NO.	SIZE	LENGTH	TYPE
8	*	4	8'–0"	STR.

*4 X (HEIGHT OF WALL (INCH)/10) (ROUNDED UP TO THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
9	24	4	DIM. "H"–2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
10	20	4	9'–0"	STR.

NOTES:

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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

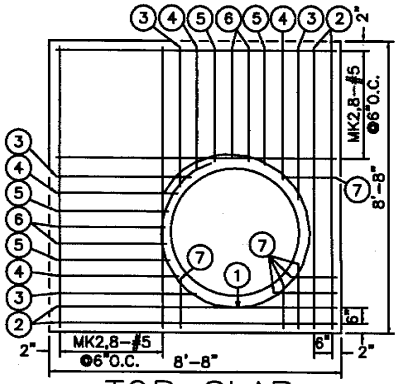
REINFORCEMENT DETAIL
7' NON–CIRCULAR M.H.
8' TO 10' DEPTH,
8" WALLS, 12" SLAB

STANDARD DRAWING NO. 114

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

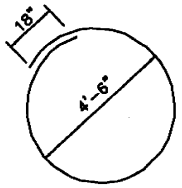
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



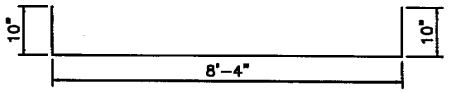
TOP SLAB
4'–0" OPENING

MARK	NO.	SIZE	LENGTH	TYPE
1	1	6	15'–10"	A
2	20	5	8'–4"	STR.
3	4	5	4'–3"	"
4	4	5	3'–9"	"
5	4	5	3'–7"	"
6	4	5	3'–6"	"
7	6	5	1'–2"	"

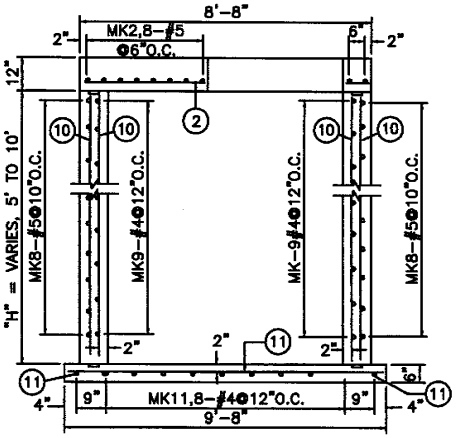
SPECIAL BAR BENDS



TYPE A



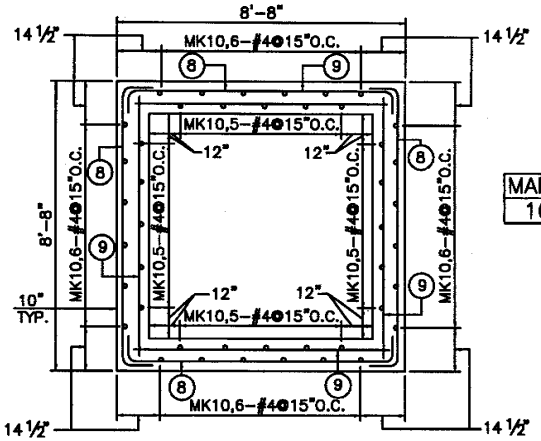
TYPE C



VERT. SECTION

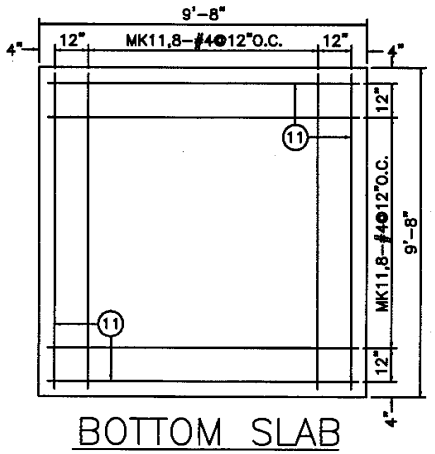
MARK	NO.	SIZE	LENGTH	TYPE
8	*1	5	10'–0"	C
9	*2	4	8'–4"	STR.

*1 4 X (WALL HEIGHT (INCH)/10)
*2 4 X (WALL HEIGHT (INCH)/12)
(ROUNDED UP TO THE NEXT WHOLE NUMBER)



HORIZ. SECTION

MARK	NO.	SIZE	LENGTH	TYPE
10	44	4	DIM. "H"–2"	STR.



BOTTOM SLAB

MARK	NO.	SIZE	LENGTH	TYPE
11	20	4	9'–4"	STR.

NOTES:

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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

REINFORCEMENT DETAIL
7' NON–CIRCULAR M.H.
10' TO 20' DEPTH,
10" WALLS, 12" SLAB

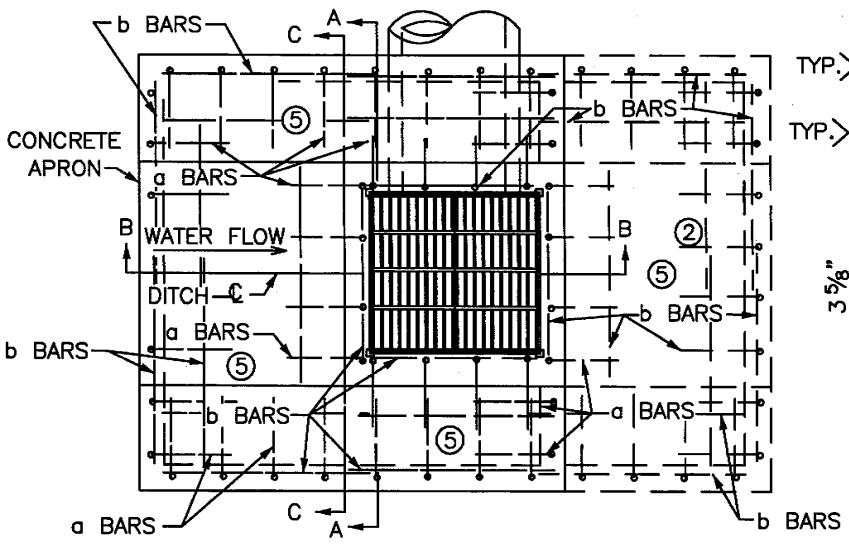
STANDARD DRAWING NO. 115

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

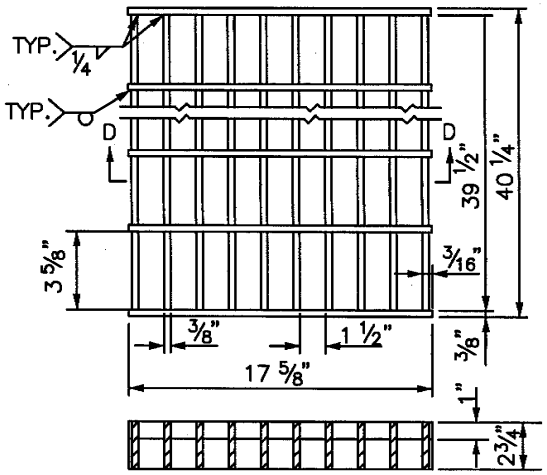
_____ DATE 5/1/08
COMMISSIONER

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

SURFACE INLETS & CATCH BASINS

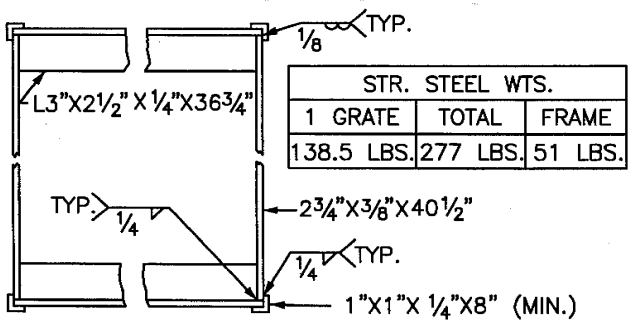


PLAN



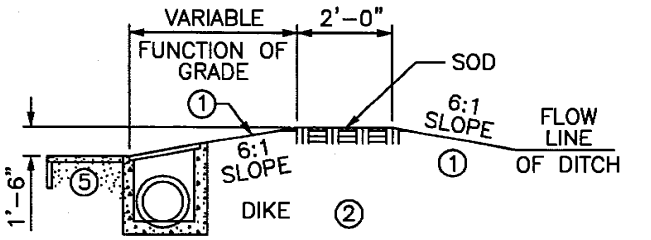
SECTION D–D

DETAIL OF GRATE
(TWO REQUIRED)

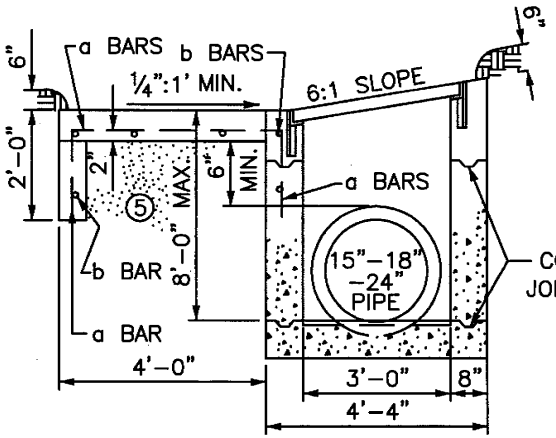


STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
138.5 LBS.	277 LBS.	51 LBS.

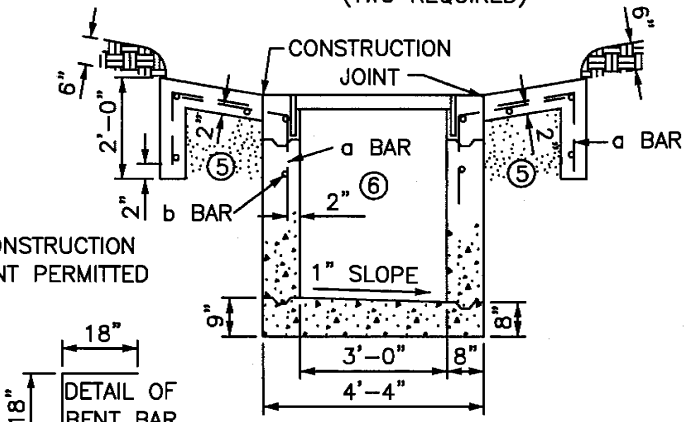
DETAIL OF FRAME



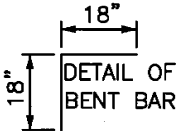
SECTION OF DIKE

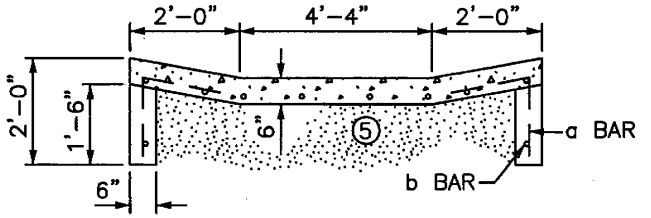


SECTION B–B



SECTION A–A





SECTION C–C

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

APPROX. QUANTITIES

TYPE	CONCRETE 3'–9" ③ BOX	REINF. STEEL
SAG	4.4 CU. YD. ④	282 LBS.
GRADE	3.4 CU. YD. ④	192 LBS.

BILL OF REINFORCEMENT

BAR	NO.	SIZE	LENGTH	APPROX. SPACING
a	40 OR 56	#5	3'–0"	12" C TO C
b	25 OR 40	#4	4'–0"	AS SHOWN

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

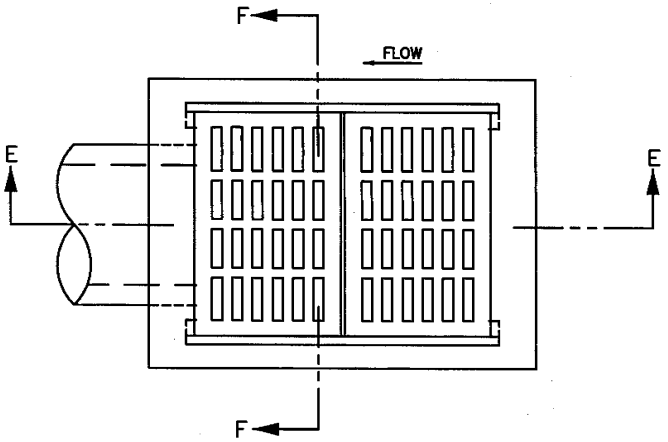
SURFACE INLET TYPE "A"

STANDARD DRAWING NO. 120

APPROVAL _____ 5/1/08 DATE
URBAN COUNTY ENGINEER

_____ 5/1/08 DATE
COMMISSIONER

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

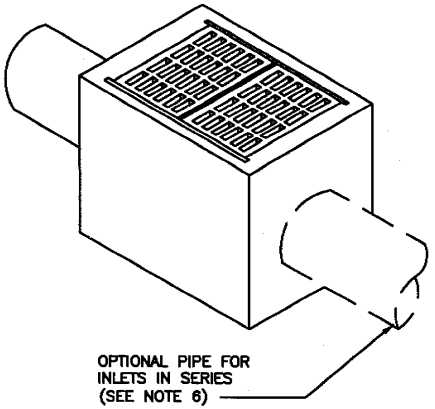


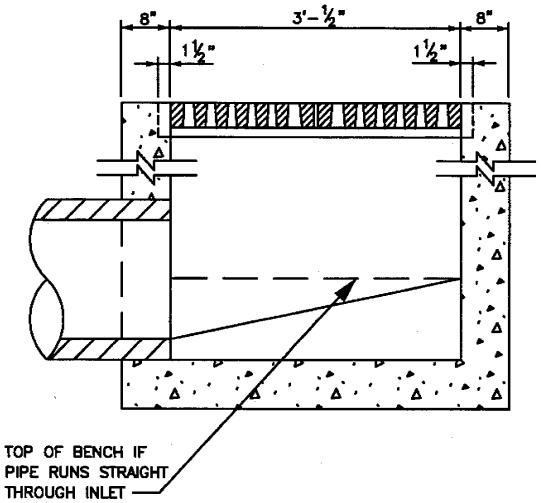
PLAN VIEW

NOTES:

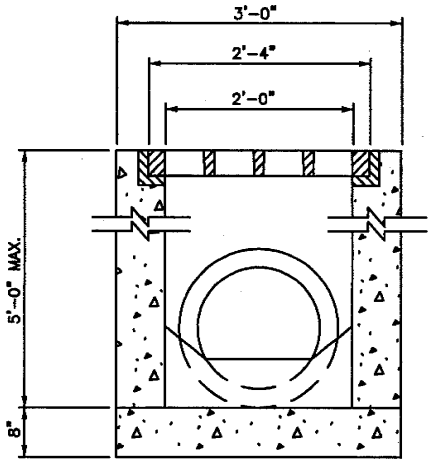
1. NO. 5 STEEL SHALL BE USED THROUGHOUT ON 12" CENTERS.
2. ALL STEEL SHALL HAVE A 2" MINIMUM CLEARANCE TO ANY CONCRETE FACE.
3. NO STEEL IS REQUIRED IN THE BOTTOM SLAB.
4. ALL VERTICAL STEEL SHALL EXTEND 4" INTO BOTTOM SLAB.
5. FOR USE IN PAVED AREAS ONLY.
6. PROVIDE MINIMUM 0.1' SLOPE THROUGH STRUCTURE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

ISOMETRIC VIEW

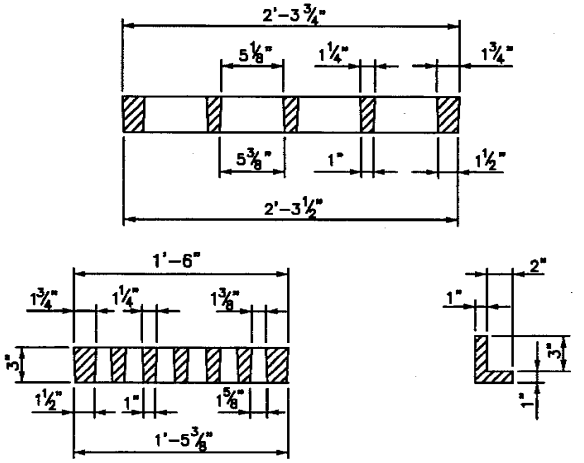




SECTION E–E



SECTION F–F



GRATE DETAILS

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

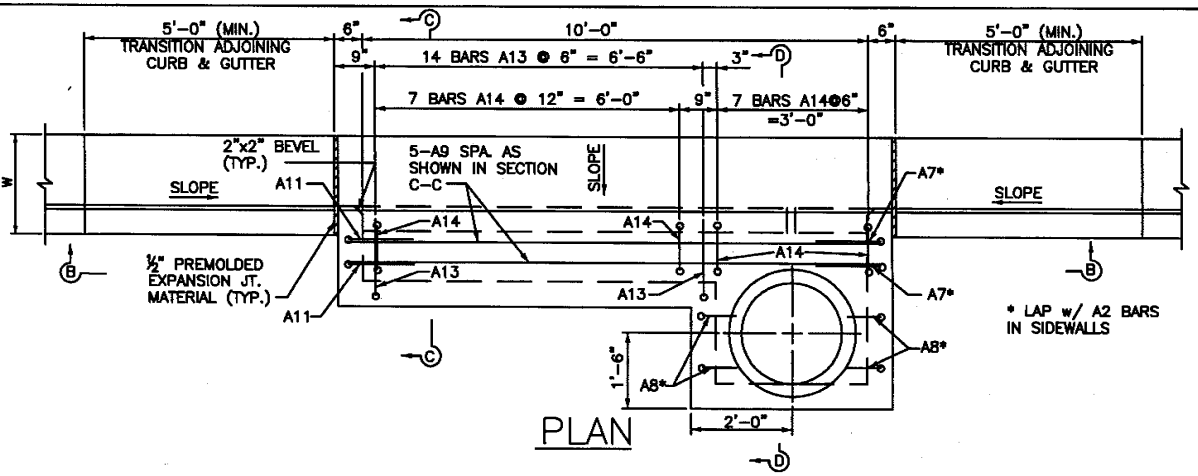
SURFACE INLET TYPE "B"

STANDARD DRAWING NO. 121

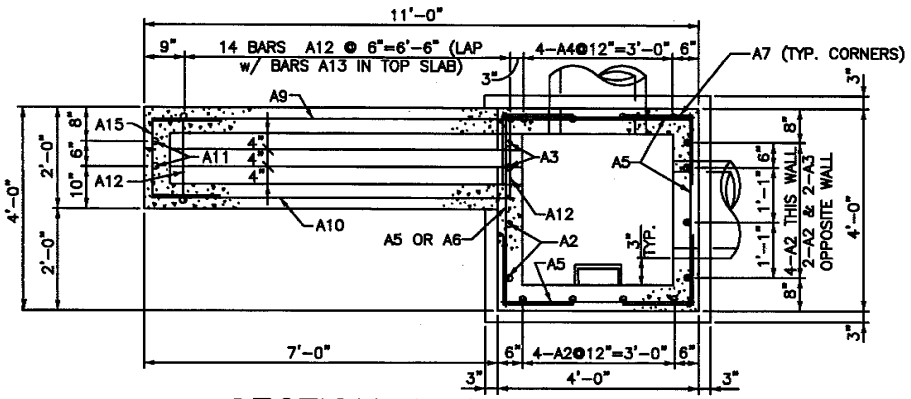
APPROVED _____ DATE 5/1/08

URBAN COUNTY ENGINEER

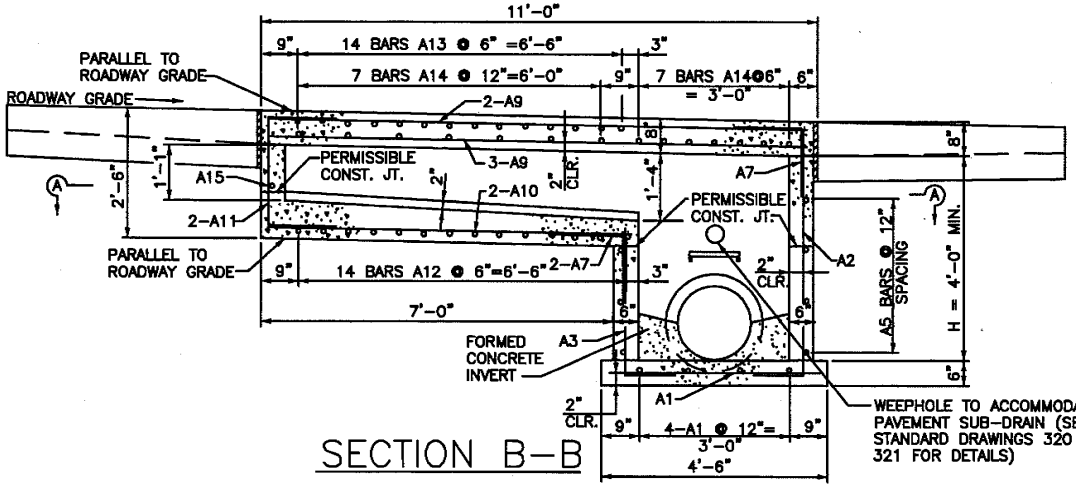
COMMISSIONER _____ DATE 5/1/08



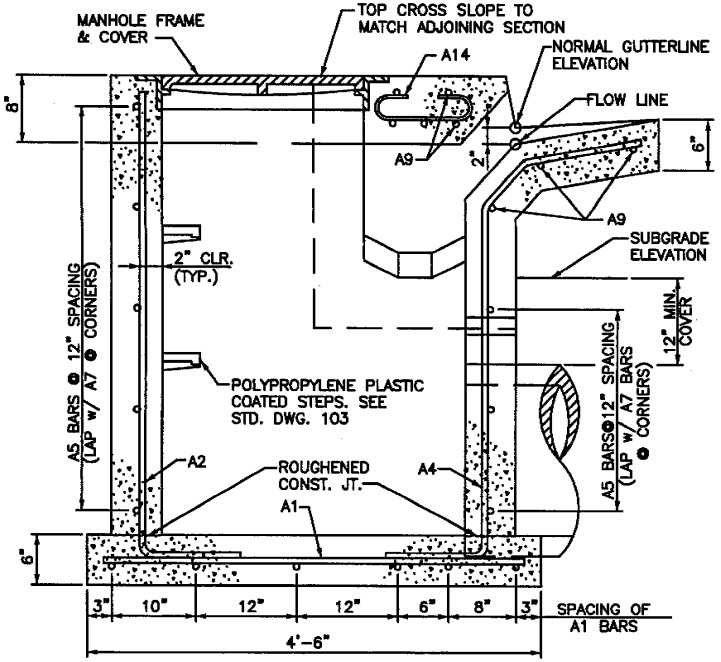
PLAN



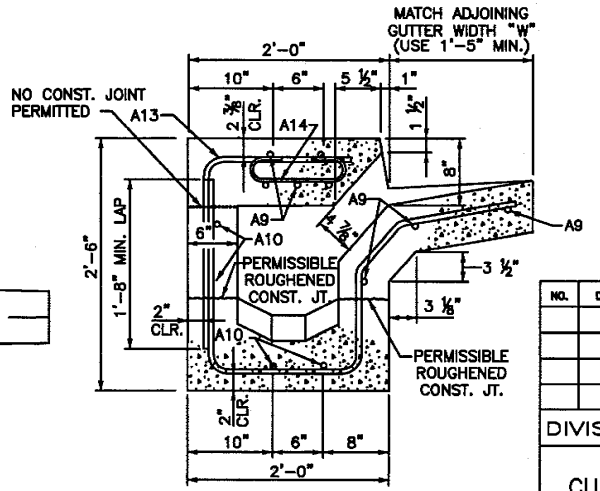
SECTION A-A



SECTION B-B



SECTION D-D



SECTION C-C

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
URBAN COUNTY ENGINEER DATE

_____ 5/1/08
COMMISSIONER DATE

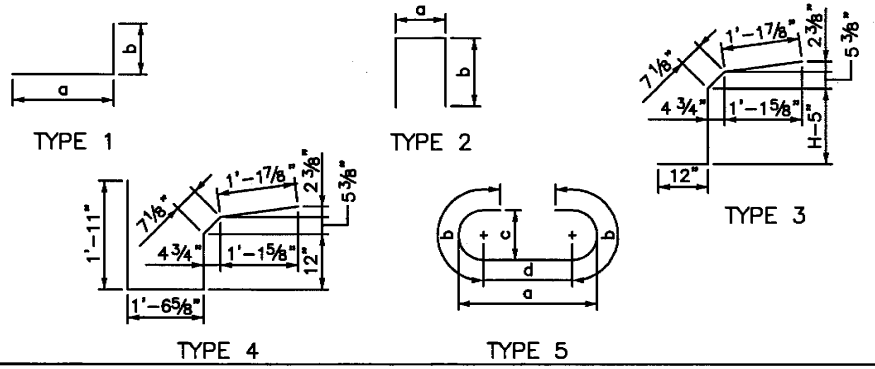
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

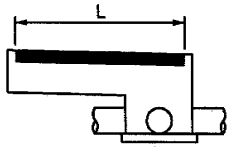
BILL OF REINFORCEMENT

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				

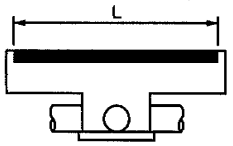
* NO. OF BARS REQUIRED FOR H=4'-0"
ADD OR DEDUCT 4-A5 & 4-A7 FOR EACH 1'-0" INCREASE OR DECREASE IN H.

BAR TYPES

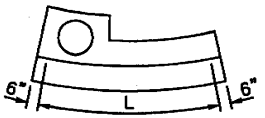




GRADE



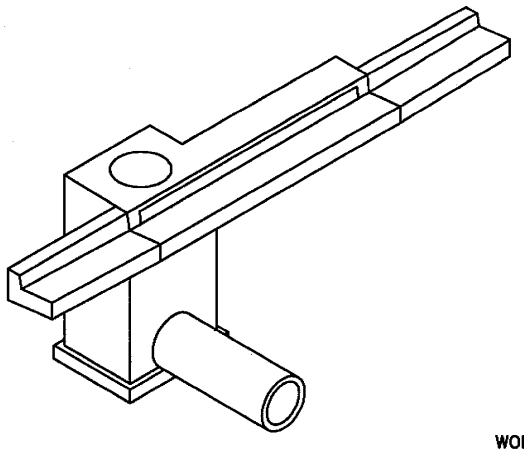
SAG



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 3/4" UNLESS OTHERWISE SHOWN.
2. THIS DRAWING DEPICTS A CURB BOX INLET IN A GRADE SITUATION. FOR CURB BOX BOX IN SAG SITUATION, DETAILS SHALL BE MODIFIED AS INDICATED IN DETAIL 'A'.
3. THE STANDARD OPENING LENGTH IS 10'-0" AS DETAILED HERE. THIS LENGTH MAY BE INCREASED OR DECREASED BASED ON HYDRAULIC ANALYSIS AND APPROVAL BY THE LEXINGTON-FAYETTE COUNTY URBAN GOVERNMENT ENGINEER. MODIFICATION TO THE OPENING LENGTH WILL REQUIRE MODIFICATION OF LENGTH OF BARS A9 & A10 AND INCREASE OR DECREASE IN NUMBER OF BARS A12, A13 & A14 MAINTAINING THE SAME MAXIMUM SPACING SHOWN ON THIS DRAWING.
4. MAXIMUM "H" FOR APPLICATION OF THIS DRAWING SHALL BE 10 FEET.
5. FIELD BEND OR CUT BARS A2, A4, AND A5 AS NECESSARY WHERE PIPES PENETRATE CHAMBER WALLS.
6. FOR CURB BOX INLET IN CURVE WITH CURB RADIUS OF LESS THAN 25', LONGITUDINAL BARS A9, A10 SHALL BE SHOP FABRICATED RADIALLY.

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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

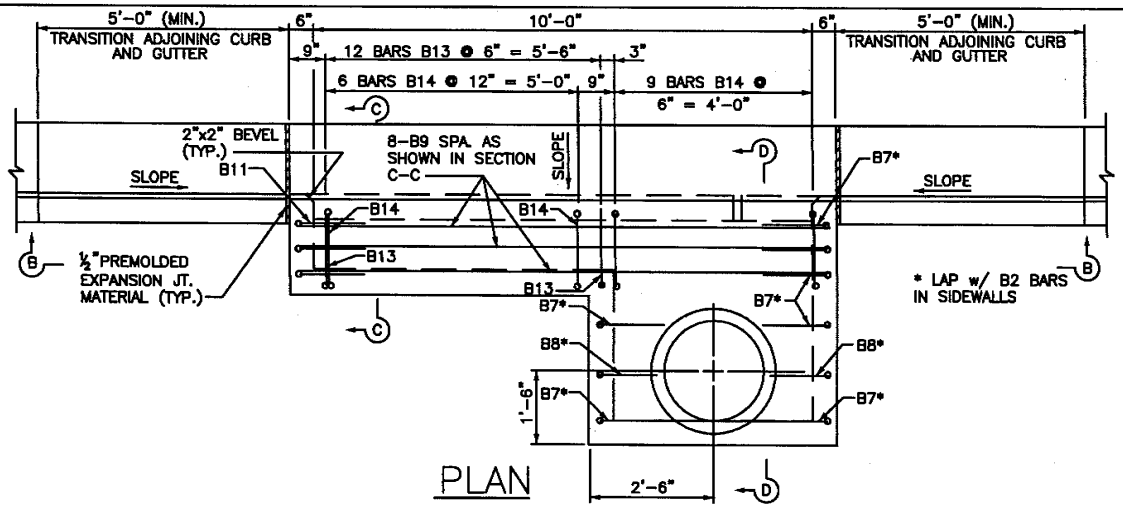
CURB BOX INLET TYPE "A"
4'X4' BOX
15'-18" PIPES

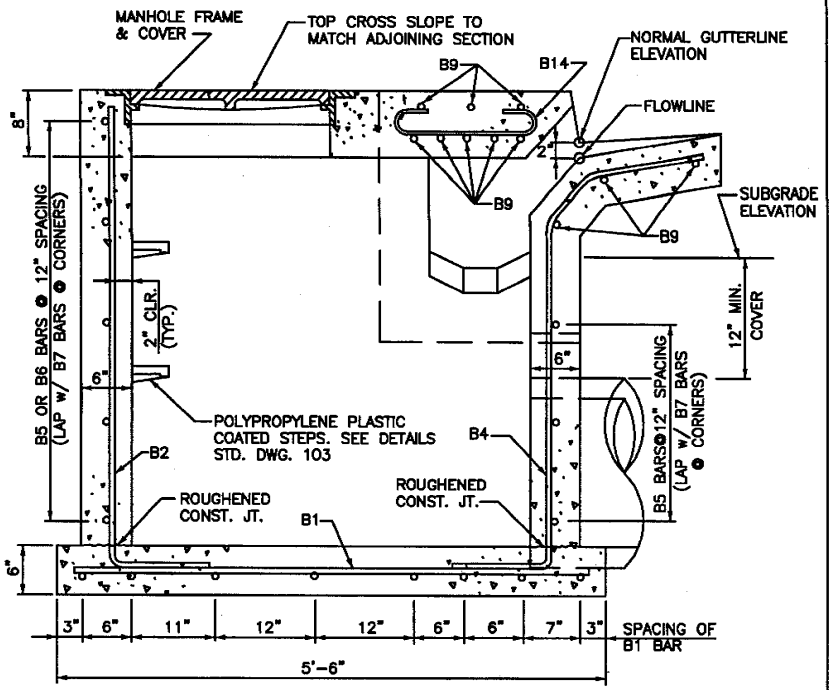
STANDARD DRAWING NO. 122-2

APPROVED: 5/1/08
URBAN COUNTY ENGINEER DATE

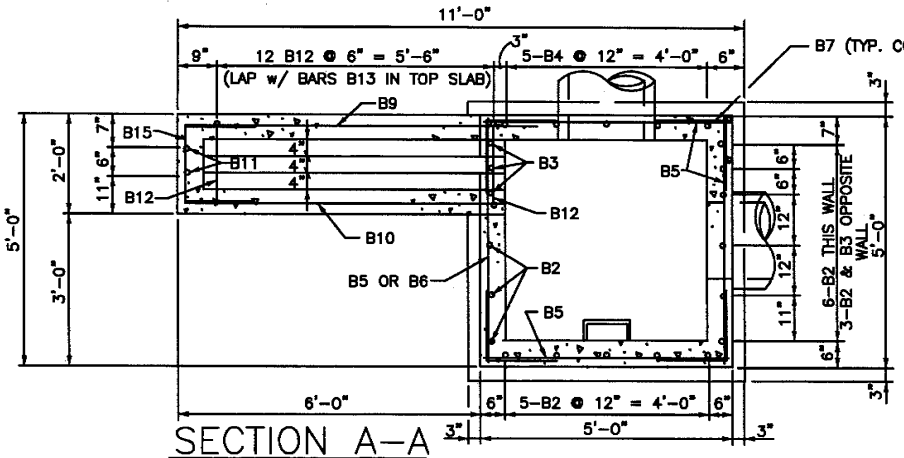
5/1/08
COMMISSIONER DATE

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

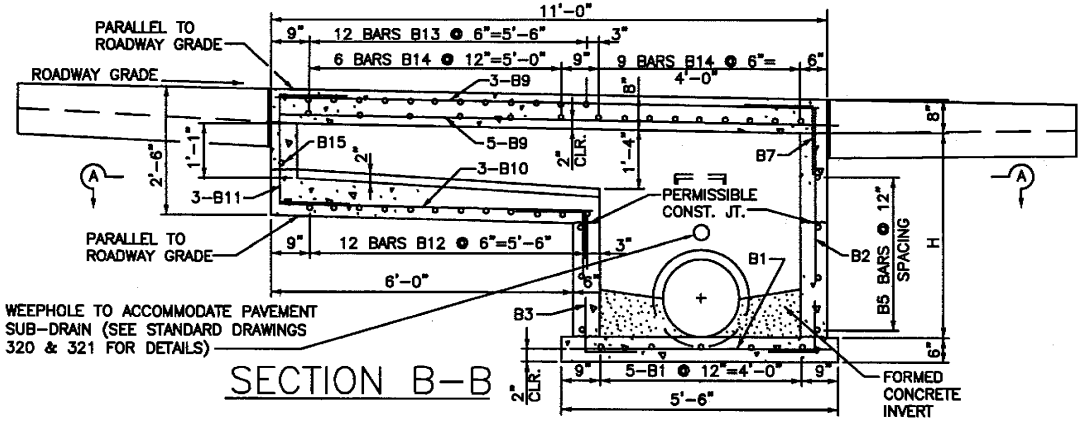




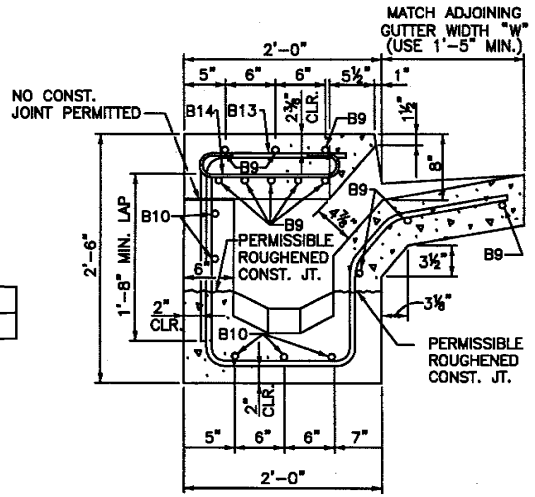
SECTION D–D



SECTION A–A



SECTION B–B



SECTION C–C

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

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

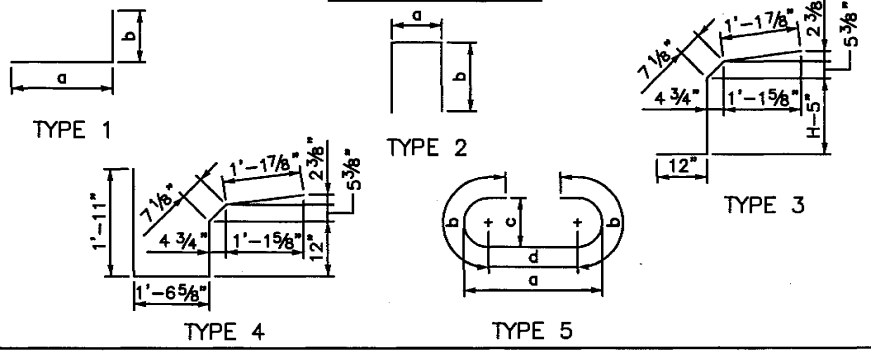
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

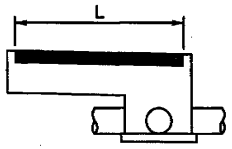
BILL OF REINFORCEMENT

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				

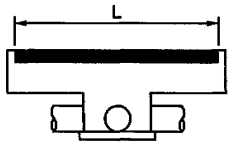
* NO. OF BARS REQUIRED FOR H=4'-0"
ADD OR DEDUCT 4-B5 & 4-B7 FOR EACH 1'-0" INCREASE OR DECREASE IN H.

BAR TYPES

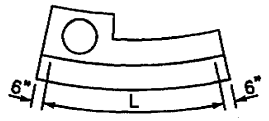




GRADE



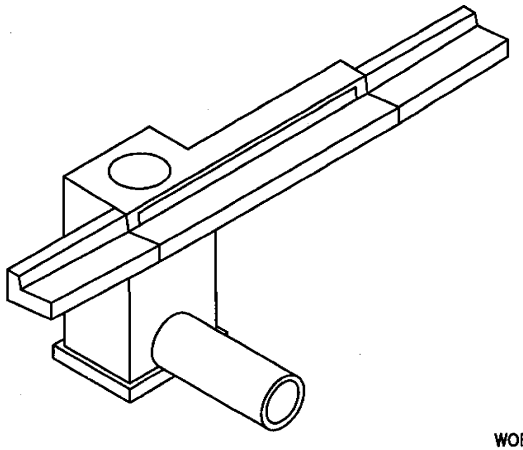
SAG



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 3/4" UNLESS OTHERWISE SHOWN.
2. THIS DRAWING DEPICTS A CURB BOX INLET IN A GRADE SITUATION. FOR CURB BOX BOX IN SAG SITUATION, DETAILS SHALL BE MODIFIED AS INDICATED IN DETAIL 'A'.
3. THE STANDARD OPENING LENGTH IS 10'-0" AS DETAILED HERE. THIS LENGTH MAY BE INCREASED OR DECREASED BASED ON HYDRAULIC ANALYSIS AND APPROVAL BY THE LEXINGTON-FAYETTE COUNTY URBAN GOVERNMENT ENGINEER. MODIFICATION TO THE OPENING LENGTH WILL REQUIRE MODIFICATION OF LENGTH OF BARS B9 & B10 AND INCREASE OR DECREASE IN NUMBER OF BARS B12, B13 & B14 MAINTAINING THE SAME MAXIMUM SPACING SHOWN ON THIS DRAWING.
4. MAXIMUM "H" FOR APPLICATION OF THIS DRAWING SHALL BE 10 FEET.
5. FIELD BEND OR CUT BARS B2, B4, AND B5 AS NECESSARY WHERE PIPES PENETRATE CHAMBER WALLS.
6. FOR CURB BOX INLET IN CURVE WITH CURB RADIUS OF LESS THAN 25', LONGITUDINAL BARS B9, B10 SHALL BE SHOP FABRICATED RADIALLY.
7. 30" PIPE MAY BE APPROVED IF BOTH PIPES ARE INSTALLED ON THE SAME LINE.

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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

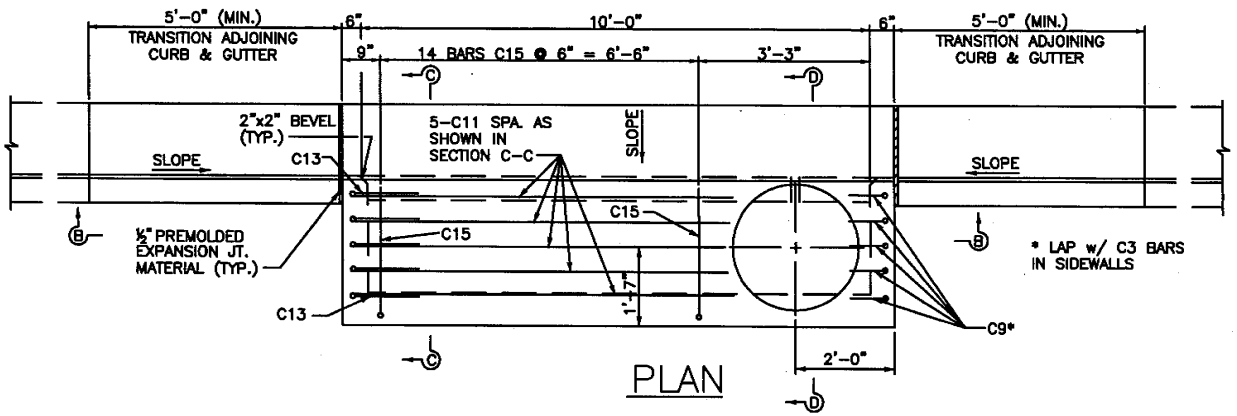
CURB BOX INLET TYPE "B"
5'X5' BOX
15"-24" PIPES

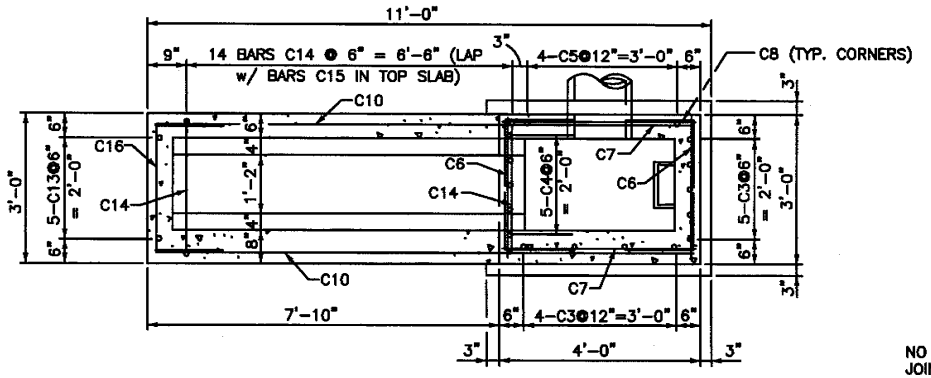
STANDARD DRAWING NO. 123-2

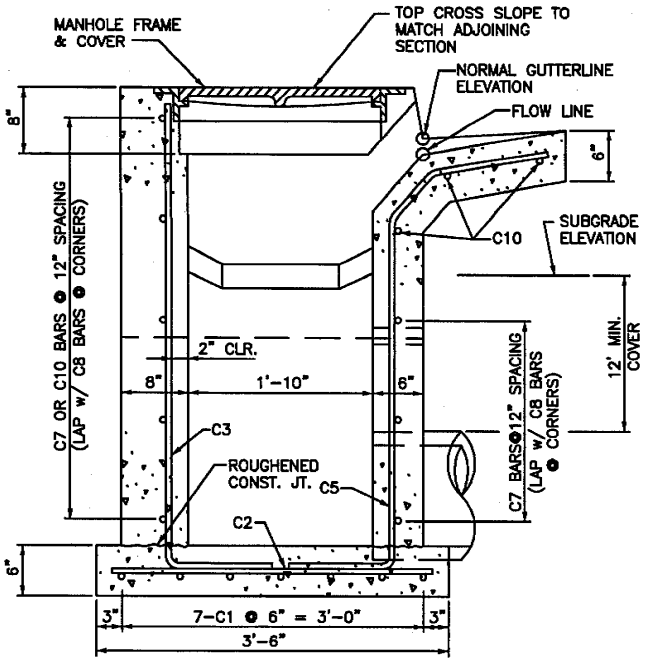
APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

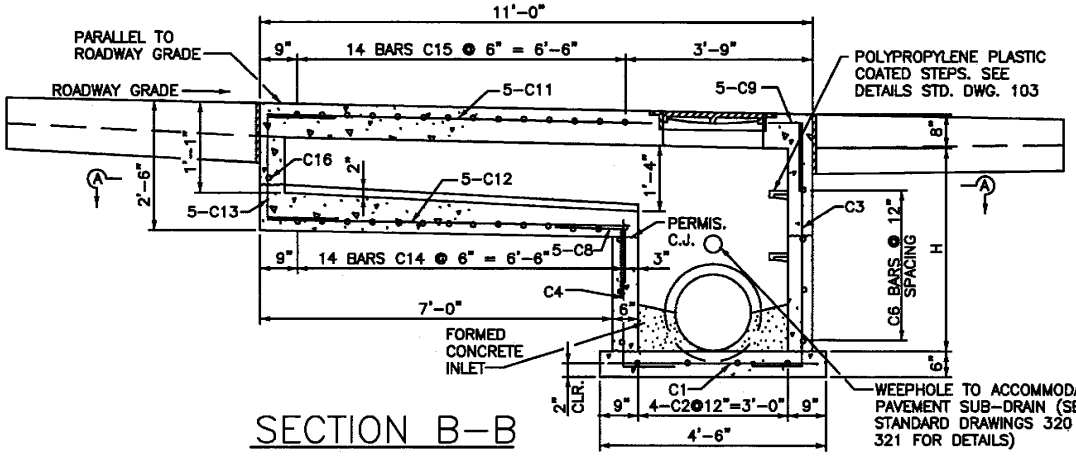
_____ DATE 5/1/08
COMMISSIONER

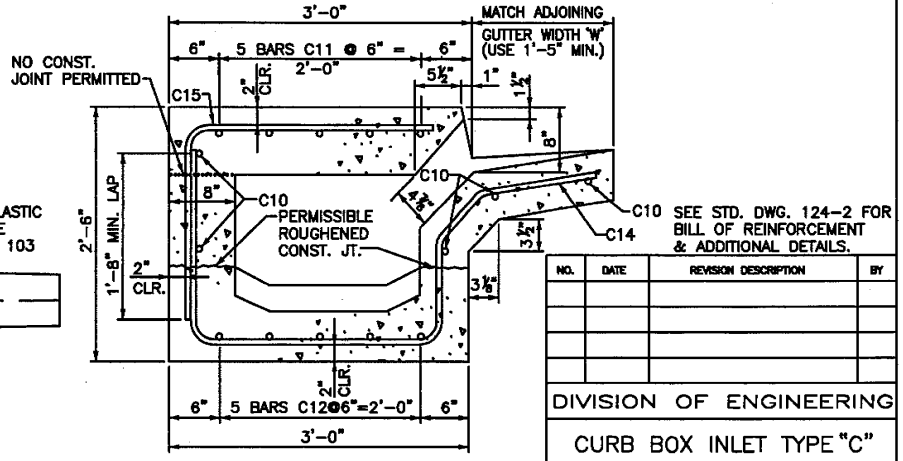
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT











NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

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

STANDARD DRAWING NO. 124-1

APPROVED: 5/1/08

URBAN COUNTY ENGINEER — DATE

COMMISSIONER — DATE 5/1/08

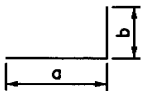
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

BILL OF REINFORCEMENT

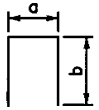
MARK	TYPE	SIZE	NO.	LENGTH FT.	LENGTH IN.	LOCATION	a FT.	a IN.	b FT.	b IN.	c FT.	c IN.	d FT.	d IN.
C1	STR	#5	7	4	2	FOOTING								
C2	STR	#5	4	3	2	FOOTING								
C3	1	#5	9	H+(1'-10")		CHAMBER WALLS	1	0	H+10"					
C4	1	#5	5	H-4"		CHAMBER WALLS	1	0	H-(1'-4")					
C5	3	#5	4	H+(2'-4")		CHAMBER WALLS				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

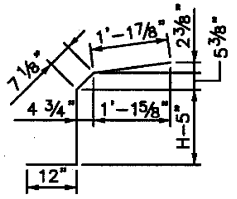
BAR TYPES



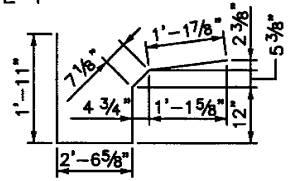
TYPE 1



TYPE 2



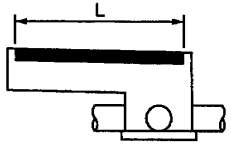
TYPE 3



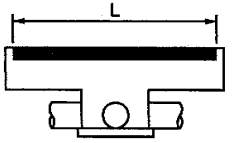
TYPE 4

NOTES:

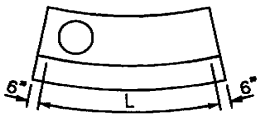
1. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI. STEEL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60. ALL EXPOSED EDGES SHALL BE BEVELED 3/4" UNLESS OTHERWISE SHOWN.
2. THIS DRAWING DEPICTS A CURB BOX INLET IN A GRADE SITUATION. FOR CURB BOX INLET IN SAG SITUATION, DETAILS SHALL BE MODIFIED AS INDICATED IN DETAIL 'A'.
3. THE STANDARD OPENING LENGTH IS 10'-0" AS DETAILED HERE. THIS LENGTH MAY BE INCREASED OR DECREASED BASED ON HYDRAULIC ANALYSIS AND APPROVAL BY THE LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT ENGINEER. MODIFICATION TO THE OPENING LENGTH WILL REQUIRE MODIFICATION OF LENGTH OF BARS C10, C11 & C12 AND INCREASE OR DECREASE IN NUMBER OF BARS C14 & C15 MAINTAINING THE SAME MAXIMUM SPACING SHOWN ON THIS DRAWING.
4. MAXIMUM "H" FOR APPLICATION OF THIS DRAWING SHALL BE 5 FEET.
5. FIELD BEND OR CUT BARS C3, C5, C6 & C7 AS NECESSARY WHERE PIPES PENETRATE CHAMBER WALLS.
6. FOR CURB BOX INLET IN CURVE WITH CURB RADIUS OF LESS THAN 25', LONGITUDINAL BARS C10, C11 & C12 SHALL BE SHOP FABRICATED RADIALLY.



GRADE



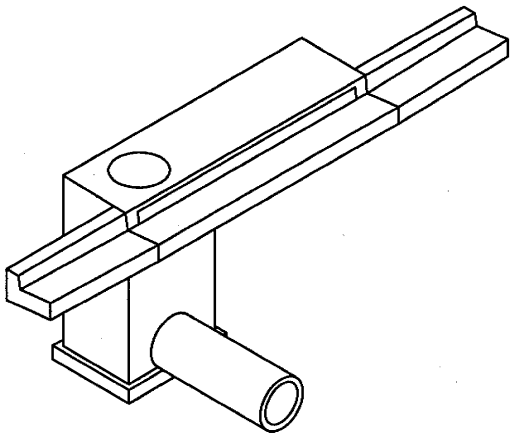
SAG



CURVE LENGTH

DETAIL 'A'

APPLICABLE SITUATIONS



ISOMETRIC VIEW

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

NO.	DATE	REVISION DESCRIPTION	BY

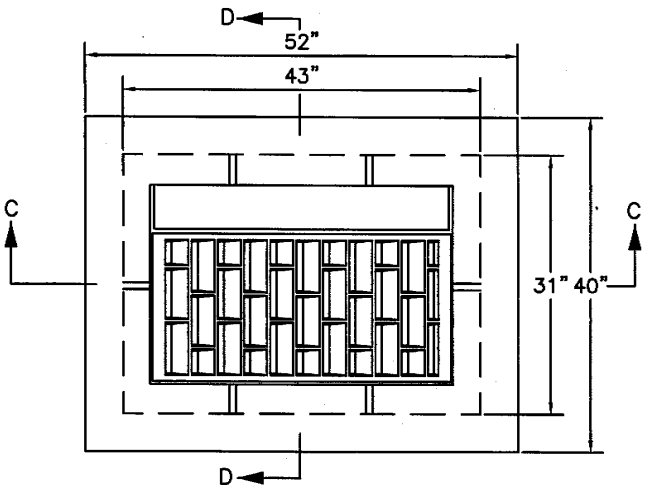
DIVISION OF ENGINEERING

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

STANDARD DRAWING NO. 124-2

APPROVED
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

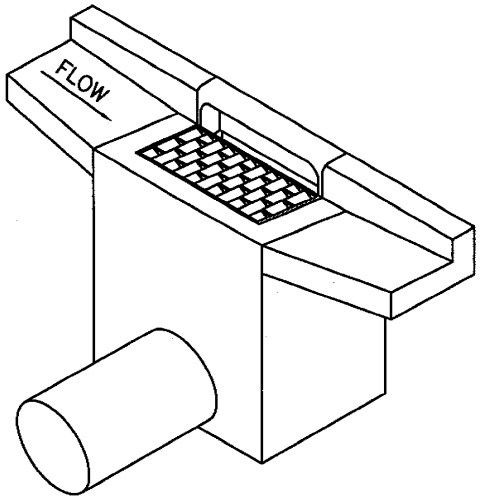
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



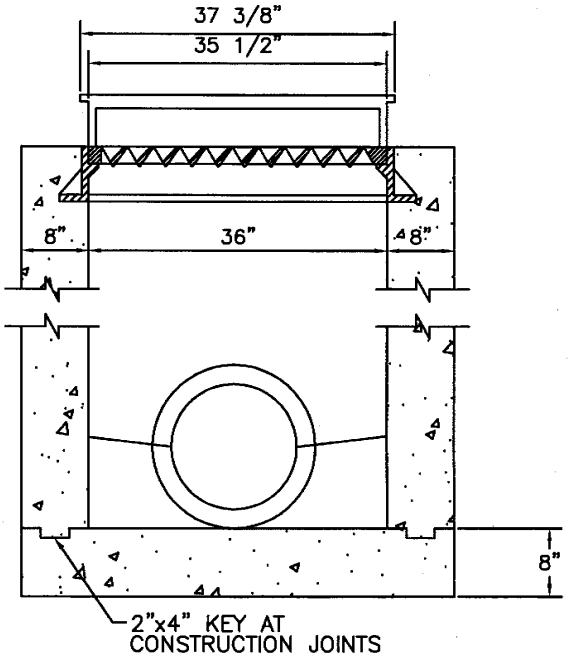
PLAN

NOTES:

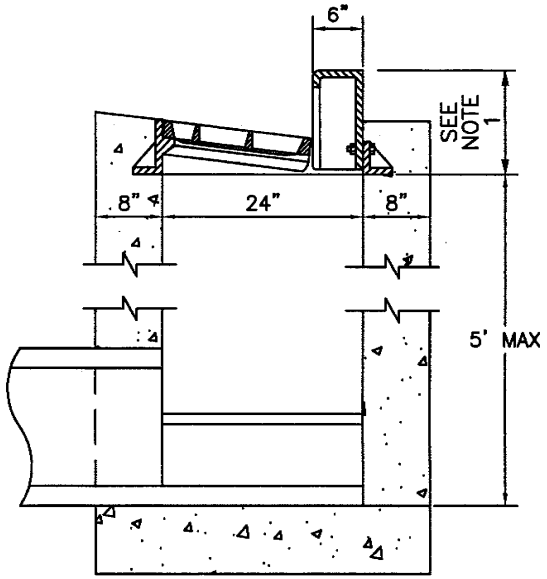
1. CURB BOX ADJUSTABLE 6" TO 9" TO MATCH TOP OF CURB.
2. NO. 5 STEEL SHALL BE USED THROUGHOUT ON 12" CENTERS. 2" CLEARANCE ON ALL EXTERIOR WALL BARS. EXTERIOR HORIZ. WALL BARS SHALL HAVE A 12" MIN. LAP AT CORNERS.
3. ALL EXPOSED FLATWORK SHALL HAVE A HAND FLOATED AND BROOMED FINISH.
4. NO STEEL IS REQUIRED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



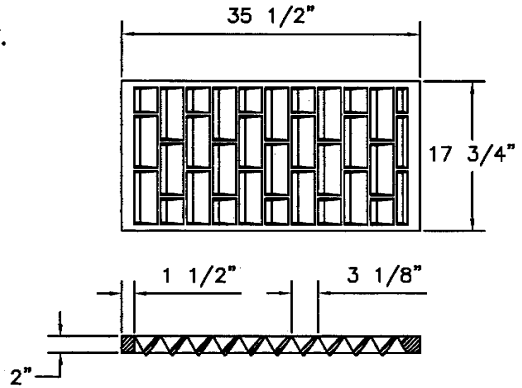
ISOMETRIC VIEW



SECTION C–C



SECTION D–D



GRATE DETAIL

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

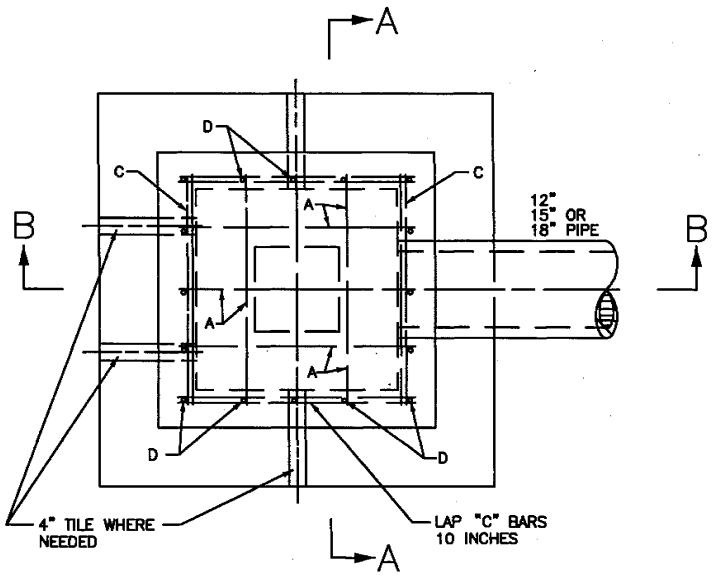
CURB BOX INLET
TYPE "D"

STANDARD DRAWING NO. 125

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

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



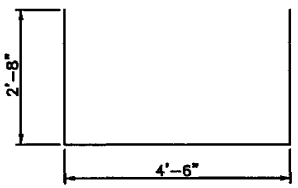
PLAN

BILL OF REINFORCEMENT

MARK	QUANTITY	SIZE	LENGTH	LOCATION	DESCRIPTION
A	10	½"ø	4'–7"	TOP SLAB	STRAIGHT
C	6	"	9'–9"	WALL	BENT
D	16	"	3'–4"	"	STRAIGHT

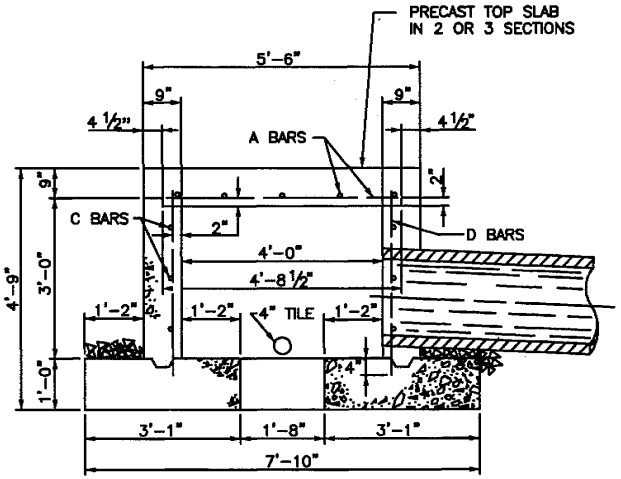
STEEL REINFORCEMENT	105 LBS.
12" CLASS "A" CONCRETE	4.61 CU. YDS.
15" CLASS "A" CONCRETE	4.59 CU. YDS.
18" CLASS "A" CONCRETE	4.58 CU. YDS.

DETAIL C–BAR

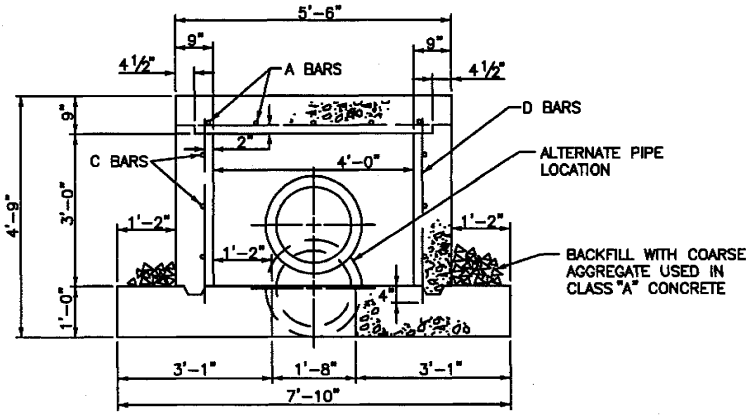


NOTES:

1. LOCATION OF OPENING MAY BE DETERMINED IN THE FIELD FOR A SIDE OR BOTTOM SPRING INLET.
2. TYPE "A" TO BE USED WHEN FILL OVER TOP IS 10' OR MORE.



SECTION B–B



SECTION A–A

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

SPRING BOX INLET
TYPE "A"

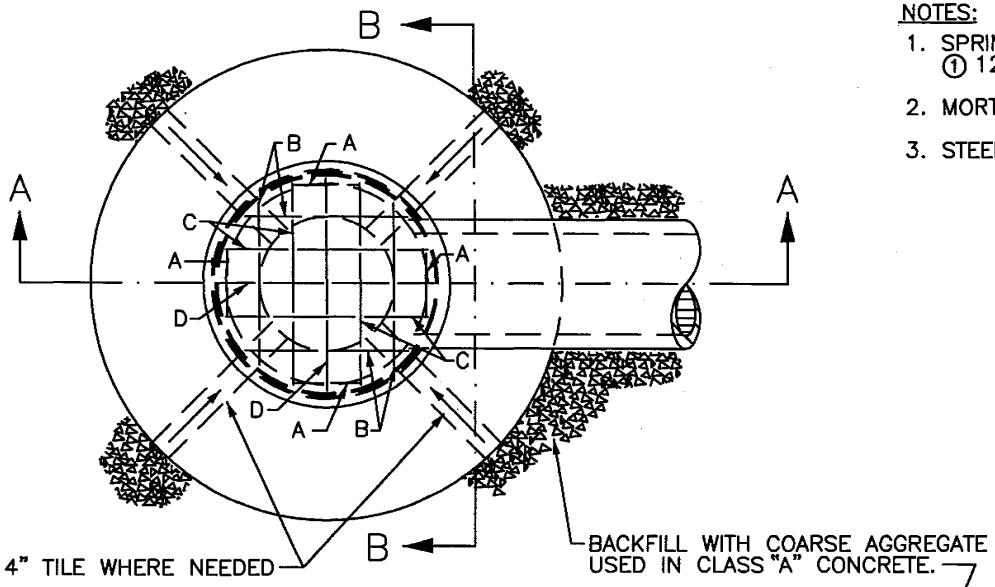
STANDARD DRAWING NO.	126
APPROVED	5/1/08
URBAN COUNTY ENGINEER	DATE
COMMISSIONER	5/1/08 DATE

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

NOTES:

1. SPRING BOX INLET TYPE "B" MAY BE USED WHEN FILL OVER TOP IS LESS THAN 10'. ① 12", 15", OR 18" DIAMETER PIPE OUTLET (SEE PIPE SECTIONS FOR SIZE AND TYPE)
2. MORTAR AROUND PIPE TO PREVENT SEEPAGE.
3. STEEL REINFORCEMENT PLACED 6" ON CENTERS.

STEEL REINFORCEMENT 13 LBS.
CLASS "A" CONCRETE 1.54 CU. YDS.

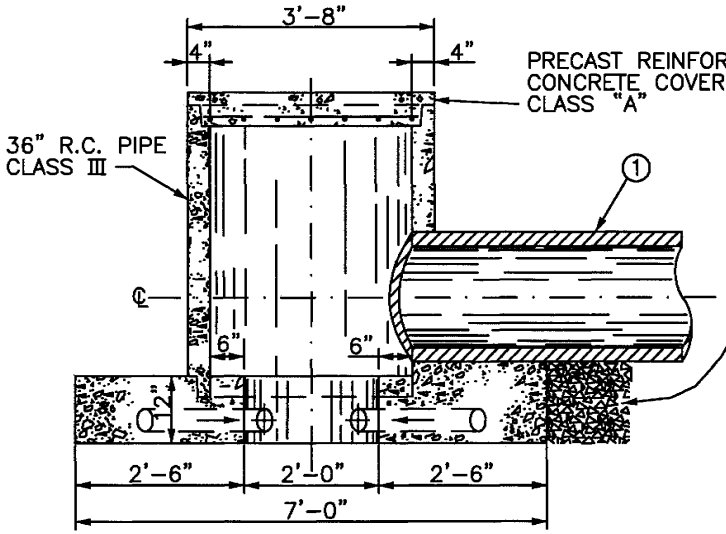


PLAN

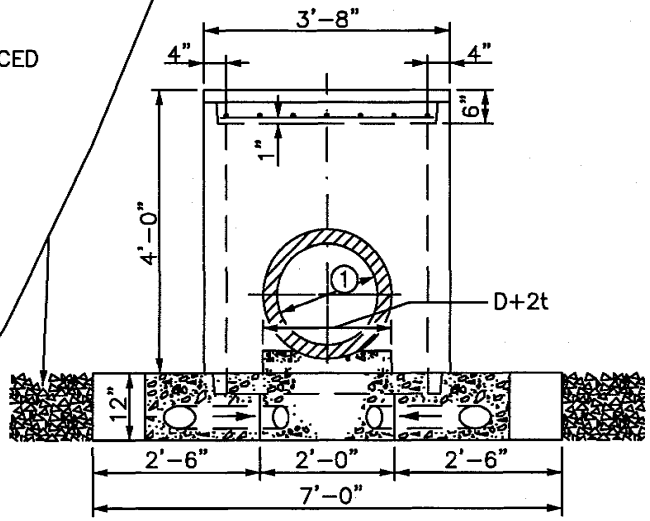
BILL OF REINFORCEMENT

MARK	QUANTITY	SIZE	LENGTH
A	4	NO.3	1'–0"
B	4	"	2'–5"
C	4	"	3'–0"
D	2	"	3'–2"

MARK	LOCATION	DESCRIPTION
A	TOP	STRAIGHT
B	"	"
C	"	"
D	"	"



SECTION A–A



SECTION B–B

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

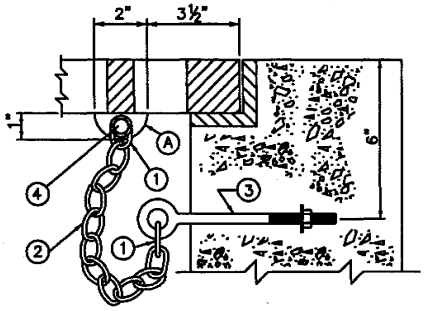
SPRING BOX INLET
TYPE "B"

STANDARD DRAWING NO. 127

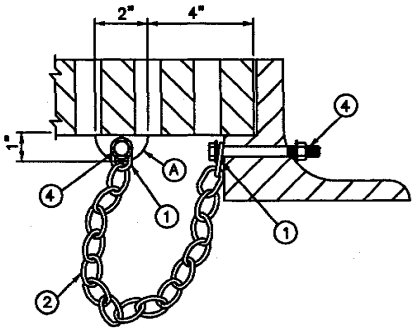
APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

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



GRATE CONNECTED TO WALL

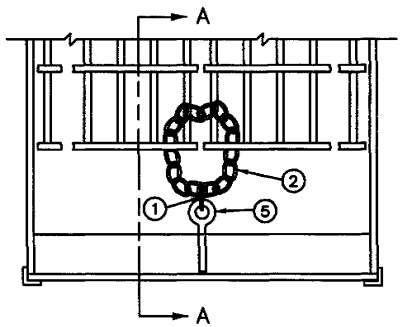


GRATE CONNECTED TO FRAME

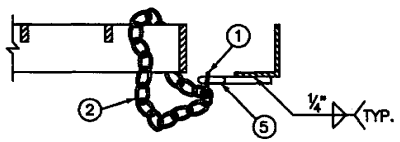
TYPICAL ILLUSTRATIONS FOR CASTINGS

NOTES:

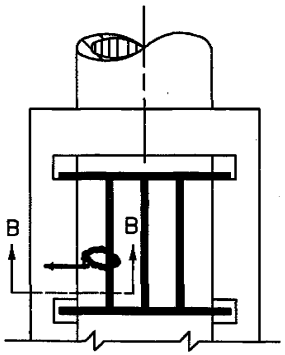
1. CHAIN SHACKLE, OR COLD SHUT OF AN APPROVED TYPE.
2. 3/8" PROOF COIL CHAIN OF SUFFICIENT LENGTH TO ALLOW REMOVAL AND DISPLACEMENT OF GRATE, 18" MIN.
3. 3/8" x 6" EYE BOLT, NUT, AND WASHER.
4. 3/8" HEX HEAD CAP SCREW (GRADE 2), NUT AND WASHERS. LENGTH DETERMINED BY THICKNESS OF FRAME OR GRATE. 7/16" DIA. HOLE FOR CAP SCREW. BATTER THREADS ON CAP SCREW TO PREVENT REMOVAL OF NUT.
5. 3/8" 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.



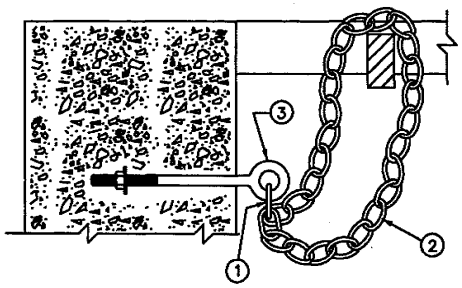
PLAN VIEW



SECTION A–A
GRATE CONNECTED TO FRAME

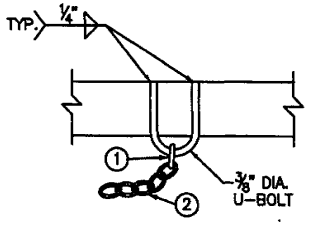


PLAN VIEW

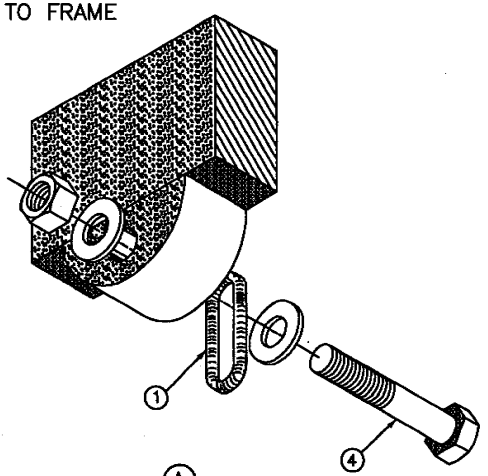


SECTION B–B

GRATE CONNECTED TO WALL



ALTERNATE FOR
STRUCTURAL STEEL
MEMBERS



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

TYPICAL ILLUSTRATIONS FOR STRUCTURAL STEEL UNITS

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

SECURITY DEVICES FOR
FRAMES AND GRATES

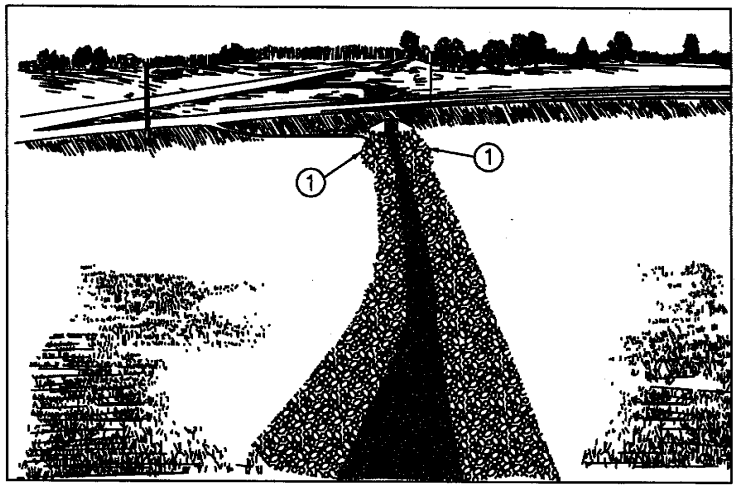
STANDARD DRAWING NO. 128

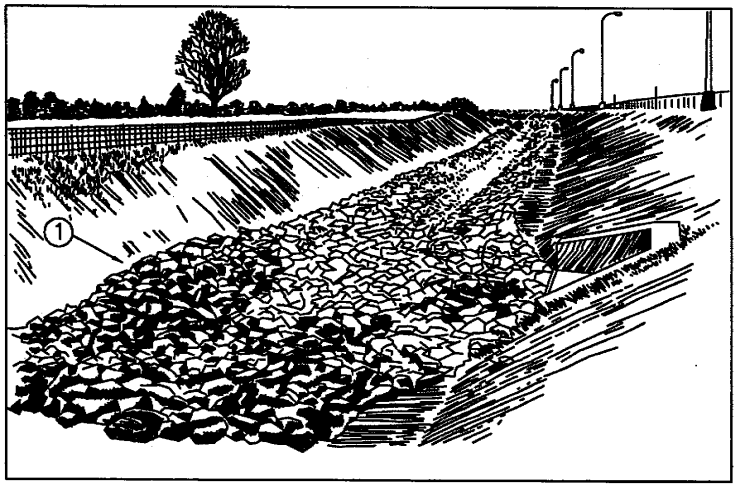
APPROVED BY _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

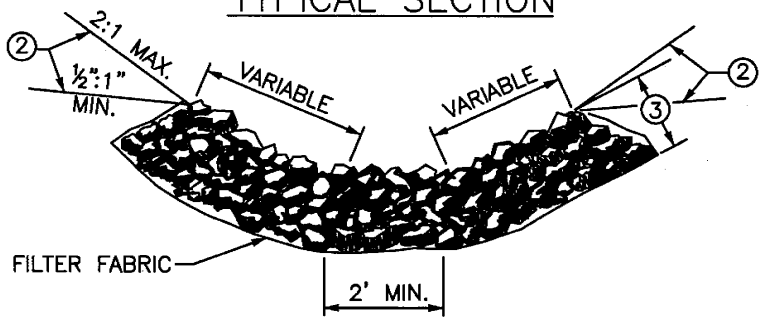
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

CHANNELS & DITCHES





TYPICAL SECTION



NOTES:

1. AGGREGATE CHANNEL LINING WILL NOT BE REQUIRED IN THE BOTTOM OF THE DITCH WHERE SOLID ROCK IS ENCOUNTERED. SIDE SLOPES SHALL BE LINED.
2. AGGREGATE ESTIMATED ON THE BASIS OF 0.50 TON/SQ. YD. PER FOOT OF DEPTH.

SHEET NOTES:

① WIDEN CHANNEL LINING AT STRUCTURES TO PREVENT EROSION.

② ALTERNATE LOCATION OF GROUNDLINE.

③ MINIMUM DEPTH OF CHANNEL LINING SHALL BE 24". LESSER DEPTHS SHALL HAVE APPROVAL FROM THE ENGINEER. STONE SHALL BE WELL GRADED SO THAT OPENINGS BETWEEN LARGER STONES ARE FILLED WITH SMALLER STONES.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

AGGREGATE CHANNEL LINING

STANDARD DRAWING NO. 130-1

APPROVED: 5/1/08
URBAN COUNTY ENGINEER — DATE

5/1/08
COMMISSIONER — DATE

NOTES:

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

SIEVE SIZE (INCHES)	PERCENT PASSING
3 1/2	100
2 1/2	70–85
1 1/2	0–10

2. BEDDING SHOULD BE AT LEAST THREE INCHES AND SPREAD UNIFORMLY.

3. PLASTIC FILTER FABRIC MAY BE USED IN PLACE OF OR IN CONJUNCTION WITH GRAVEL FILTERS. THE FOLLOWING PARTICLE SIZE RELATIONSHIPS MUST EXIST:

   A. FOR FILTER FABRIC ADJACENT TO GRANULAR MATERIALS CONTAINING 50 PERCENT OR LESS (BY WEIGHT) OF FINE PARTICLES (LESS THAN 0.074 mm):
      1.) $\frac{\text{D (PARTICLE DIAMETER) 85 BASE (mm)}}{\text{EOS* FILTER FABRIC (mm)}} > 1$

      2.) TOTAL OPEN AREA OF FILTER IS LESS THAN 36 PERCENT.

   B. FOR FILTER FABRIC ADJACENT TO ALL OTHER SOILS:
      1.) EOS* LESS THAN U.S. STANDARD SIEVE NO. 70
      2.) TOTAL OPEN AREA OF FILTER IS LESS THAN 10 PERCENT.

4. NO FILTER FABRIC SHOULD BE USED WITH LESS THAN 4 PERCENT OPEN AREA OR AN EOS* LESS THAN U.S. STANDARD SIEVE NO. 100.

5. *EOS – EQUIVALENT OPENING SIZE TO A U.S. STANDARD SIEVE SIZE.

6. THE FOLLOWING CHART SHOWS HOW TO DETERMINE THE DIAMETER OF STONE IN RELATION TO DESIGN VELOCITY.

VELOCITY (FEET/SECOND)	STONE DIAMETER (INCHES)
4	2 1/2
6	5
8	9
10	14

NO.	DATE	REVISION DESCRIPTION	BY

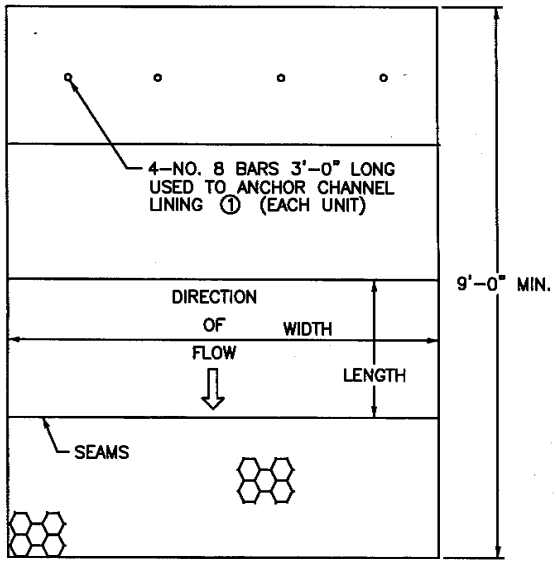
DIVISION OF ENGINEERING

AGGREGATE CHANNEL LINING

STANDARD DRAWING NO. 130–2

APPROVED _____ 5/1/08
URBAN COUNTY ENGINEER — DATE

_____ 5/1/08
COMMISSIONER — DATE



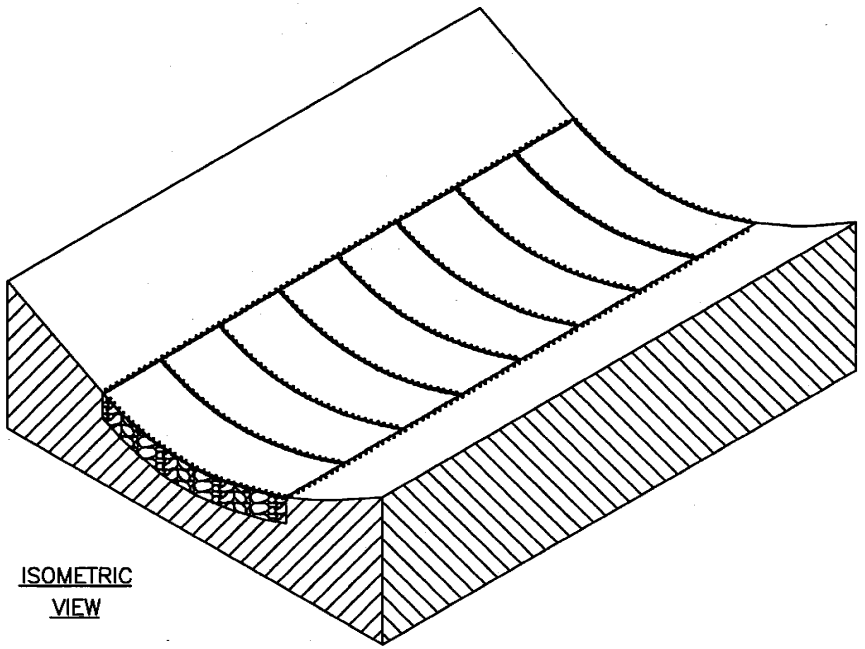
PLAN

SHEET NOTES: ○

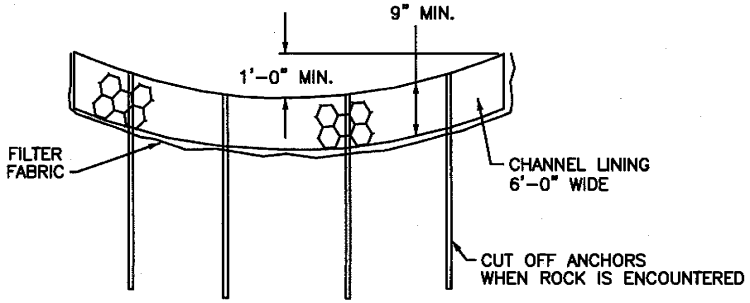
① ANCHORS REQUIRED WHEN LINING IS PLACED ON 5% GRADE OR GREATER.

NOTES:

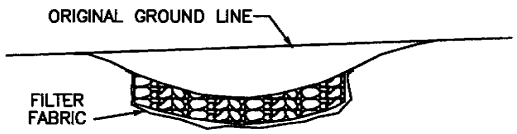
1. SECURE THE LACING WIRE AT THE CORNER OF THE BASKET BY LOOPING AND TWISTING, CONTINUE LACING THROUGHOUT WITH DOUBLE LOOPS AT APPROXIMATELY 5 INCH INTERVALS. EACH UNIT SHALL CONSIST OF LININGS SUPPLIED IN WIDTHS OF 6'–0" AS SHOWN AND LENGTHS IN MULTIPLES OF 3'–0".
2. AGGREGATE ESTIMATED ON THE BASIS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

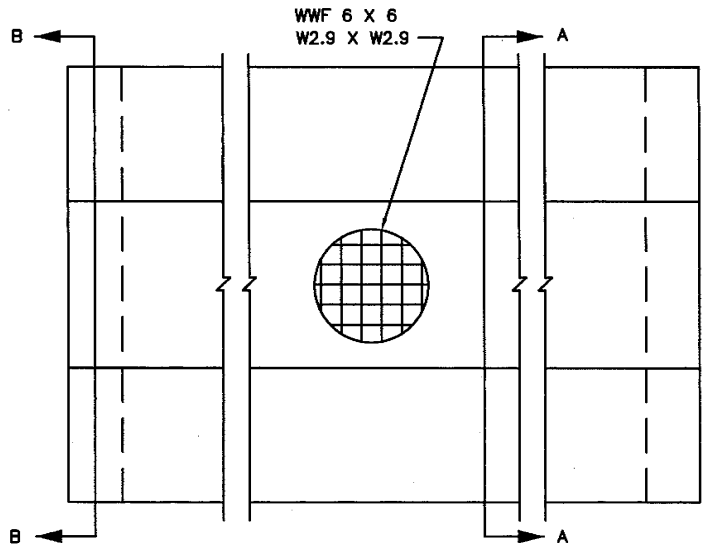
DIVISION OF ENGINEERING

MATTRESS
CHANNEL LINING

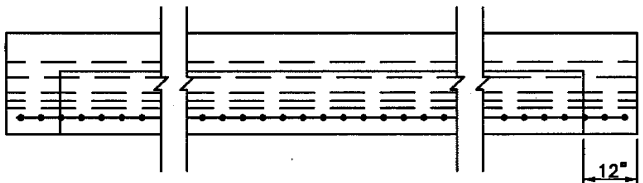
STANDARD DRAWING NO. 131

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

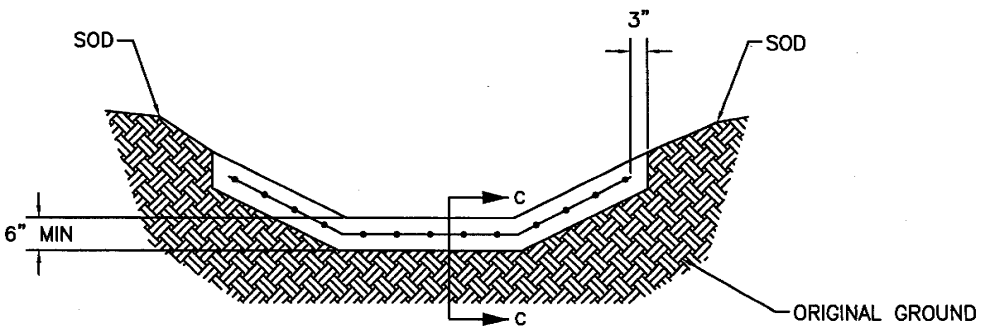
_____ DATE 5/1/08
COMMISSIONER



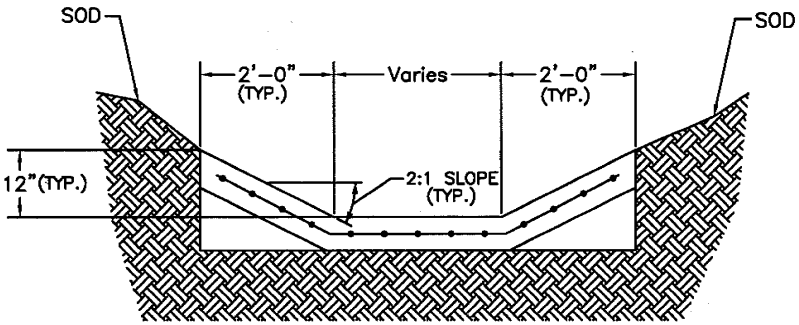
PLAN



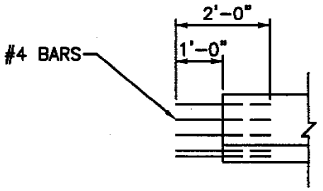
ELEVATION



SECTION A–A



SECTION B–B



SECTION C–C
(@ CONSTRUCTION JOINT)

NOTES:

1. USE "CLASS A" CONCRETE THROUGHOUT.
2. COMPACTION, FINISHING AND CURING SHALL BE THE SAME AS REQUIRED FOR CONCRETE SIDEWALK (USE WHITE COMPOUND).
3. IF THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT IN THE POURING OF THE PAVED DITCH, NO. 4 TIE BARS SPACED 6" O.C. SHALL BE USED (SEE SECTION C–C).
4. INTERMEDIATE ANCHORS MAY BE REQUIRED BY THE ENGINEER FOR SPECIAL CASES. A SPECIAL DESIGN WILL BE REQUIRED IN THIS SITUATION.
5. SHOULD THE TERRAIN OF THE EXISTING GROUND BE SO THAT WATER WOULD DRAIN INTO THE DITCH FROM ONE SIDE ONLY, THEN SODDING WILL BE REQUIRED ON THAT ONE SIDE ONLY OF THE DITCH.
6. EXPANSION JOINTS & SEALER REQUIRED ON ENDS ABUTTING STRUCTURES AND ANCHORS ON ENDS NOT ABUTTING STRUCTURES.
7. IF FIBER REINFORCED CONCRETE IS USED THE WWF 6 x 6 MAY BE ELIMINATED.
8. DO NOT PLACE PAVED DITCH ON DISTURBED SOIL.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

PAVED DITCH

STANDARD DRAWING NO. 132

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

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

ROADWAY DRAINAGE

HEADWALLS

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.

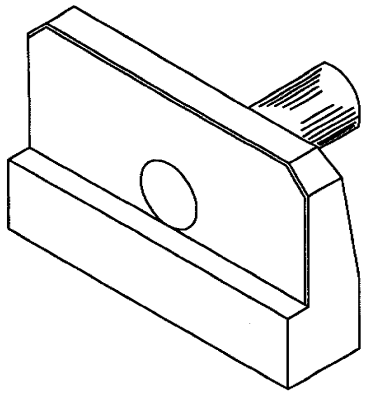
2. ALL EXPOSED EDGES TO BE CHAMFERED ¾".

3. ALL EXPOSED SURFACES TO HAVE A RUBBED FINISH.

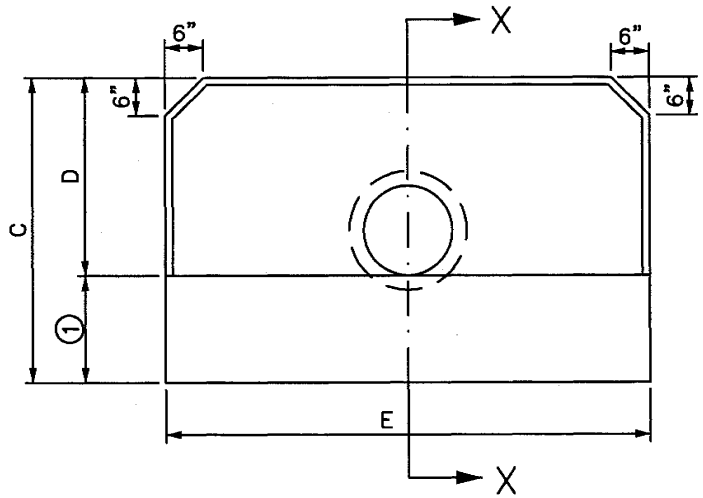
④ STANDARD HEADWALLS ARE FLUSH WITH SOIL FILL.

⑤ RAISED HEADWALLS PROTRUDE 6" ABOVE SOIL FILL.

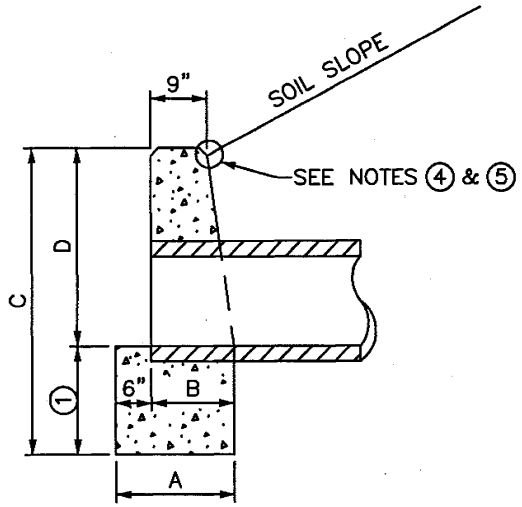
6. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "D" IS GREATER THAN 30".



ISOMETRIC VIEW



PLAN ELEVATION



SECTION X–X

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

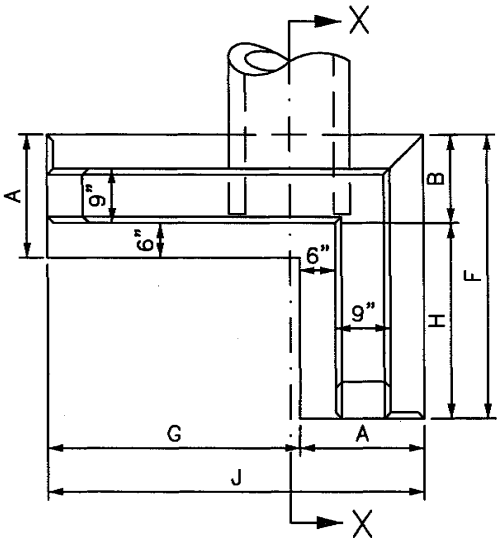
STRAIGHT HEADWALLS

STANDARD DRAWING NO. 150

APPROVED _____ DATE 5/1/08

URBAN COUNTY ENGINEER

COMMISSIONER _____ DATE 5/1/08



PLAN ELEVATION

HEADWALL TYPE	DIA. OF PIPE	HEADWALL DIMENSIONS								
		A	B	C	D	E	F	G	H	J
④ STANDARD ELL	15"	1'–8 ½"	1'–2 ½"	4'–3"	2'–9"	2'–3"	3'–11 ½"	3'–6"	2'–9"	5'–2 ½"
	18"	1'–9"	1'–3"	4'–6"	3'–0"	2'–6"	4'–3"	4'–0"	3'–0"	5'–9"
	21"	1'–9 ½"	1'–3 ½"	4'–9"	3'–3"	2'–9"	4'–6 ½"	4'–6"	3'–3"	6'–3 ½"
	24"	1'–10"	1'–4"	5'–0"	3'–6"	3'–0"	4'–10"	5'–0"	3'–6"	6'–10"
	27"	1'–10 ½"	1'–4 ½"	5'–3"	3'–9"	3'–3"	5'–1 ½"	5'–6"	3'–9"	7'–4 ½"
⑤ RAISED ELL	15"	1'–8 ½"	1'–2 ½"	4'–9"	3'–3"	3'–0"	4'–8 ½"	4'–3"	3'–6"	5'–11 ½"
	18"	1'–9"	1'–3"	5'–0"	3'–6"	3'–3"	5'–0"	4'–9"	3'–9"	6'–6"
	21"	1'–9 ½"	1'–3 ½"	5'–3"	3'–9"	3'–6"	5'–3 ½"	5'–3"	4'–0"	7'–0 ½"
	24"	1'–10"	1'–4"	5'–6"	4'–0"	3'–9"	5'–7"	5'–9"	4'–3"	7'–7"
	27"	1'–10 ½"	1'–4 ½"	5'–9"	4'–3"	4'–0"	5'–10 ½"	6'–3"	4'–6"	8'–1 ½"

NOTES:

① HEIGHT OF FOOTER SHALL BE 18" FOR SOIL AND 12" IN ROCK.

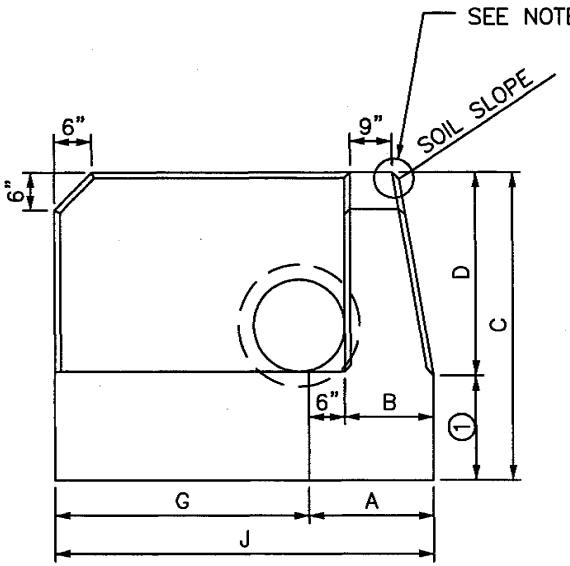
2. ALL EXPOSED EDGES TO BE CHAMFERED ¾".

3. ALL EXPOSED SURFACES TO HAVE A RUBBED FINISH.

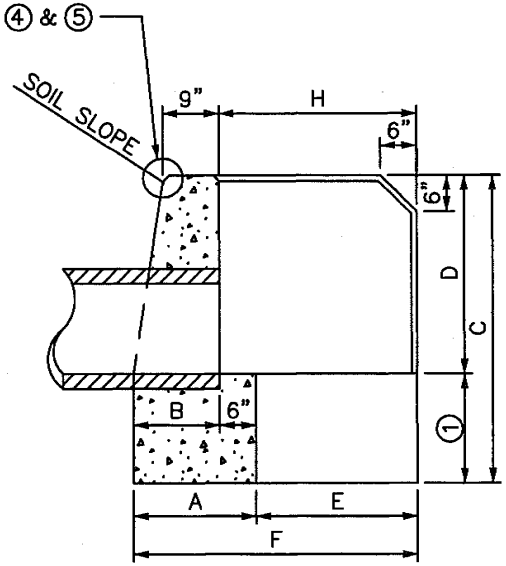
④ STANDARD HEADWALLS ARE FLUSH WITH SOIL FILL.

⑤ RAISED HEADWALLS PROTRUDE 6" ABOVE SOIL FILL.

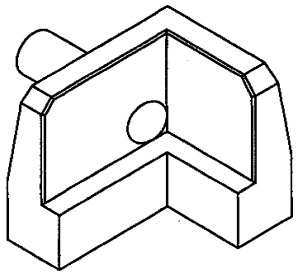
6. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "D" IS GREATER THAN 30".



FRONT ELEVATION



SECTION X–X



ISOMETRIC VIEW

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

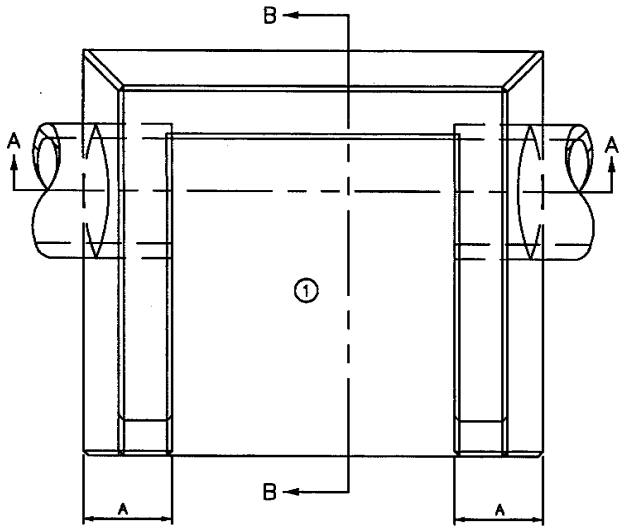
ELL HEADWALLS

STANDARD DRAWING NO. 151

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

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



PLAN

SHEET NOTE: ①

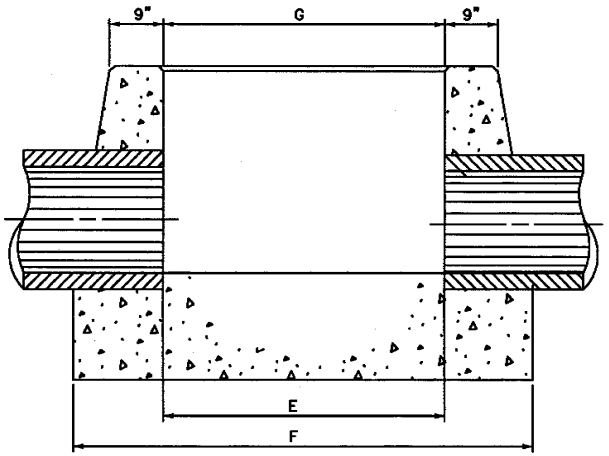
① SOLID CONCRETE BOTTOM REQUIRED.

NOTES:

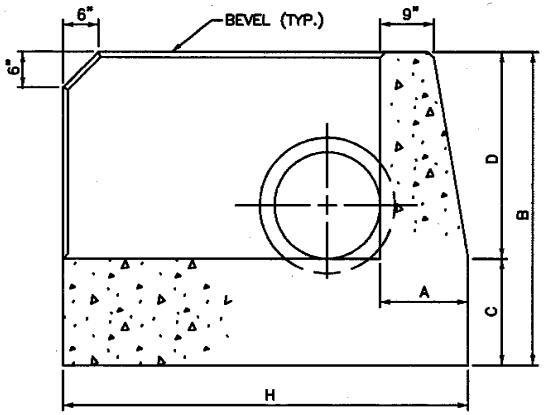
1. VOLUME DISPLACED BY BARREL OF PIPE HAS BEEN COMPUTED USING INSIDE DIAMETER OF PIPE.
2. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "D" IS GREATER THAN 30".

DIMENSIONS AND QUANTITIES

DIMENSIONS	DIAMETER OF PIPE				
	15"	18"	24"	30"	36"
A	1'-2"	1'-3"	1'-4"	1'-5"	1'-6"
B	4'-3"	4'-6"	5'-0"	5'-6"	6'-6"
C	1'-6"	1'-6"	1'-6"	1'-6"	2'-0"
D	2'-9"	3'-0"	3'-6"	4'-0"	4'-6"
E	3'-9"	4'-0"	4'-6"	4'-9"	5'-0"
F	6'-2"	6'-6"	7'-2"	7'-7"	8'-0"
G	3'-9"	4'-0"	4'-6"	4'-9"	5'-0"
H	5'-2"	5'-9"	6'-10"	7'-11"	9'-0"
C.Y. CONC. ONE HEADWALL	2.96	3.53	4.72	6.03	8.79



SECTION A–A



SECTION B–B

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

U–TYPE HEADWALLS

STANDARD DRAWING NO. 152

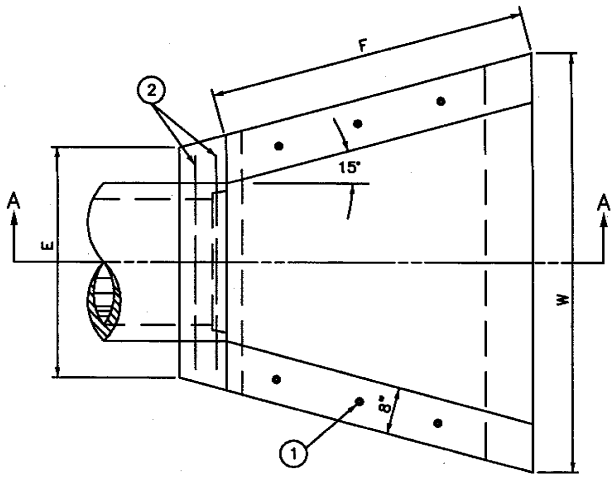
APPROVED _____ 5/1/08

URBAN COUNTY ENGINEER DATE

_____ 5/1/08

COMMISSIONER DATE

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



PLAN VIEW

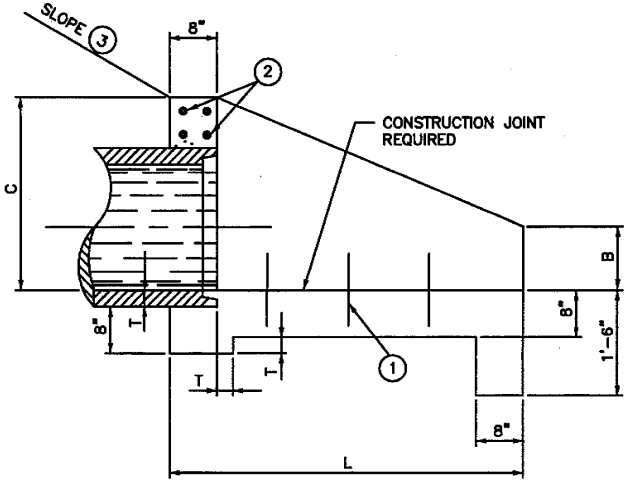
PIPE DIA.	DIMENSIONS							CLASS "A" CONC.	REINF. STEEL
	B	C	E	F	L	W	T	C.Y.	LBS.
15"	0'-7½"	2'-0"	2'-9"	3'-5⅜"	4'-0"	4'-10¾"	2¼"	0.90	10
18"	0'-9"	2'-3"	3'-0"	3'-11⁹⁄₁₆"	4'-6"	5'-4¹⁵⁄₁₆"	2½"	0.97	11
21"	0'-10½"	2'-6"	3'-3"	4'-5¹³⁄₁₆"	5'-0"	5'-11⅛"	2¾"	1.17	12
24"	1'-0"	2'-9"	3'-6"	5'-0"	5'-6"	6'-5⅜"	3"	1.38	12
27"	1'-1½"	3'-0"	3'-9"	5'-6³⁄₁₆"	6'-0"	6'-11⁹⁄₁₆"	3 ¼"	1.62	13

SHEET NOTES: ◯

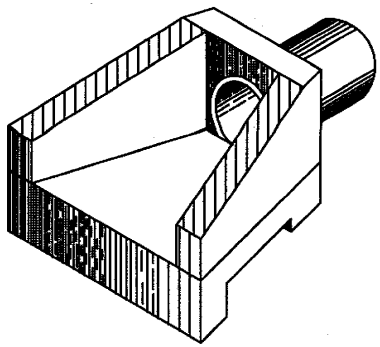
1. 6 #4 x 1'-0" DOWELS
2. 4 #4 x ("E" DIMENSION MINUS 4")
3. SLOPE SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND / OR NORMAL SLOPE VARIES FROM 2:1.

NOTES:

1. REINFORCING STEEL MINIMUM GRADE 40, EVENLY SPACED (MIN. SPACING 12" O.C.)
2. VOLUME DISPLACED BY PIPE COMPUTED USING INSIDE DIAMETER OF PIPE.
3. WING ANGLES AND / OR DIMENSIONS MAY BE ALTERED DURING CONSTRUCTION TO ACCOMMODATE FLOW OF WATER.
4. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE, BUT NOT TO EXCEED 5%. FRONT FACE OF HEADWALL SHALL REMAIN VERTICAL.
5. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "C" IS GREATER THAN 30".
6. ALL EXPOSED EDGES ARE TO HAVE ¾" CHAMFER.
7. SKEWED PIPE REQUIRES SPECIAL DESIGN.



SECTION A–A



ISOMETRIC VIEW

NO.	DATE	REVISION DESCRIPTION	BY

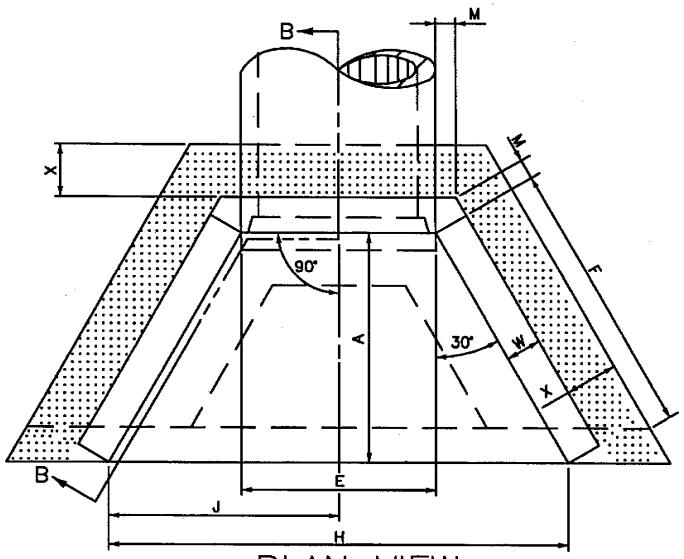
DIVISION OF ENGINEERING

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

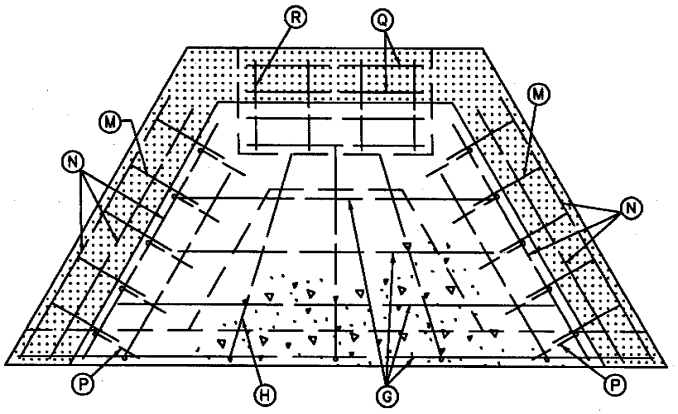
STANDARD DRAWING NO. 153

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

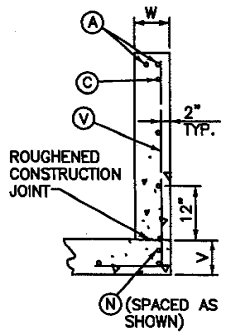
_____ DATE 5/1/08
COMMISSIONER



PLAN VIEW

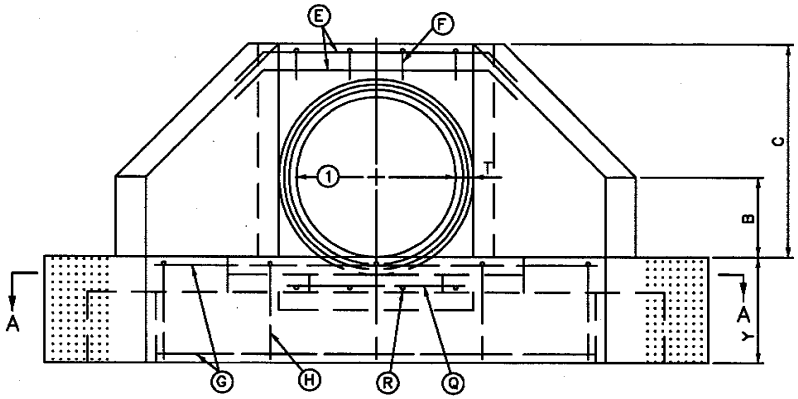


SECTION A–A

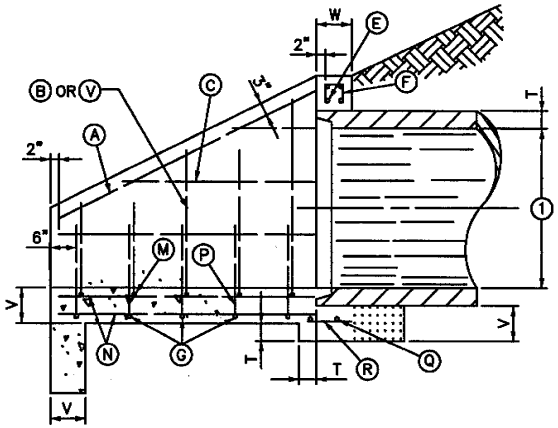


WING SECTION

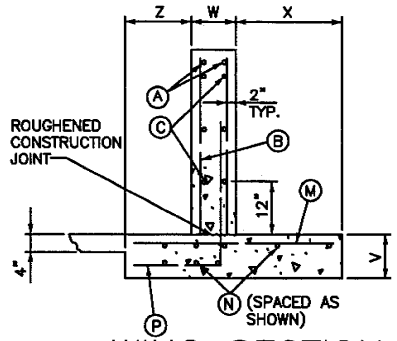
30"–60" CIRCULAR PIPE



FRONT ELEVATION



SECTION B–B



WING SECTION

66"–108" CIRCULAR PIPE

SHEET NOTE: ①

① DIAMETER OF PIPE

NOTES:

1. ⋯⋯ APPLIES TO 66" DIAMETER AND GREATER. (CIRCULAR PIPE)
2. SEE SHEETS 2, 3, AND 4 OF CURRENT STD. DWG. 154 FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT.
3. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE UNLESS OTHERWISE NOTED.
4. ENCIRCLED LETTERS, Ⓐ, INDICATE STEEL BAR LOCATIONS.
5. BARS Ⓑ, Ⓒ, Ⓖ, Ⓟ, Ⓜ, Ⓥ 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.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

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

STANDARD DRAWING NO. 154–1

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

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

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

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

STANDARD DRAWING NO. 154–2

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

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	6	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_5	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_5	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_5	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_5	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		

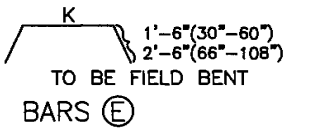
NOTES:

① NUMBER OF BARS IN ONE HEADWALL.

2. DIMENSIONS ARE OUT TO OUT OF BARS.

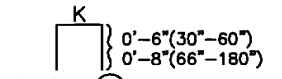
3. ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES

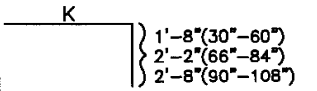


TO BE FIELD BENT

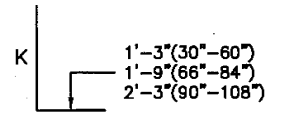
BARS Ⓔ



BARS Ⓕ



BARS Ⓗ



BARS Ⓟ AND Ⓥ

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

APPROVED: 5/1/08
URBAN COUNTY ENGINEER DATE

COMMISSIONER 5/1/08 DATE

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
96"						
A	5	4	13	0		
B1	5	8	4	1		
B2	5	8	5	0		
B3	5	8	5	11		
B4	5	8	6	10		
B5	5	8	7	10		
B6	5	8	8	9		
C1	4	4	3	0		
C2	4	4	5	2		
C3	4	4	7	3		
C4	4	4	9	5		
C5	4	4	11	7		
C6	4	12	11	9		
E1	5	2	14	9	9	9
E2	5	2	15	3	10	3
F	4	10	1	9	0	6
G1	4	3	10	9		
G2	4	3	14	3		
G3	4	3	17	9		
G4	4	3	20	0		
H	4	10	12	8	10	0
M	4	24	4	9		
N	4	16	11	9		
P	6	24	6	9	4	6
Q	5	4	9	2		
R	5	10	3	3		

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
102"						
A	5	4	13	9		
B1	5	8	4	4		
B2	5	8	5	3		
B3	5	8	6	2		
B4	5	8	7	2		
B5	5	8	8	1		
B6	5	8	9	0		
B7	5	4	9	11		
C1	4	4	2	0		
C2	4	4	4	2		
C3	4	4	6	4		
C4	4	4	8	6		
C5	4	4	10	7		
C6	4	16	12	5		
E1	5	2	15	4	10	4
E2	5	2	15	10	10	10
F	4	10	1	9	0	6
G1	4	3	12	1		
G2	4	3	15	8		
G3	4	3	19	2		
G4	4	3	21	7		
H	4	11	13	3	10	7
M	4	26	4	9		
N	4	16	12	5		
P	7	26	7	0	4	9
Q	5	4	9	9		
R	5	10	3	4		

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
108"						
A	5	4	14	6		
B1	5	8	4	7		
B2	5	8	5	6		
B3	5	8	6	5		
B4	5	8	7	4		
B5	5	8	8	3		
B6	5	8	9	3		
B7	5	8	10	2		
C1	4	4	3	3		
C2	4	4	5	5		
C3	4	4	7	7		
C4	4	4	9	8		
C5	4	4	11	10		
C6	4	16	13	1		
E1	5	2	15	10	10	10
E2	5	2	16	5	11	5
F	4	11	1	9	0	6
G1	4	1	9	10		
G2	4	3	13	4		
G3	4	3	16	10		
G4	4	3	20	3		
G5	4	3	22	7		
H	4	11	13	10	11	2
M	4	28	4	9		
N	4	16	13	1		
P	7	28	7	3	5	0
Q	5	4	10	4		
R	5	11	3	4		

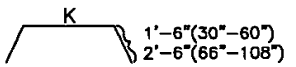
NOTES:

① NUMBER OF BARS IN ONE HEADWALL.

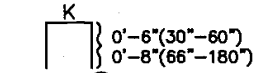
2. DIMENSIONS ARE OUT TO OUT OF BARS.

3. ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

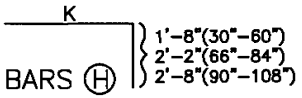
BENT BAR SHAPES



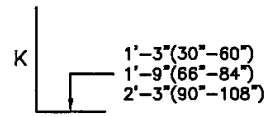
TO BE FIELD BENT
BARS (E)



BARS (F)



BARS (H)



BARS (P) AND (V)

SHEET 4 OF 4

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

BILL OF REINFORCEMENT
96"-108" DIAMETER
CIRCULAR PIPE HEADWALLS
0° SKEW

STANDARD DRAWING NO. 154-4

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

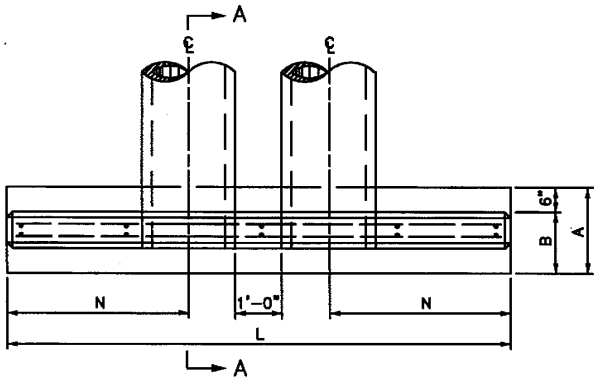
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

DIMENSIONS AND QUANTITIES

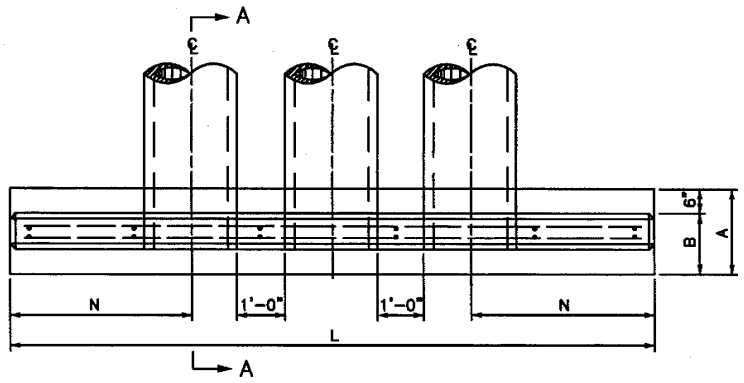
HEADWALL TYPE	PIPE DIA.	A	B	C	E	L	M	N	CU. YD. CONC. 2 HDWLS.
STANDARD DOUBLE LINE	18"	1'-9"	1'-3"	4'-6"	3'-0"	10'-5"	10 ¾"	3'-9"	4.18
	24"	1'-10"	1'-4"	5'-0"	3'-6"	12'-6'		4'-6"	5.65
STANDARD TRIPLE LINE	18"	1'-9"	1'-3"	4'-6"	3'-0"	13'-4"		3'-9"	4.87
	24"	1'-10"	1'-4"	5'-0"	3'-6"	16'-0"		4'-6"	6.68
RAISED DOUBLE LINE	18"	1'-9"	1'-3"	5'-0"	3'-6"	11'-11"		4'-6"	5.28
	24"	1'-10"	1'-4"	5'-6"	4'-0"	14'-0"		5'-3"	7.43
RAISED TRIPLE LINE	18"	1'-9"	1'-3"	5'-0"	4'-0"	14'-10"		4'-6"	6.76
	24"	1'-10"	1'-4"	5'-6"	4'-6"	17'-6"		5'-3"	8.83

NOTES:

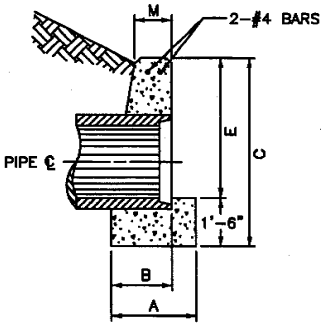
1. ALL VOLUMES ARE IN CUBIC YARDS FOR TWO HEADWALLS; VOLUME DISPLACED BY BARREL OF PIPE HAS BEEN COMPUTED USING INSIDE DIAMETER OF PIPE. NO DEDUCTION HAS BEEN MADE FOR BEVELED EDGES.
2. WHERE HEADWALLS ARE LOCATED AT THE EDGE OF THE SHOULDER, THE TOP OF THE HEADWALLS SHALL BE PARALLEL TO THE EDGE OF SHOULDER.
3. WHERE A RAISED HEADWALL IS USED ON THE OUTLET END OF THE PIPE, THE TOPS OF BOTH WALLS SHALL BE AT THE SAME ELEVATION.
4. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "E" IS GREATER THAN 30".



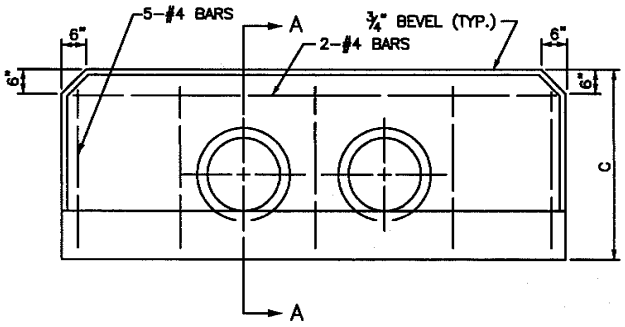
PLAN



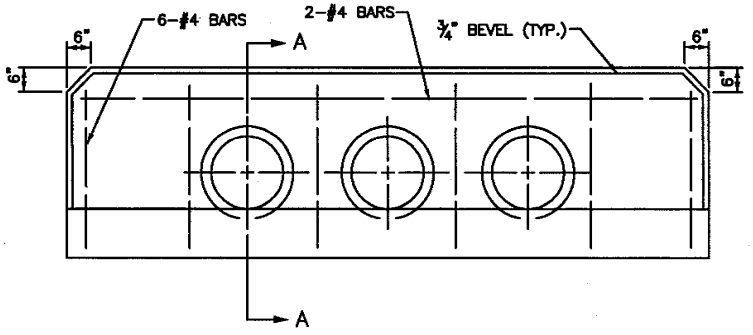
PLAN



SECTION A-A



ELEVATION



ELEVATION

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

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

STANDARD DRAWING NO. 158

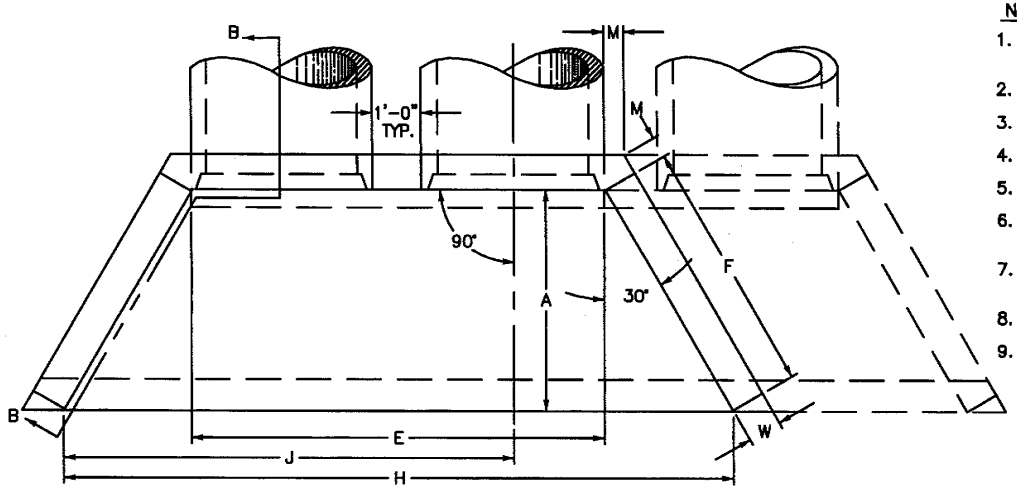
APPROVED: URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 5/1/08

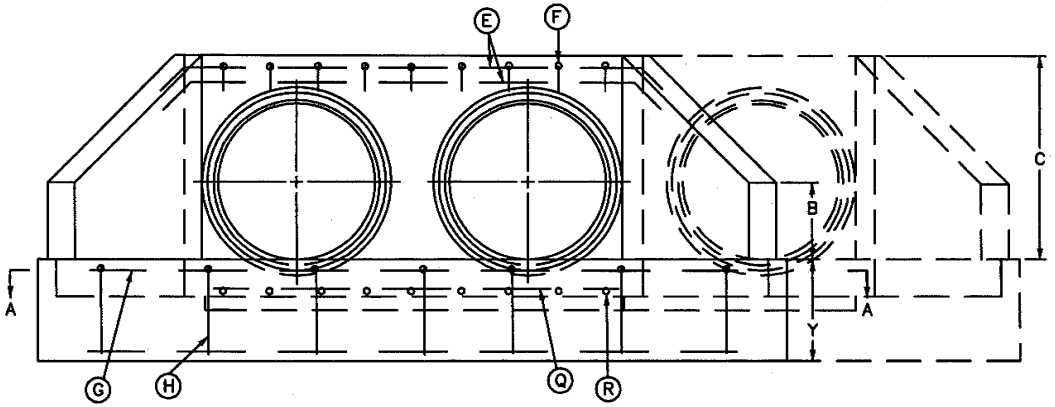
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

NOTES:

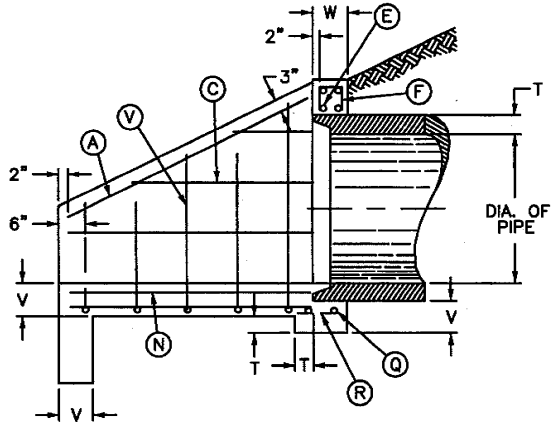
1. SEE SHEETS 2 AND 3 OF CURRENT STD. DWG. 159 FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT.
2. ENCIRCLED LETTERS, Ⓐ, INDICATE STEEL BAR LOCATIONS.
3. BARS Ⓒ, Ⓖ, Ⓥ ARE SPACED 1'–0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
4. BARS Ⓥ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
5. BARS Ⓒ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
6. HEADWALLS LOCATED AT THE EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
7. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE AND ENDS OF WINGS SHALL REMAIN VERTICAL.
8. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
9. CHAIN LINK FENCE IS REQUIRED ON ALL HEADWALLS WHEN VERTICAL FACE "C" IS GREATER THAN 30". SEE STD. DWG. 308.



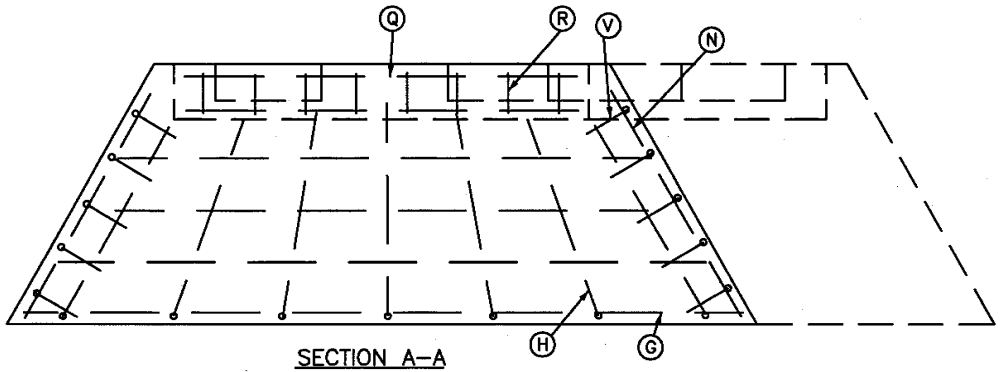
PLAN VIEW



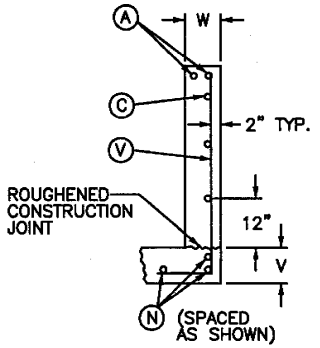
FRONT ELEVATION



SECTION B–B



SECTION A–A



WING SECTION

SHEET 1 OF 3

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

DOUBLE & TRIPLE PIPE CULVERT HEADWALLS 0° SKEW

STANDARD DRAWING NO. 159-1

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

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

DIMENSIONS FOR MULTIPLE PIPE HEADWALLS – 0° SKEW

DIMENSION	DOUBLE				TRIPLE				DIMENSION
	30"	36"	42"	48"	30"	36"	42"	48"	
A	3'–9"	4'–4"	4'–11"	5'–6"	3'–9"	4'–4"	4'–11"	5'–6"	A
B	1'–3"	1'–6"	1'–9"	2'–0"	1'–3"	1'–6"	1'–9"	2'–0"	B
C	3'–6"	4'–0"	4'–7"	5'–1"	3'–6"	4'–0"	4'–7"	5'–1"	C
E	7'–2"	8'–4"	9'–6"	10'–8"	11'–3"	13'–0"	14'–9"	16'–6"	E
F	4'–4"	5'–0"	5'–8"	6'–4"	4'–4"	5'–0"	5'–8"	6'–4"	F
H	11'–6"	13'–4"	15'–2"	17'–0"	15'–6"	18'–0"	20'–6"	22'–10"	H
J	–	–	–	–	7'–9"	9'–0"	10'–3"	11'–5"	J
M	0'–5"				0'–5"				M
T	0'–3.5"	0'–4"	0'–4.5"	0'–5"	0'–3.5"	0'–4"	0'–4.5"	0'–5"	T
V	0'–8"				0'–8"				V
W	0'–8"				0'–8"				W
Y	2'–0"				2'–0"				Y
CLASS "A" CONC. CU. YDS. 2 HEADWALLS	4.91	6.22	7.75	9.38	6.49	8.20	10.19	12.30	CLASS "A" CONC. CU. YDS. 2 HEADWALLS
LBS. STEEL 2 HEADWALLS	379	480	561	660	475	594	702	797	LBS. STEEL 2 HEADWALLS

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

DIMENSIONS AND QUANTITIES
30"–48"
DOUBLE & TRIPLE
HEADWALLS–CIRCULAR PIPE
0° SKEW

STANDARD DRAWING NO. 159–2

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
DOUBLE 30"						
A	5	4	4	8		
C1	4	2	2	4		
C2	4	2	4	2		
E1	5	2	10	6	7	6
E2	5	2	10	8	7	8
F	4	8	1	3	0	4
G1	4	2	7	8		
G2	4	3	10	0		
H	4	6	5	1	3	5
N	4	6	4	2		
Q	4	2	7	1		
R	4	8	0	8		
V1	5	4	3	1	1	10
V2	5	4	4	1	2	10
36"						
A	5	4	5	5		
C1	4	2	1	7		
C2	4	2	3	8		
C3	4	2	4	10		
E1	5	2	11	8	8	8
E2	5	2	11	10	8	10
F	4	9	1	3	0	4
G1	4	3	9	7		
G2	4	3	12	0		
H	4	7	5	8	4	0
N	4	6	4	10		
Q	4	2	8	2		
R	4	9	0	8		
V1	5	4	3	4	2	1
V2	5	4	4	4	3	1
V3	5	2	5	4	4	1

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
42"						
A	5	4	6	2		
C1	4	2	2	9		
C2	4	2	4	9		
C3	4	2	5	6		
E1	5	2	12	10	9	10
E2	5	2	13	0	10	0
F	4	10	1	3	0	4
G1	4	3	11	5		
G2	4	3	13	9		
H	4	7	6	3	4	7
N	4	6	5	6		
Q	4	2	9	2		
R	4	10	0	9		
V1	5	4	3	6	2	3
V2	5	4	4	6	3	3
V3	5	4	5	6	4	3
48"						
A	5	4	6	11		
C1	4	2	1	10		
C2	4	2	3	10		
C3	4	2	5	10		
C4	4	2	6	2		
E1	5	2	14	0	11	0
E2	5	2	14	2	11	2
F	4	11	1	3	0	4
G1	4	1	11	0		
G2	4	3	13	3		
G3	4	3	15	7		
H	4	9	16	10	5	2
N	4	6	6	2		
Q	4	2	10	4		
R	4	11	0	9		
V1	5	4	3	9	2	6
V2	5	4	4	9	3	6
V3	5	4	5	9	4	6

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
TRIPLE 30"						
A	5	4	4	8		
C1	4	2	2	4		
C2	4	2	4	2		
E1	5	2	14	7	11	7
E2	5	2	14	9	11	9
F	4	12	1	3	0	4
G1	4	2	11	10		
G2	4	3	14	1		
H	4	8	5	1	3	5
N	4	6	4	2		
Q	4	2	11	1		
R	4	12	0	8		
V1	5	4	3	1	1	10
V2	5	4	4	1	2	10
36"						
A	5	4	5	5		
C1	4	2	1	7		
C2	4	2	3	8		
C3	4	2	4	10		
E1	5	2	16	4	13	4
E2	5	2	16	6	13	6
F	4	13	1	3	0	4
G1	4	3	14	4		
G2	4	3	16	8		
H	4	9	5	8	4	0
N	4	6	4	10		
Q	4	2	12	8		
R	4	13	0	8		
V1	5	4	3	4	2	1
V2	5	4	4	4	3	1
V3	5	2	5	4	4	1

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
42"						
A	5	4	6	2		
C1	4	2	2	9		
C2	4	2	4	9		
C3	4	2	5	6		
E1	5	2	18	1	15	1
E2	5	2	18	3	15	3
F	4	15	1	3	0	4
G1	4	3	16	8		
G2	4	3	19	1		
H	4	10	6	3	4	7
N	4	6	5	6		
Q	4	2	14	5		
R	4	15	0	9		
V1	5	4	3	6	2	3
V2	5	4	4	6	3	3
V3	5	4	5	6	4	3
48"						
A	5	4	6	11		
C1	4	2	1	10		
C2	4	2	3	10		
C3	4	2	5	10		
C4	4	2	6	2		
E1	5	2	19	10	16	10
E2	5	2	20	0	17	10
F	4	17	1	3	0	4
G1	4	1	16	9		
G2	4	3	19	0		
G3	4	3	21	5		
H	4	12	6	11	5	3
N	4	6	6	2		
Q	4	6	16	2		
R	4	17	0	9		
V1	5	4	3	9	2	6
V2	5	4	4	9	3	6
V3	5	4	5	9	4	6

NOTES:

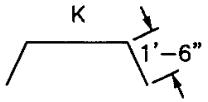
① NUMBER OF BARS IN ONE HEADWALL.

2. DIMENSIONS ARE OUT TO OUT OF BARS.

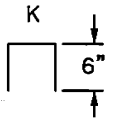
3. ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES

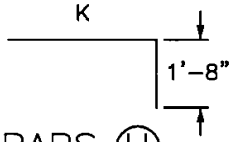
TO BE FIELD BENT



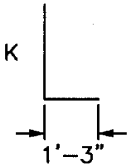
BARS (E)



BARS (F)



BARS (H)



BARS (V)

SHEET 3 OF 3

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

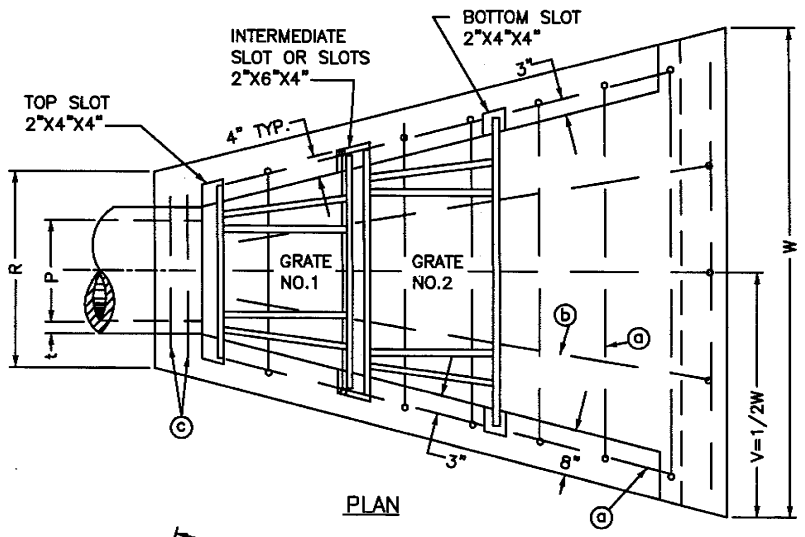
BILL OF REINFORCEMENT
30"-48" DOUBLE & TRIPLE
HEADWALLS-CIRCULAR PIPE
0° SKEW

STANDARD DRAWING NO. 159-3

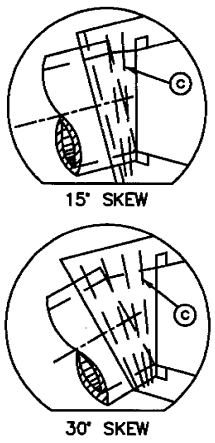
APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

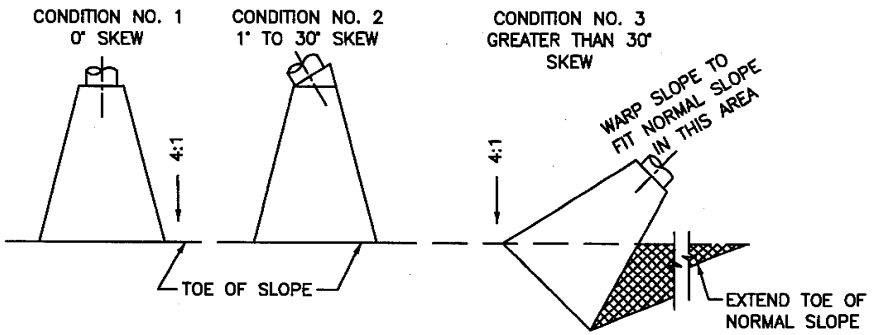
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

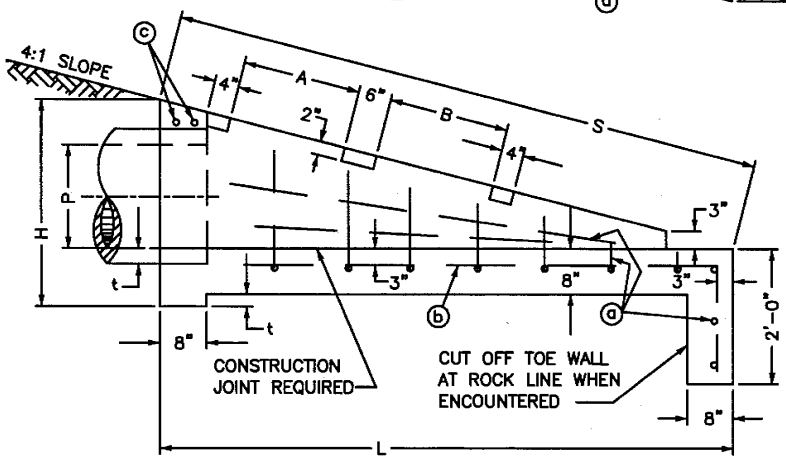


PLAN

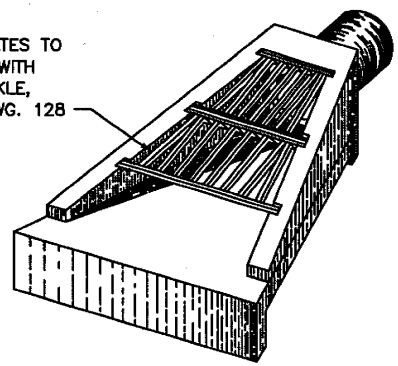


PLAN VIEW OF STRUCTURE LOCATIONS





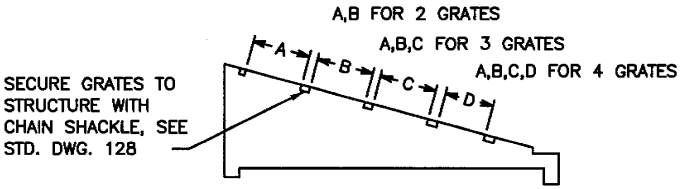
ELEVATION



18"–24"
TRIMETRIC VIEW

NOTES:
1. THE MINIMUM REQUIREMENT FOR REINFORCING STEEL SHALL BE GRADE 40. FIELD BENDING WILL BE PERMITTED.
2. ONE ADDITIONAL (c) BAR WILL BE REQUIRED FOR EACH 15° SKEW.
3. t IS CONCRETE PIPE WALL THICKNESS.

DETAIL SHOWING LOCATION
OF SLOTS FOR GRATES



SEE STD. DWG. 163 FOR GRATE DETAILS.

DIMENSIONS											
P	H	L	S	R	V	W	A	B	C	D	
18"	3'–0"	8'–6"	8'–9 1/8"	2'–11 1/2"	3'–7 1/2"	7'–3"	1'–9"	1'–9"	–	–	
24"	3'–7"	10'–8"	11'–0"	3'–6 1/2"	4'–5 1/2"	8'–11"	2'–9"	2'–9"	–	–	
30"	4'–2"	12'–10"	13'–2 3/4"	4'–1 1/2"	5'–3 1/2"	10'–7"	2'–9"	2'–9"	1'–9"	–	
36"	4'–9"	15'–0"	15'–5 1/2"	4'–8 1/2"	6'–1 1/2"	12'–3"	2'–9"	2'–9"	1'–9"	1'–9"	

NO. OF GRATES REQ'D	
2'	3'
2	–
–	2
1	2
2	2

NO. 4 REINFORCEMENT BARS NUMBER–LENGTH AND WEIGHT				CLASS "A" CONC.
ⓐ	ⓑ	② ⓒ	LBS.	CU.YD.
14 AT 6'–5"	3 AT 8'–6"	2 AT 2'–8"	81	1.8
16 AT 8'–0"	3 AT 10'–6"	2 AT 3'–3"	111	2.7
18 AT 9'–7"	3 AT 12'–9"	2 AT 3'–10"	146	3.8
20 AT 11'–4"	3 AT 15'–0"	2 AT 4'–5"	187	5.1

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

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

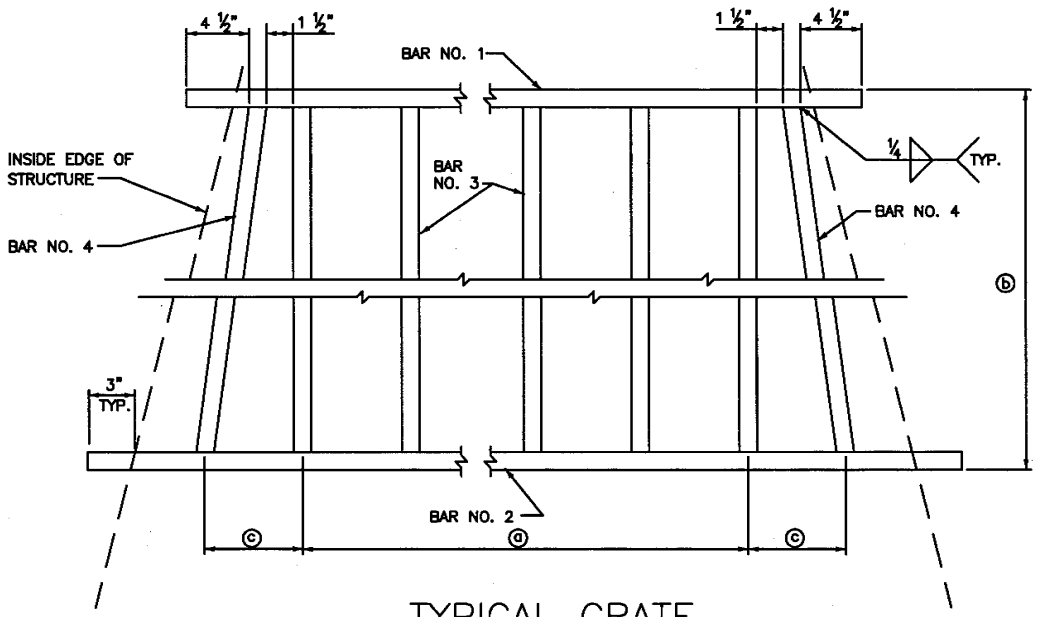
STANDARD DRAWING NO. 162

APPROVED: 5/1/08
URBAN COUNTY ENGINEER — DATE

5/1/08
COMMISSIONER — DATE

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'–6 ¾"	9'–5 ⅞"	16	1'–10"	1'–10 ¼"	347	



TYPICAL GRATE

NOTES:

ⓐ EQUALLY SPACE BARS NO. 3.

ⓑ SIZE OF GRATE EITHER 2'–0" OR 3'–0".

ⓒ 5 ½" FOR 2'–0" GRATE, 7" FOR 3'–0" GRATE.

1. ALL COMPONENTS ARE 1" x 2" STRUCTURAL STEEL BARS.
2. SEE STD. DWG. 162.
3. SECURE GRATE TO STRUCTURE WITH CHAIN SHACKLE, SEE STD. DWG. 128.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

GRATES FOR SLOPED AND FLARED BOX INLET–OUTLET

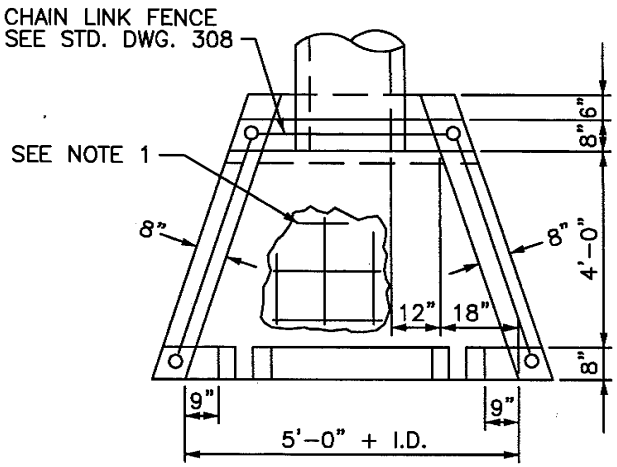
STANDARD DRAWING NO. 163

APPROVED: 5/1/08
URBAN COUNTY ENGINEER — DATE

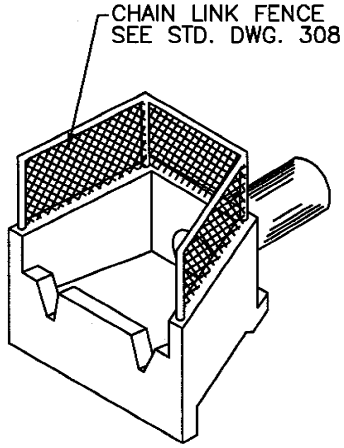
5/1/08
COMMISSIONER — DATE

NOTES:

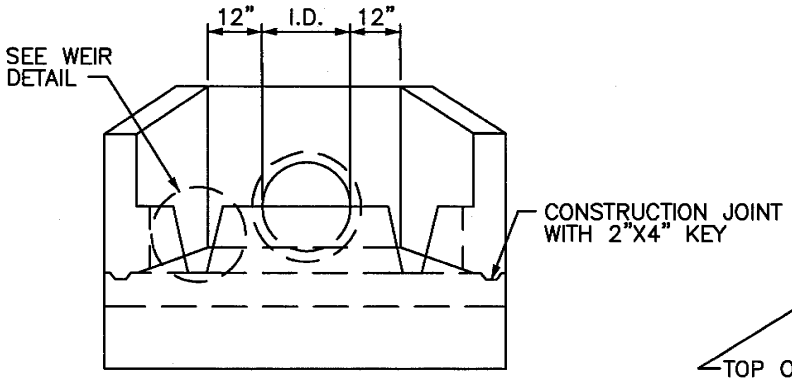
1. NO. 5 STEEL BARS TO BE USED THROUGHOUT ON 12" CENTERS.
2. HEIGHT OF WALL SHALL BE DETERMINED BY THE AMOUNT OF FILL BEHIND PIPE. TOP OF WALL SHALL BE 18" ABOVE TOP O.D. OF PIPE.
3. TOP OF END SILL SHALL BE LEVEL WITH CENTERLINE OF PIPE.
4. CHANNEL LINING TO BE WIDTH OF END SILL, 18" MINIMUM THICKNESS, AND COMPOSED OF CLASS III CHANNEL LINING.
5. ALL VERTICAL OR SLOPED EXPOSED SURFACES SHALL HAVE A RUBBED FINISH.
6. ALL EXPOSED FLAT WORK TO HAVE A HAND FLOATED AND BROOMED FINISH.
7. ALL EXPOSED EDGES SHALL HAVE A ¾" CHAMFER.
8. ALL STEEL SHALL HAVE 2" MINIMUM CLEARANCE TO THE CONCRETE FACE ON THE BACKFILL SIDE OF THE WALLS.
9. FENCES REQUIRED ON HEADWALLS.



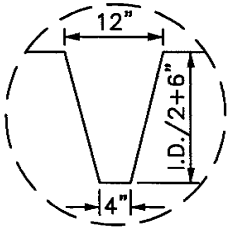
PLAN ELEVATION



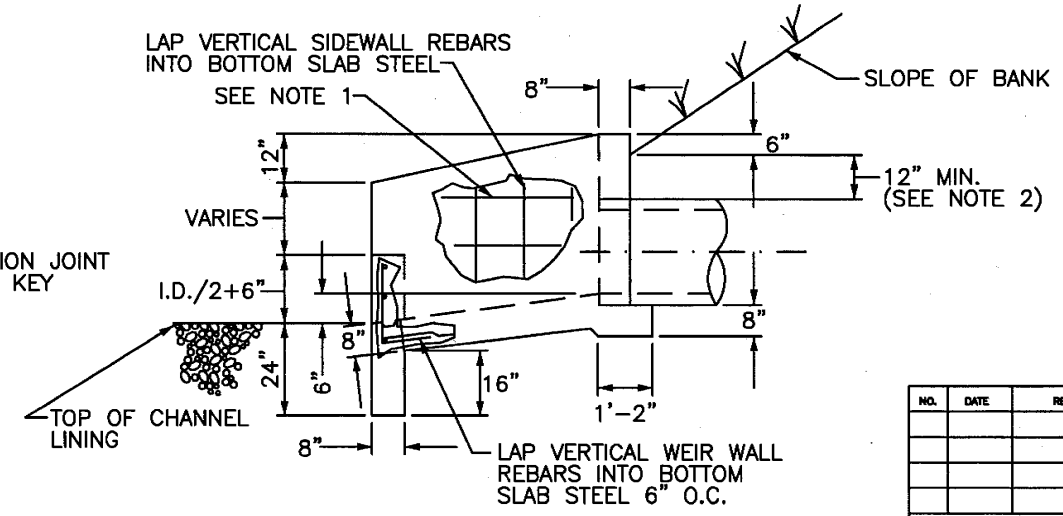
ISOMETRIC VIEW



FRONT ELEVATION



WEIR DETAIL



SIDE ELEVATION

NO.	DATE	REVISION DESCRIPTION	BY

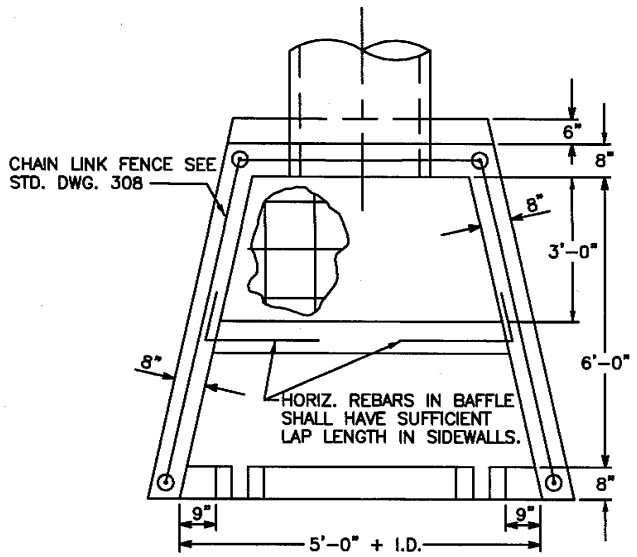
DIVISION OF ENGINEERING

IMPACT STILLING BASIN
15"–24" PIPES

STANDARD DRAWING NO. 164

APPROVED 5/1/08
URBAN COUNTY ENGINEER DATE
COMMISSIONER 5/1/08 DATE

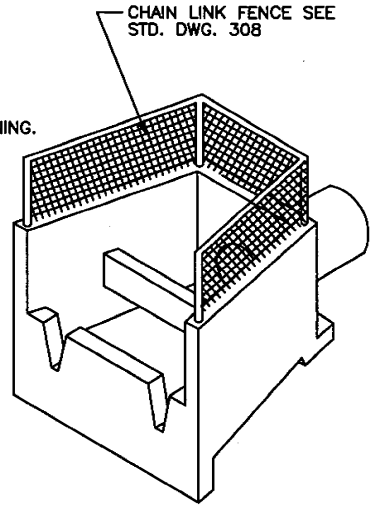
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



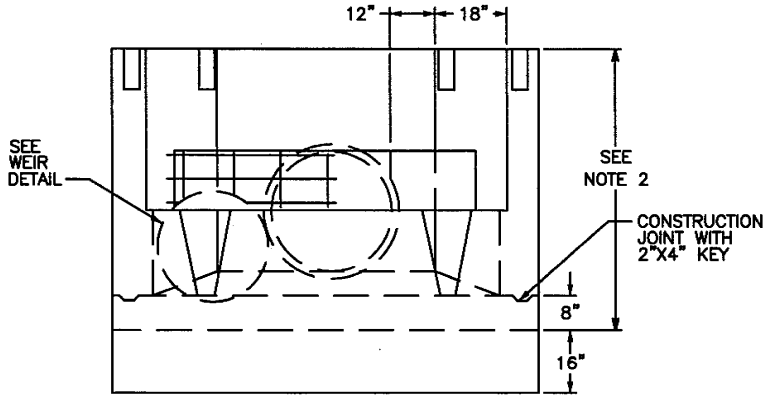
PLAN ELEVATION

NOTES:

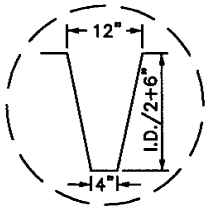
1. NO. 5 STEEL BARS SHALL BE USED THROUGHOUT ON 12" CENTERS EXCEPT ON BAFFLE WHERE HORIZONTAL AND VERTICAL STEEL WILL BE ON 6" CENTERS.
2. HEIGHT OF WALL SHALL BE DETERMINED BY THE AMOUNT OF FILL BEHIND PIPE. TOP OF WALL SHALL BE 18" ABOVE TOP O.D. OF PIPE.
3. TOP OF END SILL SHALL BE LEVEL WITH CENTERLINE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



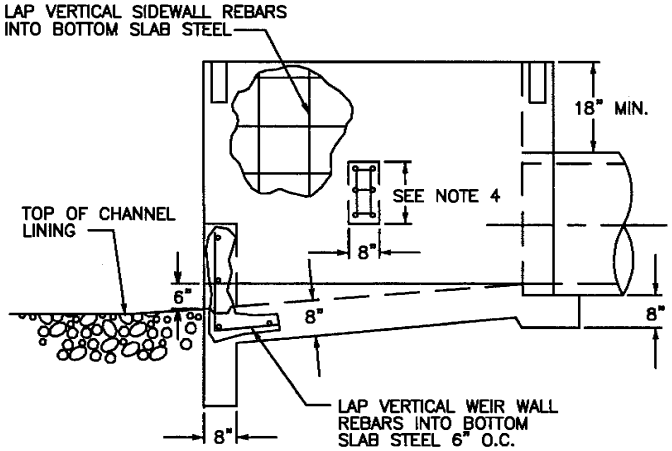
ISOMETRIC VIEW



FRONT ELEVATION



WEIR DETAIL



SIDE ELEVATION

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

IMPACT STILLING BASIN
27"–48" PIPES

STANDARD DRAWING NO. 165

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

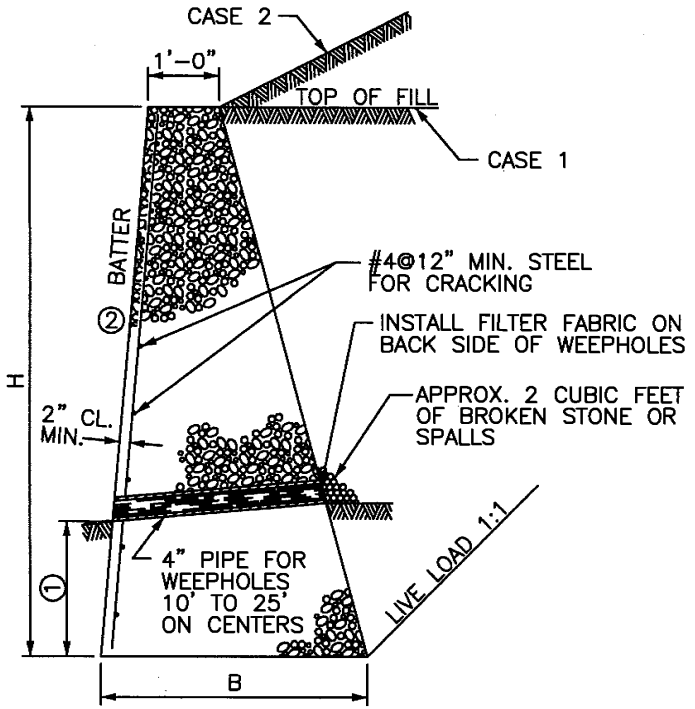
_____ DATE 5/1/08
COMMISSIONER

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

SILT & EROSION CONTROL

See Chapter 11 of *LFUCG Stormwater Manual*

RETAINING STRUCTURES



RETAINING WALL

H	B	END AREA SQ. FT.	VOLUME C.Y./L.F.
CASE 1 OR 2			
2'-6"	1'-3"	2.8125	0.1042
3'-0"	1'-6"	3.7500	0.1389
3'-6"	1'-9"	4.8125	0.1782
4'-0"	2'-0"	6.0000	0.2222
4'-6"	2'-3"	7.3125	0.2708
5'-0"	2'-6"	8.7500	0.3241
5'-6"	2'-9"	10.3125	0.3819
6'-0"	3'-0"	12.0000	0.4444
6'-6"	3'-3"	13.8125	0.5116
7'-0"	3'-6"	15.7500	0.5833
7'-6"	3'-9"	17.8125	0.6597
8'-0"	4'-0"	20.0000	0.7407
8'-6"	4'-3"	22.3125	0.8264
9'-0"	4'-6"	24.7500	0.9167
9'-6"	4'-9"	27.3125	1.0116
CASE 1			
10'-0"	5'-0"	30.0000	1.1111
10'-6"	5'-3"	32.8125	1.2153
11'-0"	5'-6"	35.7500	1.3241
11'-6"	5'-9"	38.8125	1.4375
12'-0"	6'-0"	42.0000	1.5556
CASE 2			
10'-0"	6'-0"	35.0000	1.2963
10'-6"	6'-3"	38.0625	1.4097
11'-0"	6'-6"	41.2500	1.5278
11'-6"	6'-9"	44.5625	1.6505
12'-0"	7'-0"	48.0000	1.7778

NOTES:

1. THE RETAINING WALL DEPICTED ON THIS DRAWING SHALL BE USED WHEN THE HEIGHT ("H" DIMENSION) OF THE WALL IS 2'-6" TO 12'-0" PROVIDED THE FILL COMPLIES WITH THE FOLLOWING CONDITIONS:
   CASE 1 – TOP OF FILL IS LEVEL WITH TOP OF WALL.
   CASE 2 – WALL IS SURCHARGED WITH DEAD LOAD FILL SLOPES OF 2:1 OR LESS.
2. AREAS AND VOLUMES HAVE BEEN COMPUTED WITHOUT DEDUCTING FOR BEVELED EDGES OR PIPE DRAINS. WHEN A RETAINING WALL VARIES IN HEIGHT, THE PRISMOIDAL FORMULA SHALL BE USED IN COMPUTING VOLUMES.
3. GRAVITY TYPE RETAINING WALLS SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE.
4. TRANSVERSE EXPANSION JOINTS 1/2 INCH IN WIDTH SHALL BE PLACED AT INTERVALS OF NOT OVER 30 FEET THROUGHOUT THE LENGTH OF RETAINING WALLS AND EXPANSION JOINT MATERIAL SHALL BE PLACED THEREIN. ALL EXPOSED EDGES SHALL BE BEVELED 3/4 INCH. THE WALLS SHALL NOT BE SURCHARGED EXCEPT IN SPECIAL CASES WHEREIN SPECIAL DRAWINGS WILL BE FURNISHED.

SHEET NOTES:Ⓞ

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

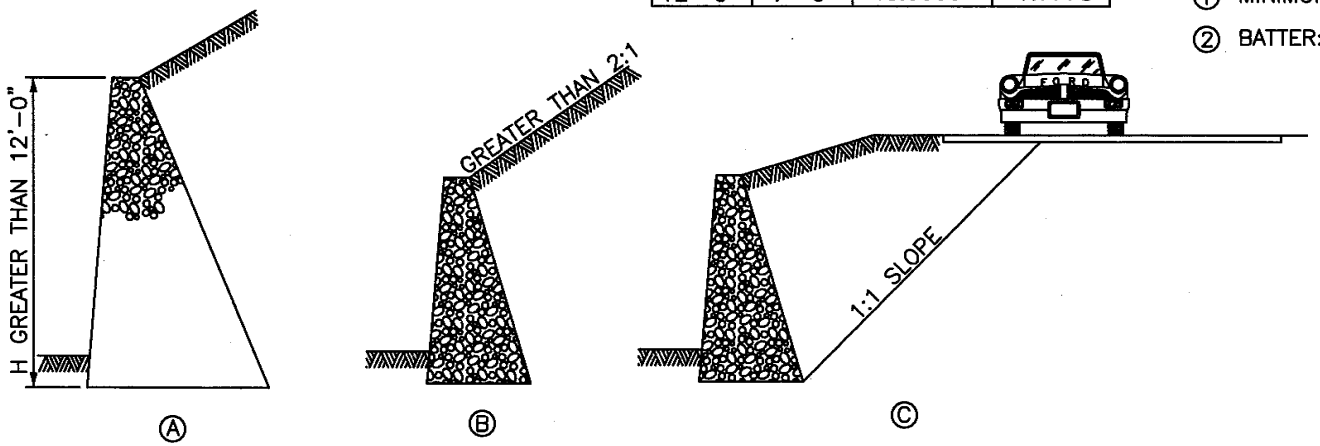
Ⓐ WALL HEIGHT IS GREATER THAN 12'-0" (CASE 1 OR CASE 2 FILL).

Ⓑ WALL IS SURCHARGED WITH DEAD LOAD FILL SLOPES GREATER THAN 2:1.

Ⓒ WALL IS SURCHARGED WITH A LIVE LOAD WITHIN THE LIMITS OF A 1:1 SLOPE EXTENDING FROM THE BASE OF THE WALL.

① MINIMUM VALUE FOR FIRM SOIL IS 2'-0".

② BATTER: H=3'-0" TO LESS THAN 5'-0" (VERTICAL)
H=5'-0" TO LESS THAN 10'-0" (1":1')
H=10'-0" TO 12'-0" (2":1')



SPECIAL DESIGNS REQUIRED

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

RETAINING WALL
GRAVITY TYPE

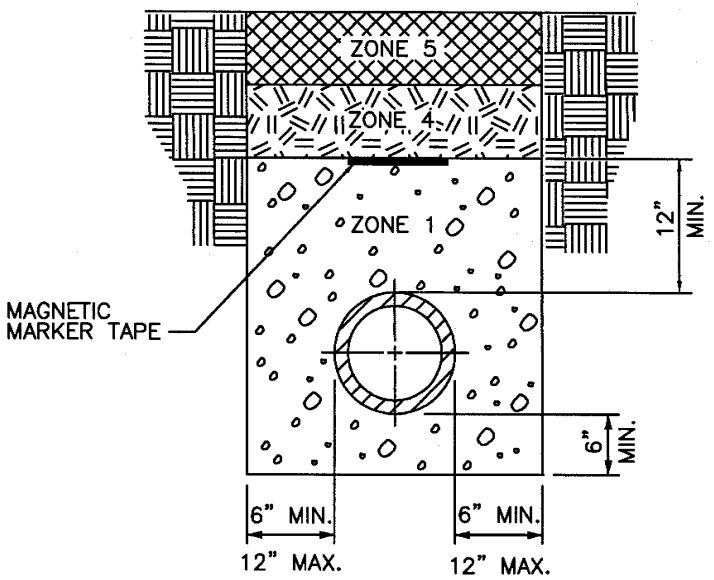
STANDARD DRAWING NO. 180

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

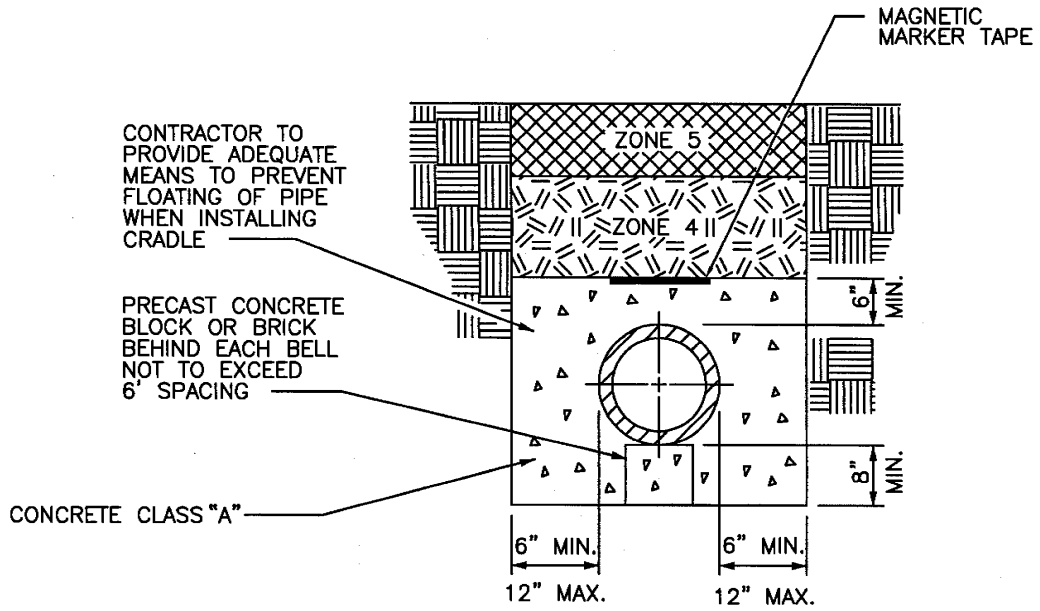
_____ DATE 5/1/08
COMMISSIONER

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

TRENCHING



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

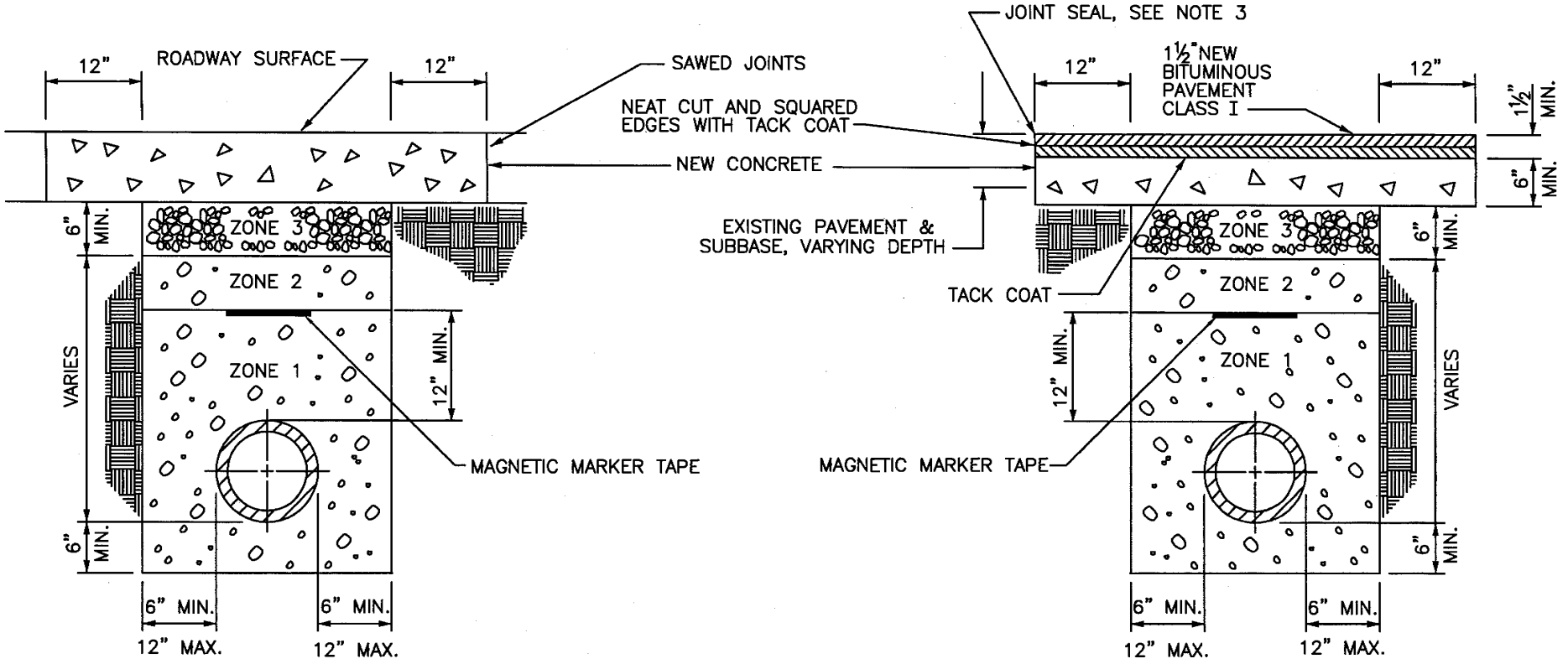
DIVISION OF ENGINEERING

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

STANDARD DRAWING NO. 200

APPROVAL _____ 5/1/08
URBAN COUNTY ENGINEER — DATE

_____ 5/1/08
COMMISSIONER — DATE



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

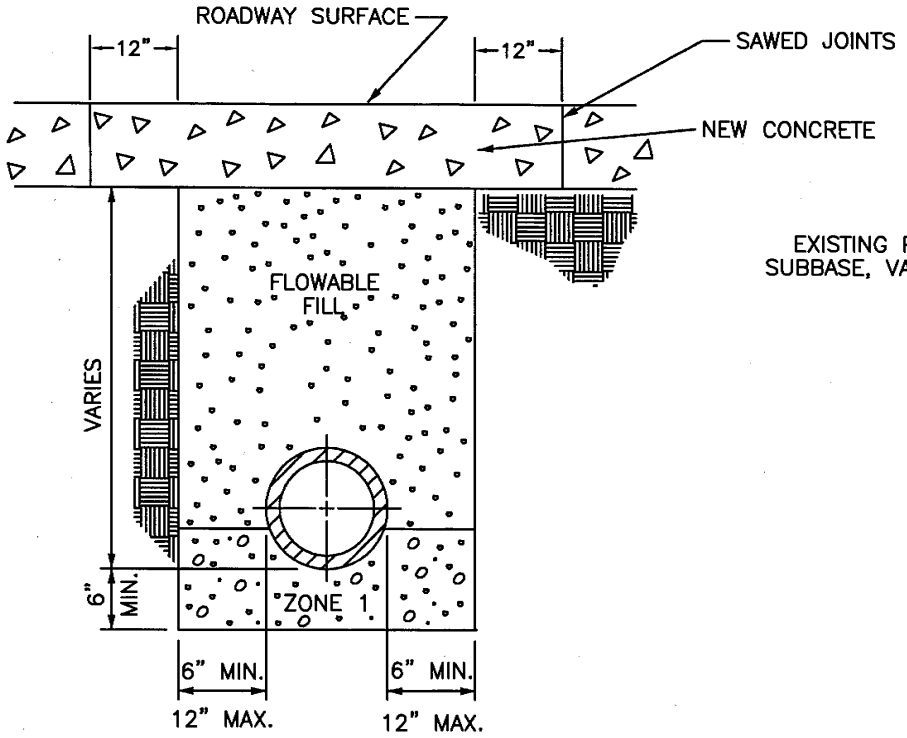
DIVISION OF ENGINEERING

TRENCHING, LAYING, BACKFILLING AND BEDDING UNDER STREET PAVEMENT

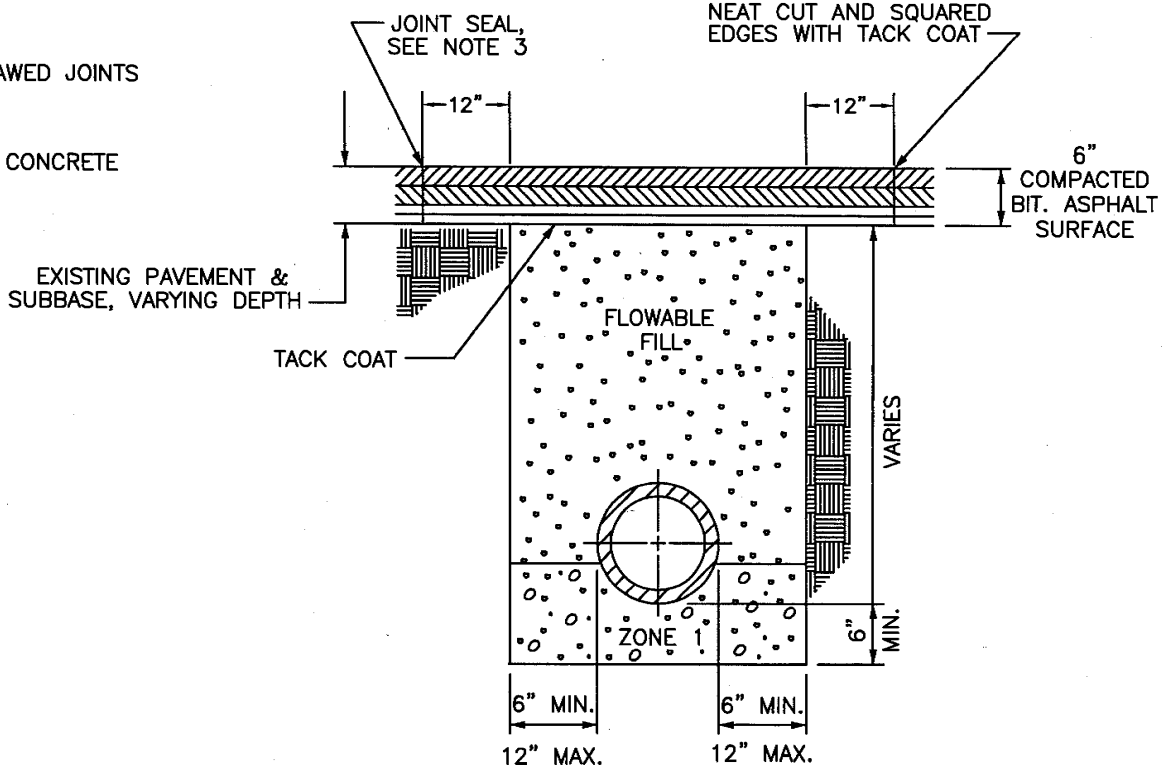
STANDARD DRAWING NO. 201-1

APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 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

APPROVAL _____ 5/1/08
URBAN COUNTY ENGINEER — DATE

_____ 5/1/08
COMMISSIONER — DATE

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

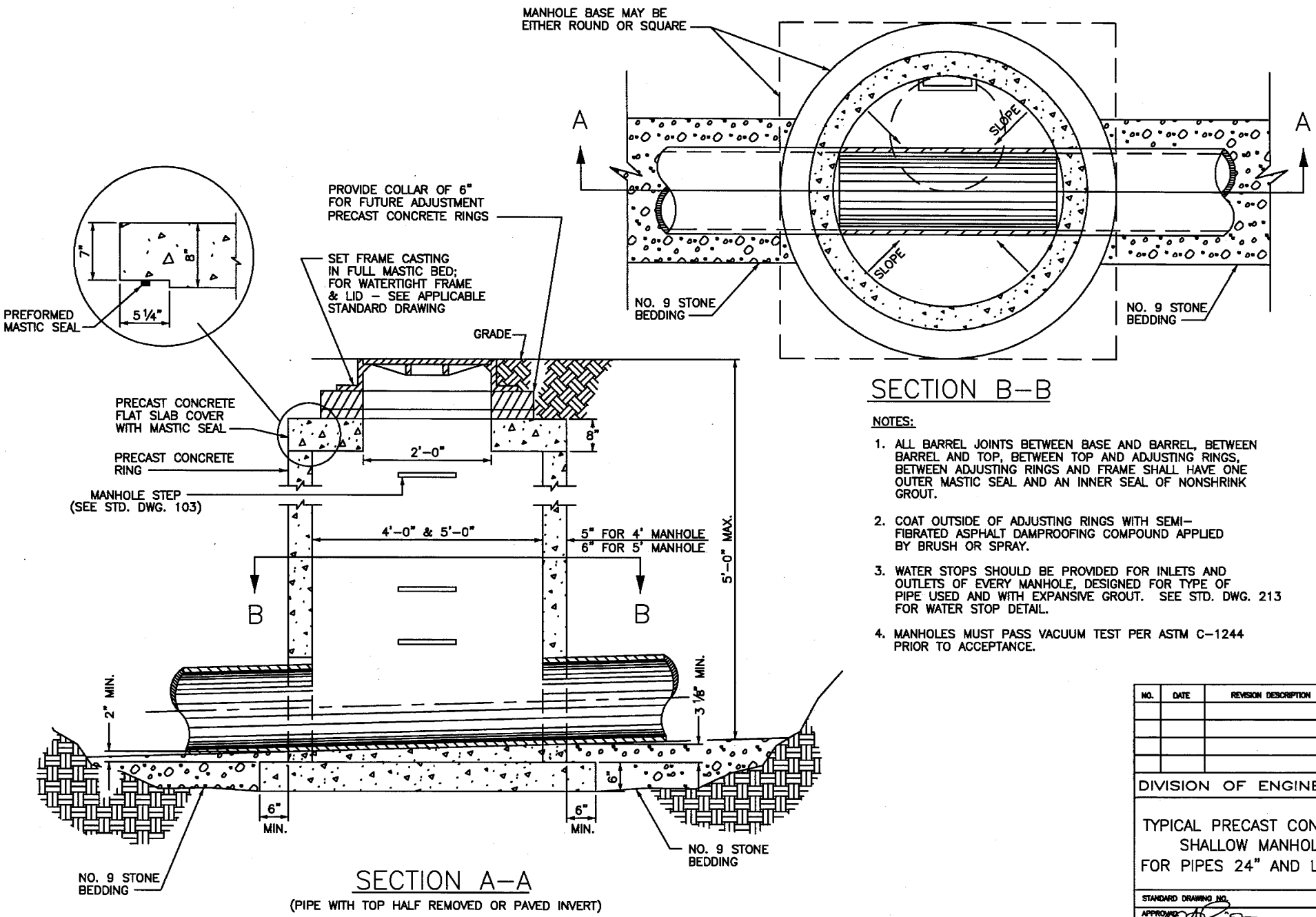
STANDARD DRAWING NO. 204

APPROVAL

URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 5/1/08

MANHOLES



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

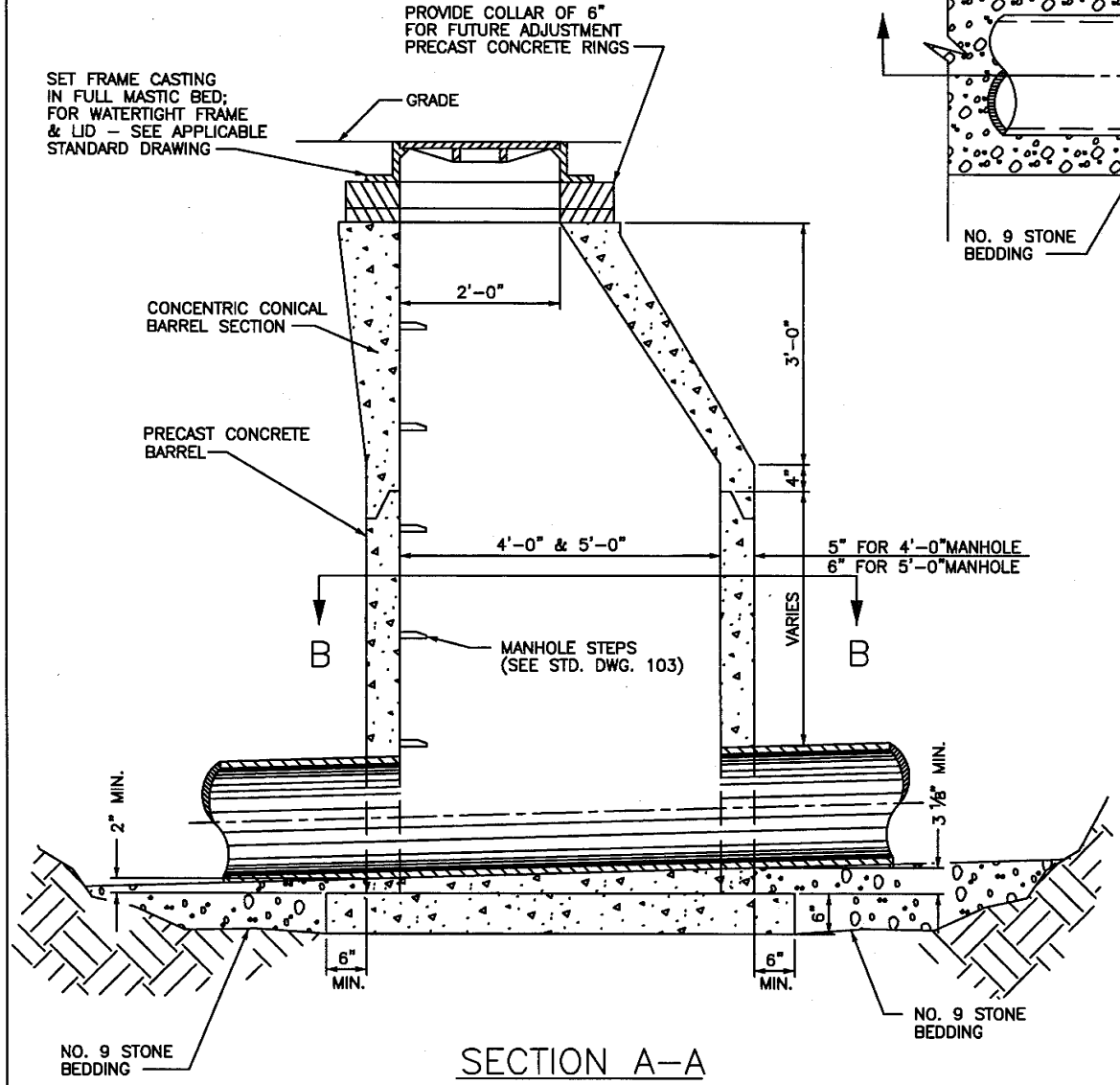
APPROVED _____ DATE 5/1/08

URBAN COUNTY ENGINEER

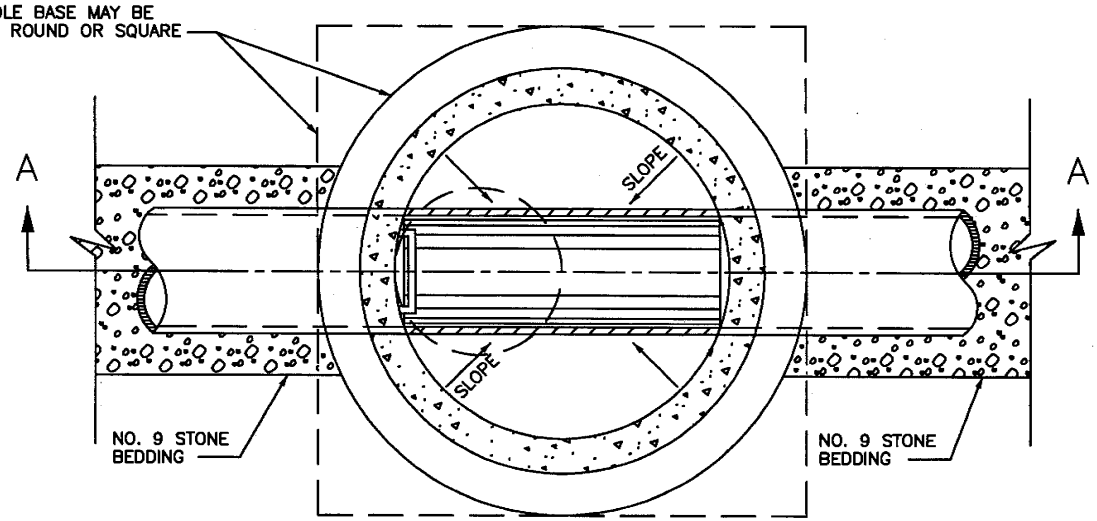
_____ DATE 5/1/08

COMMISSIONER

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 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"

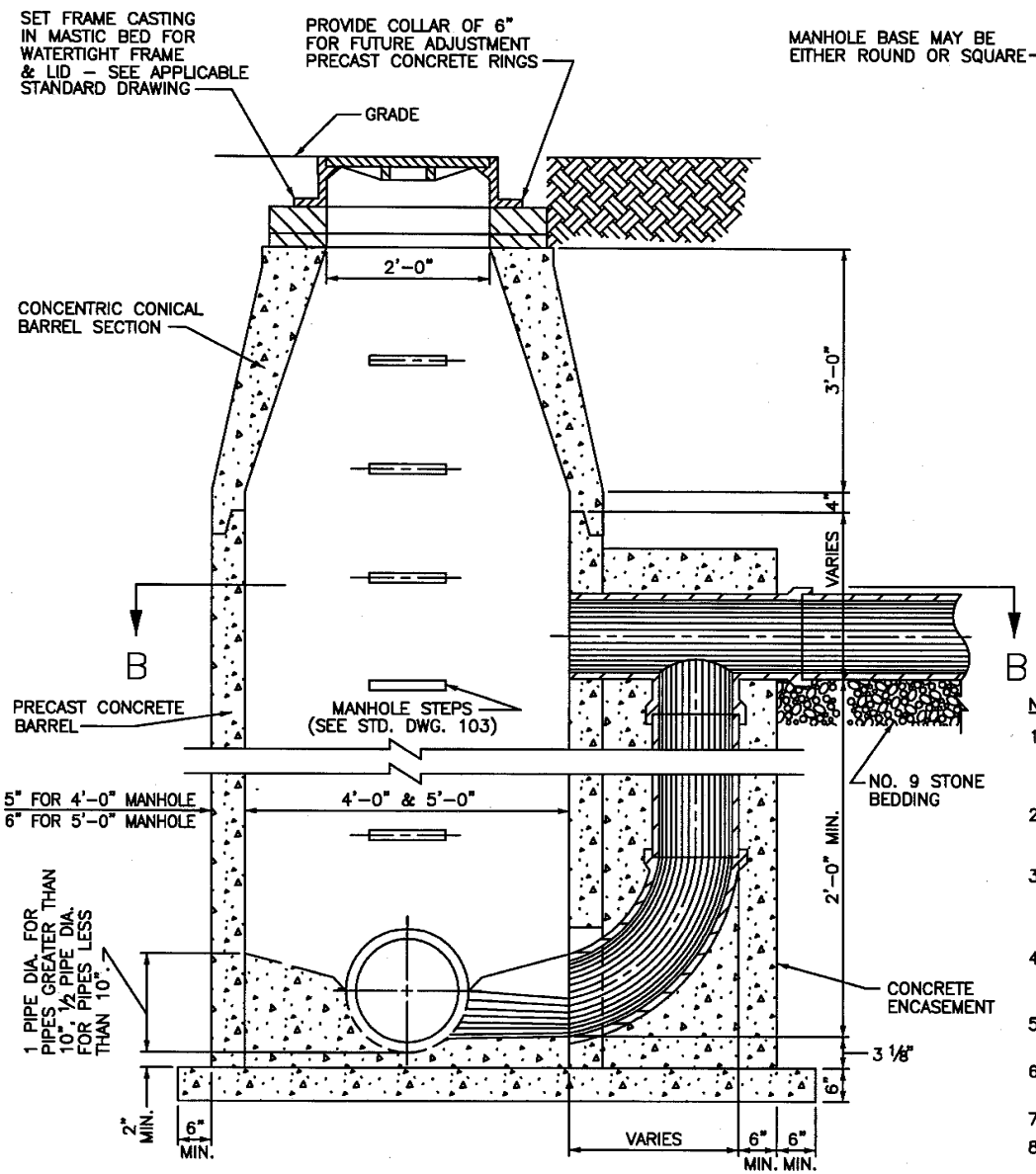
STANDARD DRAWING NO. 211

APPROVAL

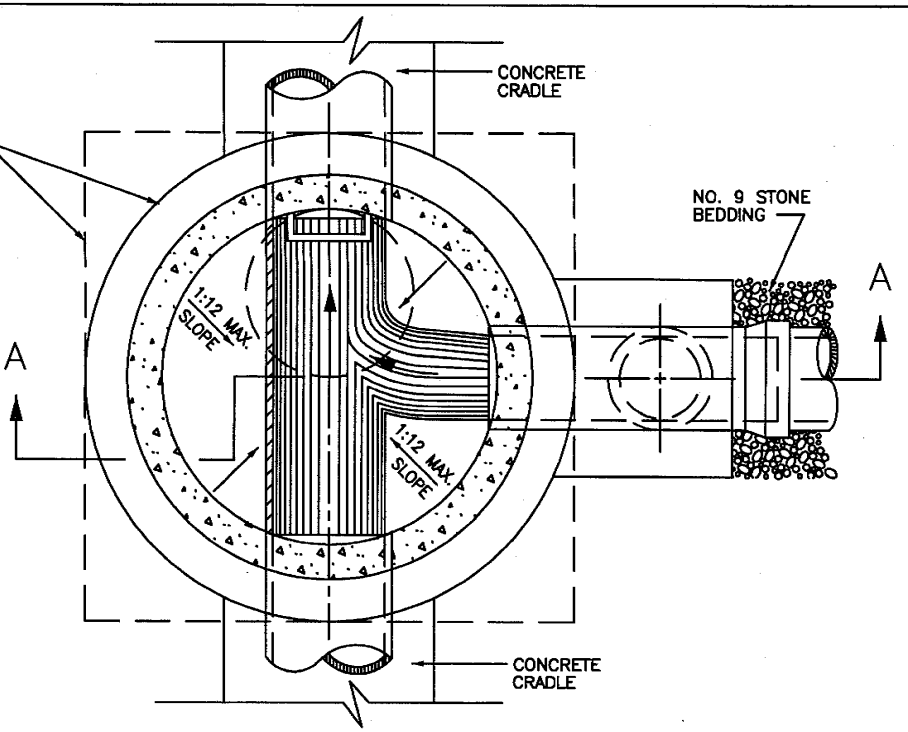
URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 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

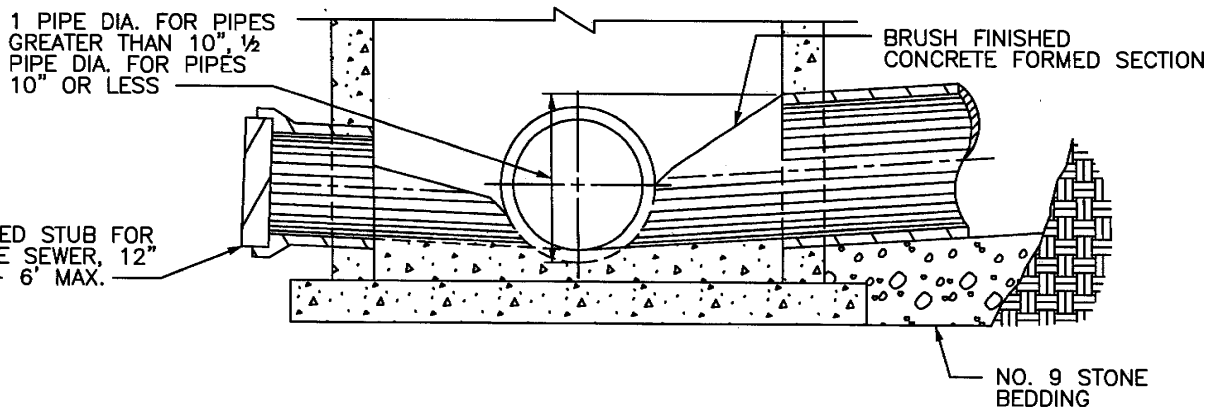
DIVISION OF ENGINEERING

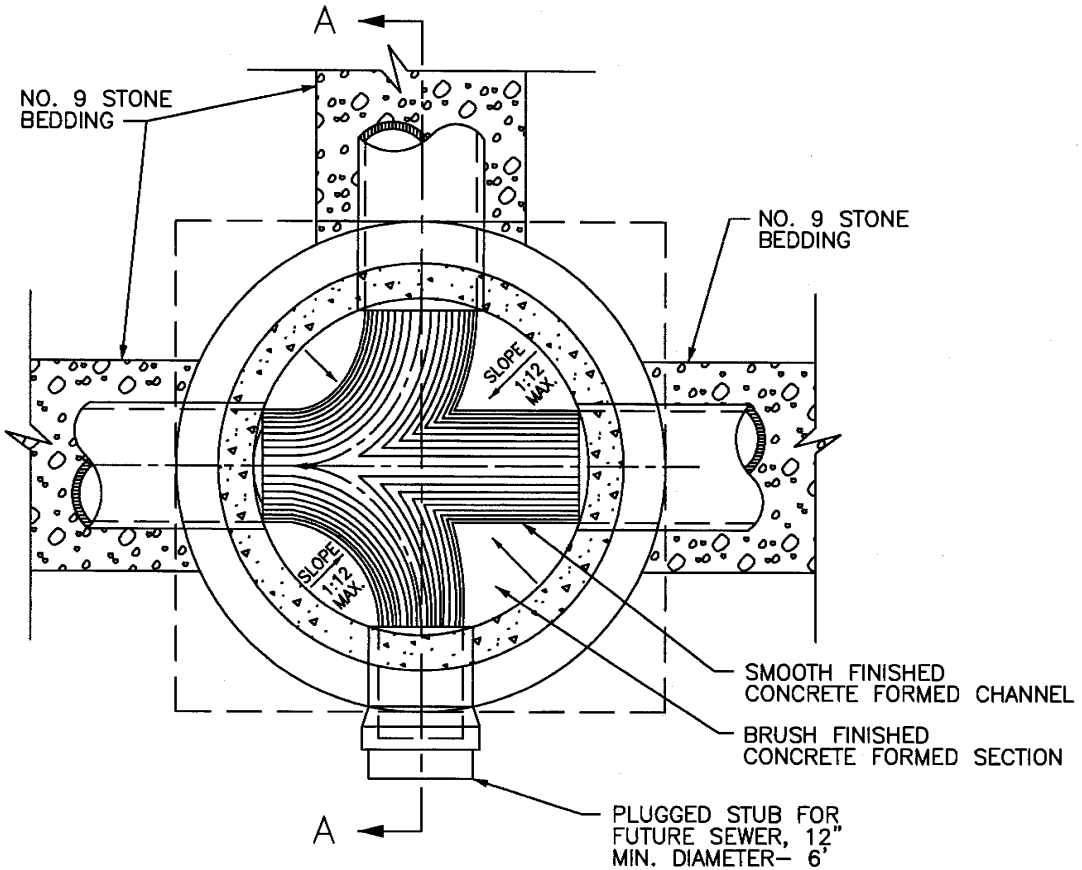
TYPICAL PRECAST CONCRETE DROP MANHOLE FOR PIPES UP TO 36"

STANDARD DRAWING NO. 212

APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

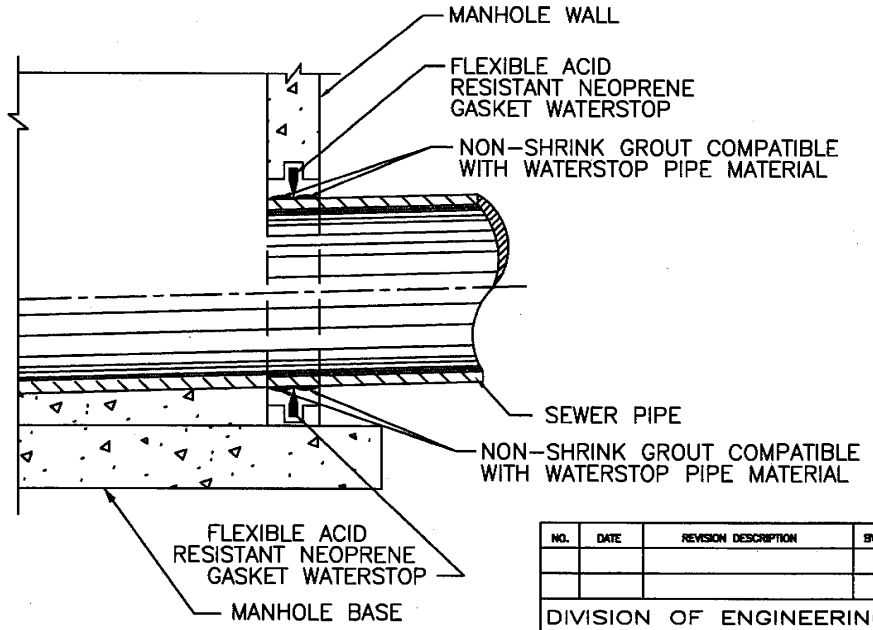
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT





SECTION PLAN

SECTION A–A



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

APPROVAL

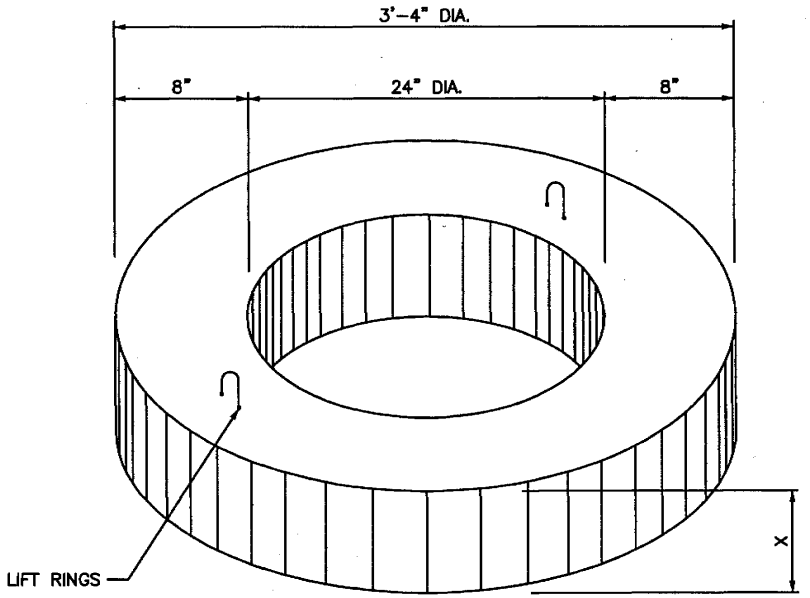
URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 5/1/08

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

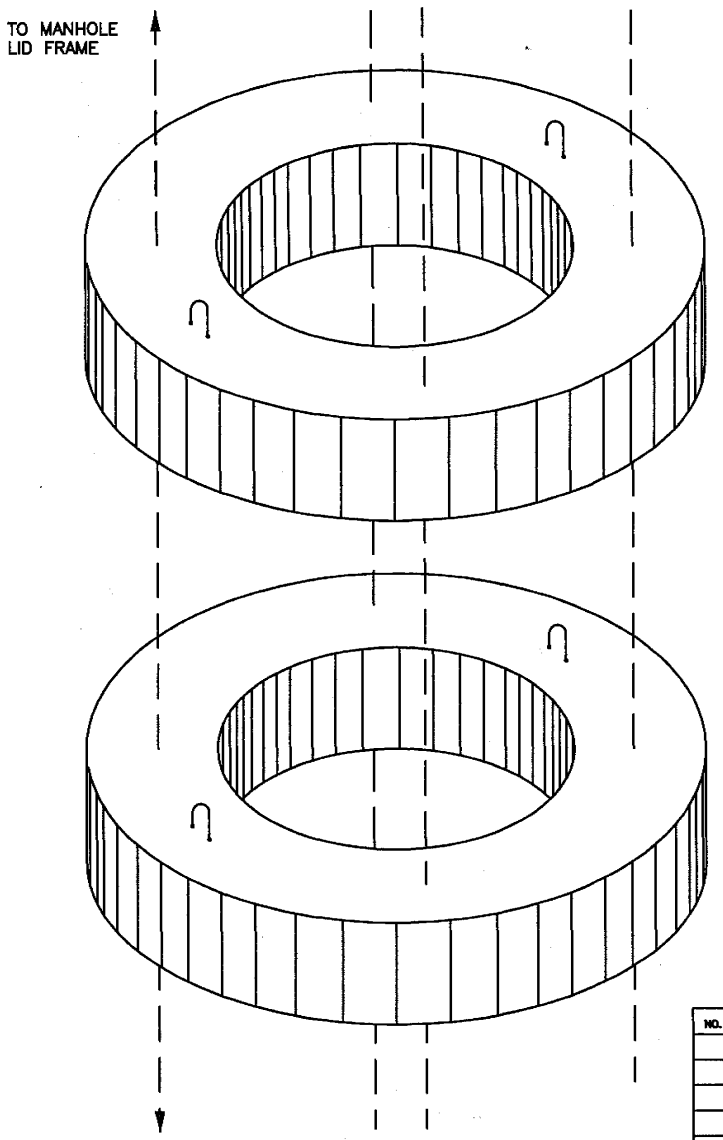
NOTES:

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

APPROVAL

URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 5/1/08

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

URBAN COUNTY ENGINEER — DATE 5/1/08

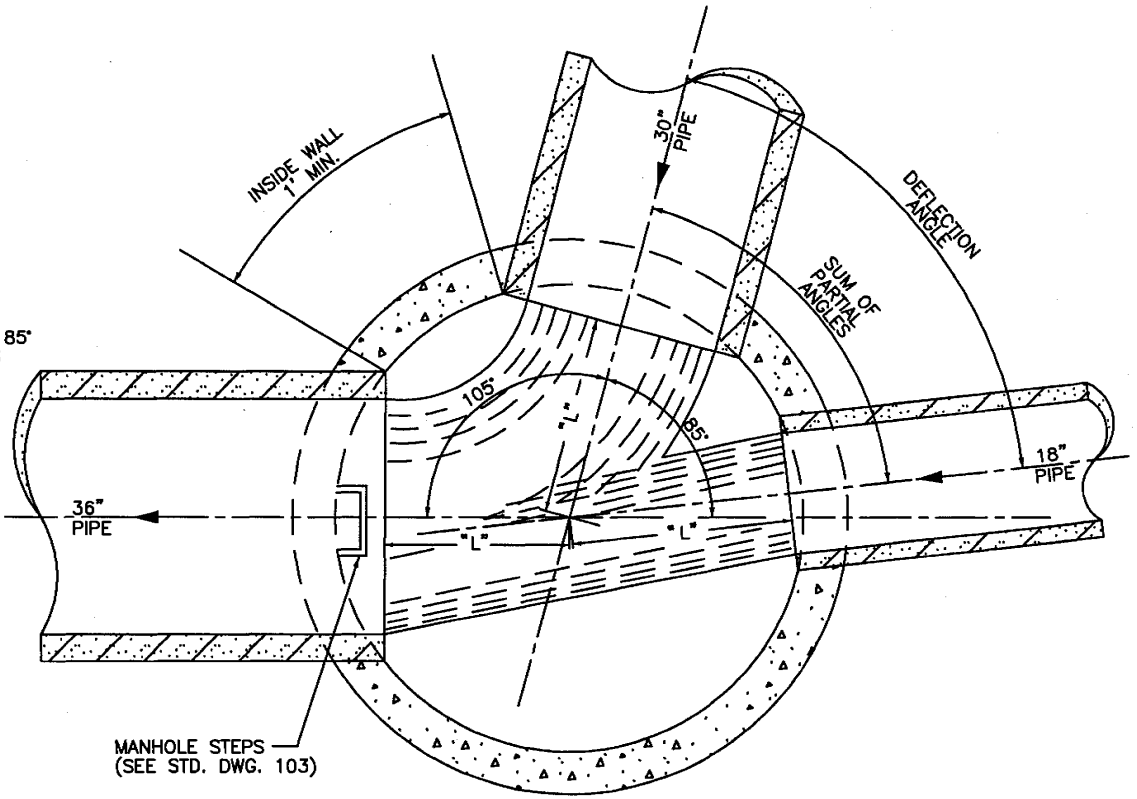
COMMISSIONER — DATE 5/1/08

CIRCULAR MANHOLE NOTES:

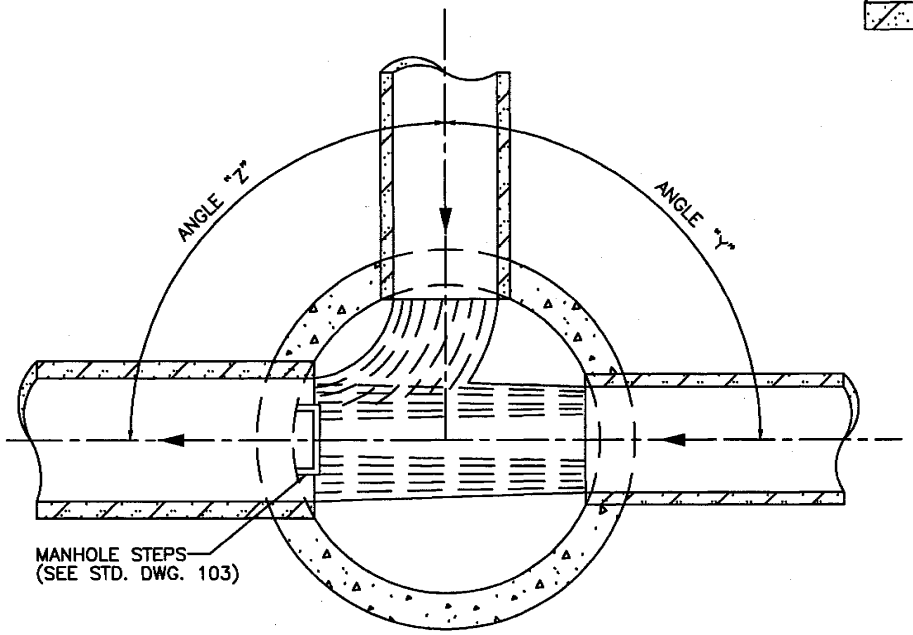
1. THE ANGLE BETWEEN ANY TWO PIPES (e.g. ANGLE "Y" OR "Z") MUST BE GREATER THAN THE SUM OF THE PARTIAL ANGLES. REFER TO SEPARATE STANDARD DRAWINGS FOR TABLE OF MINIMUM PARTIAL ANGLES. ANGLES SMALLER THAN LISTED ON TABLE SHALL REQUIRE LARGER MANHOLE SELECTION.
2. THE MAXIMUM DEFLECTION ANGLE BETWEEN ANY 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"		5'–0"	
	P. ANGLE	L. DIST.	P. ANGLE	L. DIST.
15"	38°	1'–10"	30°	2'–3"
18"	43°	1'–8"	34°	2'–3"
24"	53°	1'–6"	39°	2'–2"
27"	–	–	45°	2'–0"
30"	–	–	50°	1'–11"

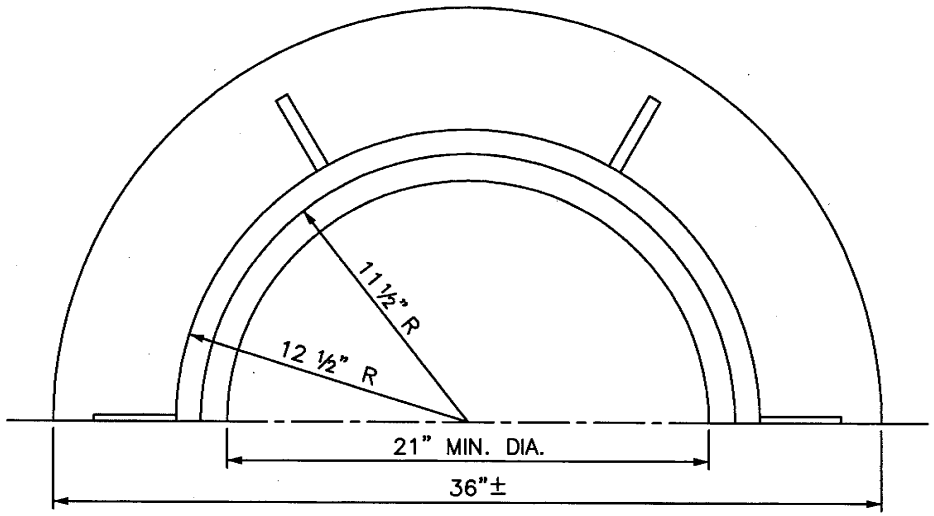
NO.	DATE	REVISION DESCRIPTION	BY

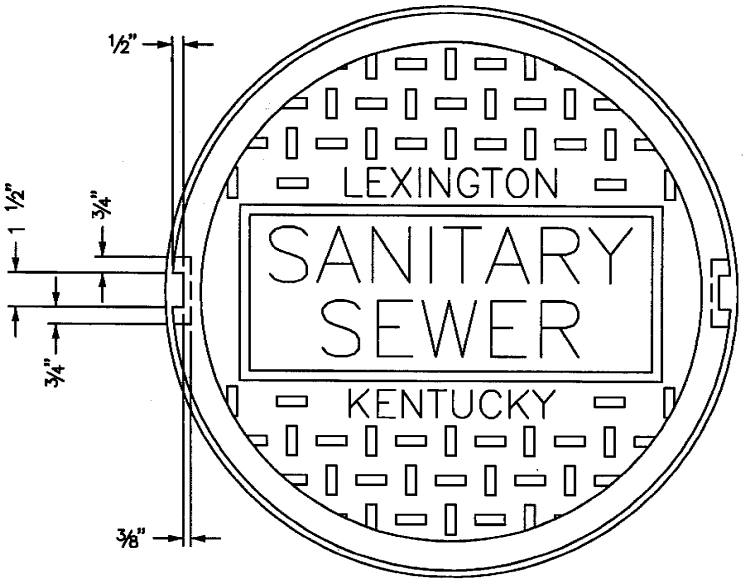
DIVISION OF ENGINEERING

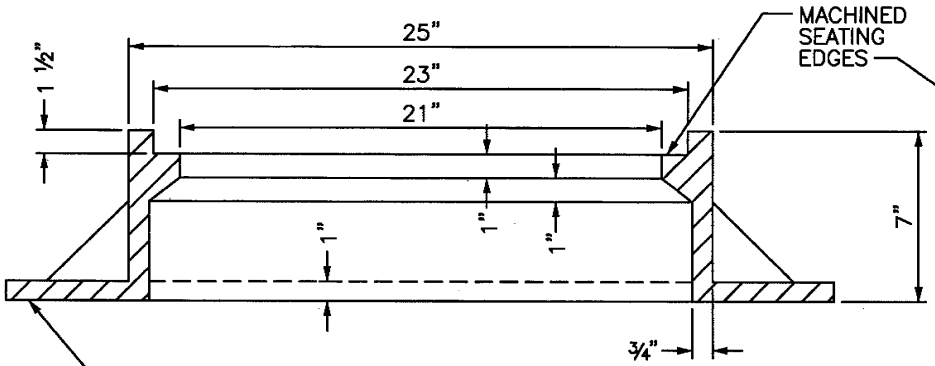
DEFLECTION ANGLE CRITERIA FOR SANITARY MANHOLES

STANDARD DRAWING NO. 217

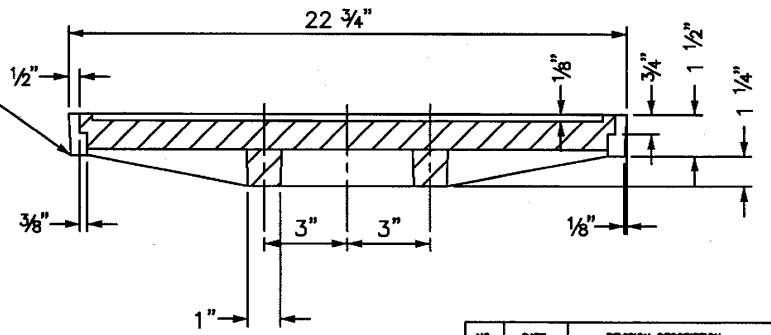
APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08







FRAME DETAIL



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

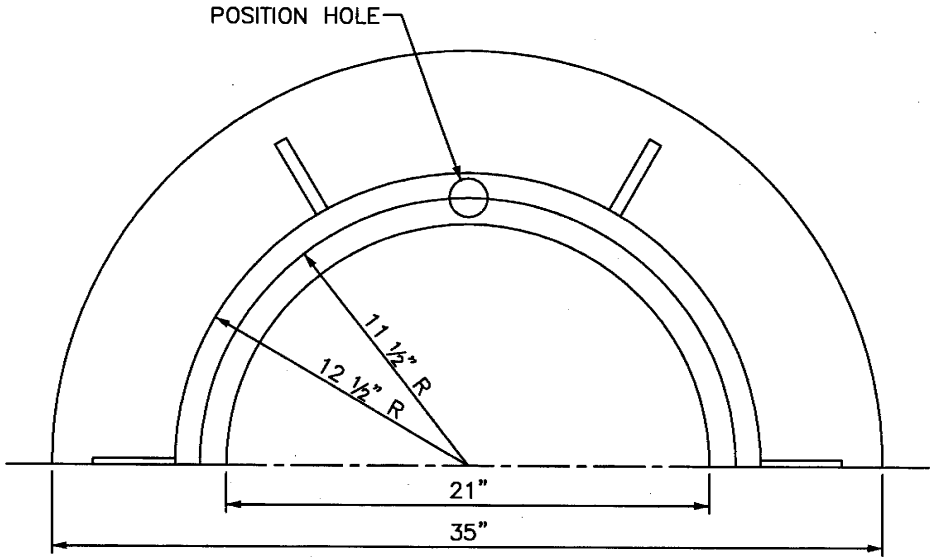
STANDARD CIRCULAR
MANHOLE FRAME & COVER

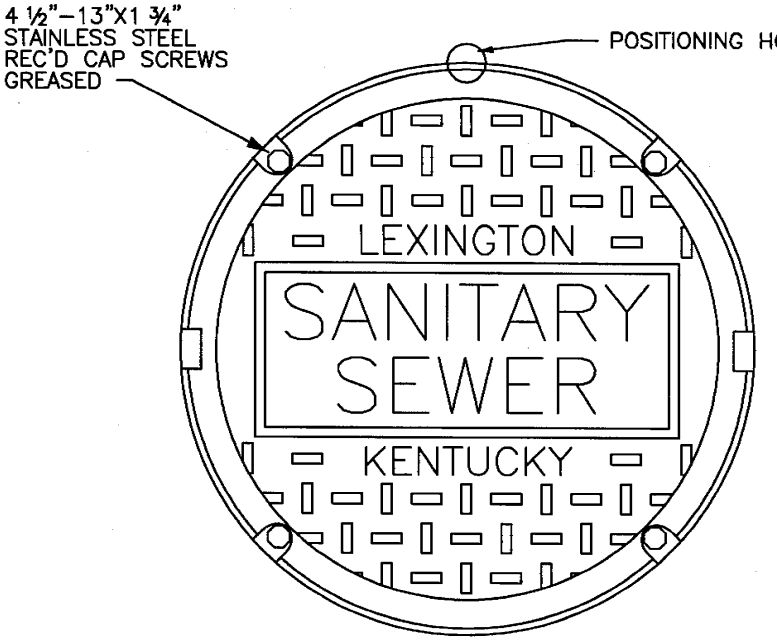
STANDARD DRAWING NO. 220

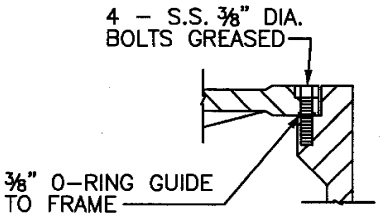
APPROVAL

URBAN COUNTY ENGINEER — DATE 5/1/08

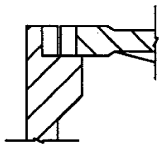
COMMISSIONER — DATE 5/1/08





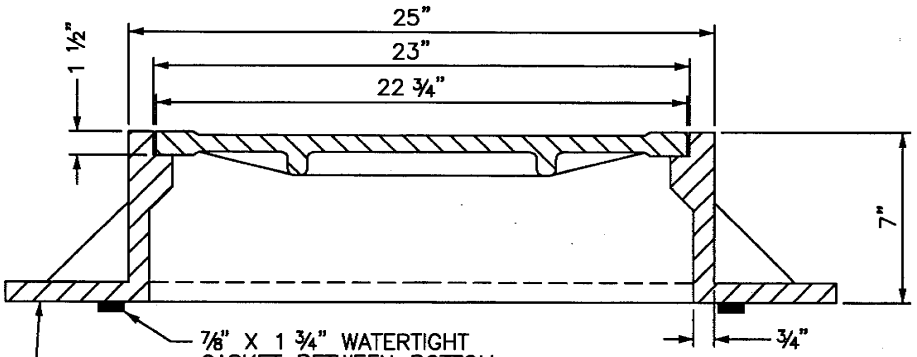


WATERTIGHT DETAIL



POSITIONING HOLE

COVER DETAIL



SET FRAME CASTING IN FULL MORTAR BED, FOR WATERTIGHT MANHOLE FRAME AND LID – SEE APPLICABLE STANDARD DRAWING.

FRAME 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

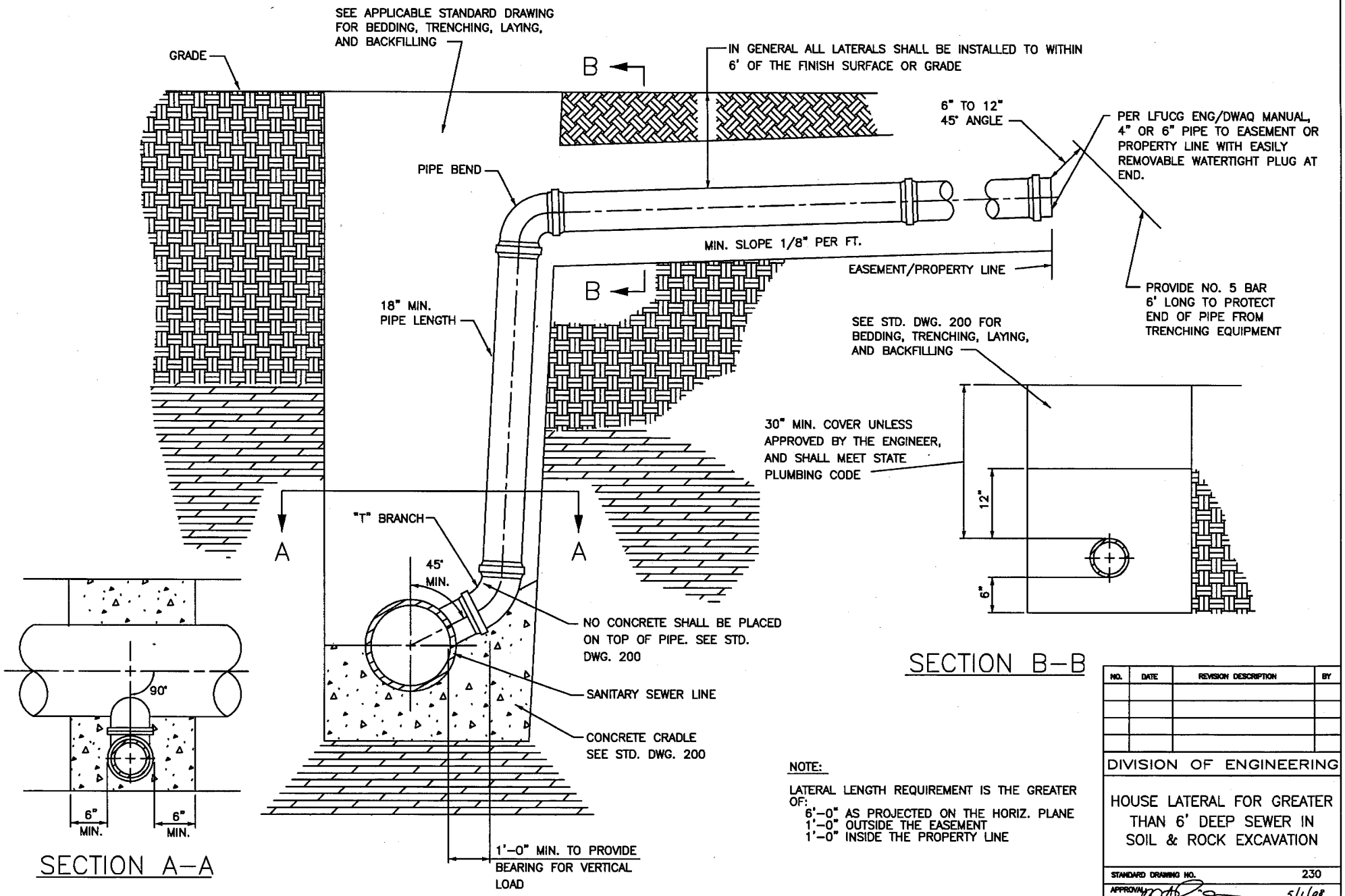
STANDARD WATERTIGHT MANHOLE FRAME & COVER

STANDARD DRAWING NO. 222

APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

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

CONNECTIONS



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

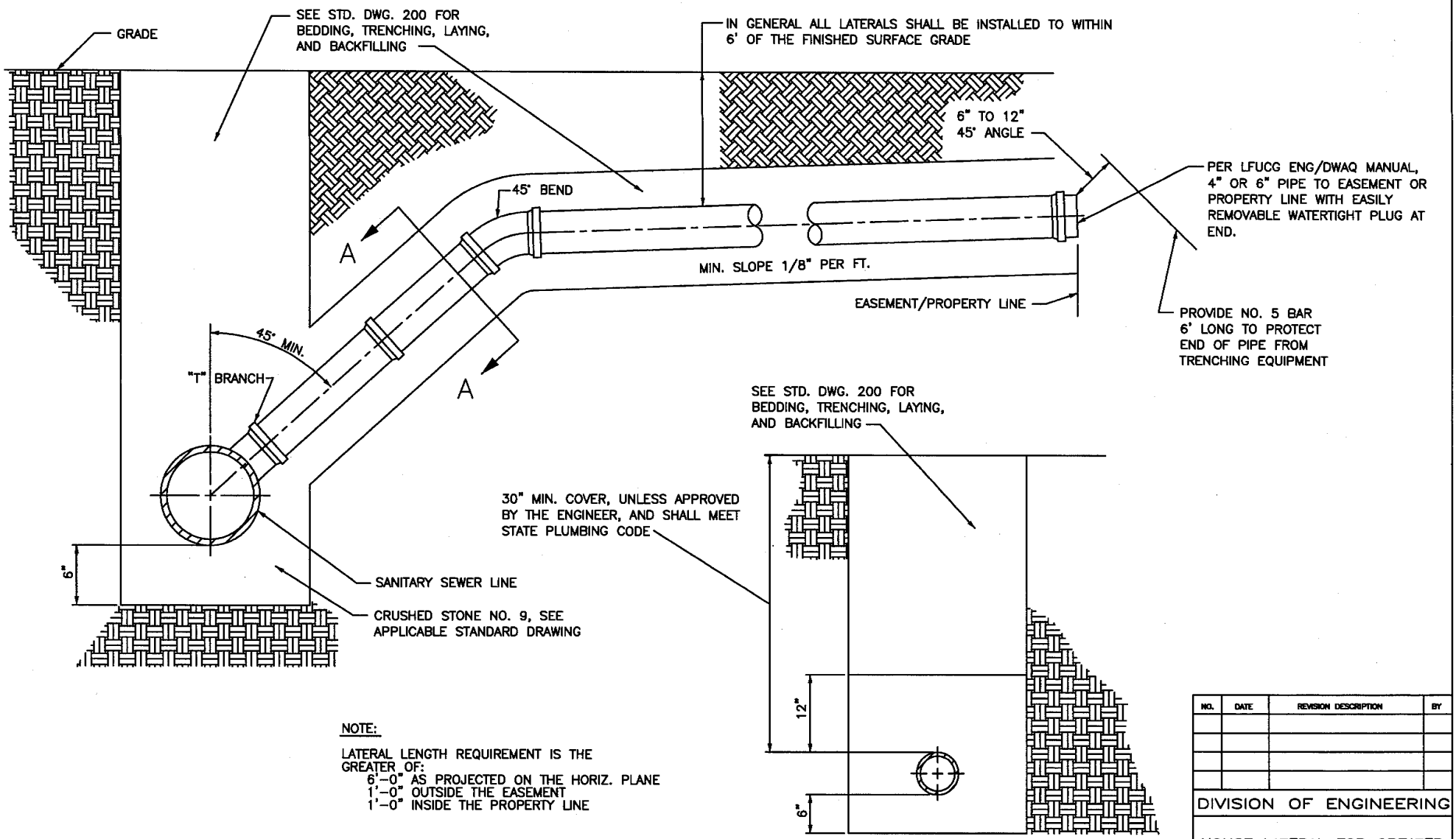
DIVISION OF ENGINEERING

HOUSE LATERAL FOR GREATER THAN 6' DEEP SEWER IN SOIL & ROCK EXCAVATION

STANDARD DRAWING NO. 230

APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

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



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

SECTION A–A

NO.	DATE	REVISION DESCRIPTION	BY

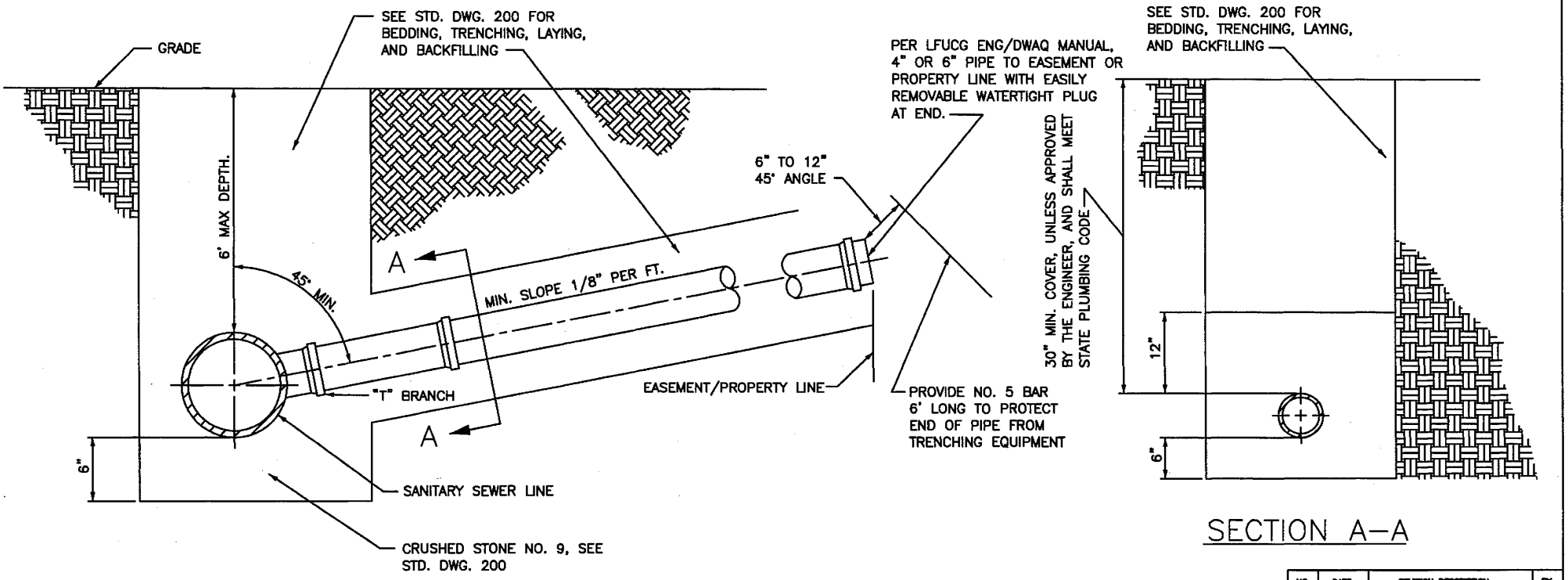
DIVISION OF ENGINEERING

HOUSE LATERAL FOR GREATER THAN 6' DEEP SEWER IN SOIL

STANDARD DRAWING NO. 231

APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

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

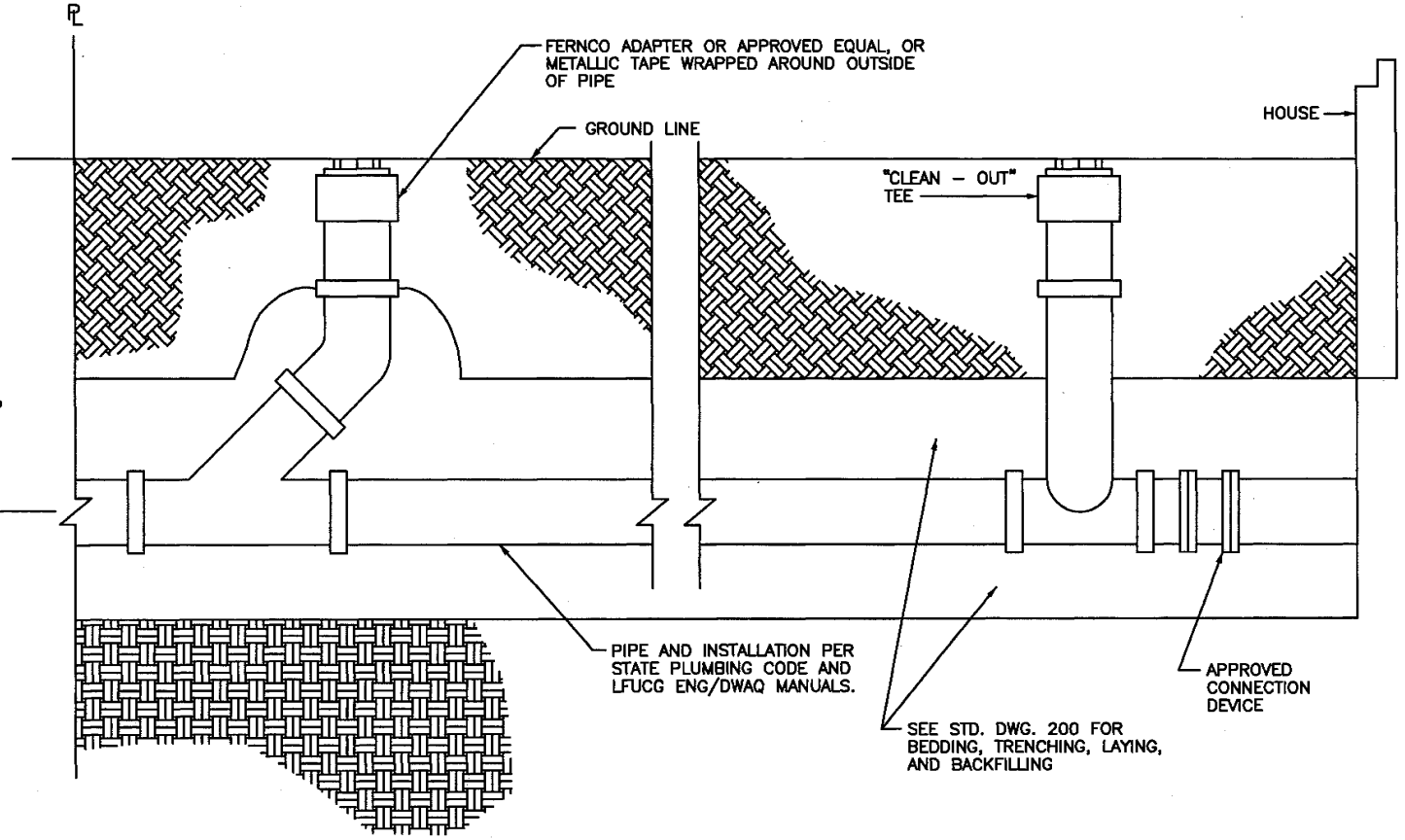
DIVISION OF ENGINEERING

HOUSE LATERAL FOR SHALLOW SEWER IN SOIL OR ROCK

STANDARD DRAWING NO. 232

APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

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

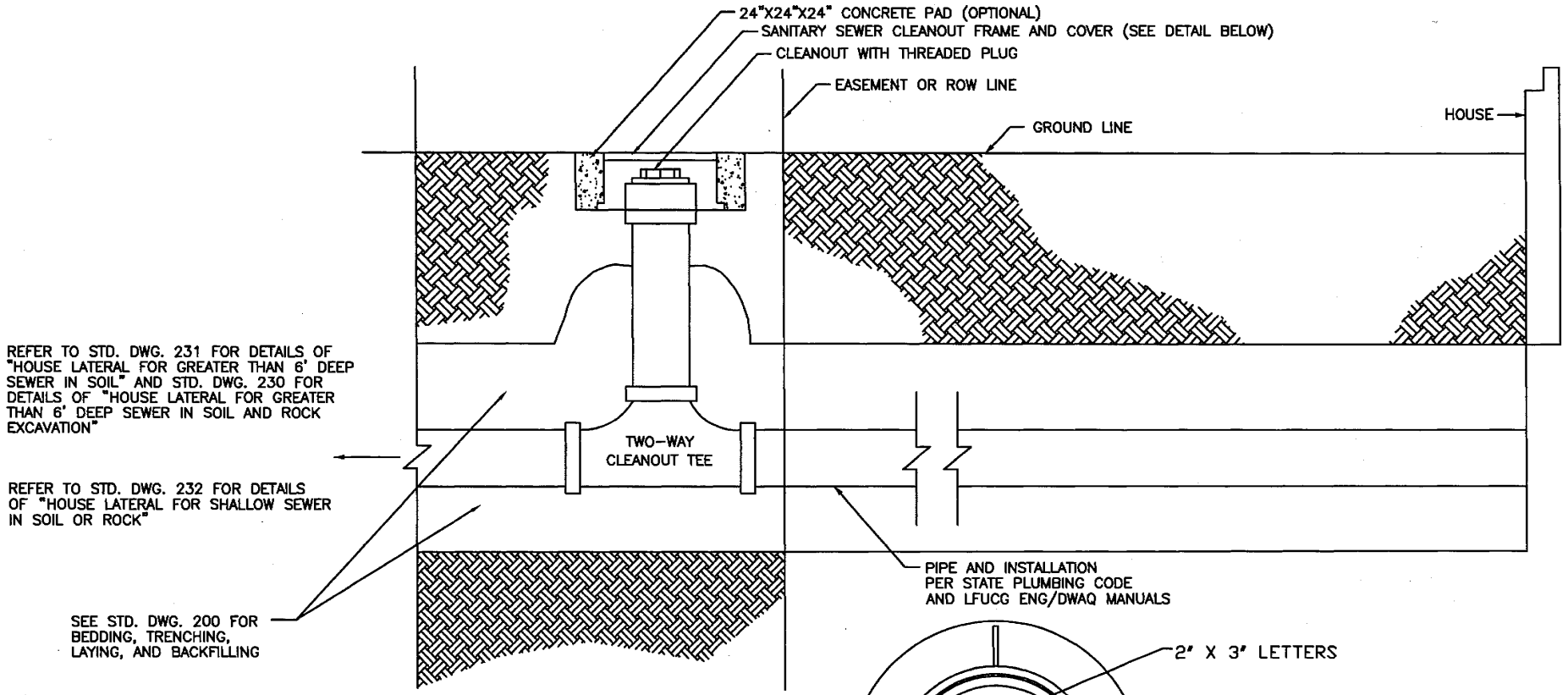
LATERAL CLEANOUT IN NON–PAVED AREAS AND YARDS

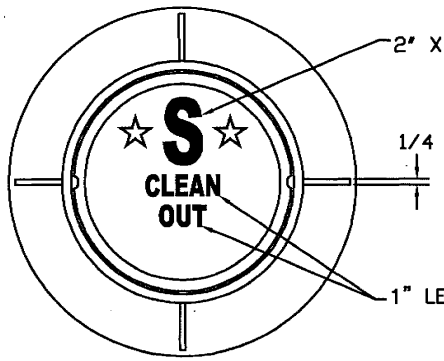
STANDARD DRAWING NO. 233

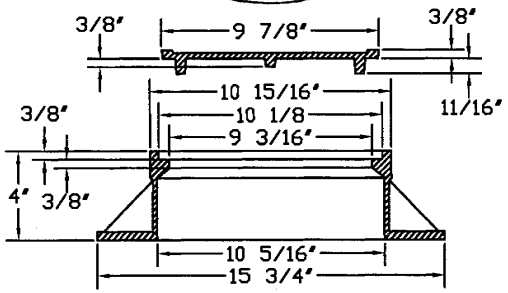
APPROVAL

URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 5/1/08







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

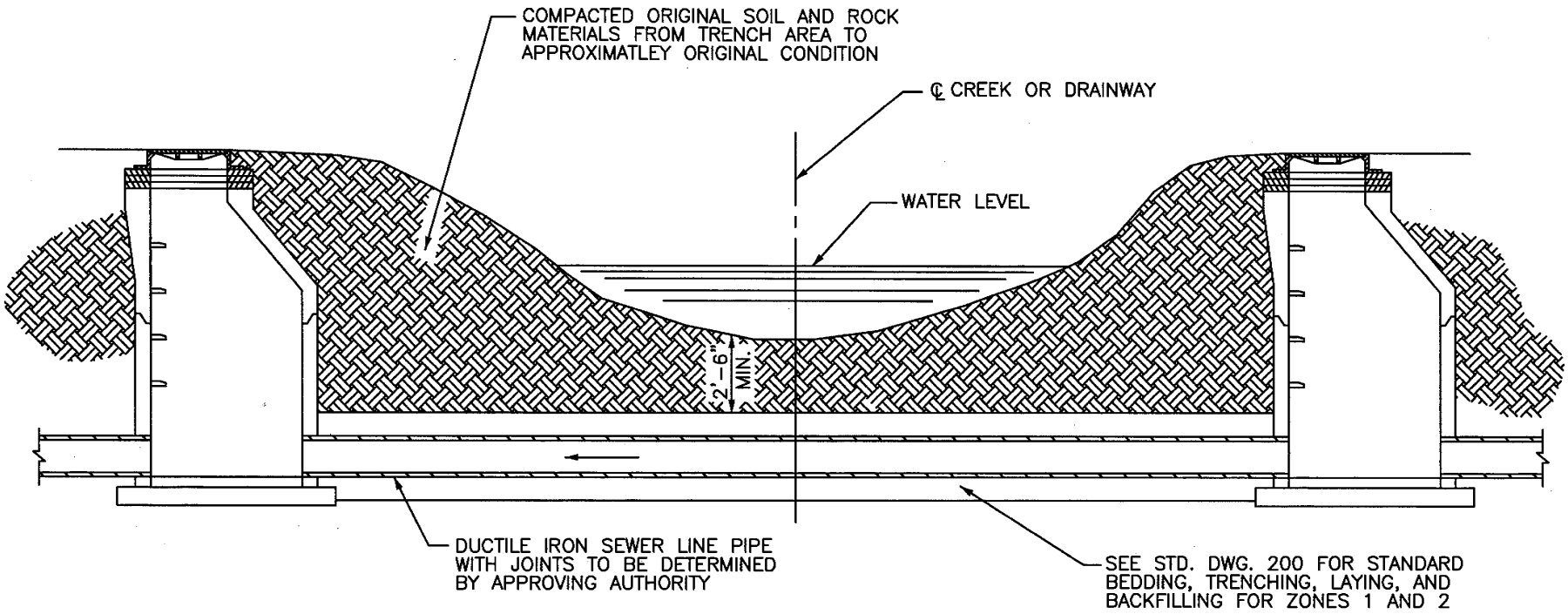
DIVISION OF ENGINEERING

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

STANDARD DRAWING NO. 234

APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 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

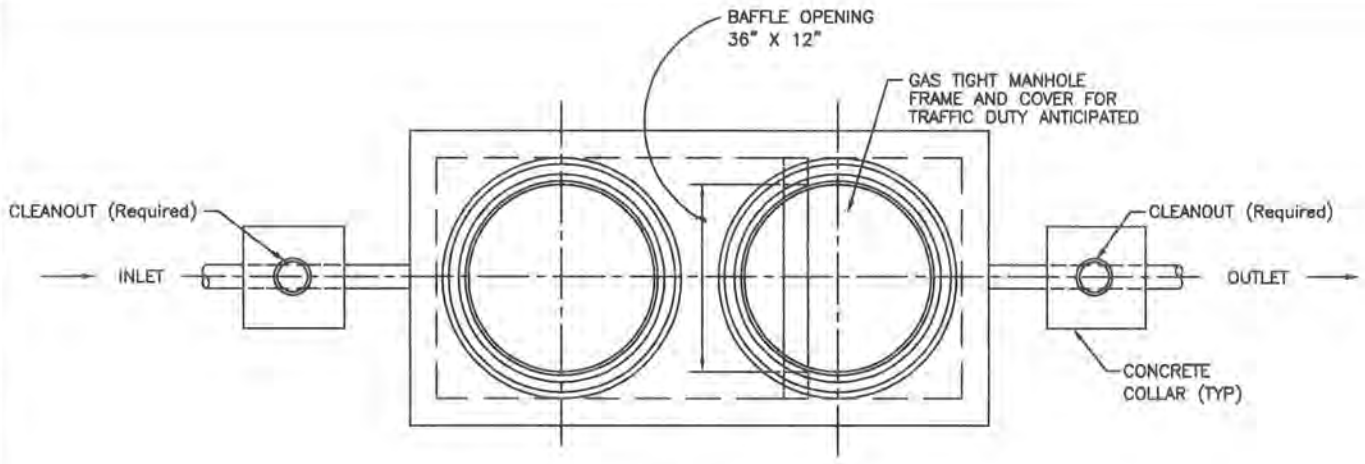
DIVISION OF ENGINEERING

TYPICAL CREEK CROSSING FOR SANITARY SEWER LINE

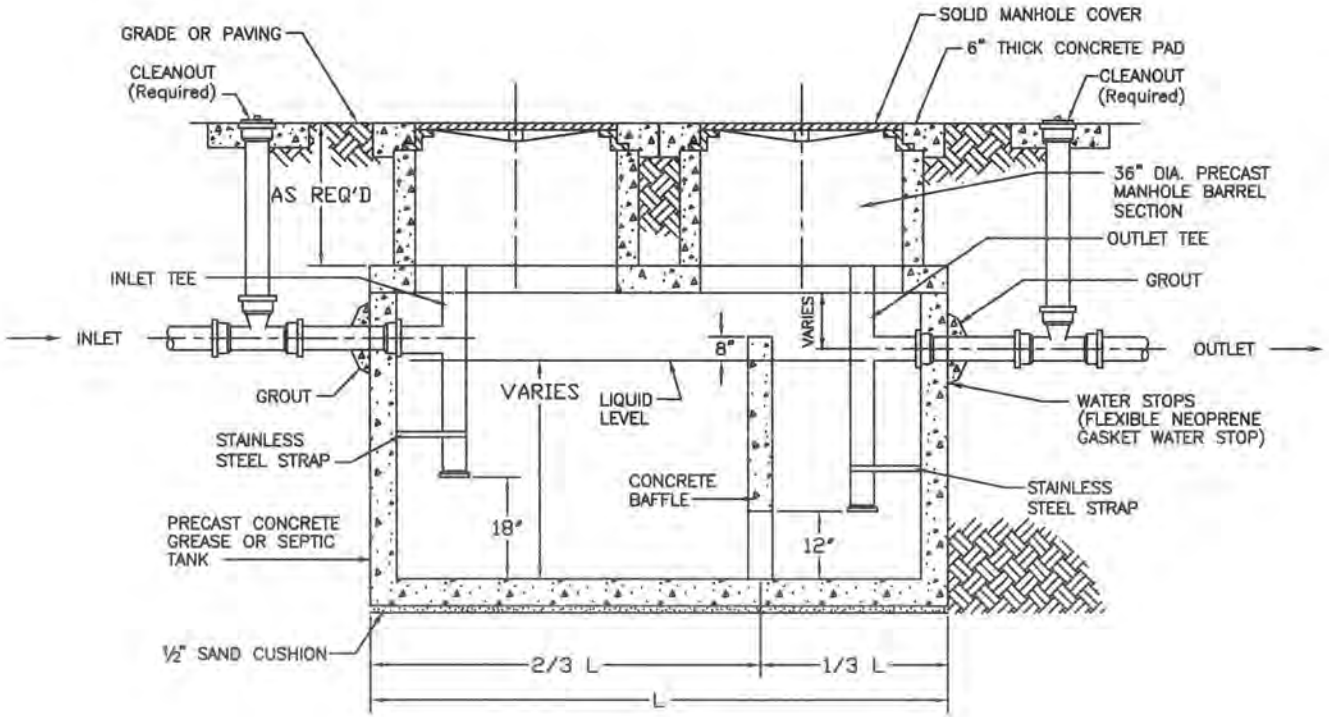
STANDARD DRAWING NO. 240

APPROVAL _____ 5/1/08
URBAN COUNTY ENGINEER DATE

_____ 5/1/08
COMMISSIONER DATE



TOP VIEW



SECTION

GENERAL NOTES:

1. THIS STRUCTURE IS TO BE ACCESSIBLE FOR MAINTENANCE OR INSPECTION WITH COVERS AND CLEANOUTS BROUGHT TO GRADE.
2. DESIGN CRITERIA SHALL BE HS-20 LOADING.
3. FLOW TO THE INTERCEPTOR SHALL EXCLUDE SANITARY SEWAGE AND SURFACE DRAINAGE.
4. DESIGN AND CAPACITY OF GREASE INTERCEPTOR TO BE CERTIFIED BY ENGINEER IN ACCORD WITH KENTUCKY STATE PLUMBING CODE AND REVIEWED FOR CAPACITY BY THE DIVISION OF ENGINEERING PRIOR TO CONSTRUCTION.
5. MULTIPLE COMPARTMENT INTERCEPTORS ARE REQUIRED.
6. PIPE CLEANOUT TEE SHALL BE THE SAME SIZE AS THE PIPE AND BE WITHIN 6' OF THE GREASE INTERCEPTOR ON THE OUTLET LINE.
7. MANUFACTURER WILL PROVIDE GREASE TRAP WITH TWO(2) ACCESS POINTS AS SHOWN. PLUMBING CONTRACTOR TO INSTALL FIXTURES AS SHOWN.
8. THE MINIMUM CAPACITY OF INTERCEPTORS IS 1000 GALLONS.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

GREASE INTERCEPTOR
TYPICAL
CONFIGURATION

STANDARD DRAWING NO. 250

APPROVAL:
URBAN COUNTY ENGINEER — 1/13/12 DATE
COMMISSIONER — 1/16/12 DATE

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

Mayor Jim Gray

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT

Division of Engineering

Date: February 2, 2012

Re: LFUCG **Standard Drawings 250 Revision**

The Lexington Fayette Urban County Government, Department of Environmental Quality and Public Works, has revised the Division of Engineering **Standard Drawings 250 – Schematic Example For Grease Interceptor**. This Standard Drawing became effective on January 16, 2012 and replaces any/all previous versions.

Attached is the revised Standard Drawing.

A paper copy of the **Standard Drawings 2008** edition is available for purchase from the Lexington Fayette Urban County Government, Division of Engineering, 101 East Vine Street 4th floor.

If you have questions please contact Mr. Andrew Grunwald, P.E. with the Division of Engineering at 258-3410.

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

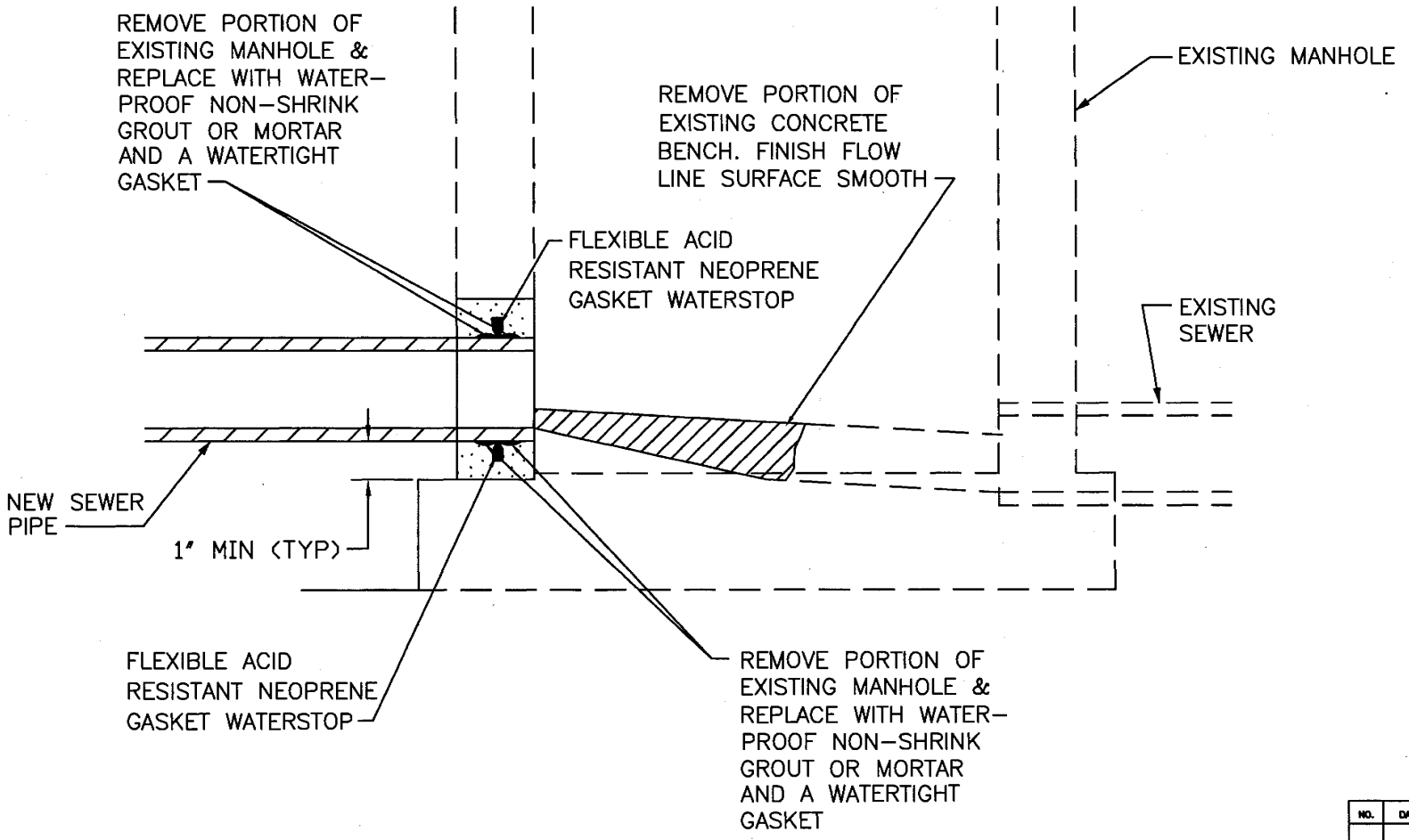
Sincerely,

Marwan A. Rayan, P.E.
Urban County Engineer

MAR:RAB:AFG

C: File

12.1000.106.Letter for Amended STD#250.doc



ALL HOLES CUT INTO SEWER MANHOLES SHALL BE CORE DRILLED.

SEWER CONNECTION TO EXISTING MANHOLE

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

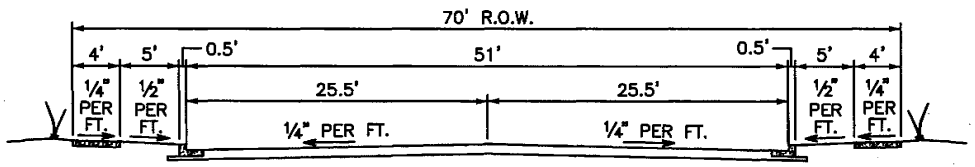
SEWER CONNECTION TO EXISTING CONCRETE MANHOLE

STANDARD DRAWING NO. 260

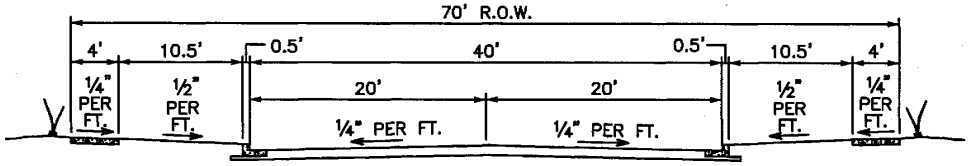
APPROVAL _____ 5/1/08
URBAN COUNTY ENGINEER DATE

_____ 5/1/08
COMMISSIONER DATE

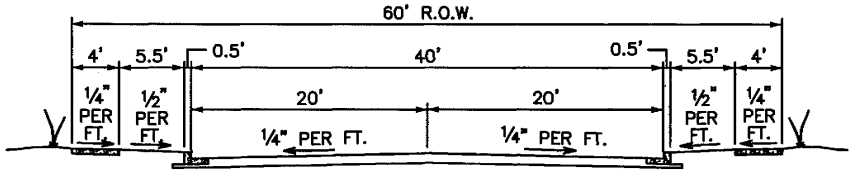
STREETS & ROADS



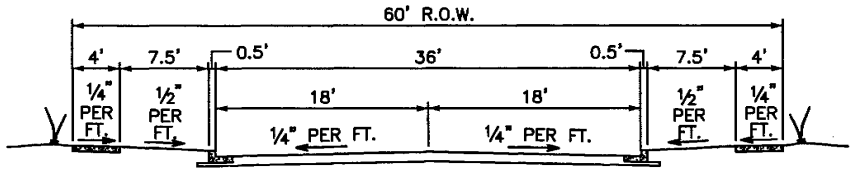
NON–RESIDENTIAL COLLECTOR



NON–RESIDENTIAL AND INDUSTRIAL COLLECTORS

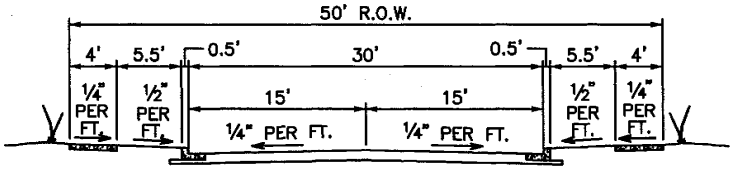


RESIDENTIAL COLLECTOR AND INDUSTRIAL LOCALS

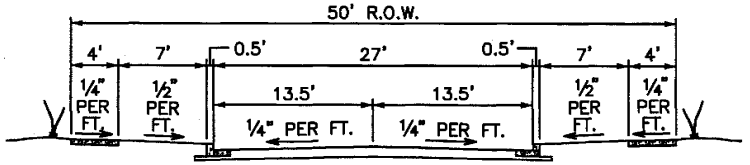


RESIDENTIAL COLLECTOR

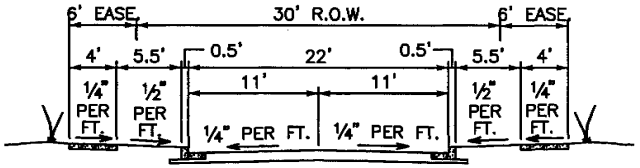
(OBSOLETE) – USED TO COMPLETE EXISTING STREETS



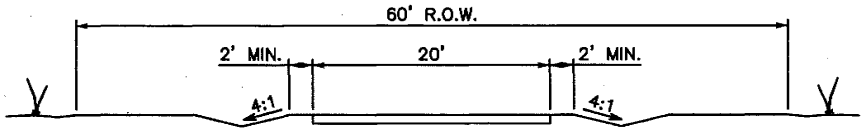
RESIDENTIAL LOCAL



RESIDENTIAL CUL–DE–SAC



URBAN RESIDENTIAL LOCAL



RURAL RESIDENTIAL LOCAL

NOTES:

1. SLOPES AND DRAINAGE DITCHES OUTSIDE THE R.O.W. SHALL BE APPROVED BY THE ENGINEER.
2. THE APPLICATIONS AND USES OF THE ABOVE TYPICAL SECTIONS SHALL BE IN ACCORDANCE WITH THE L.F.U.C.G. LAND SUBDIVISION REGULATIONS, ARTICLE 6.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

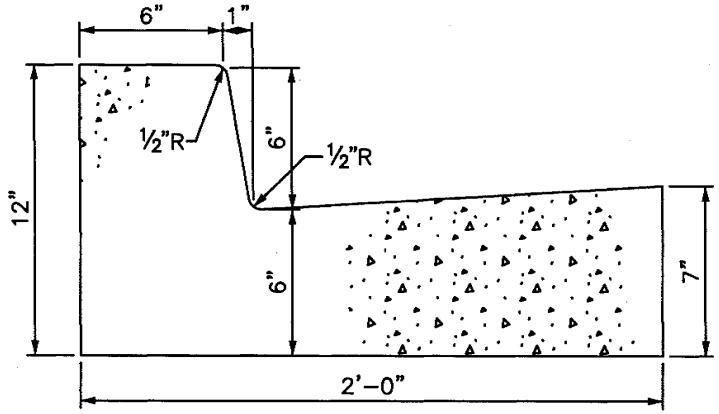
TYPICAL STREET SECTIONS

STANDARD DRAWING NO. 300

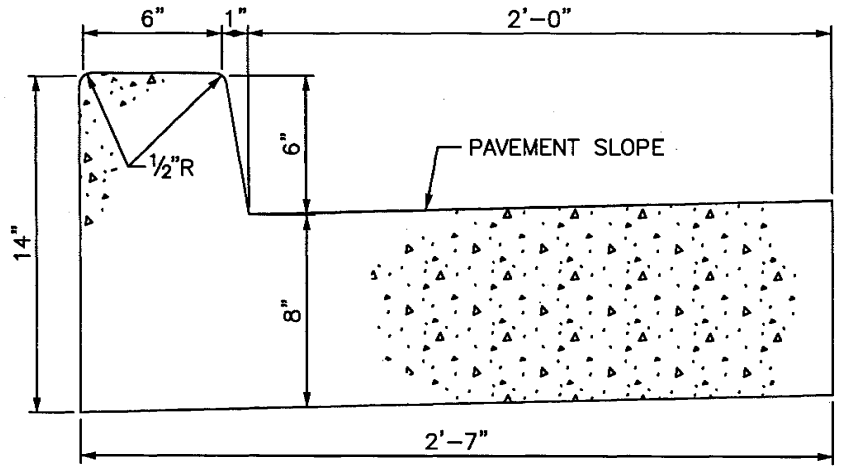
APPROVAL

URBAN COUNTY ENGINEER — DATE 5/1/08

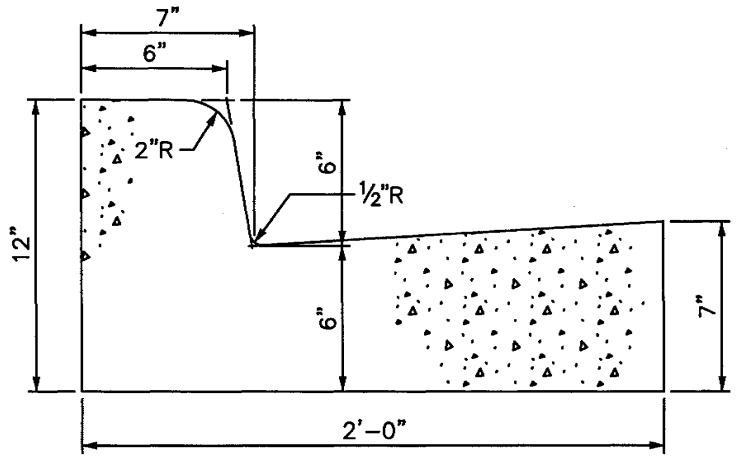
COMMISSIONER — DATE 5/1/08



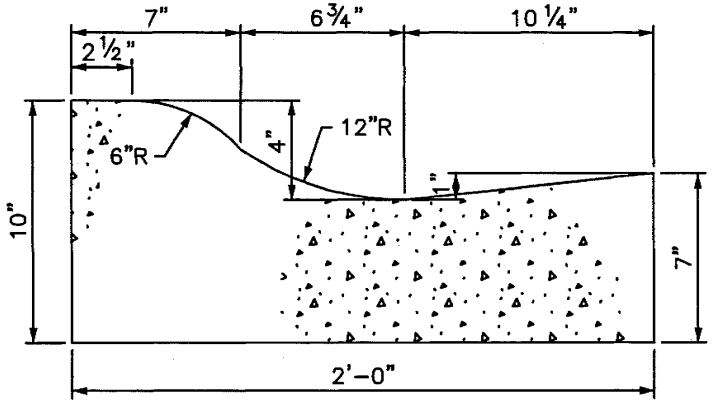
TYPE 1



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

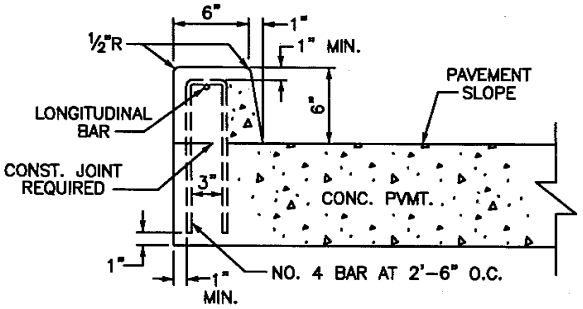
CURB & GUTTER

STANDARD DRAWING NO. 301

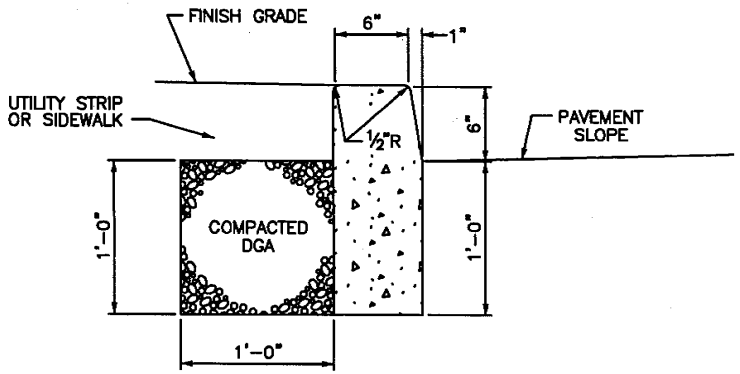
APPROVAL

URBAN COUNTY ENGINEER — DATE 5/1/08

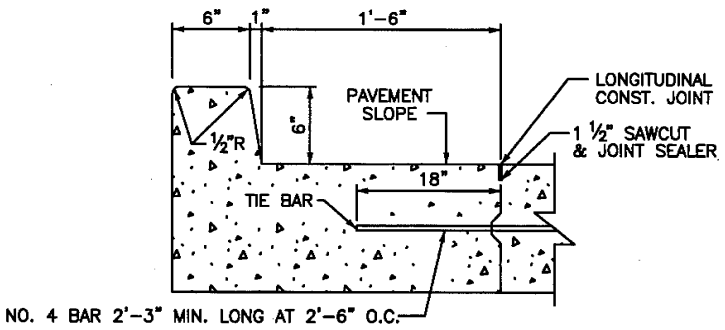
COMMISSIONER — DATE 5/1/08



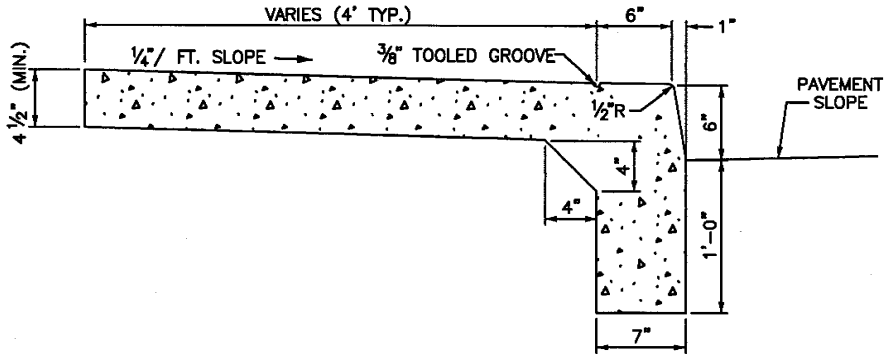
INTEGRAL CURB, TYPE 1



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

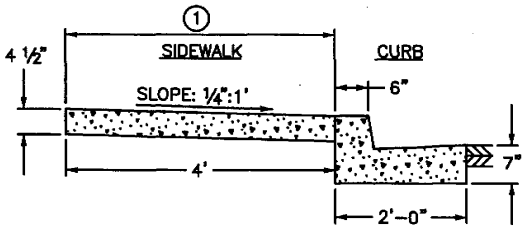
INTEGRAL CURB, HEADER CURB, MONOLITHIC CURB & SIDEWALK

STANDARD DRAWING NO. 302

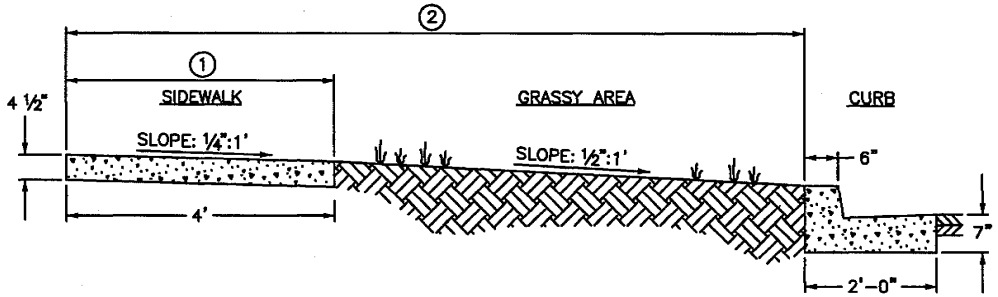
APPROVAL

URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 5/1/08



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.

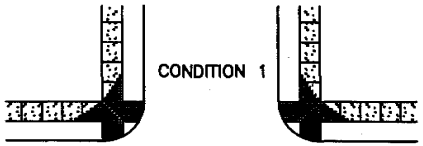
NO.	DATE	REVISION DESCRIPTION	BY

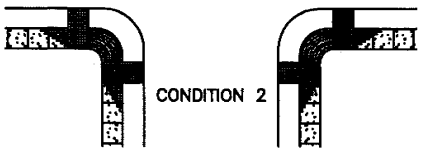
DIVISION OF ENGINEERING

SIDEWALK CONSTRUCTION SPECIFICATIONS

STANDARD DRAWING NO. 303

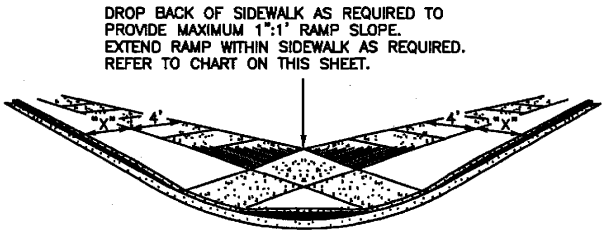
APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08



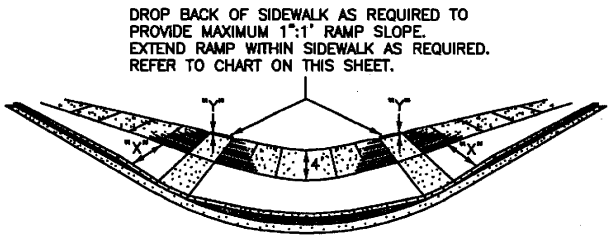


RAMP TYPE 1

NORMAL TREATMENT FOR ARTERIALS AND SIGNALIZED INTERSECTIONS



RAMP TYPE 1 CONDITION 1

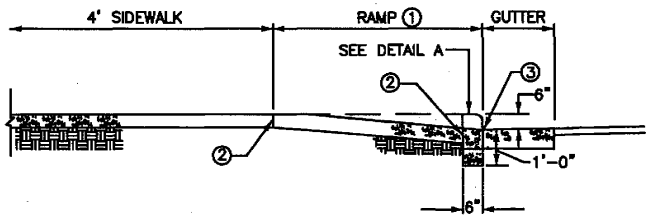


RAMP TYPE 1 CONDITION 2

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	2½"
2	2"
3	1½"
4	1"
5	½"
≥6	0

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



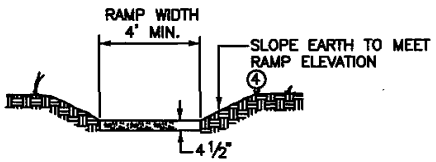
PROFILE RAMP TYPE 1

NOTES:

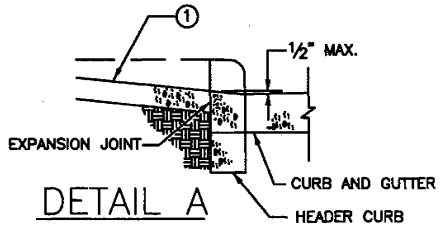
1. INLET LOCATIONS WILL VARY, DEPENDENT ON CROSSWALK AND RAMP LOCATION.
2. THE RAMP SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE. STEP-SAFE® TRANSPO INDUSTRIES TILE OR ENGINEER APPROVED EQUIVALENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. THE NORMAL GUTTER LINE SHOULD BE MAINTAINED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

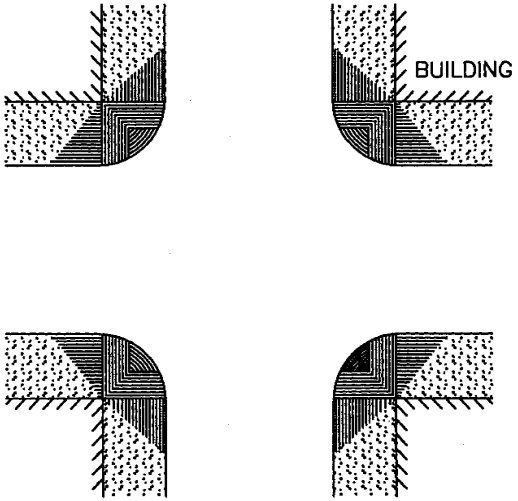
NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

SIDEWALK
RAMP TYPE 1

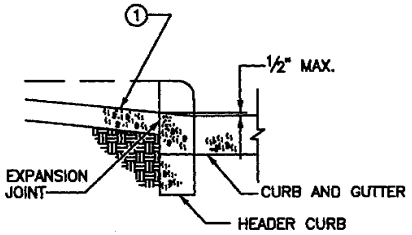
STANDARD DRAWING NO. 304

APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

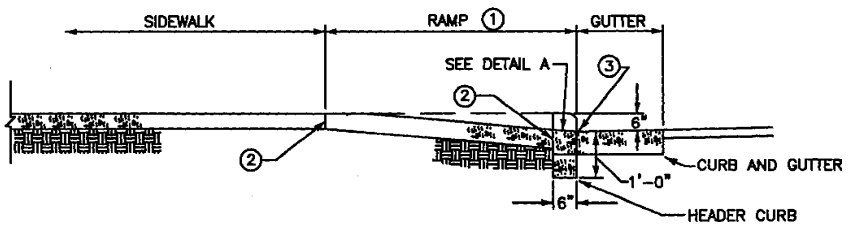


RAMP TYPE 3

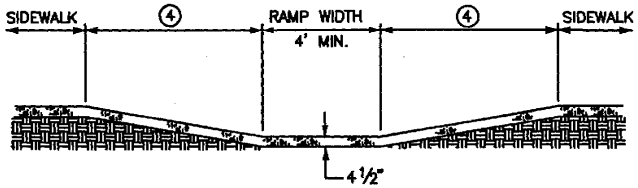
NORMAL TREATMENT FOR SIDEWALK ADJACENT TO CURB



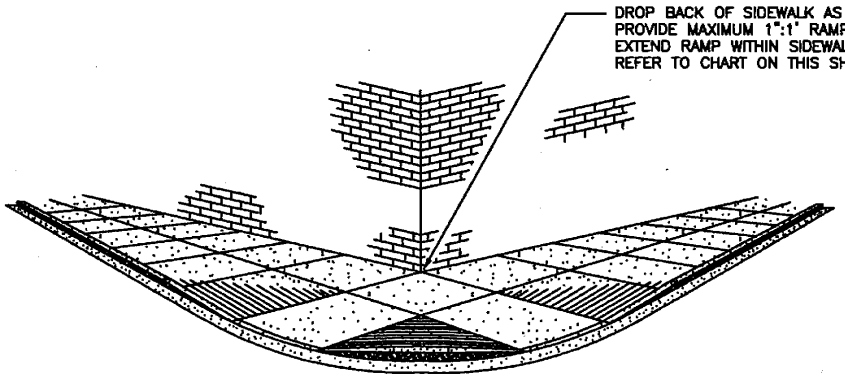
DETAIL A



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.

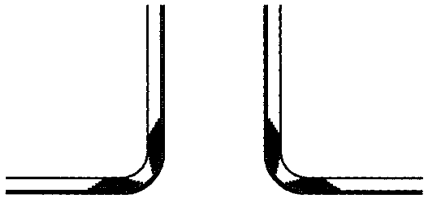
NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

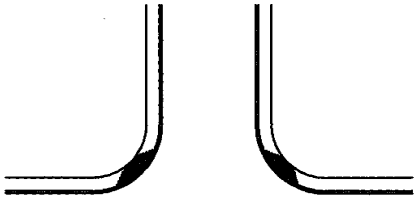
SIDEWALK
RAMP TYPE 2

STANDARD DRAWING NO. 305

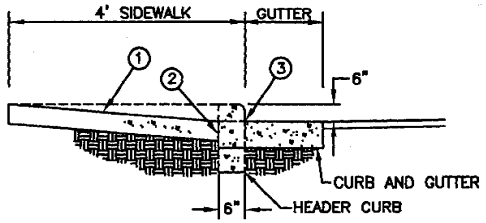
APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08



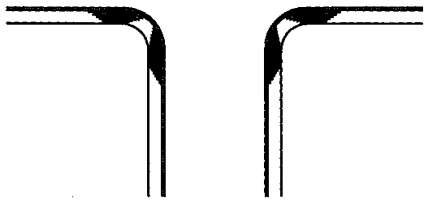
CONDITION 1



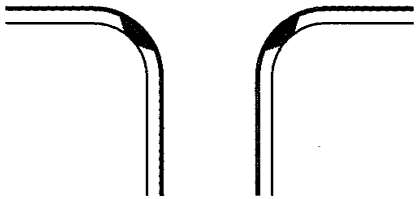
CONDITION 2



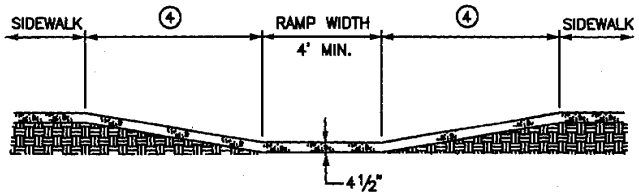
RAMP PROFILE



4' SIDEWALK ADJACENT TO CURB



4' SIDEWALK ADJACENT TO CURB



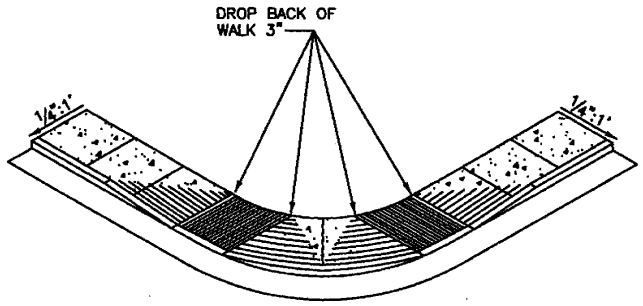
RAMP CROSS-SECTION

NOTES:

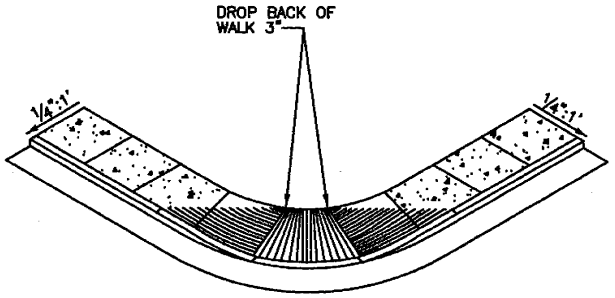
1. INLET LOCATIONS WILL VARY, DEPENDENT ON CROSSWALK AND RAMP LOCATION
2. THE RAMP SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE. STEP-SAFE® TRANSPO INDUSTRIES TILE OR ENGINNEERS APPROVED EQUIVALENT SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
3. THE NORMAL GUTTER LINE SHOULD BE MAINTAINED THROUGH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

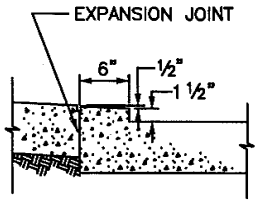
SIDEWALK RAMP
TYPE 3

STANDARD DRAWING NO. 306

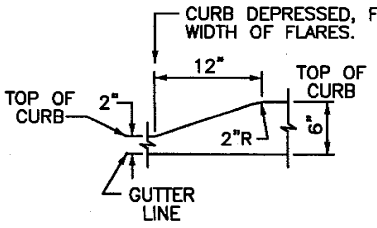
APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

MAXIMUM ALLOWABLE APRON AND DRIVEWAY WIDTHS

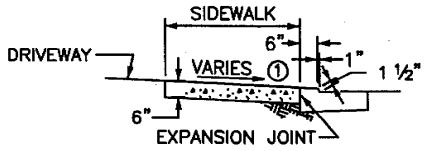
CLASSIFICATION	DRIVEWAY	APRON
SINGLE RESIDENTIAL	12'	18'
DOUBLE OR JOINT RESIDENTIAL	20'	26'



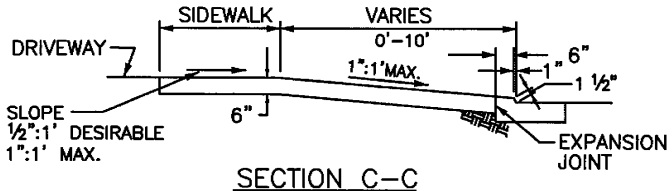
SECTION A–A



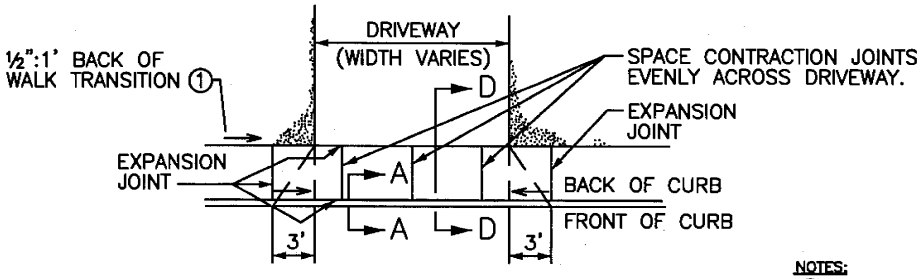
SECTION B–B



SECTION D–D



SECTION C–C



ENTRANCE WITHOUT UTILITY STRIP

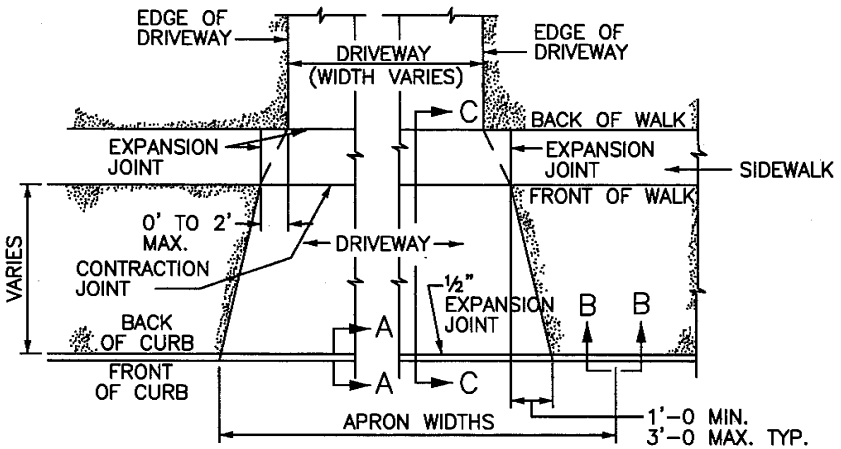
NOTES:

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.

STREET WITH PARKING LANE

STREET WITHOUT PARKING LANE



ENTRANCE WITH UTILITY STRIP

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

BASED ON UTILITY STRIP WITH ½":1' CROSS SLOPE

UTILITY STRIP WIDTH	DROP BACK OF 4' SIDEWALK	SIDEWALK SLOPE	SLOPE ON APRON
0'	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%	7.50%

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%	7.64%
8'	0"	2.08%	6.25%
10'	0"	2.08%	5.42%

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

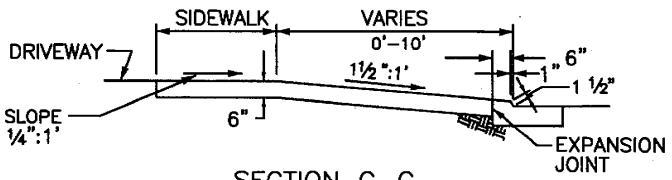
RESIDENTIAL ENTRANCE DETAILS

STANDARD DRAWING NO. 307

APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

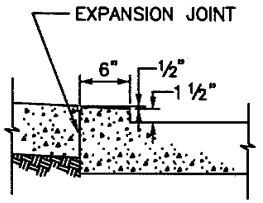
MAXIMUM ALLOWABLE APRON AND DRIVEWAY WIDTHS

CLASSIFICATION	DRIVEWAY	STANDARD APRON	ALTERNATE APRON
NON–RESIDENTIAL	30'	5' STRAIGHT FLARE=40' CURB CUT	10' RADIAL FLARE=50' CURB CUT
COMMERCIAL LOADING	30'	15' STRAIGHT FLARE=60' CURB CUT	20' RADIAL FLARE=70' CURB CUT
INDUSTRIAL	40'	20' STRAIGHT FLARE=80' CURB CUT	25' RADIAL FLARE=90' CURB CUT

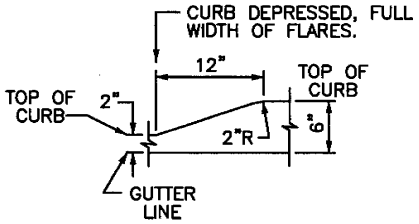


SECTION C–C

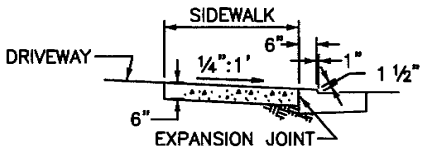
FRONT OF SIDEWALK ELEVATION DETERMINED BY ADDING ½ ": 1' ACROSS UTILITY STRIP FROM TOP OF CURB. IF COMING OFF 1½ " LIP ADD ANOTHER 4½ " TO DETERMINE ELEVATION AT FRONT OF SIDEWALK.



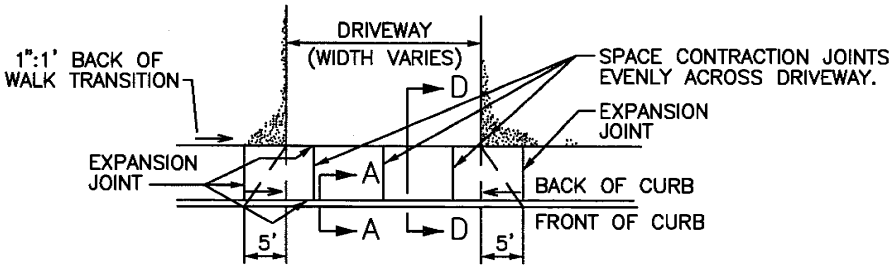
SECTION A–A



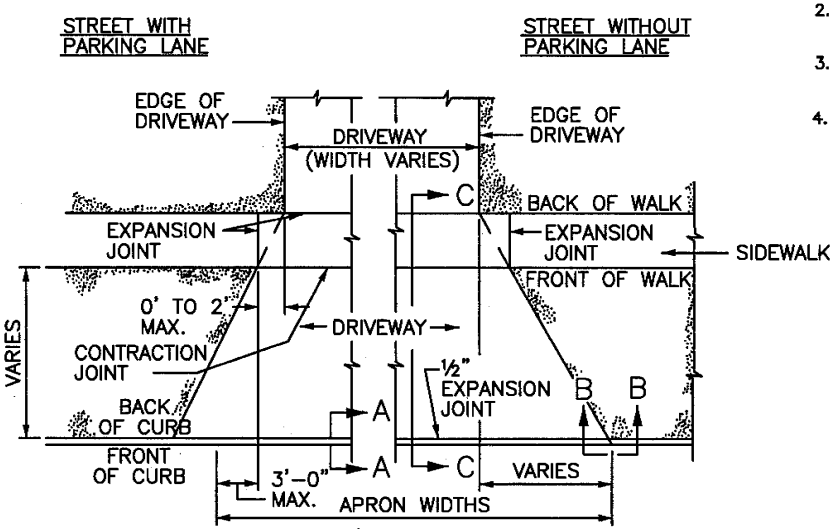
SECTION B–B



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

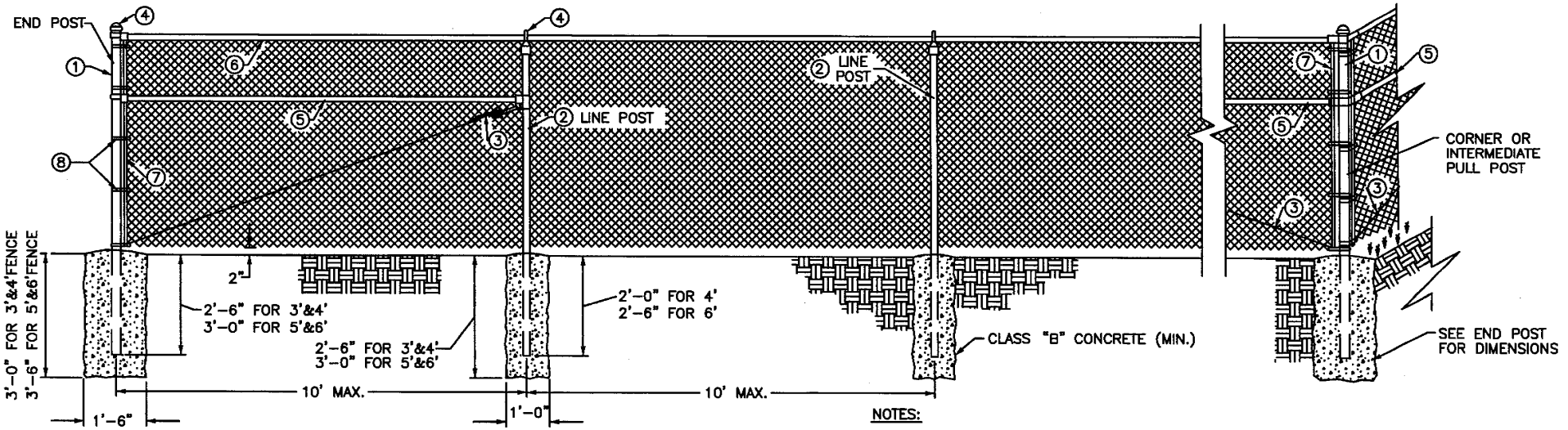
DIVISION OF ENGINEERING

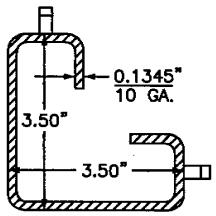
COMMERCIAL ENTRANCE DETAILS

STANDARD DRAWING NO. 307–1

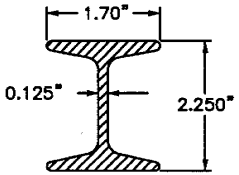
APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

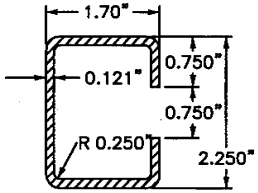




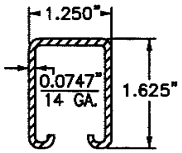
TERMINAL POST & CORNER POST



LINE POST H-COLUMN



LINE POST HEAVY "C" ROLL FORM



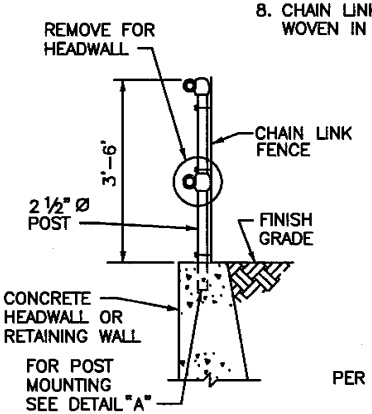
TOP & BRACE RAIL

LEGEND-(ALTERNATES)

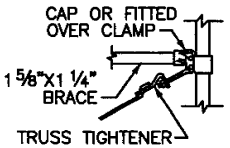
	TUBULAR	ROLL FORMED
①	2 ½" O.D. @ 3.65#/L.F.	3.5"X3.5" @ 5.14#/L.F.
②	2" O.D. @ 2.72#/L.F.	2.250" H-COL @ 3.26#/L.F. OR 2.250" C-COL @ 2.64#/L.F.
③	⅜" Ø TRUSS ROD & TIGHTENER	0.375" Ø TRUSS ROD & TIGHTENER
④	APPROVED CAPS	NOT REQUIRED
⑤	1⅝" BRACE @ 2.27#/L.F.	1.250"X1.625" @ 1.35#/L.F.
⑥	1⅝" O.D. @ 2.27#/L.F.	1.250"X1.625" @ 1.35#/L.F.
⑦	3/16"X¾" FLAT STRETCHER BAR	NOT REQUIRED
⑧	BRACE BAND & TENSION BAND	NOT REQUIRED

NOTES:

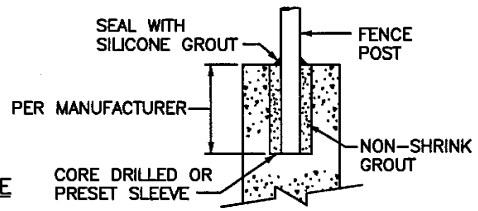
1. ALL POSTS SHALL BE SET IN CONCRETE TO THE DIMENSIONS AS INDICATED ON THIS DRAWING.
2. 3' HIGH FENCE SHALL HAVE 3' FABRIC HEIGHT. 4' HIGH FENCE SHALL HAVE 4' FABRIC HEIGHT. 5' HIGH FENCE SHALL HAVE 5' FABRIC HEIGHT. 6' HIGH FENCE SHALL HAVE 6' FABRIC HEIGHT.
3. BRACE BANDS SHALL BE ⅞"X⅛" GALVANIZED STEEL 5/16"X1 ¼" 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.



CHAIN LINK FENCE MOUNTED TO CONCRETE HEADWALL OR RETAINING WALL



BRACE & TRUSS CONNECTION



DETAIL "A"

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

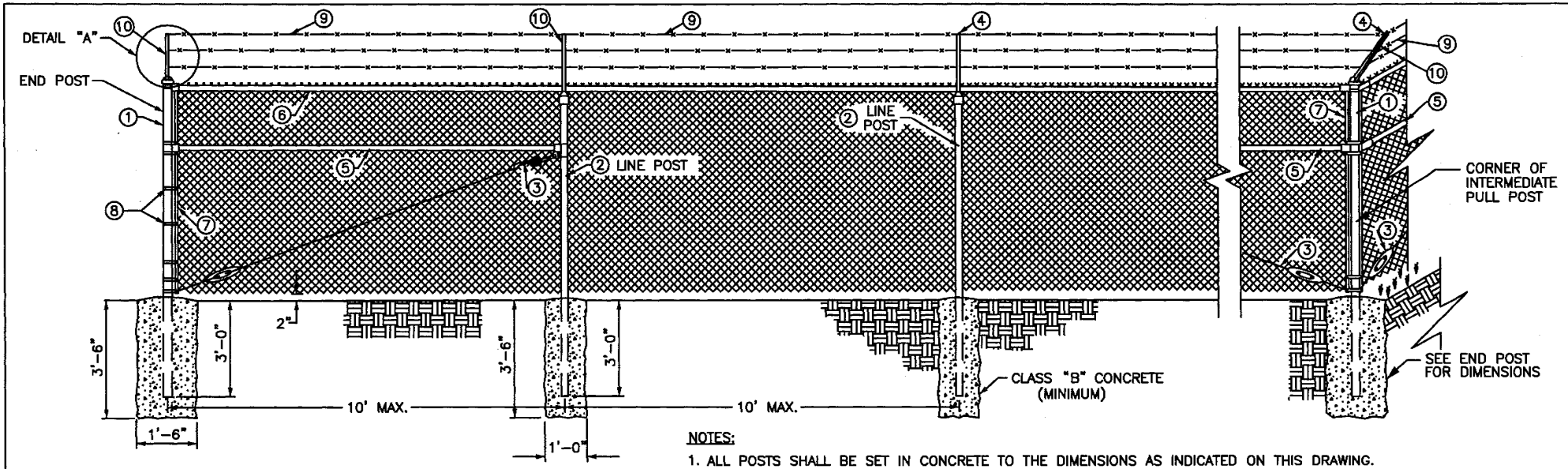
CHAIN LINK FENCE
3'-6"

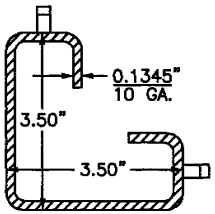
STANDARD DRAWING NO. 308

APPROVAL _____ DATE 5/1/08
URBAN COUNTY ENGINEER

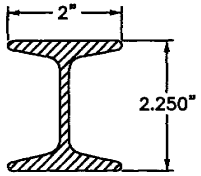
_____ DATE 5/1/08
COMMISSIONER

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

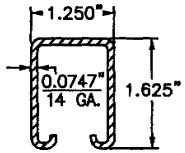




TERMINAL POST & CORNER POST



LINE POST



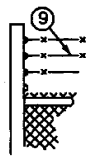
TOP & BRACE RAIL

LEGEND–(ALTERNATES)

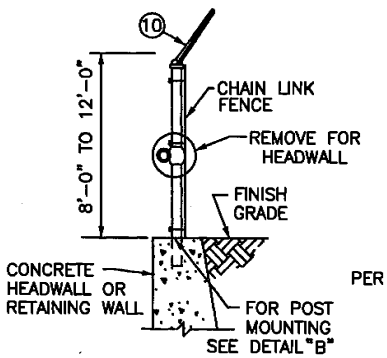
	TUBULAR	ROLL FORMED
①	2 ½" O.D. @ 3.65#/L.F.	3.5"X3.5" @ 5.14#/L.F.
②	2" O.D. @ 2.72#/L.F.	2.250" H–COL. @ 3.26#/L.F. OR 2.250" C–COL. @ 2.64#/L.F.
③	⅜" Ø TRUSS ROD & TIGHTENER	0.375" Ø TRUSS ROD & TIGHTENER
④	APPROVED CAPS	NOT REQUIRED
⑤	1 5/8" BRACE @ 2.27#/L.F.	1.250"X1.625" @ 1.35#/L.F.
⑥	1 5/8" O.D. @ 2.27#/L.F.	1.250"X1.625" @ 1.35#/L.F.
⑦	3/16"X ¾" FLAT STRETCHER BAR	NOT REQUIRED
⑧	BRACE BAND & TENSION BAND	NOT REQUIRED
⑨	BARBED WIRE	BARBED WIRE
⑩	BARBED WIRE ARMS	BARBED WIRE ARMS

NOTES:

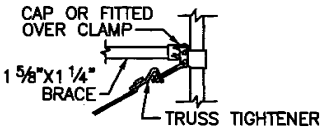
1. ALL POSTS SHALL BE SET IN CONCRETE TO THE DIMENSIONS AS INDICATED ON THIS DRAWING.
2. A 1 5/8" O.D. AT 2.27 LB. PER L.F. OR 1 ¼"X1 5/8" ROLL FORMED SECTION AT 1.35 LB. PER L.F. BOTTOM RAIL SHALL BE REQUIRED AROUND ALL UTILITY INSTALLATIONS AND AT OTHER LOCATIONS DESIGNATED BY THE ENGINEER.
3. 8' HIGH FENCE SHALL HAVE 7' FABRIC HEIGHT. 9' HIGH FENCE SHALL HAVE 8' FABRIC HEIGHT. 10' HIGH FENCE SHALL 9' FABRIC HEIGHT. 11' HIGH FENCE SHALL HAVE 10' FABRIC HEIGHT. 12' HIGH FENCE SHALL HAVE 11' FABRIC HEIGHT.
4. BRACE BAND SHALL BE ⅞"X ⅛" GALVANIZED STEEL WITH 5/16"X1 ¼" CARRIAGE BOLTS. POST CAPS AND SOCKET TYPE BRACE END CONNECTION SHALL BE GALVANIZED MALLEABLE IRON OR OTHER TYPE AS APPROVED BY THE ENGINEER. THEY SHALL BE DESIGNED IN A MANNER TO EXCLUDE MOISTURE FROM INSIDE POSTS AND RAILS.
5. O.D. DEPICTED FOR TUBULAR POSTS IS NOMINAL – ASTM A–120 SHALL GOVERN.
6. CHAIN LINK FENCE FABRIC SHALL BE 0.148 INCH NOMINAL DIAMETER (NO.9 GAGE) WIRE WOVEN IN 2 INCH MESH.



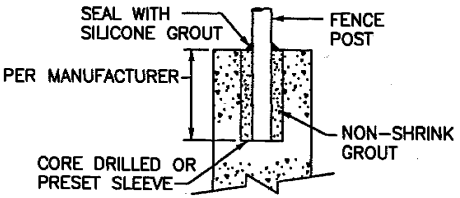
DETAIL "A" ROLL FORMED



CHAIN LINK FENCE MOUNTED TO CONCRETE HEADWALL OR RETAINING WALL



BRACE & TRUSS CONNECTION



DETAIL "B"

NO.	DATE	REVISION DESCRIPTION	BY

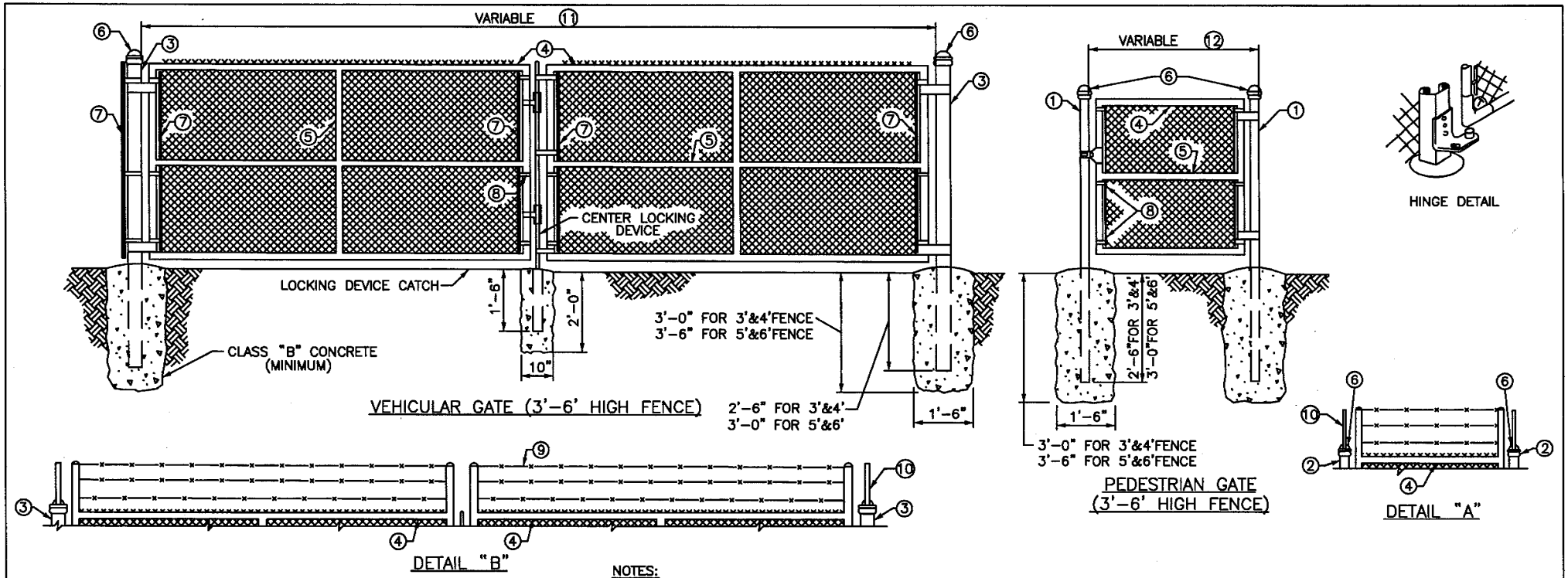
DIVISION OF ENGINEERING

CHAIN LINK FENCE
8'–12'

STANDARD DRAWING NO. 309

APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

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



LEGEND – (ALTERNATES)

	TUBULAR	ROLL FORMED
①	END POST 2½" O.D. @ 3.65#/L.F.	3½"X3½" @ 5.14#/L.F.
②	END POST 3" O.D. @ 3.65#/L.F.	3½"X3½" @ 5.14#/L.F.
③	4" O.D. @ 9.1#/L.F. GATE POST	NO ALTERNATE
④	2" O.D. @ 2.72#/L.F. GATE FRAME	NO ALTERNATE
⑤	1⅝" O.D. @ 2.27#/L.F.	NO ALTERNATE
⑥	APPROVED CAPS	NOT REQUIRED
⑦	3/16"X⅝" FLAT STRETCHER BAR	NOT REQUIRED
⑧	BRACE BAND & TENSION BAND	NOT REQUIRED
⑨	BARBED WIRE	BARBED WIRE
⑩	BARBED WIRE ARMS	BARBED WIRE ARMS

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.

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

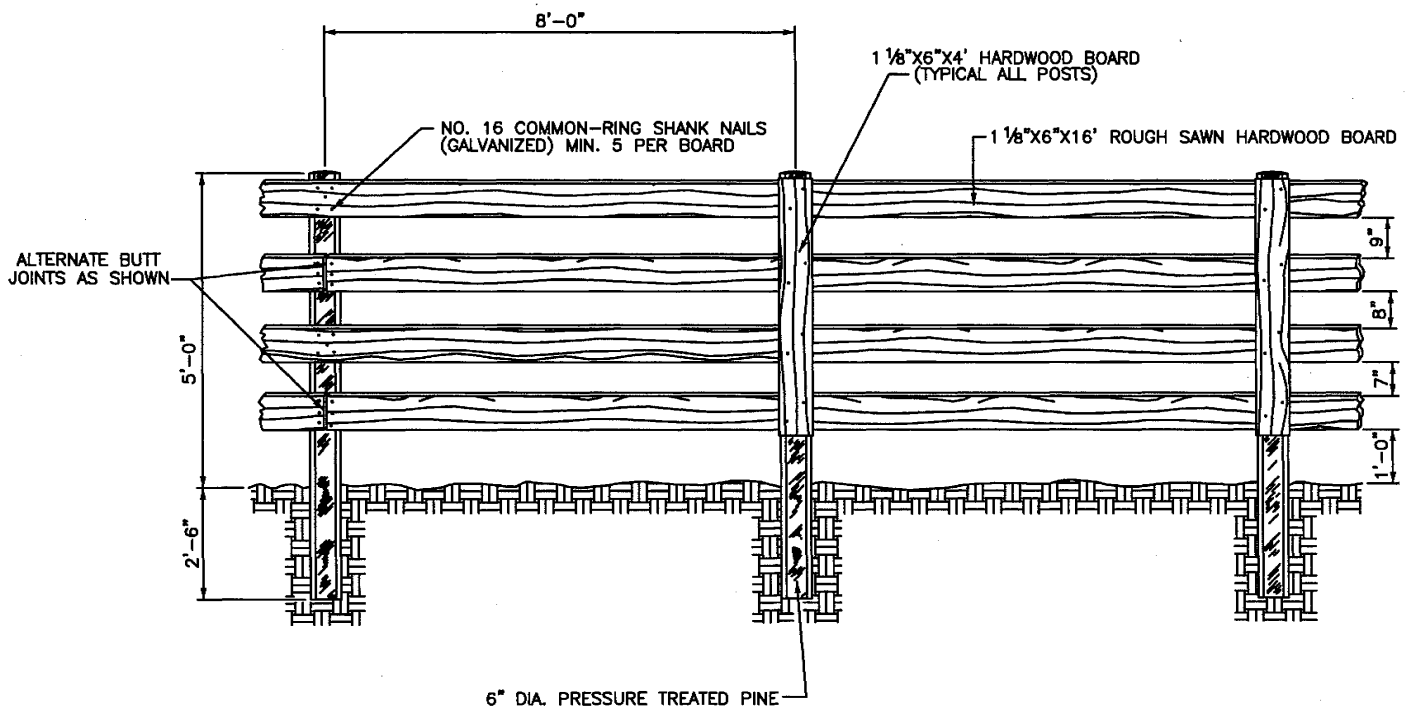
CHAIN LINK GATE

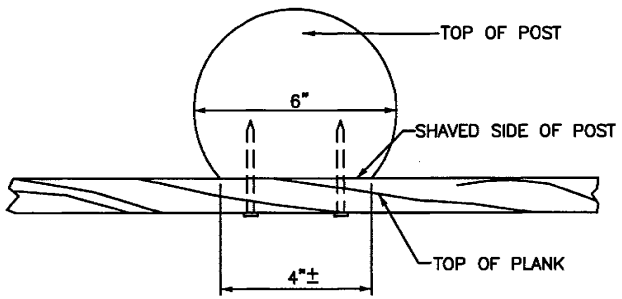
STANDARD DRAWING NO. 310

APPROVAL _____ 5/1/08
URBAN COUNTY ENGINEER DATE

_____ 5/1/08
COMMISSIONER DATE

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





NOTES:

1. POSTS ARE TO BE DRIVEN 2'-6" INTO GROUND AND TOPS CUT AT AN ANGLE TO DRAIN WATER.
2. FENCE SHALL BE PAINTED BLACK OR WHITE WITH PAINT AND APPLICATION RATE AS APPROVED BY THE ENGINEER.
3. HARDWOODS APPROVED ARE RED OAK, WHITE OAK, AND POPLAR.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

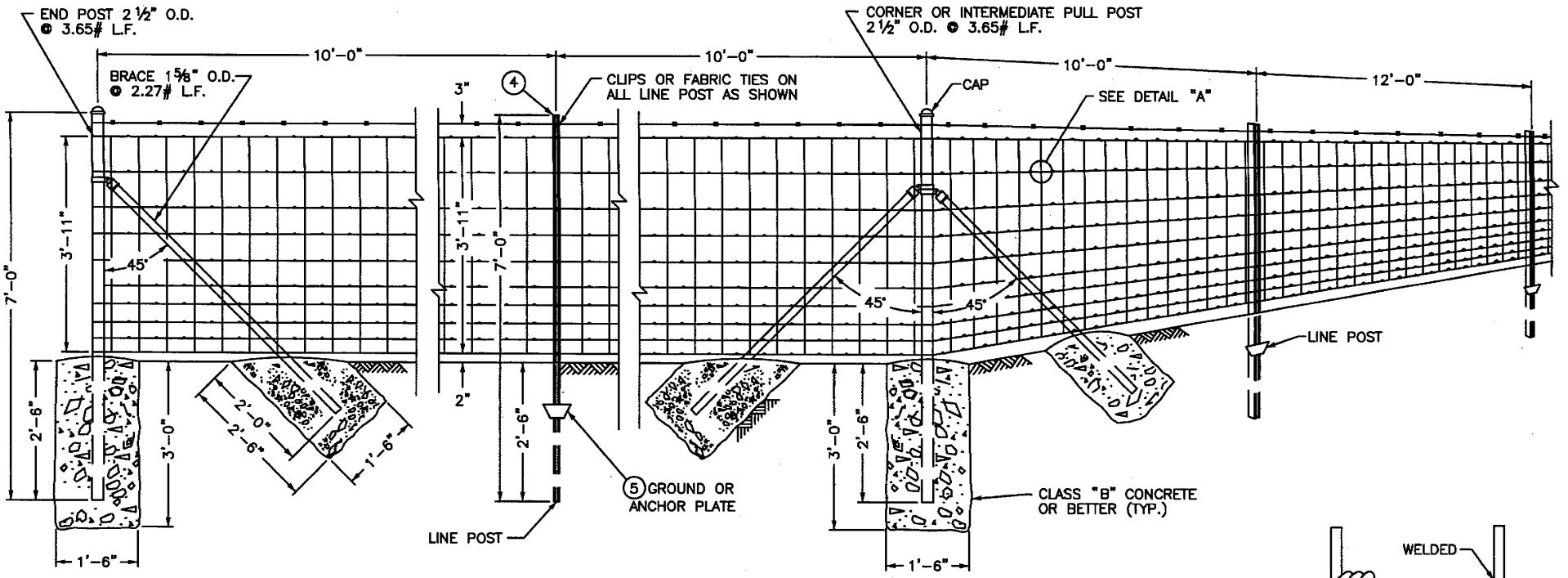
PLANK FENCE

STANDARD DRAWING NO. 311

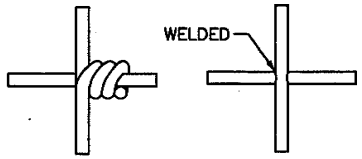
APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

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:

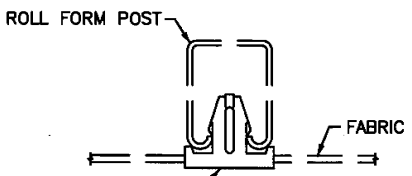
1. WOVEN-WIRE USED FABRIC IN RIGHT-OF-WAY FENCE SHALL BE EITHER ALUMINUM-COATED STEEL NO. 1047-6-9 OR ZINC-COATED STEEL NO. 1047-6-9.
2. ALL FENCE FITTINGS SHALL COMPLY WITH ASTM F 626.
3. O.D. DEPICTED FOR TUBULAR POSTS IS NOMINAL - ASTM F 1083 SHALL GOVERN.

(4) STUDDED "T" POST AT 1.33 LBS. PER FOOT.

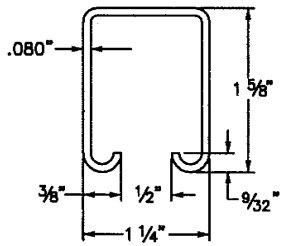
- OR -

ROLL FORM POST AT 1.35 LBS. PER FOOT. (SEE DETAIL)

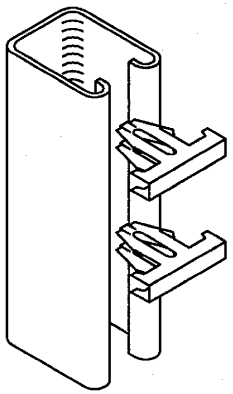
(5) NOT REQUIRED FOR ROLL FORM POST.



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

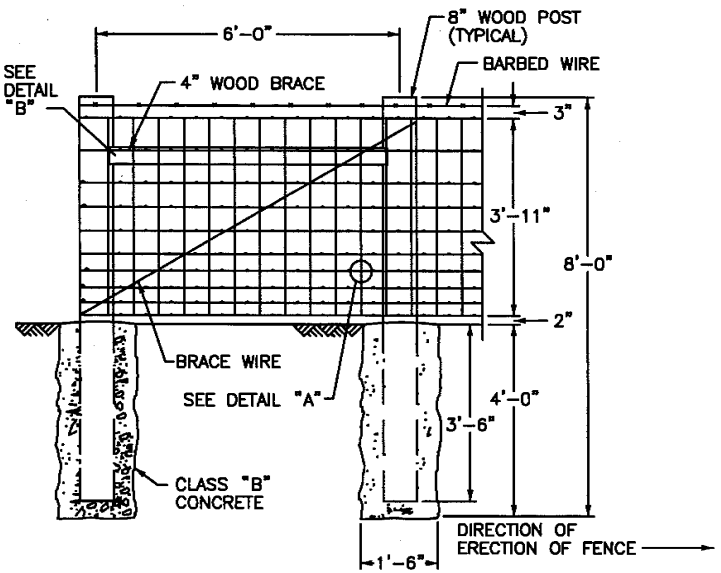
WOVEN WIRE
RIGHT-OF-WAY FENCE
TYPE 1

STANDARD DRAWING NO. 312

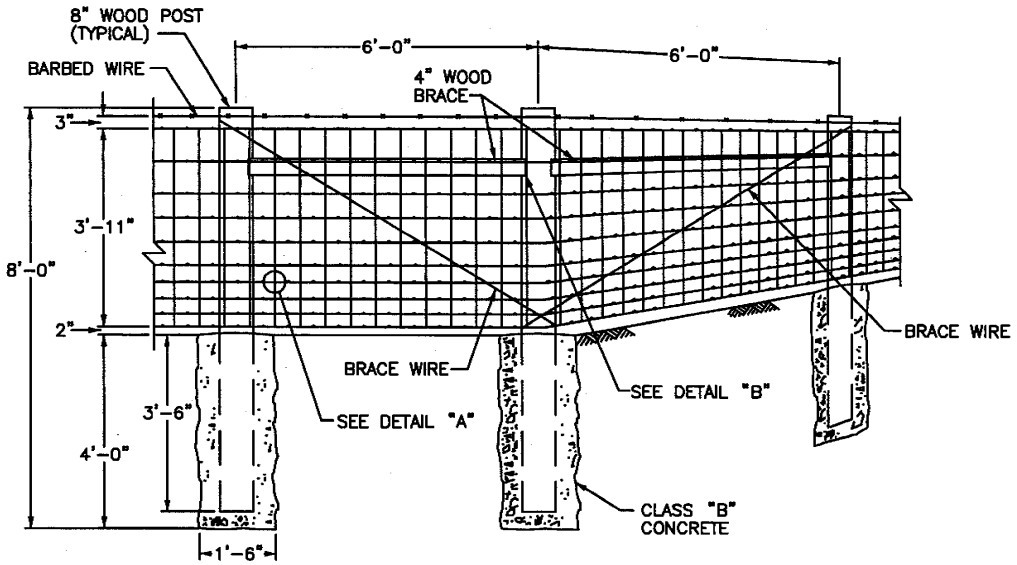
APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

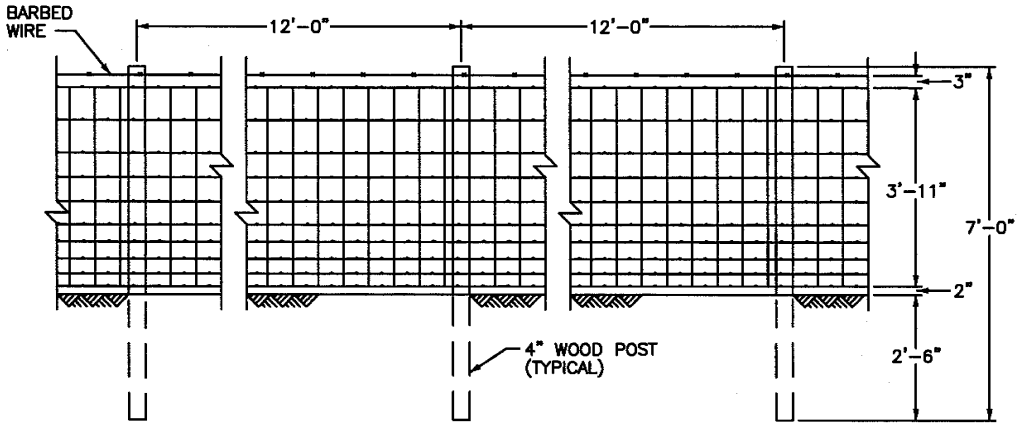
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



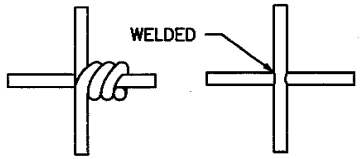
PULL OR END POST ASSEMBLY



CORNER POST ASSEMBLY

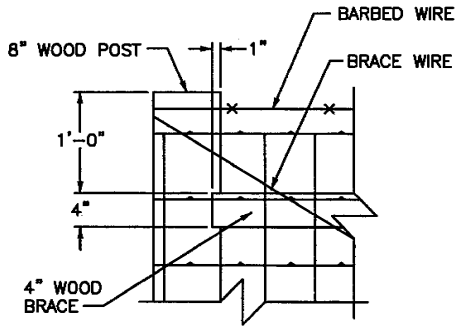


LINE POST



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

DETAIL "A"



DETAIL "B"

NOTES:

1. ON INTERMEDIATE PULL POST ASSEMBLIES, BRACE WIRES SHALL BE REQUIRED FOR BOTH DIRECTIONS.
2. WOVEN-WIRE FABRIC USED IN RIGHT-OF-WAY FENCE SHALL BE EITHER ALUMINUM-COATED STEEL NO. 1047-6-9 OR ZINC-COATED STEEL NO. 1047-6-9.

NO.	DATE	REVISION DESCRIPTION	BY

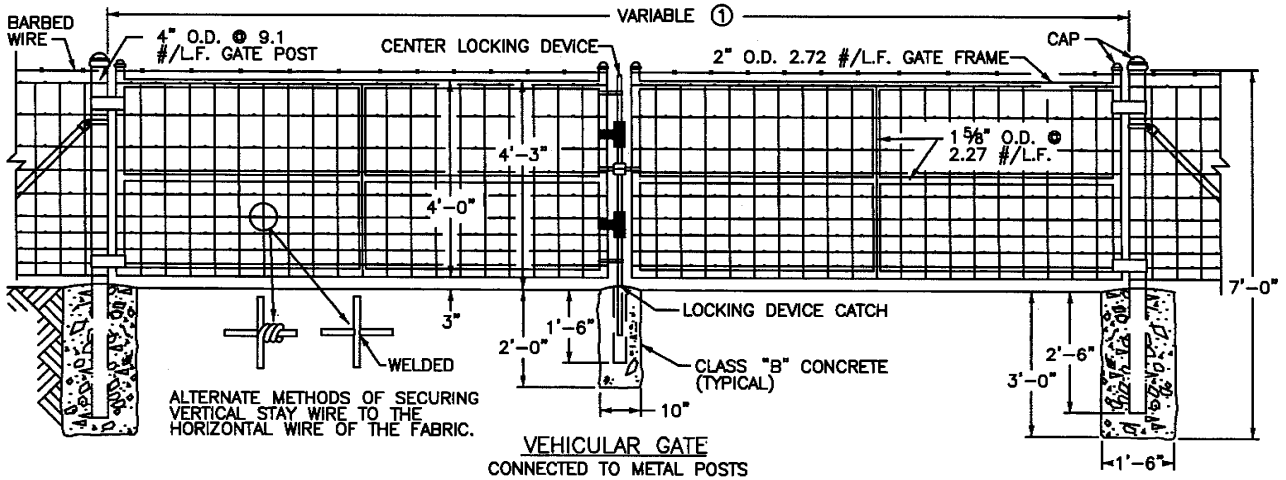
DIVISION OF ENGINEERING

WOVEN WIRE RIGHT-OF-WAY FENCE TYPE 2

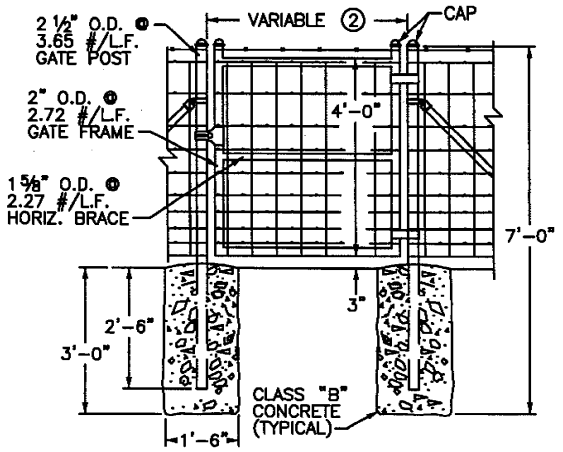
STANDARD DRAWING NO. 313

APPROVED: URBAN COUNTY ENGINEER — DATE 5/1/08

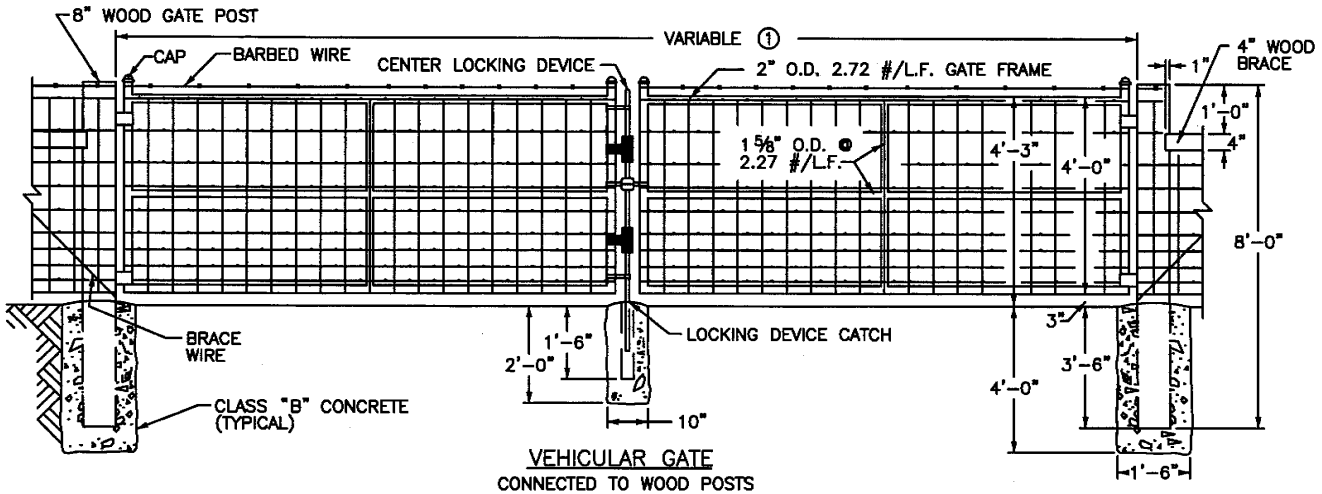
COMMISSIONER — DATE 5/1/08



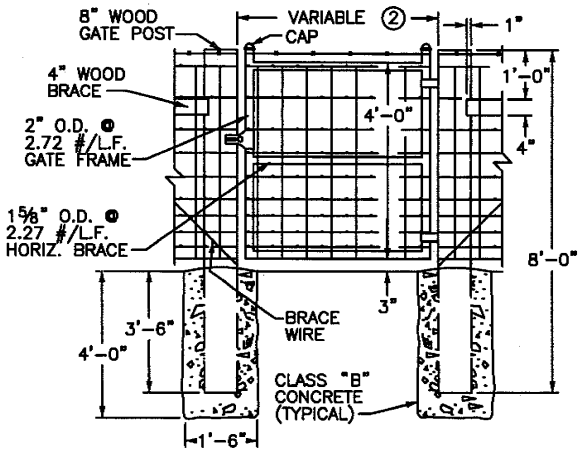
VEHICULAR GATE
CONNECTED TO METAL POSTS



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

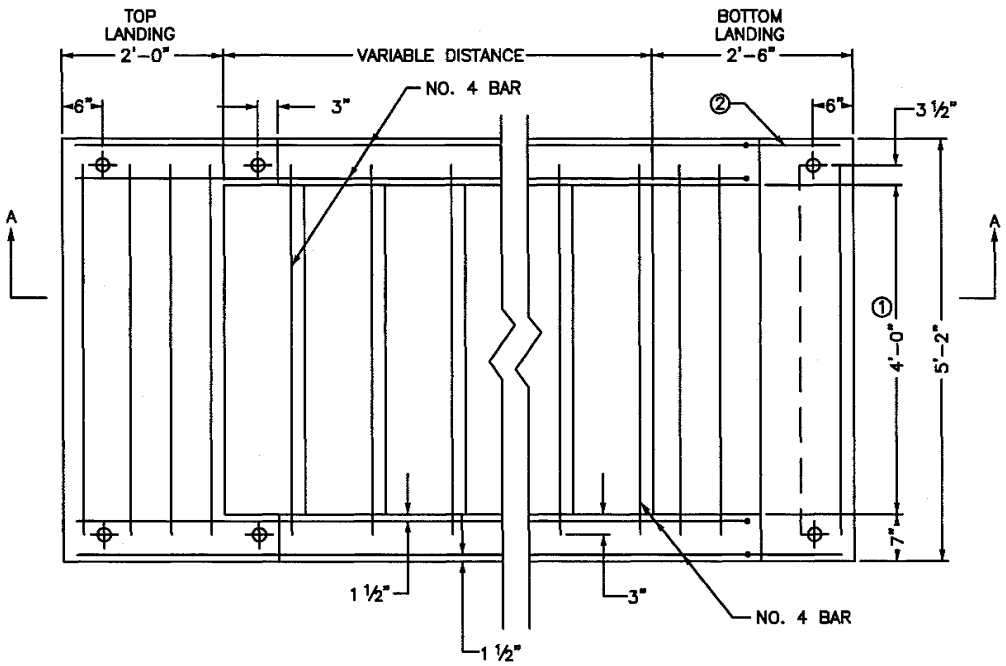
WOVEN WIRE GATES

STANDARD DRAWING NO. 314

APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

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



PLAN

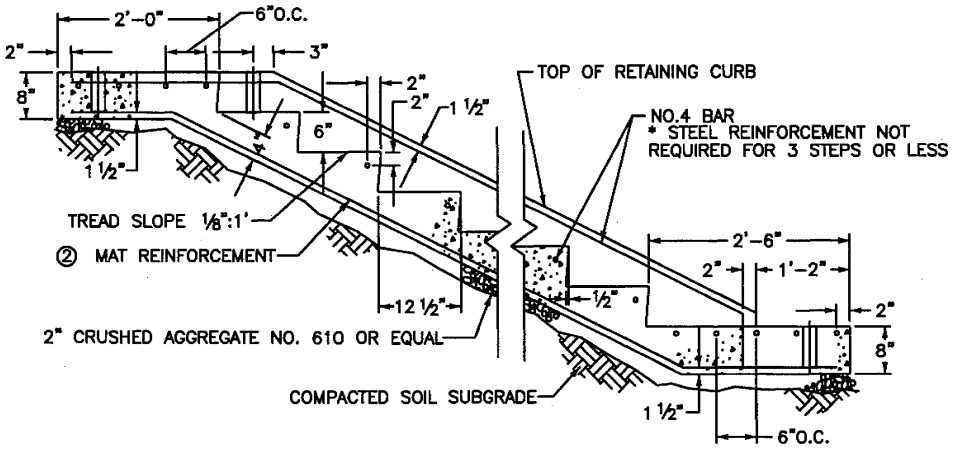
NOTES:

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.

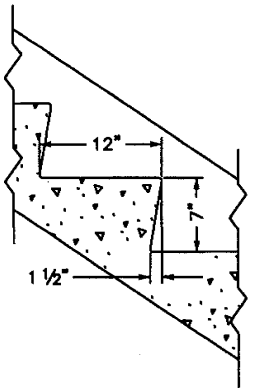
TABLE OF QUANTITIES

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	12.602	2.542	28.613	5.400	0.36	0.062
	INTERMEDIATE STEP	7.431	1.336	5.268	1.063	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

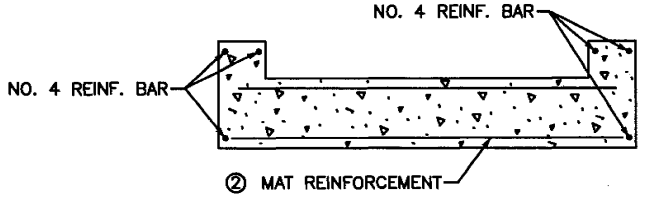
① APPROXIMATE QUANTITY TO ADD FOR EACH ADDITIONAL FOOT OF WIDTH OVER 4'–0".



SECTION A–A 2:1 SLOPE



STEP DETAIL FOR 1 ½:1 SLOPE



STEP CROSS SECTION

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

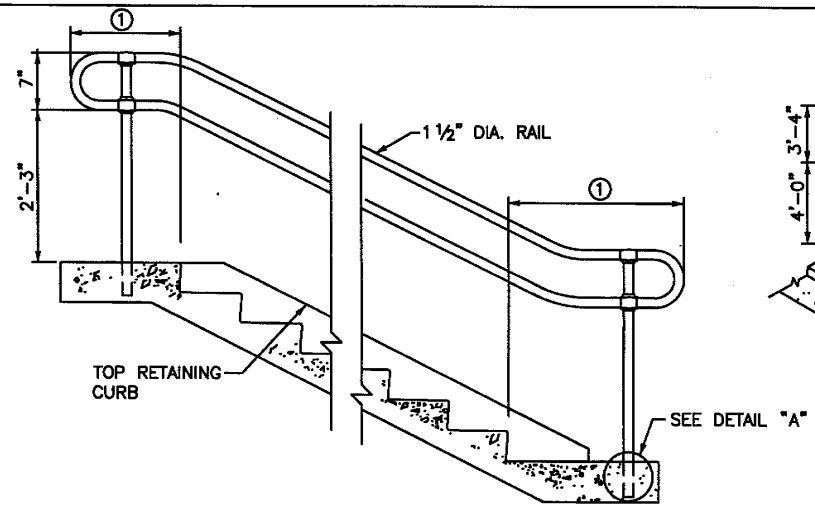
CONCRETE STEPS

STANDARD DRAWING NO. 315

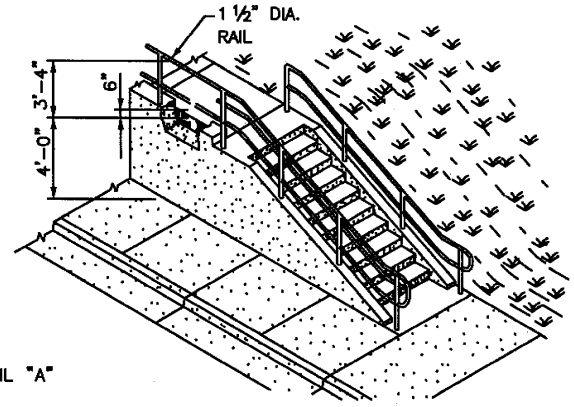
APPROVED _____ DATE 5/1/08

URBAN COUNTY ENGINEER

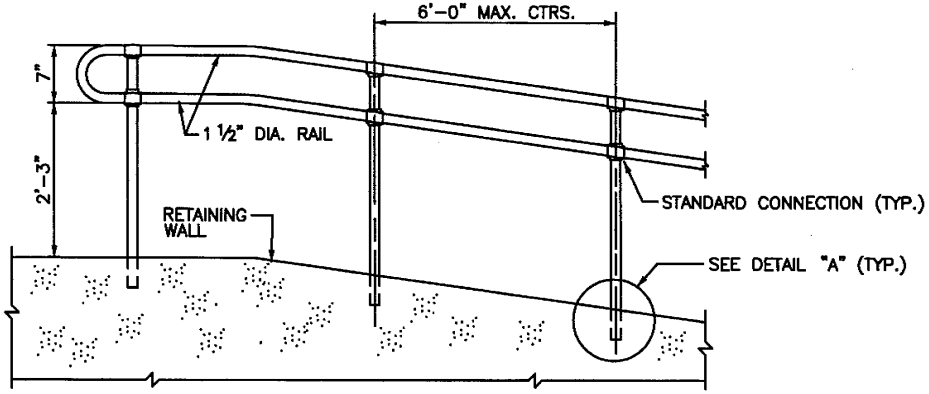
COMMISSIONER _____ DATE 5/1/08



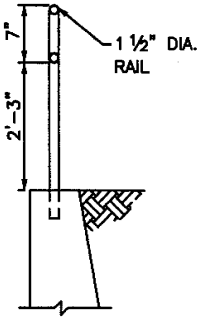
ELEVATION OF HANDRAIL TYPE 2



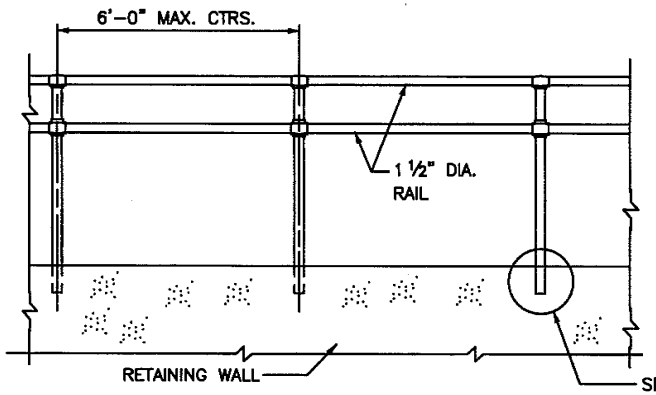
ELEV. OF HANDRAIL TYPE 1



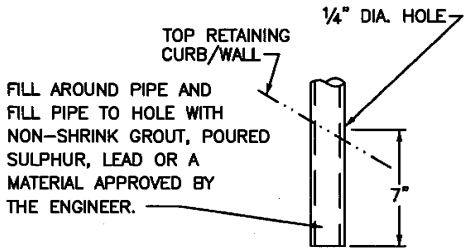
ELEV. HANDRAIL TYPE 1 FOR SLOPES



RT. SIDE ELEVATION



ELEVATION OF HANDRAIL TYPE 2



DETAIL "A"

NOTES:

1. ALL HANDRAILS SHALL COMPLY WITH THE LATEST EDITION OF THE AMERICANS WITH DISABILITIES ACT (ADA) GUIDELINES.
2. ANCHOR POST IN CORED OR FORMED HOLES (SEE DETAIL "A").
3. HANDRAIL SHALL BE REQUIRED WITH THREE OR MORE STEPS.
4. HANDRAIL USED AS A TOP HANDRAIL ON STEPS AND HANDRAIL USED ON A RETAINING WALL SHALL BE REQUIRED WHEN THE ADJACENT FLOOR, GROUND LEVEL, ROAD, WALK, ETC. IS 4' OR MORE BELOW THE TOP OF THE RETAINING WALL. HANDRAIL SHALL BE UNIFORMLY CONSTRUCTED.
5. THE TOP OF THE RETAINING WALL OR CURB SHALL BE A MINIMUM OF 6" ABOVE THE ADJOINING SIDEWALK.
6. RAILS SHALL NOT ROTATE IN FITTINGS AND SHALL HAVE WELDED CONNECTIONS.
7. THE CLEAR SPACE BETWEEN HANDRAILS AND WALL SHALL BE 1½".
8. HANDRAILS SHOULD BE CONSTRUCTED OF DN 40 SCHEDULE 40 ALUMINUM PIPE IN ACCORDANCE WITH ASTM-B221 OR B210 ALLOY 6061-T6.

SHEET NOTE: ①

① HANDRAILS SHALL EXTEND 12" BEYOND THE TOP RISER AND AT LEAST 12" PLUS THE WIDTH OF ONE TREAD BEYOND THE BOTTOM RISER. AT THE TOP, THE EXTENSION SHALL BE PARALLEL WITH THE FLOOR OR GROUND SURFACE. AT THE BOTTOM, THE HANDRAIL SHALL CONTINUE TO SLOPE FOR A DISTANCE OF THE WIDTH OF ONE TREAD FROM THE BOTTOM RISER, THE REMAINDER OF THE EXTENSION SHALL BE HORIZONTAL.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

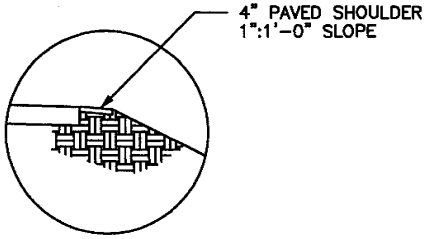
HANDRAIL

STANDARD DRAWING NO. 316

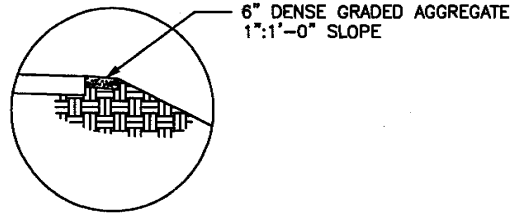
APPROVED _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

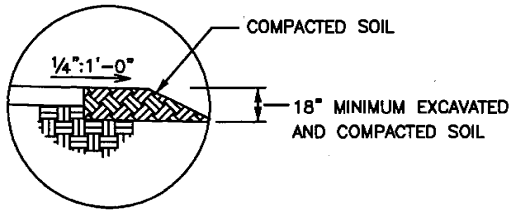
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



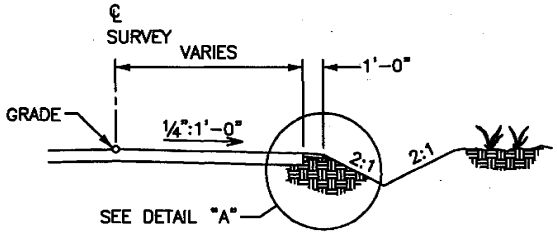
DETAIL "A"



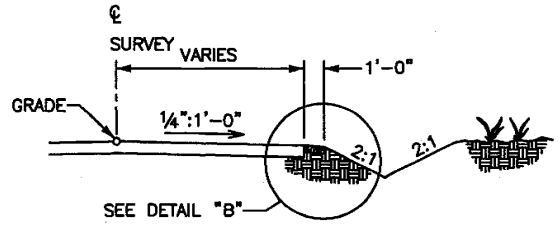
DETAIL "B"



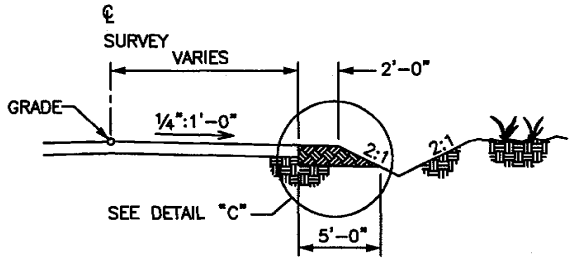
DETAIL "C"



PAVED SHOULDER



ROCK SHOULDER



SOIL SHOULDER

NOTES:

1. SLOPES AND DRAINAGE DITCHES OUTSIDE THE R/W SHALL BE APPROVED BY THE ENGINEER.
2. DRAINAGE DITCH SIDE SLOPES SHALL BE 2:1 MAXIMUM.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

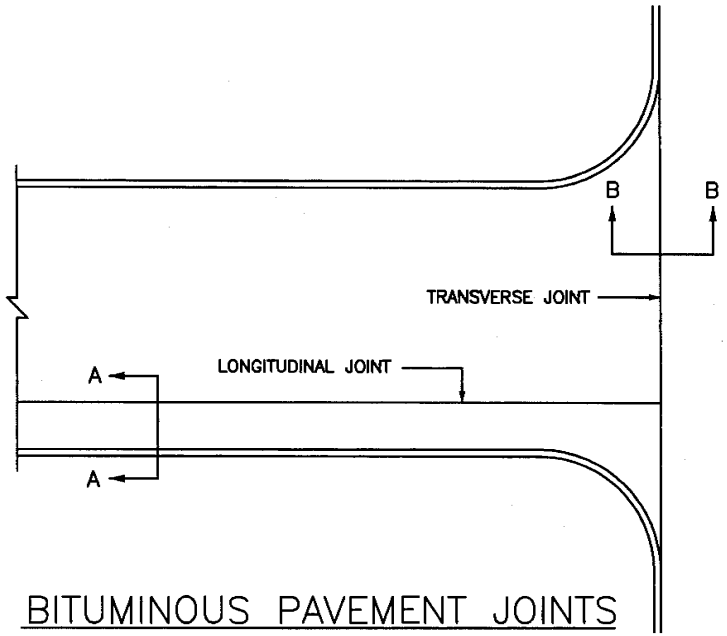
COUNTY ROAD
TYPICAL SHOULDER SECTIONS
(MINIMUM REQUIREMENTS)

STANDARD DRAWING NO. 317

APPROVED: _____ DATE 5/1/08
URBAN COUNTY ENGINEER

_____ DATE 5/1/08
COMMISSIONER

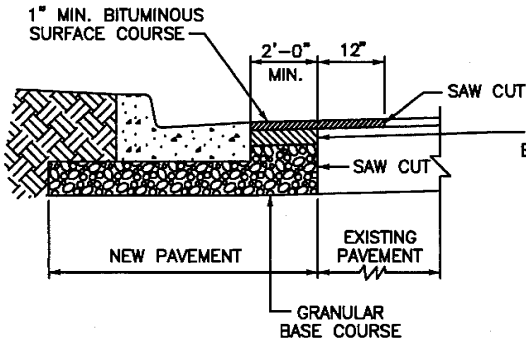
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



BITUMINOUS PAVEMENT JOINTS

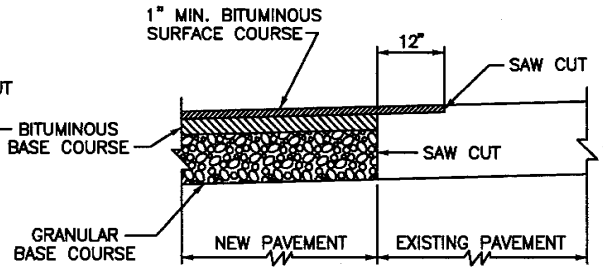
NOTES:

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

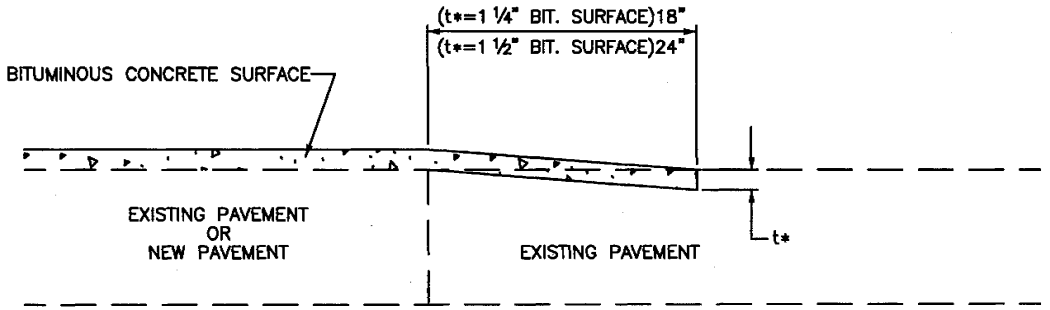
EDGE KEY

STANDARD DRAWING NO. 318

APPROVED _____ DATE 5/1/08

URBAN COUNTY ENGINEER

COMMISSIONER _____ DATE 5/1/08



EDGE KEY

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

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

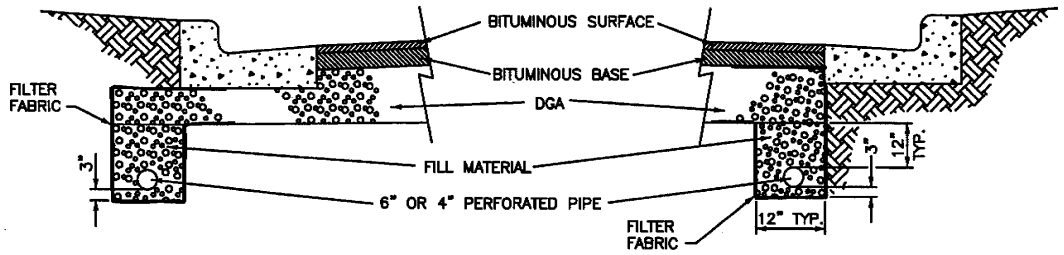
STANDARD DRAWING NO. 319

APPROVED _____ 5/1/08
URBAN COUNTY ENGINEER DATE

_____ 5/1/08
COMMISSIONER DATE

TYPICAL SECTION

CASE 1

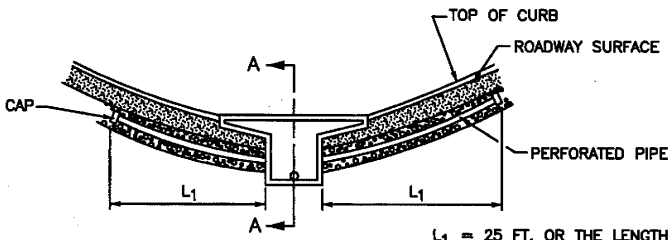


CASE 2

NOTES:

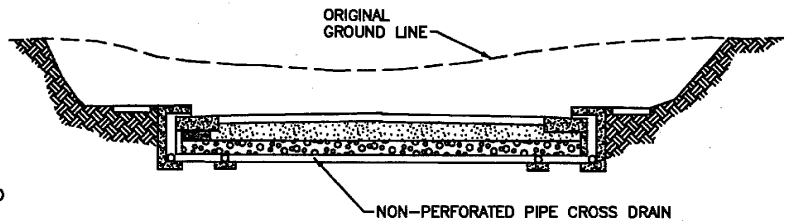
1. SUBGRADE DRAINAGE, AS DEPICTED, IS INTENDED FOR USE WITH THE SURFACING PHASE OF CONSTRUCTION, AND SHALL BE INSTALLED ONLY AFTER THE SUBGRADE HAS BEEN COMPLETED, AND PRIOR TO CONSTRUCTING PAVING MATERIALS.
2. THE CAP SHALL BE A STANDARD MANUFACTURED ITEM FURNISHED BY THE PIPE SUPPLIER.
3. TERMINATE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

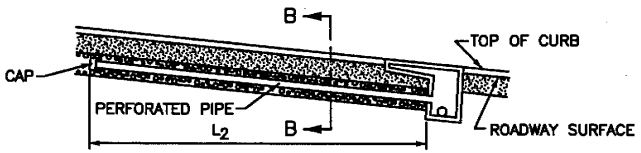


SAG VERTICAL CURVE

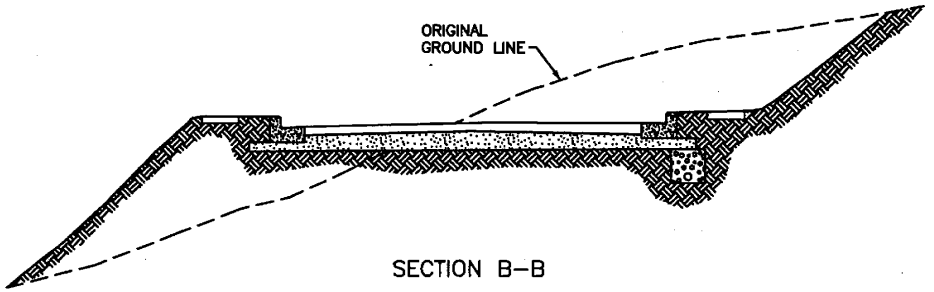
L_1 = 25 FT. OR THE LENGTH REQUIRED TO REACH THE 1% SLOPE POINT, WHICHEVER IS LARGER.



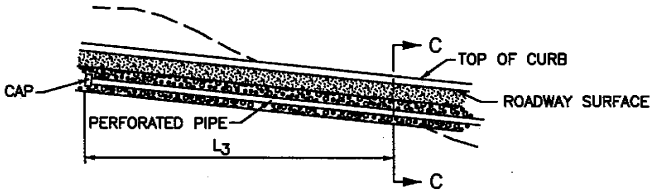
SECTION A-A



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

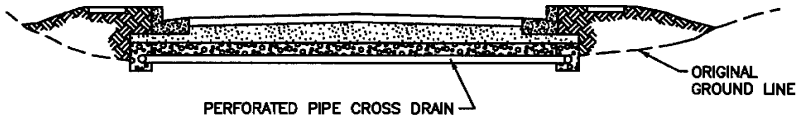


SECTION B-B



CUT TO FILL

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



SECTION C-C

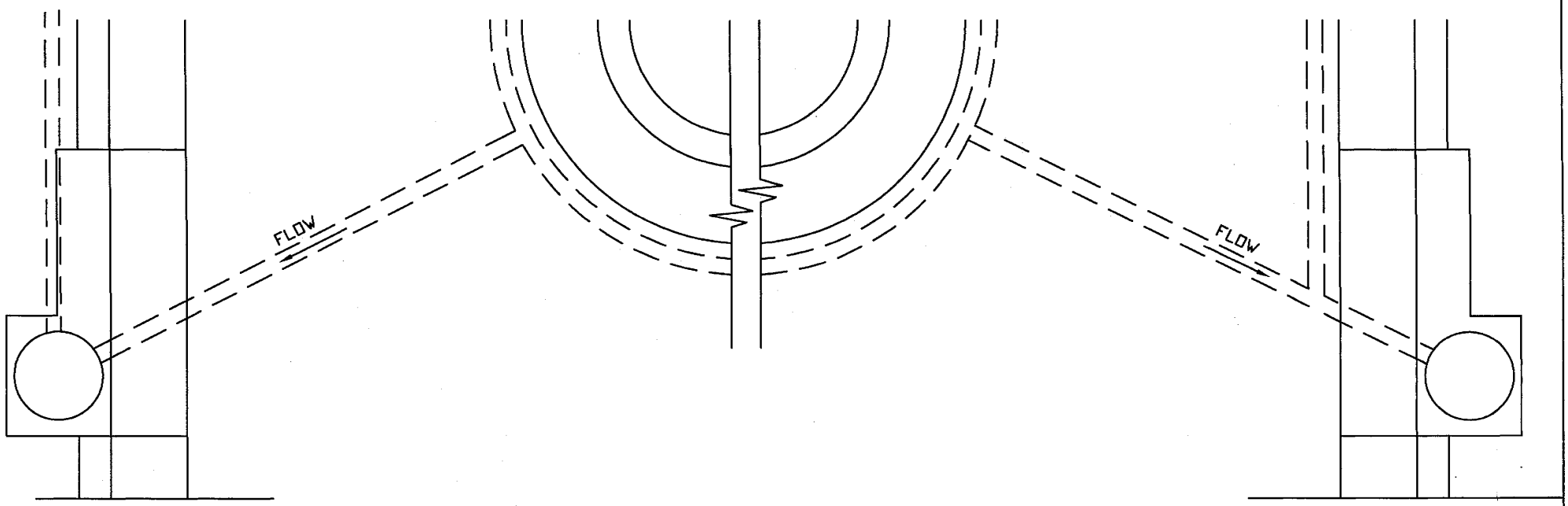
NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

PERFORATED PIPE SUBGRADE DRAINAGE ALONG ROADWAY

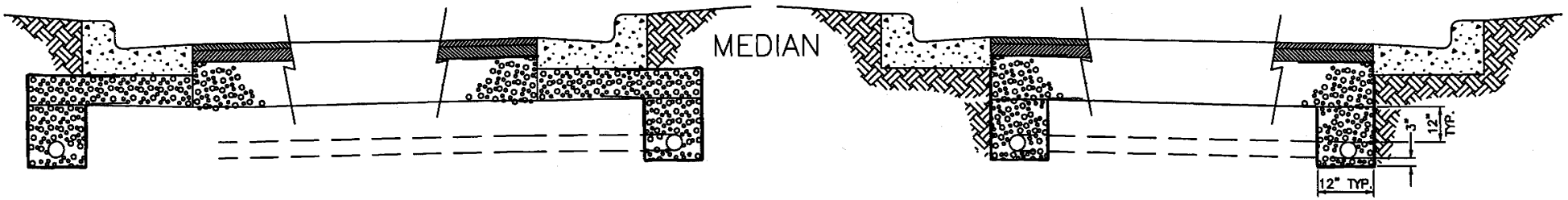
STANDARD DRAWING NO.	320
APPROVED: URBAN COUNTY ENGINEER	DATE 5/1/08
COMMISSIONER	DATE 5/1/08

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

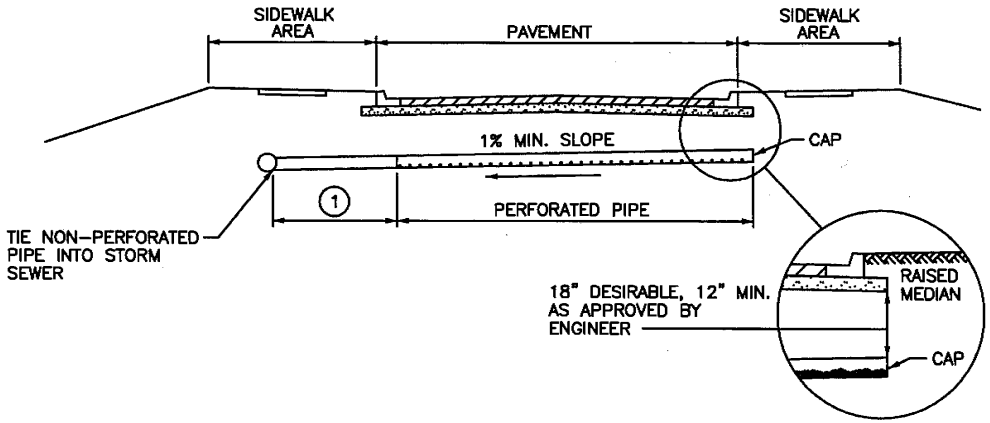
PERFORATED PIPE SUBGRADE DRAINAGE FOR RAISED NON-PAVED MEDIANS

STANDARD DRAWING NO. 320-1

APPROVED _____ DATE 5/1/08

URBAN COUNTY ENGINEER

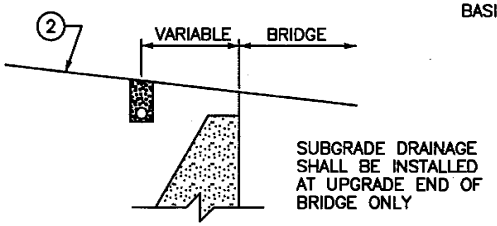
COMMISSIONER _____ DATE 5/1/08



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.

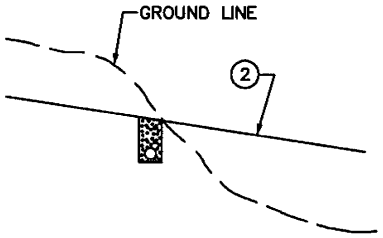
SAG VERTICAL CURVES



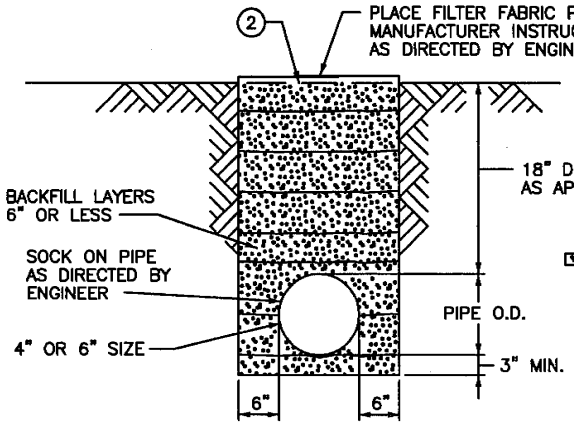
BRIDGES

(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

SM-1 – 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

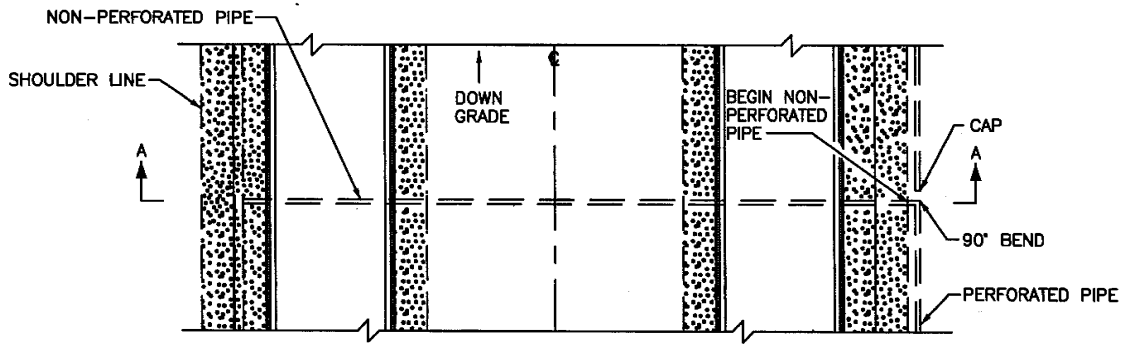
PERFORATED PIPE FOR SUBGRADE DRAINAGE

STANDARD DRAWING NO. 321

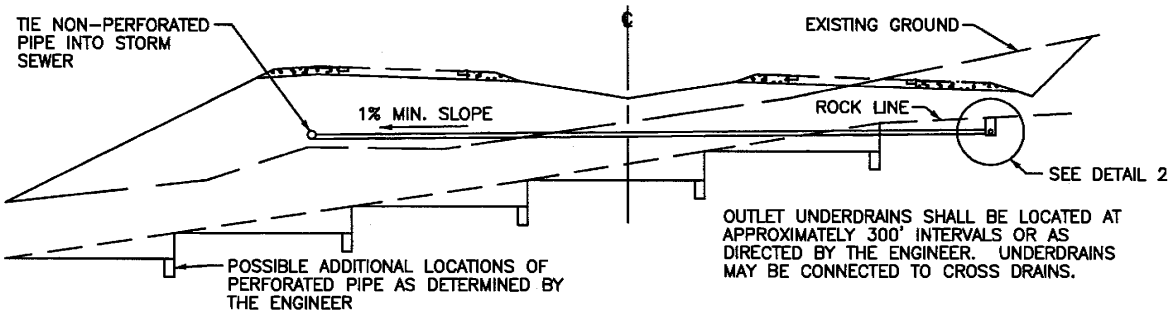
APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

TYPICAL SUBGRADE DRAINAGE LOCATIONS

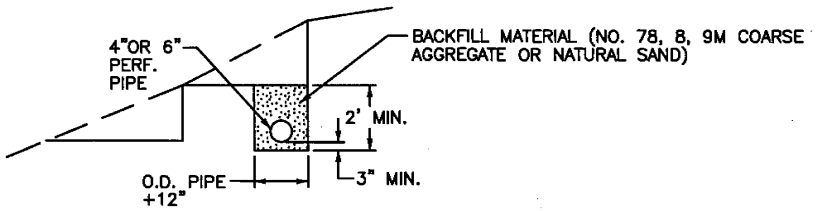
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



PLAN VIEW



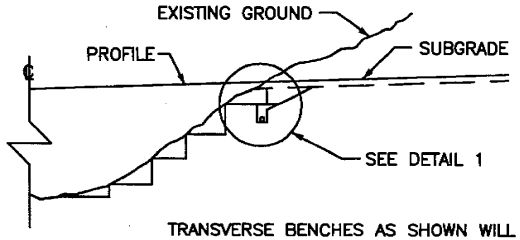
SECTION A–A



DETAIL 2

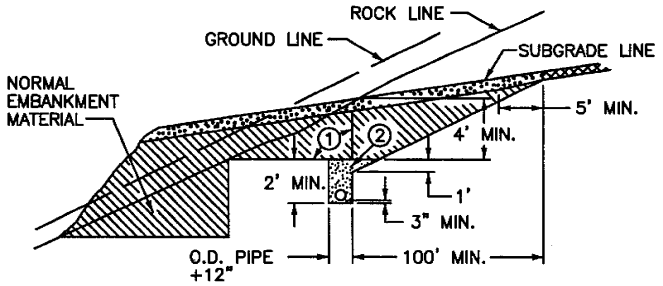
DETAIL FOR LONGITUDINAL UNDERDRAINS

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

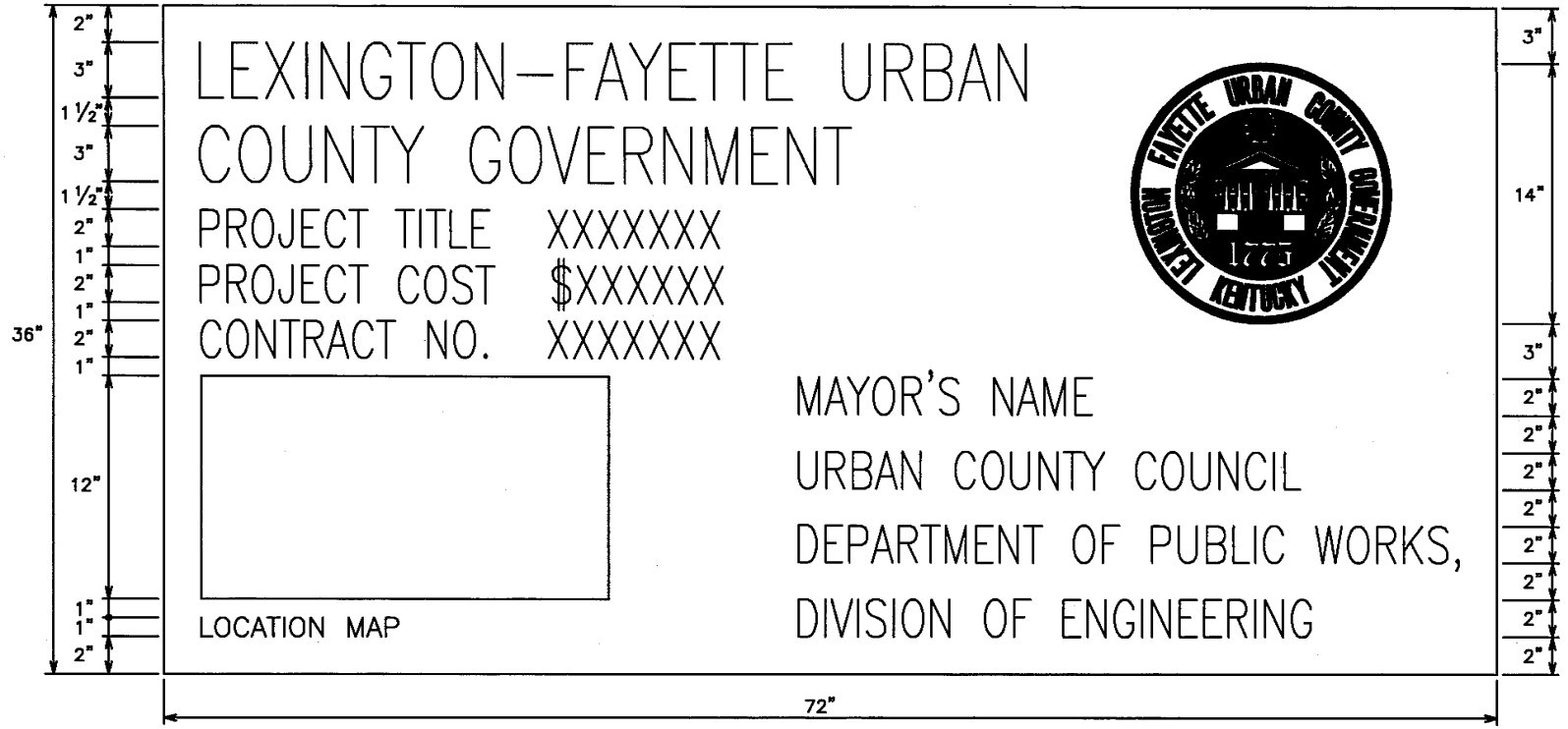
STANDARD DRAWING NO. 322

APPROVAL

URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 5/1/08

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

APPROVAL _____ 5/1/08
URBAN COUNTY ENGINEER DATE

_____ 5/1/08
COMMISSIONER DATE