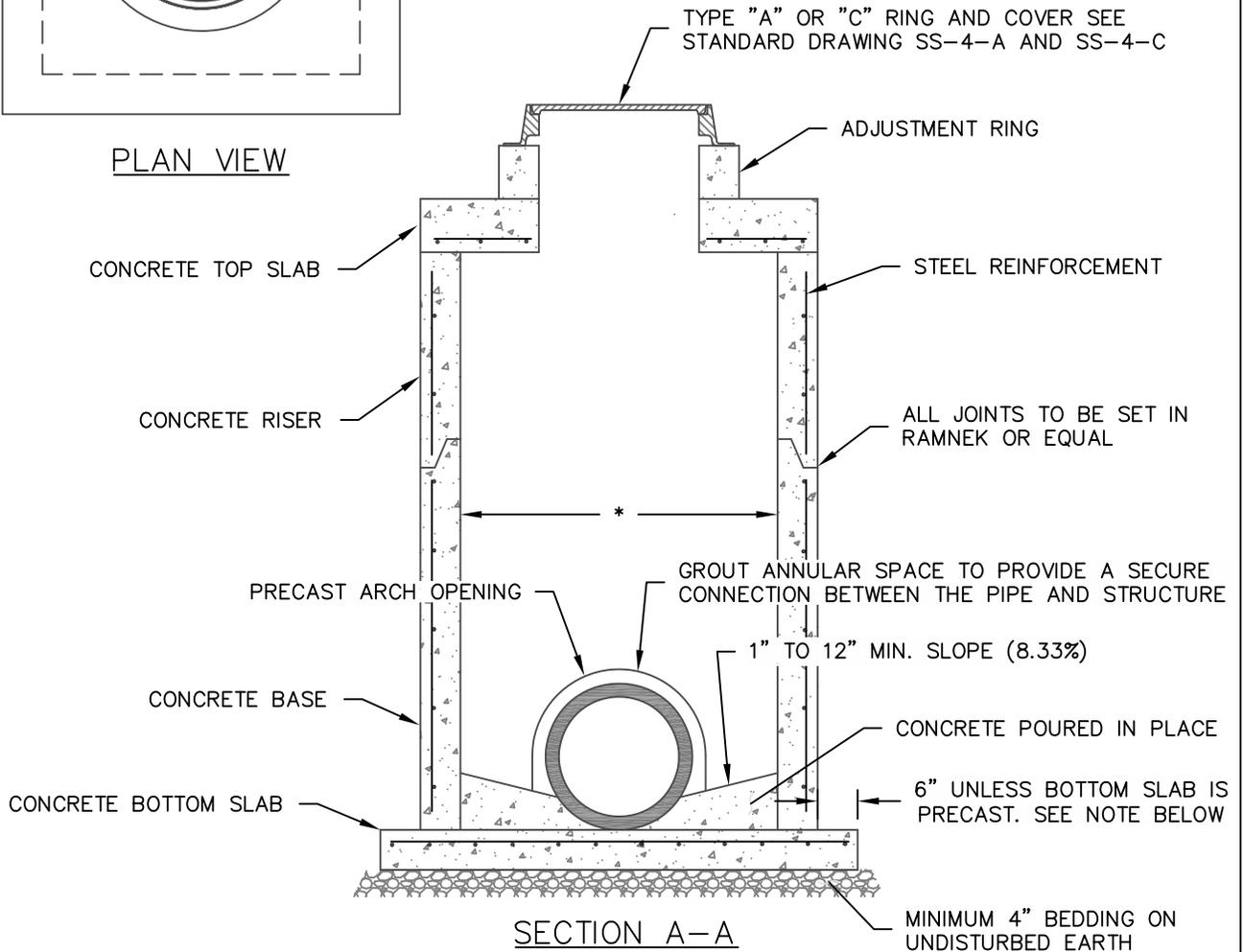




PLAN VIEW



SECTION A-A

NOTES:

1. JUNCTION BOX SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH ASTM C 913.
2. CONCRETE TOP SLAB SHALL BE DESIGNED TO WITHSTAND LOADING BASED ON A COMBINATION OF DEAD LOADS, SNOW LOADS, AND A-16 (HS20-44) TRAFFIC LOADS IN ACCORDANCE WITH ASTM C890.
3. BOTTOM SLAB SHALL BE POURED IN PLACE. IF MANUFACTURER IS CONCERNED ABOUT STRUCTURAL INTEGRITY OF BASE DURING TRANSPORTATION THEN THE BOTTOM SLAB MAY BE PRECAST WITH RISER.
4. PIPE TO BE ON GRADE BEFORE BOTTOM SLAB IS CONSTRUCTED UNLESS BOTTOM IS PRECAST WITH BASE.
5. ALL PIPES SHALL FIT FLUSH WITH INSIDE FACE OF JUNCTION BOX.
6. BOTTOM OF JUNCTION BOX TO BE FILLED WITH CONCRETE FORMING CHANNELS TOWARD OUTLET PIPE FROM ALL INLET PIPES. CONCRETE SHALL BE FLUSH WITH INVERT OF OUTLET PIPE.
7. NO MORE THAN 2 ADJUSTMENT RINGS MAY BE USED BUT SHALL NOT EXCEED 18 INCHES.
8. CONCRETE TOP SLAB SHALL BE PINNED TO STRUCTURE AT THE CORNERS USING ONE #4 DEFORMED BAR IN EACH CORNER. BAR SHALL EXTEND A MINIMUM OF 6 INCHES INTO RISER BELOW.

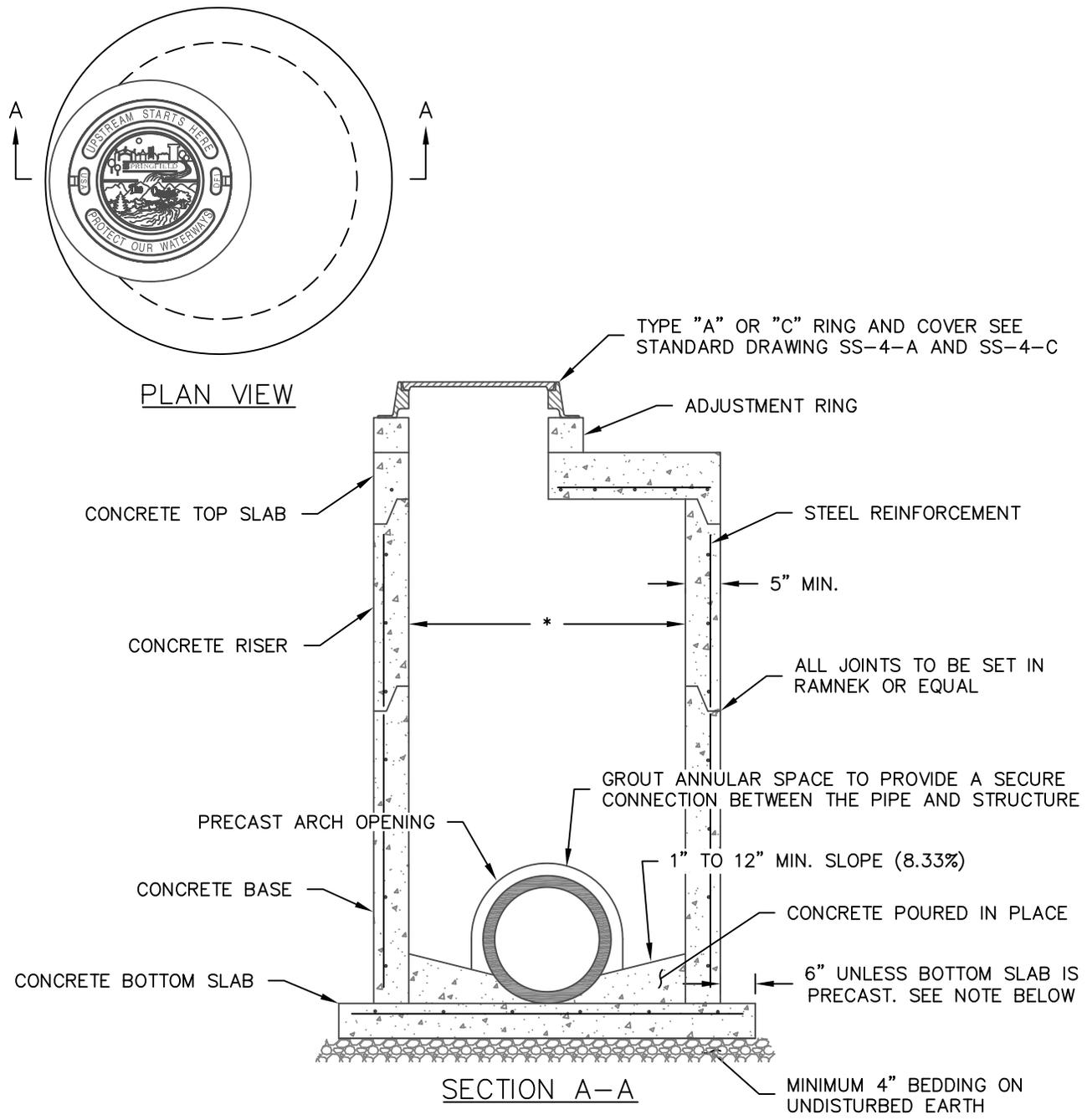
PIPE DIAMETER	*MINIMUM INSIDE DIMENSION OF STRUCTURE
15" - 24"	THREE FEET (3')
27" - 30"	FOUR FEET (4')
36" - 42"	FIVE FEET (5')
48" - 54"	SIX FEET (6')

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MO.

JUNCTION BOX

ADOPTED: 7-1-15

SS-1

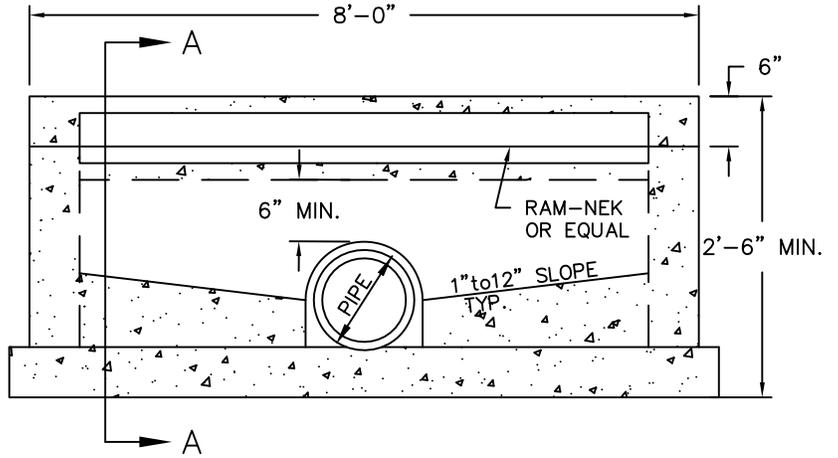
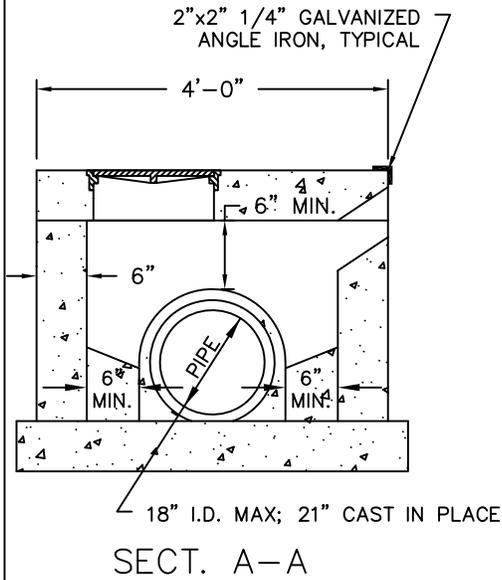


- NOTES:
1. MANHOLE SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH ASTM C 478.
 2. BOTTOM SLAB SHALL BE POURED IN PLACE. IF MANUFACTURER IS CONCERNED ABOUT STRUCTURAL INTEGRITY OF CONCRETE BASE DURING TRANSPORTATION THEN THE BOTTOM SLAB MAY BE PRECAST WITH CONCRETE BASE.
 3. PIPE TO BE ON GRADE BEFORE BOTTOM SLAB IS CONSTRUCTED.
 4. ALL PIPES SHALL FIT FLUSH AT SPRINGLINE WITH INSIDE FACE OF MANHOLE.
 5. BOTTOM OF MANHOLE TO BE FILLED WITH CONCRETE FORMING CHANNELS TOWARD OUTLET PIPE FROM ALL INLET PIPES. CONCRETE SHALL BE FLUSH WITH INVERT OF OUTLET PIPE.
 6. NO MORE THAN 2 ADJUSTMENT RINGS MAY BE USED AND SHALL NOT EXCEED 18 INCHES.
 7. A MINIMUM CLEARANCE OF TWO FEET, MEASURED AT THE INSIDE FACE OF THE MANHOLE SHALL BE MAINTAINED BETWEEN THE OUTSIDE EDGE OF STORM SEWER PIPES..

PIPE DIAMETER	*MINIMUM INSIDE DIAMETER OF MANHOLE (SEE NOTE 7)
15" - 24"	FOUR FEET (4')
27" - 42"	FIVE FEET (5')
48"	SIX FEET (6')
54" - 66"	EIGHT FEET (8')

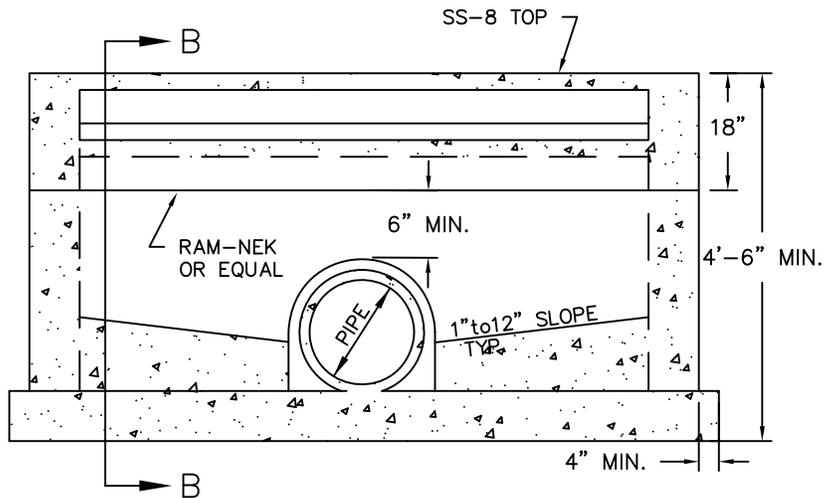
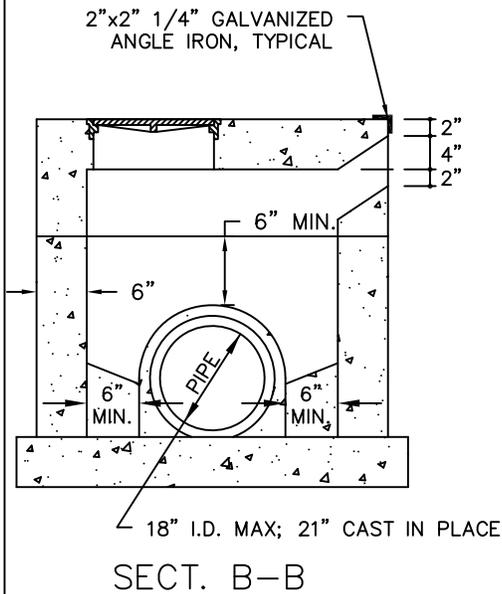
PRECAST TOPS

REQUIRED DIMENSIONS



FOR 6" PRECAST TOP

NOTE: #4 ϕ AT 10" O.C. (ALL WALLS, VERT. & HORZ.)
SEE SS-8 FOR TOP SLAB REINFORCEMENT.



FOR SS-8 TOP (18" PRECAST TOP)

NOTES:

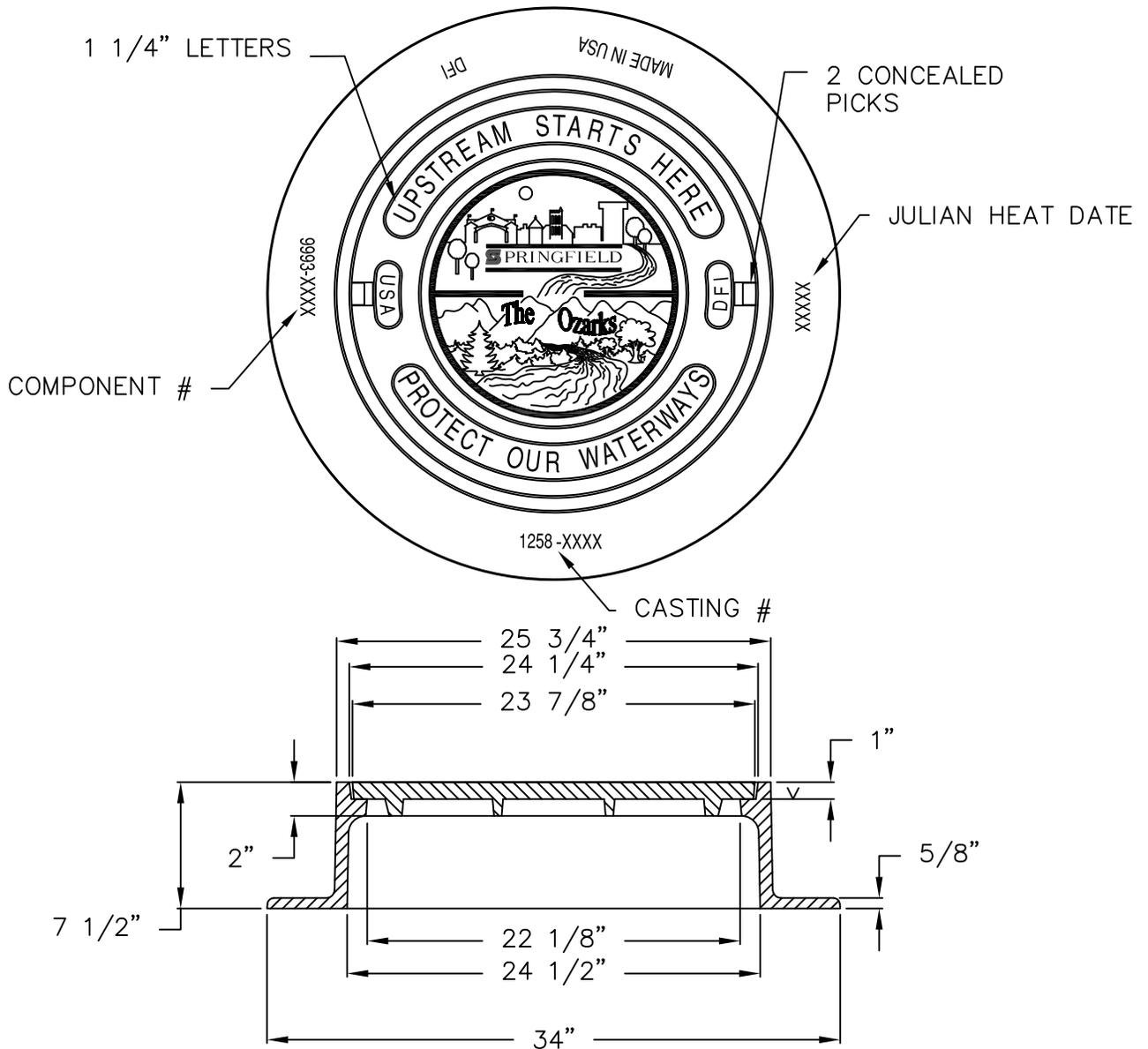
1. BOTTOM TO BE POURED IN PLACE
2. PIPE TO BE ON GRADE BEFORE BOTTOM IS CONSTRUCTED.
3. FOR 6" TOP, USE 4 - #4 ϕ DOWELS: ONE IN EACH CORNER WITH RAM-NEK OR EQUAL.
4. RAM-NEK ALL JOINTS (OR EQUAL).
5. 6" INVERT REQUIRED TO PREVENT SEDIMENTATION.
6. THERE MUST BE A 6" MIN. CONCRETE SEGMENT ABOVE PRECAST OPENING.
7. IF CLEARANCE CAN'T BE PROVIDED FROM TOP AND SIDES OF PIPE, A MODIFIED INLET MUST BE USED.

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MO.

NON-RECESSED
CURB INLET

ADOPTED: 7-1-15
SS-3

RING & COVER DETAILS

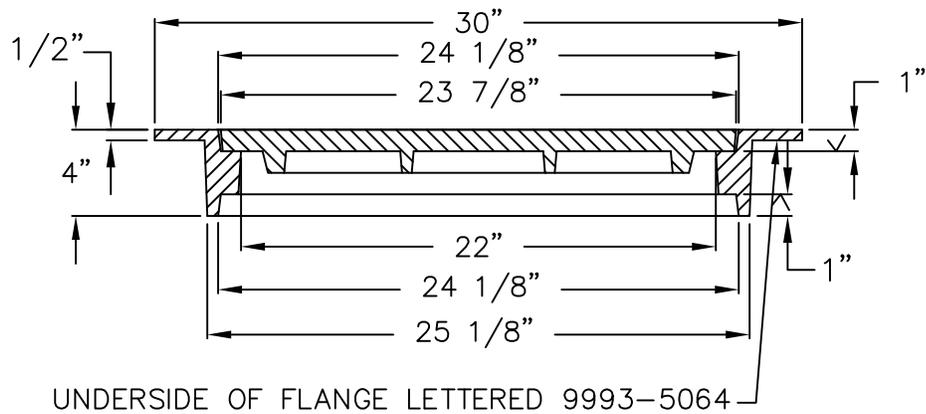


NOTE:
 1. FURNISHED WITH MACHINED HORIZONTAL BEARING SURFACES.

TYPE "A" RING & COVER

DEETER # 1258 RING & COVER, EAST JORDAN IRON WORKS #2420Z
 RING W/2408A COVER, SS-4-C INSTALLED FLANGE DOWN OR EQUAL

RING & COVER DETAILS

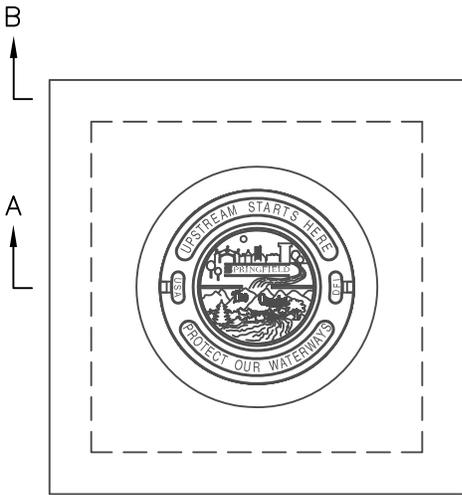


NOTE:

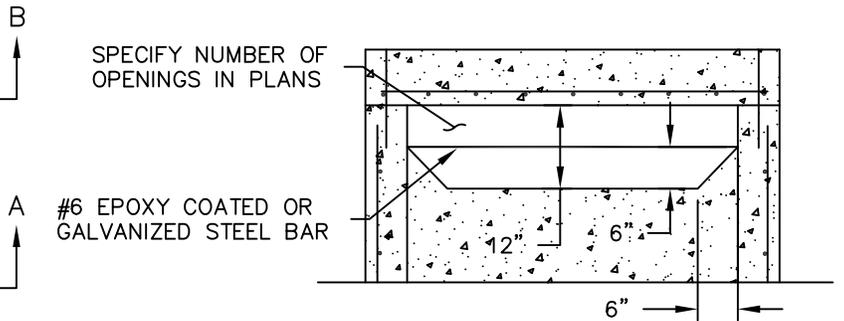
1. FURNISHED WITH MACHINED HORIZONTAL BEARING SURFACE.
2. RING IS REVERSIBLE AND CAN BE INSTALLED WITH FLANGE UP OR DOWN.

TYPE "C" RING & COVER FOR STORM SEWERS

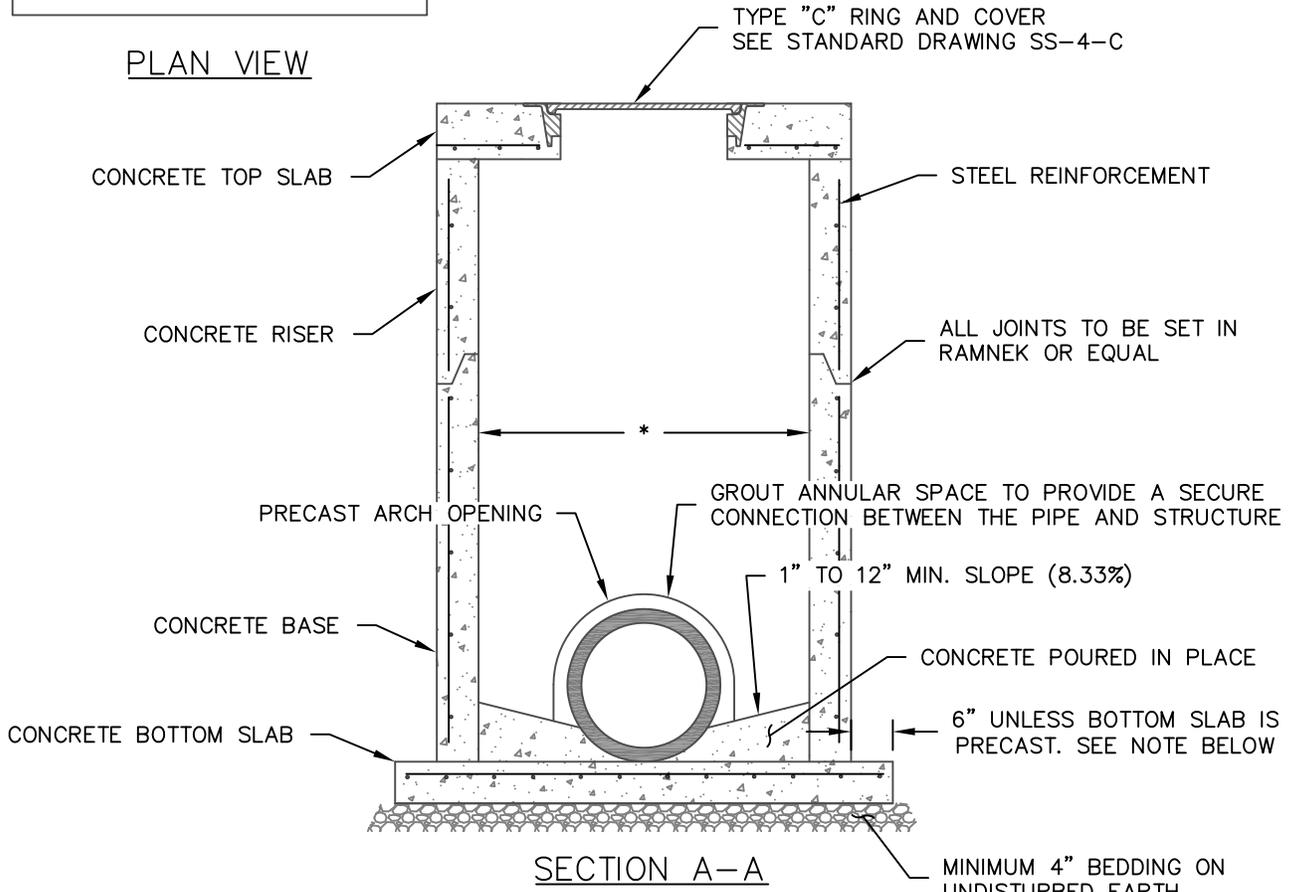
DEETER # 1157 RING W/ #2018-A COVER, EAST JORDAN
IRON WORKS #2425Z RING W/2408A COVER OR EQUAL



PLAN VIEW



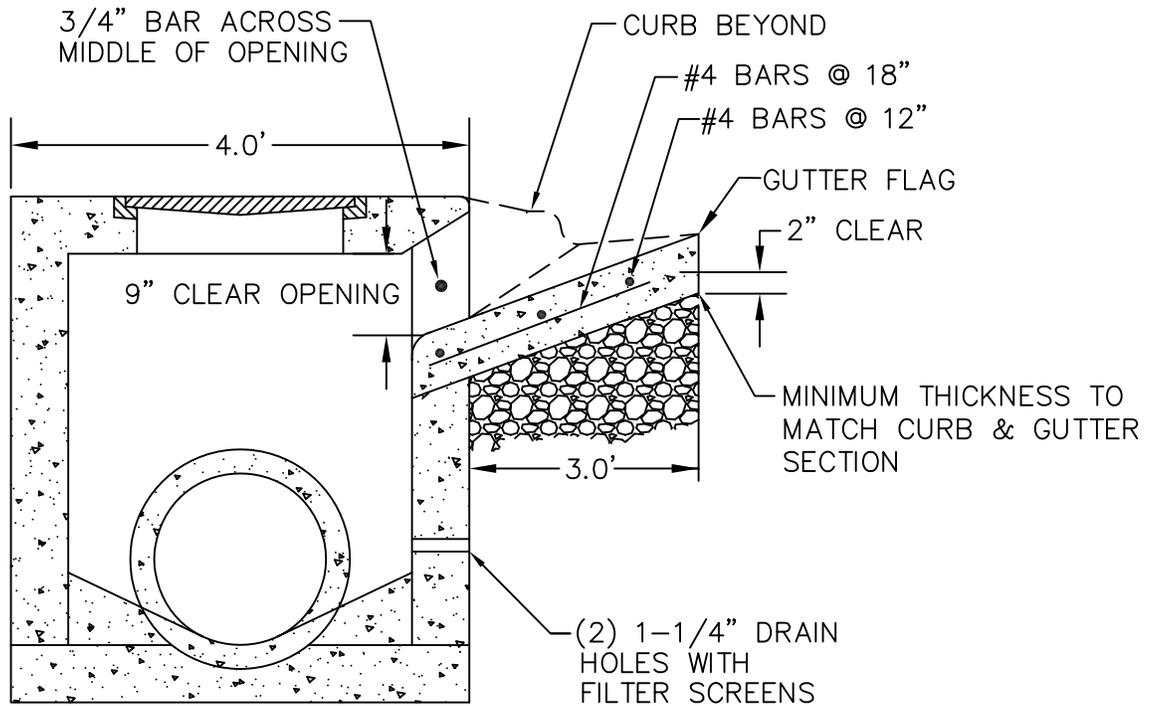
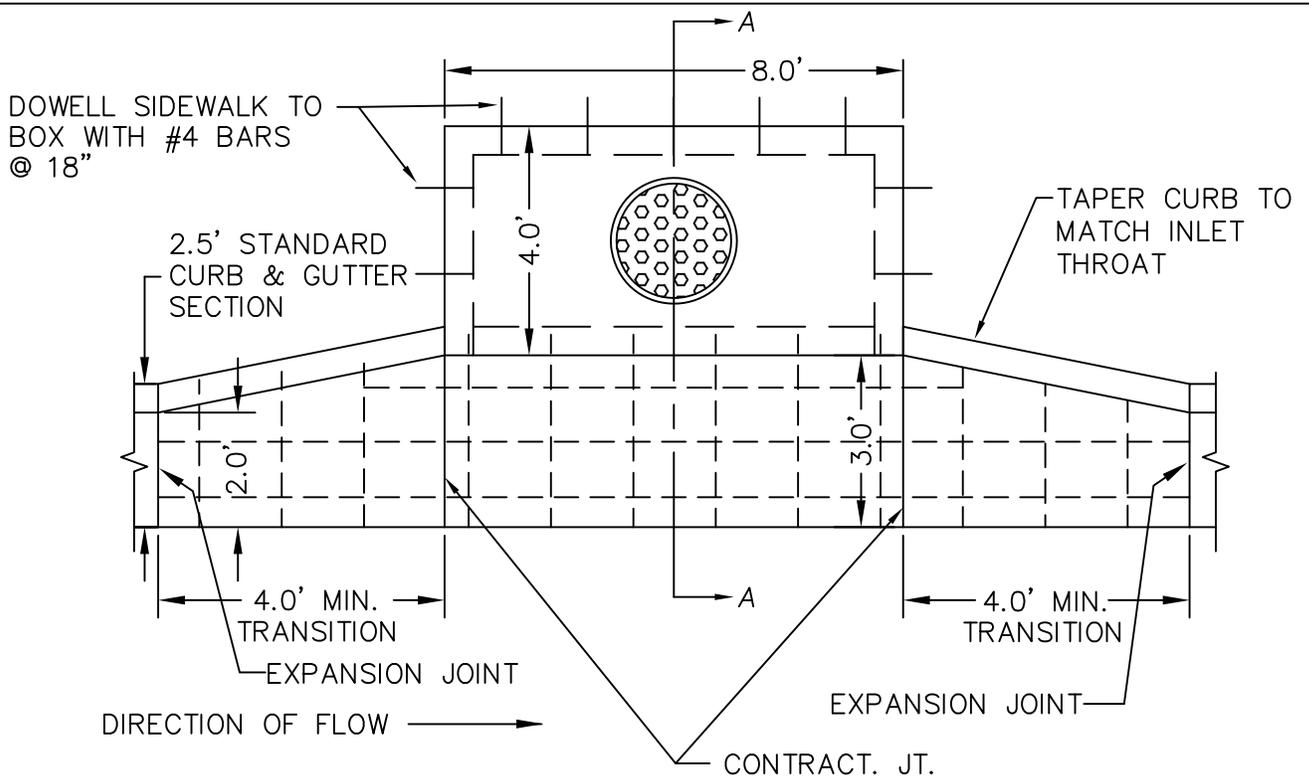
SECTION B-B



SECTION A-A

- NOTES:
1. AREA INLET SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH ASTM C 913.
 2. CONCRETE TOP SLAB SHALL BE DESIGNED TO WITHSTAND LOADING BASED ON A COMBINATION OF DEAD LOADS, SNOW LOADS, AND A-16 (HS20-44) TRAFFIC LOADS IN ACCORDANCE WITH ASTM C890.
 3. BOTTOM SLAB SHALL BE POURED IN PLACE. IF MANUFACTURER IS CONCERNED ABOUT STRUCTURAL INTEGRITY OF CONCRETE BASE DURING TRANSPORTATION THEN THE BOTTOM SLAB MAY BE PRECAST WITH CONCRETE BASE.
 4. PIPE TO BE ON GRADE BEFORE BOTTOM SLAB IS CONSTRUCTED UNLESS BOTTOM IS PRECAST WITH BASE.
 5. ALL PIPES SHALL FIT FLUSH WITH INSIDE FACE OF INLET.
 6. BOTTOM OF INLET TO BE FILLED WITH CONCRETE FORMING CHANNELS TOWARD OUTLET PIPE FROM ALL INLET PIPES. CONCRETE SHALL BE FLUSH WITH INVERT OF OUTLET PIPE.
 7. CONCRETE TOP SLAB SHALL BE PINNED TO STRUCTURE AT THE CORNERS USING ONE #4 DEFORMED BAR IN EACH CORNER. BAR SHALL EXTEND A MINIMUM OF 6 INCHES INTO RISER BELOW.

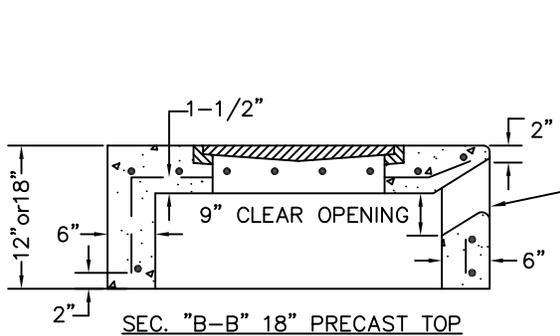
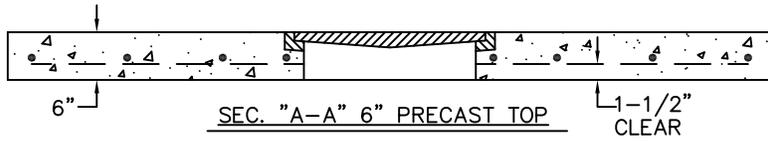
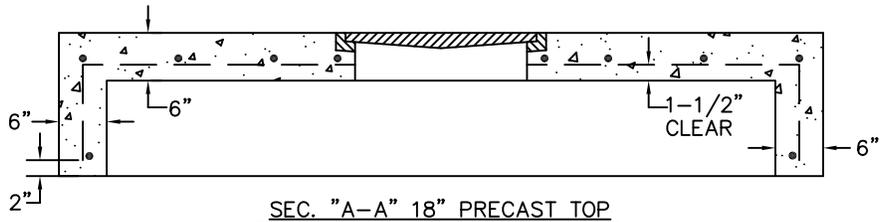
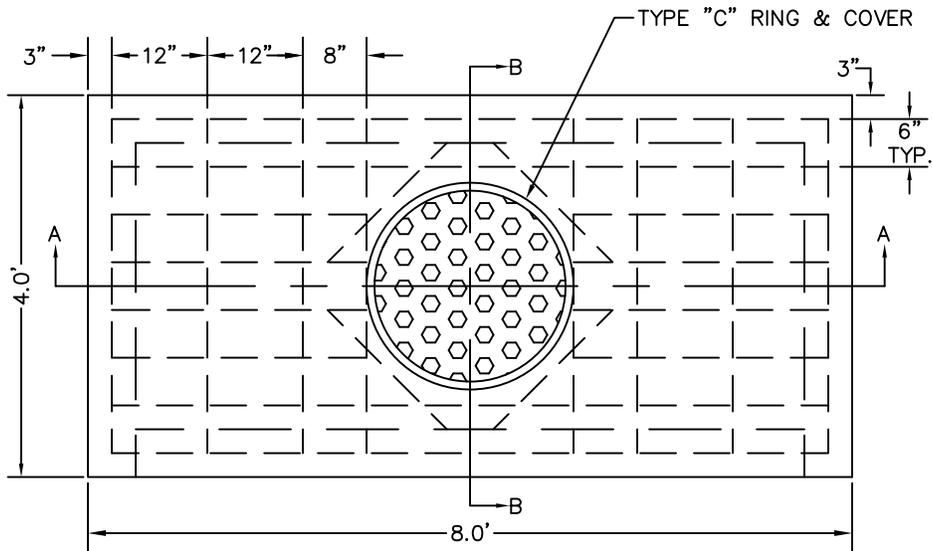
PIPE DIAMETER	*MINIMUM INSIDE DIMENSION OF STRUCTURE
15" - 24"	THREE FEET (3')
27" - 30"	FOUR FEET (4')
36" - 42"	FIVE FEET (5')
48" - 54"	SIX FEET (6')



SECTION "A-A"

NOTE:

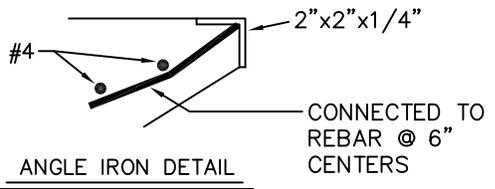
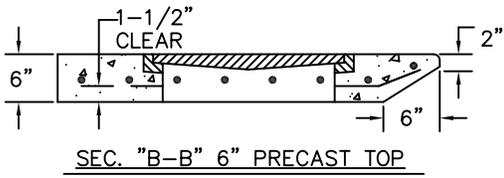
1. #4 BARS @ 10" O.C.(ALL WALLS, VERT. & HORIZ.)
2. IF CLEARANCE CAN'T BE PROVIDED FROM TOP AND SIDES OF PIPE, A MODIFIED INLET MUST BE USED.
3. 6", 12" OR 18" PRECAST LIDS MAY BE USED.
4. IF INLET IS NOT RECESSED, THROAT OPENING IS 7 INCHES.

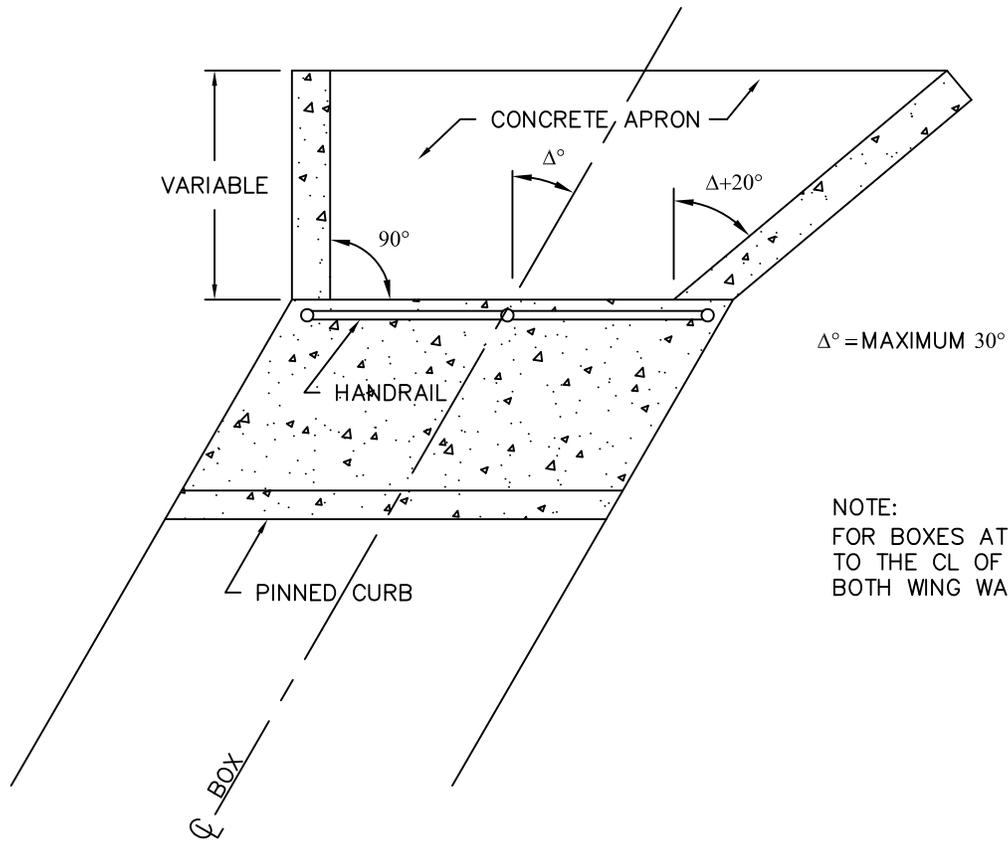


CHANGE THROAT DEPTH TO 7" IF NON RECESSED INLET IS USED.

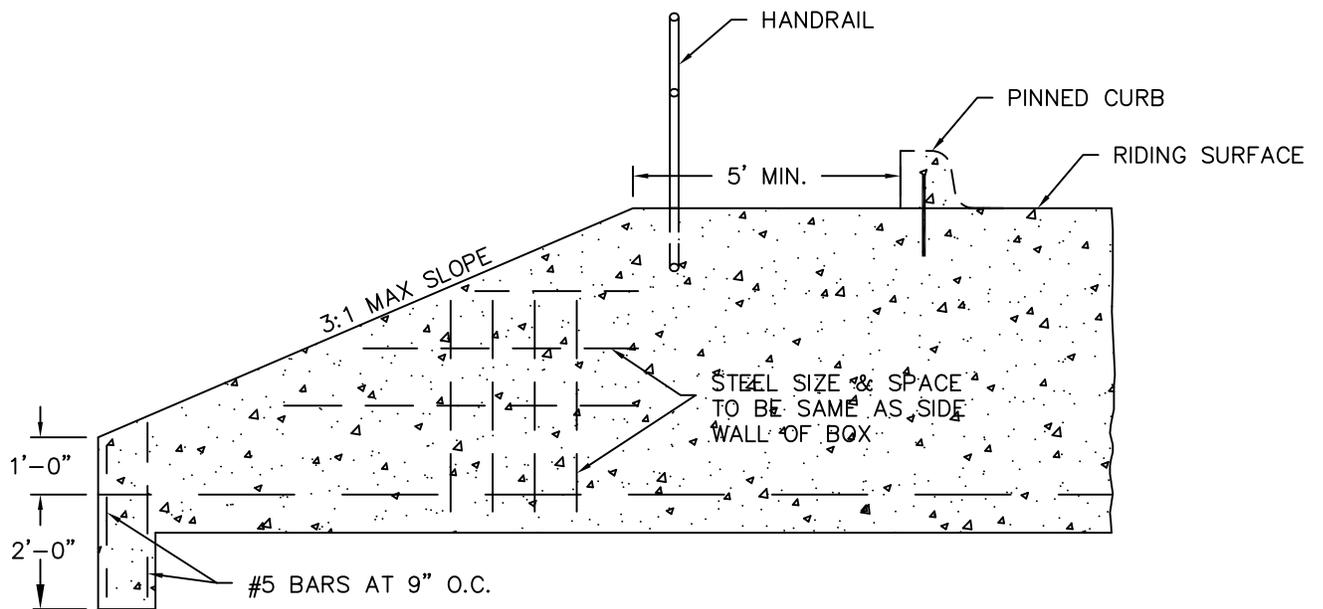
NOTES:

1. REINFORCEMENT IS THE SAME IN THE TOP SLAB OF THE 6" AND THE 18" PRECAST TOP.
2. USE NO. 4 BAR THROUGHOUT.
3. 6" & 12" PRECAST TOPS TO BE PINNED AT 4 CORNERS.
4. IF INLET IS NOT RECESSED THAN A PROTECTIVE 2" x 2" x 1/4" GALVANIZED ANGLE IRON IS REQUIRED AS SHOWN.



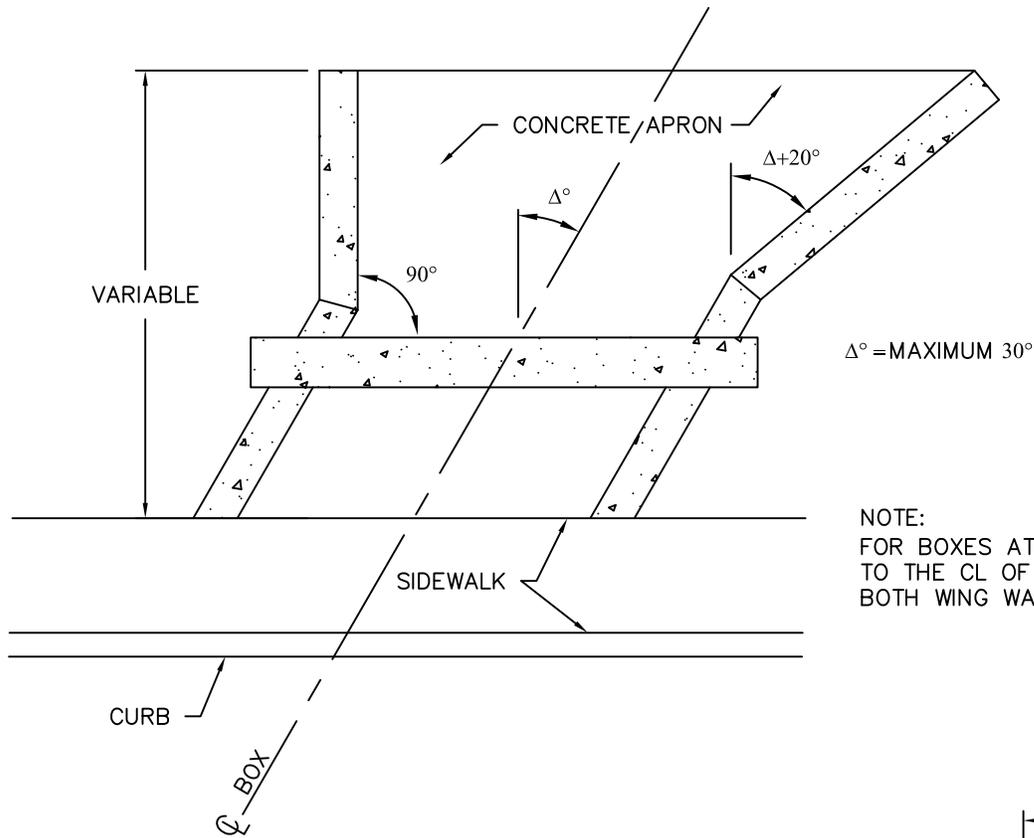


PLAN

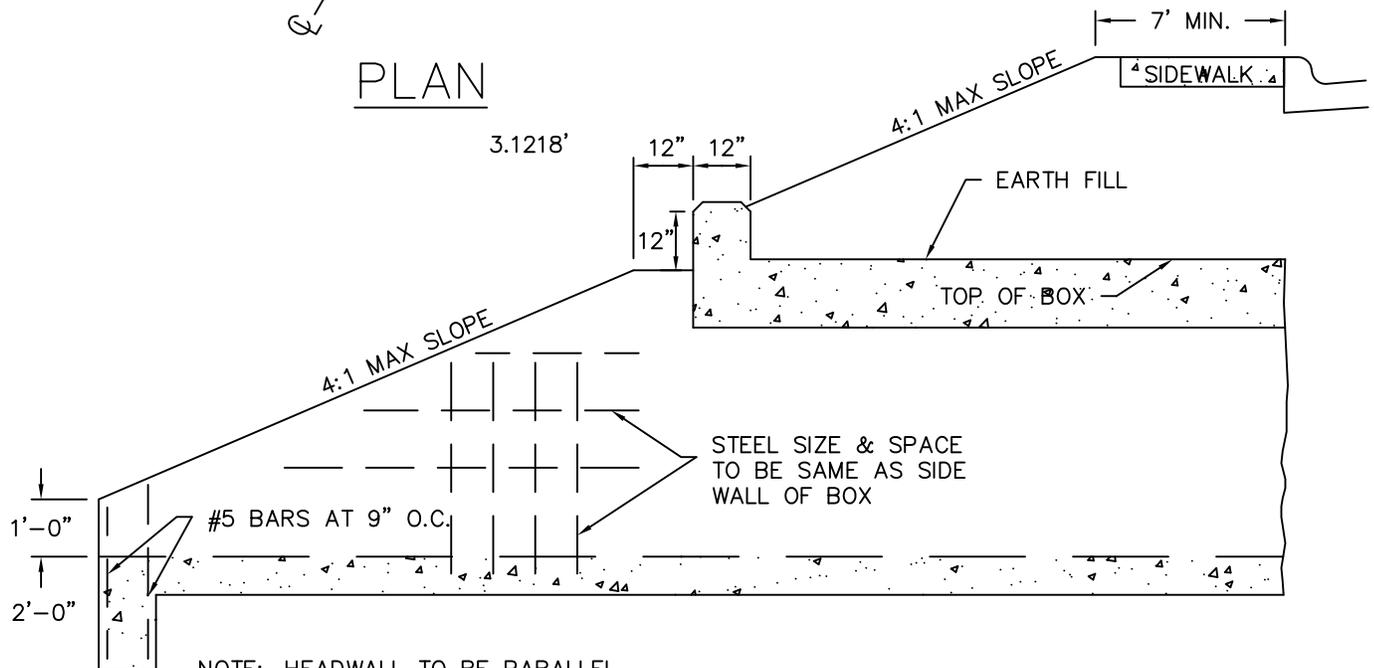


(TOE WALL REQUIRED
ON BOTH ENDS OF BOX)

ELEVATION



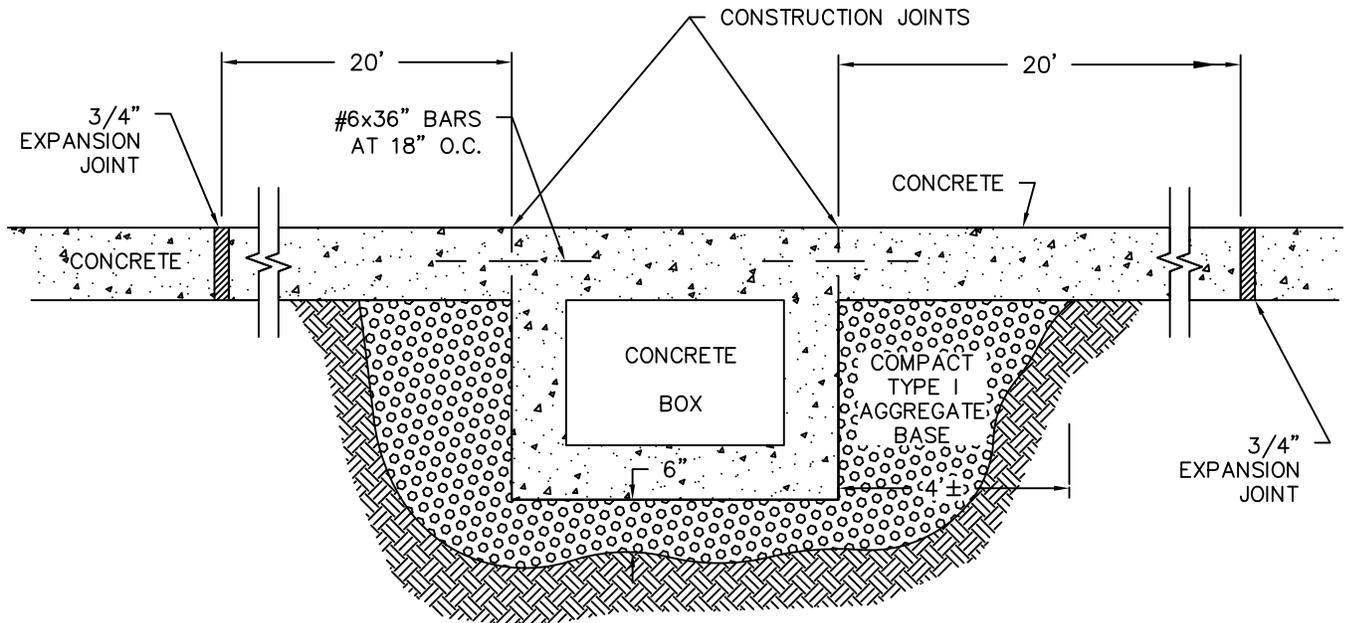
PLAN



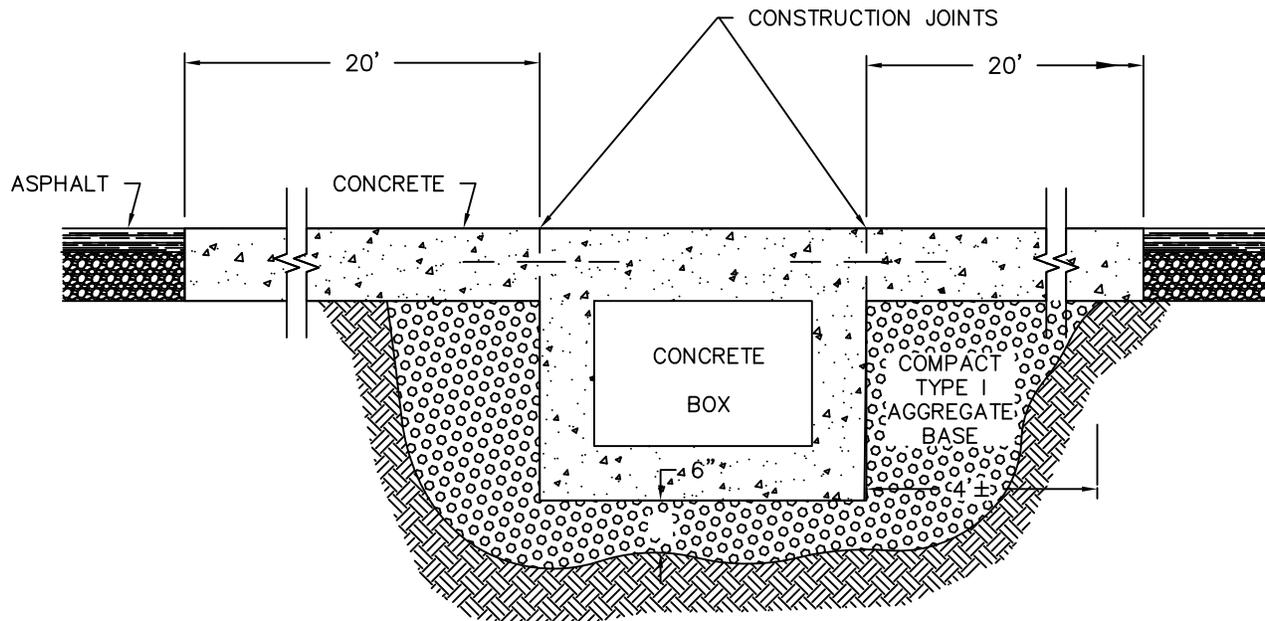
NOTE: HEADWALL TO BE PARALLEL TO CL OF ROADWAY

(TOE WALL REQUIRED ON BOTH ENDS OF BOX)

ELEVATION

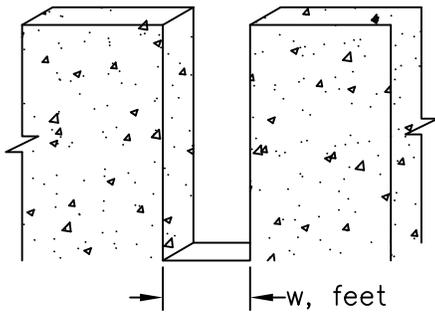


APPROACH TO CULVERT
CONCRETE PAVING

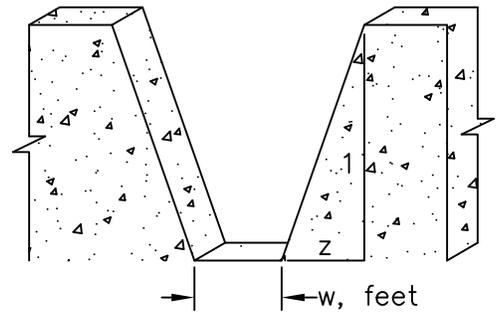


APPROACH TO CULVERT
ASPHALT PAVING

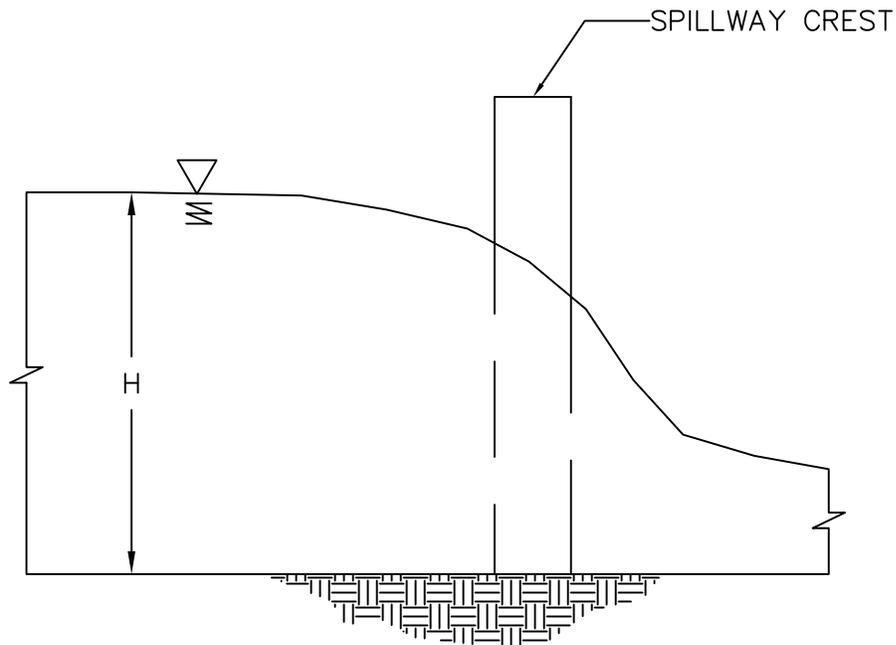
NOTE: PLACE 4' CLAY CAP ON STREET SIDE SLOPES AT EDGES OF CULVERT.



VERTICAL SLOT OUTLET



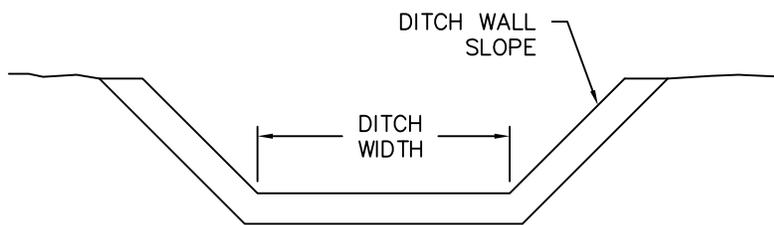
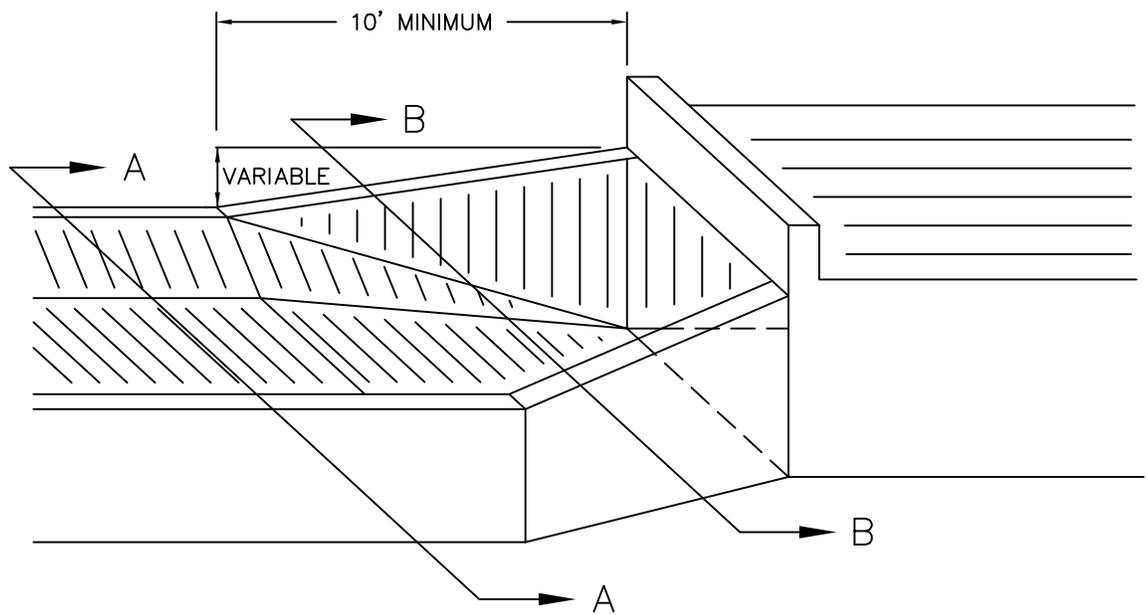
SLOPING SLOT OUTLET



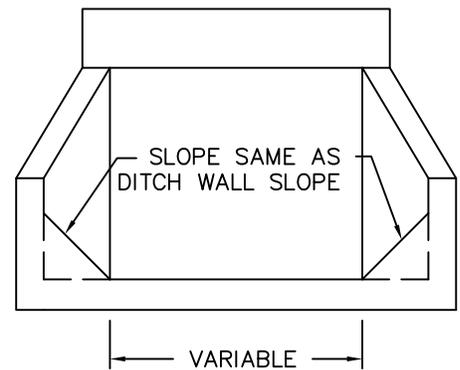
$$Q = 0.86H + (3.65w + 5.82z)H^{3/2}$$

WHERE :

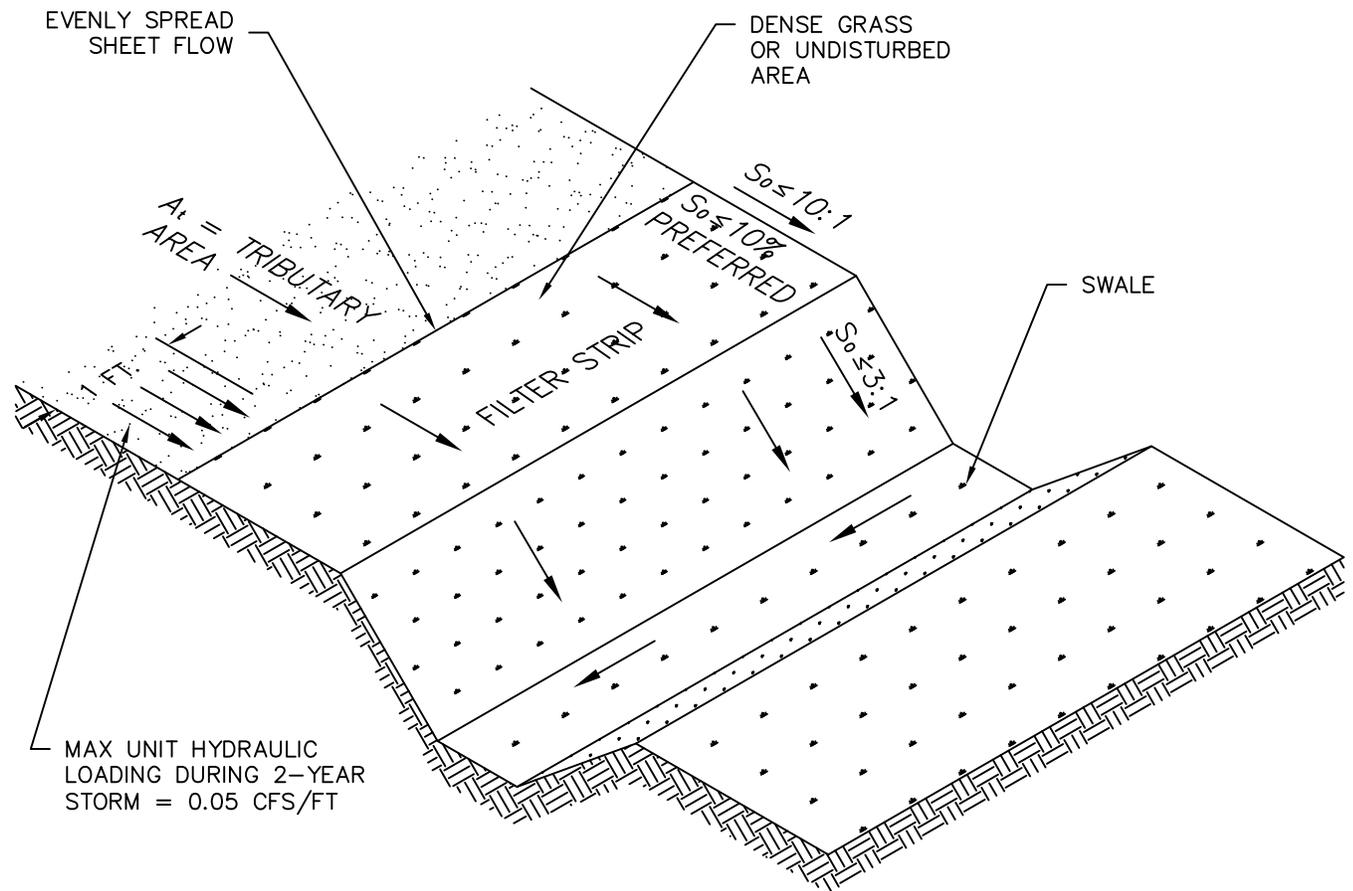
- Q = FLOWRATE IN CUBIC FEET PER SECOND.
- H = UPSTREAM HEAD (PONDED DEPTH ABOVE SLOT INVERT PLUS ANY VELOCITY HEAD) IN FEET.
- HEAD IS LIMITED TO A MAXIMUM OF SIX FEET.
- w = SLOT INVERT WIDTH PERPENDICULAR TO FLOW IN FEET.
- MINIMUM WIDTH OF 0.333 FEET AND MAXIMUM WIDTH OF 2.0 FEET.
- z = SLOPE OF SLOT SIDES EXPRESSED IN TERMS z HORIZONTAL:1 VERTICAL.
- MINIMUM z = 0.0 FEET MAXIMUM z OF 0.6.



SECTION A-A

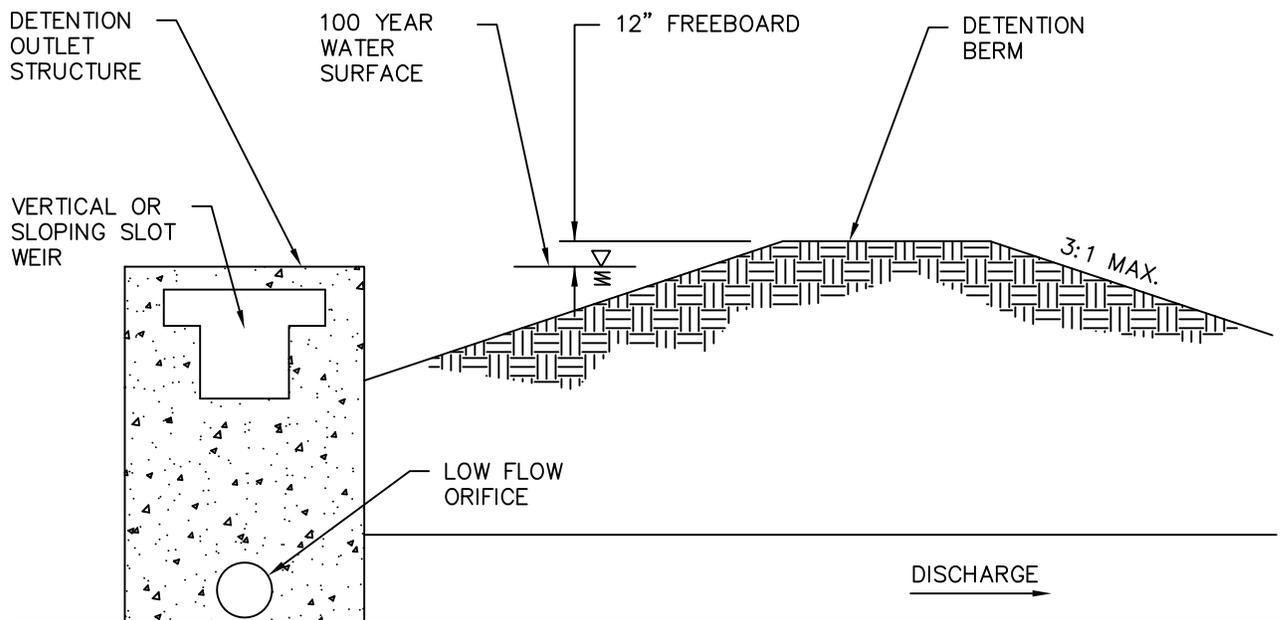


SECTION B-B



REFER TO SPRINGFIELD WATER QUALITY PROTECTION
POLICY FOR FURTHER DESIGN CRITERIA

ADAPTED FROM DENVER URBAN DRAINAGE & FLOOD
CONTROL DISTRICT - DRAINAGE CRITERIA MANUAL



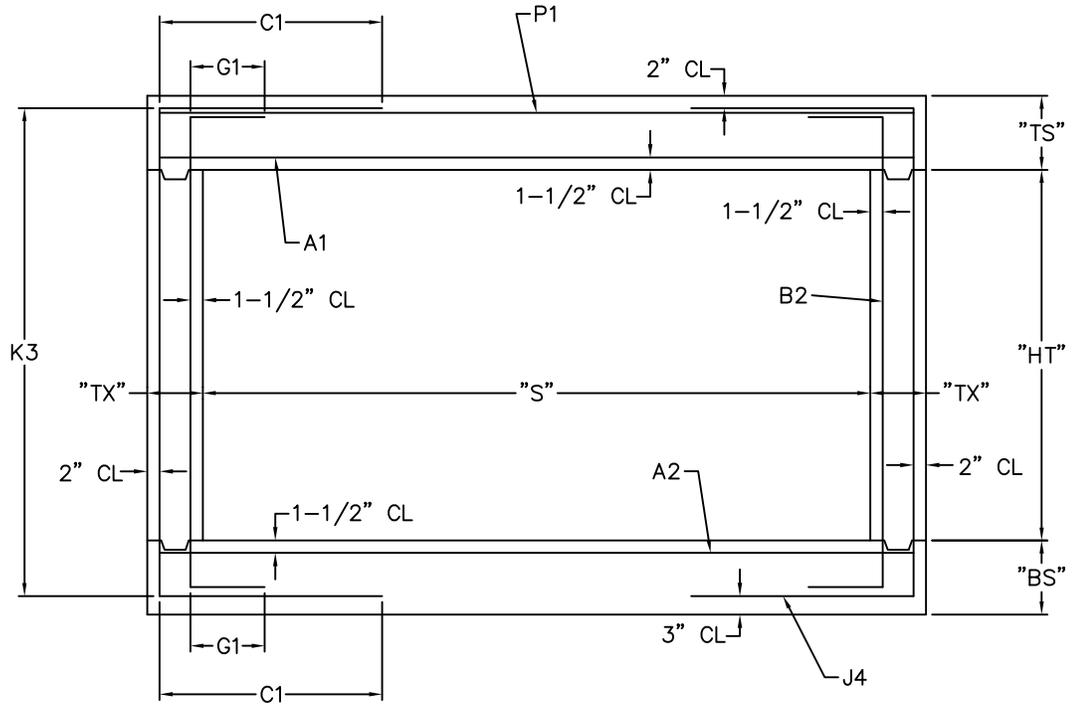
REFER TO SPRINGFIELD WATER QUALITY PROTECTION
POLICY FOR FURTHER DESIGN CRITERIA

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MO.

VERTICAL BOX
DETENTION OUTLET

ADOPTED:

SS-14-D



TYPICAL SECTION TO BE COMPLETED AND SHOWN ON PLANS ALONG WITH LOCATION OF F BARS.

GENERAL NOTES:

1. ALL CULVERTS SHALL BE DESIGNED FOR HS20 LOADINGS USING CONCRETE, $f'_c = 4,000$ psi OR GREATER, REINFORCING STEEL (GRADE 60), $f_y = 60,000$ psi
2. LAP ALL LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES
3. ALL DIMENSIONS ARE TO BE SHOWN IN INCHES.
4. MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1-1/2 INCHES UNLESS OTHERWISE SHOWN.
5. F BARS ARE TO BE A MINIMUM #4 WITH SPACING LABELED ON SECTION VIEW.
6. A FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE APPLIED TO ALL TRANSVERSE JOINTS IN THE TOP SLAB AND SIDEWALLS. THE MATERIAL SHALL BE CENTERED ON THE JOINT AND THE EDGES SHALL BE SEALED WITH A MASTIC OR WITH TWO SIDED TAPE. THE FILTER CLOTH SHALL BE A GEOTEXTILE MEETING THE APPROVAL OF THE ENGINEER AND HAVING A GRAB TENSILE STRENGTH OF 180 LBS. (ASTM D-4632) AND AN APPARENT OF 50 TO 100 (ASTM D-4751). COST OF FURNISHING AND INSTALLING THE FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.
7. THE DESIGN SHALL SHOW AS A MINIMUM; THE DESIGN LOAD, DESIGN FILL HEIGHT, CONCRETE AND STEEL STRESS USED, AND THE FOLLOWING INFORMATION.

TABLE TO BE COMPLETED BY DESIGNER

BAR	SIZE	C to C	LENGTH
A1			
A2			
B2			
J4			
P1			
F			

DESIGN LOAD _____

f'_c _____

f_y _____