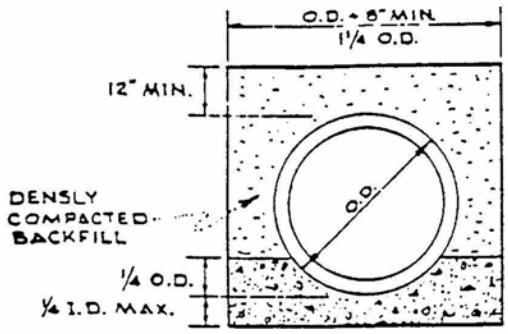
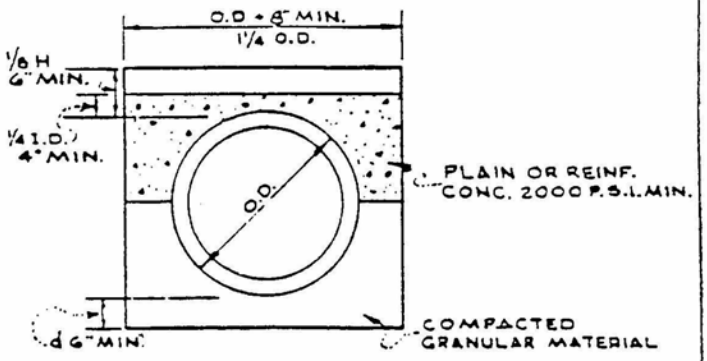
CLASS "A" TRENCH BEDDING

REINFORCED A_s = 1.0% Lf = 4.8
REINFORCED A_s = 0.4% Lf = 3.4
PLAIN Lf = 2.8



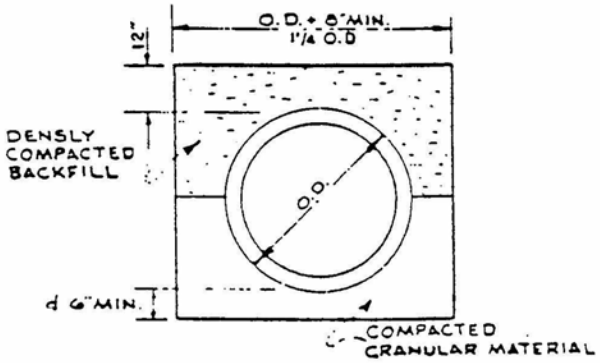
SECTION OF TRENCH SHOWING CONCRETE CRADLE



SECTION OF TRENCH SHOWING CONCRETE ARCH

CLASS "B" TRENCH BEDDING

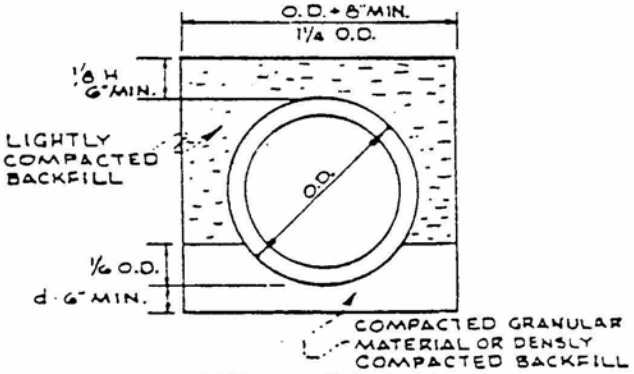
Lf = 1.9



SECTION OF TRENCH SHOWING GRANULAR FOUNDATION

CLASS "C" TRENCH BEDDING

Lf = 1.5



SECTION OF TRENCH SHOWING GRANULAR FOUNDATION

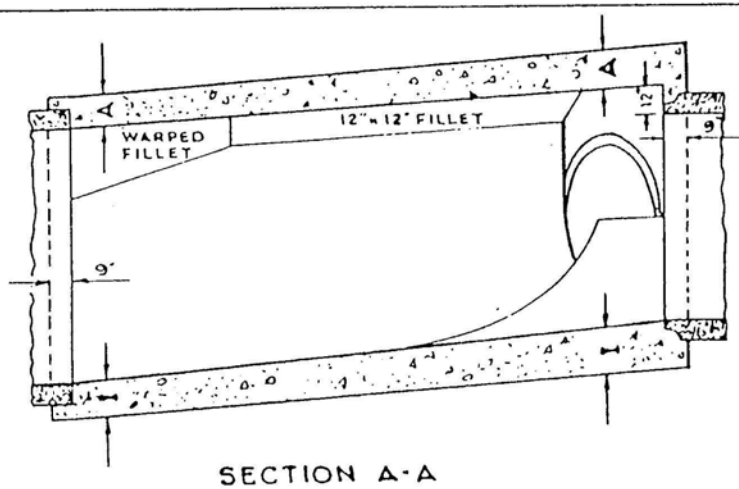
NOTE:

FOR ROCK OR OTHER INCOMPRESSIBLE MATERIALS, THE TRENCH SHOULD BE OVER EXCAVATED A MINIMUM OF 6" INCHES AND REFILLED WITH GRANULAR MATERIAL.

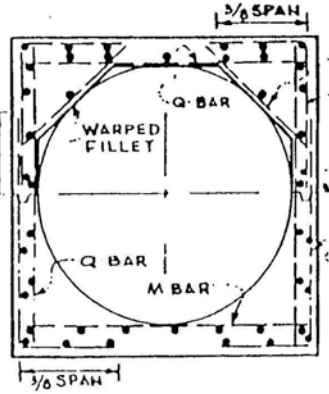
LEGEND:

O.D. = OUTSIDE DIAMETER
I.D. = INSIDE DIAMETER
H. = BACKFILL COVER ABOVE TOP OF PIPE
d = DEPTH OF BEDDING MATERIAL BELOW PIPE
A_s = AREA OF TRAVERSE STEEL IN THE CRADLE OR ARCH EXPRESSED AS A % OF AREA OF CONCRETE AT INVERT OR CROWN.
Lf = LIVE LOAD

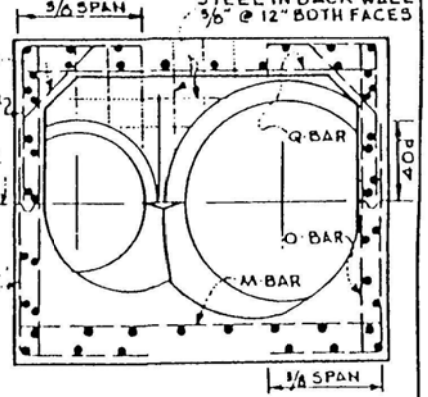
PIPE BEDDING	
PLATE 1	
603.06	



SECTION A-A

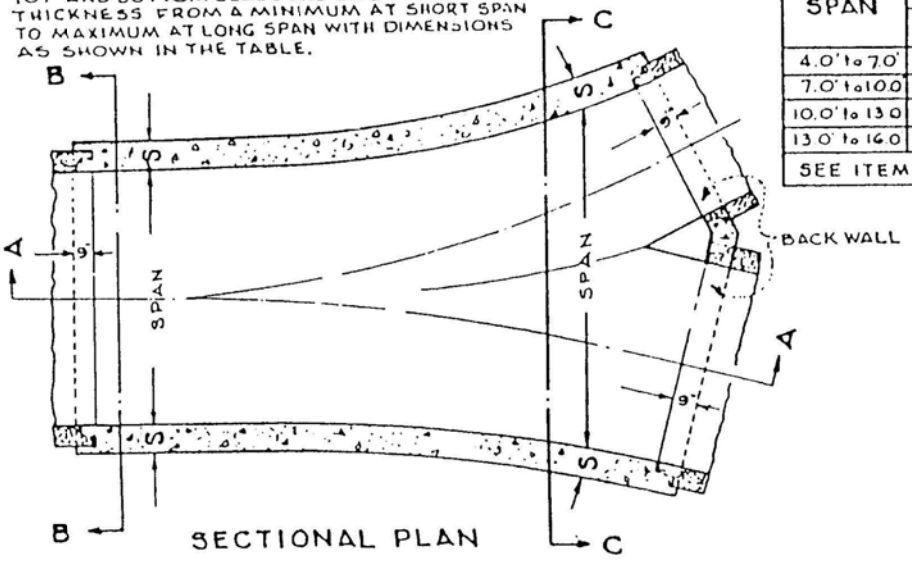


SECTION B-B



SECTION C-C

TOP AND BOTTOM SLABS AND SIDE WALLS VARY IN THICKNESS FROM A MINIMUM AT SHORT SPAN TO MAXIMUM AT LONG SPAN WITH DIMENSIONS AS SHOWN IN THE TABLE.



SECTIONAL PLAN

SPAN	CONC. DIMENSION			REINFORCING BARS & SPACING					
	A	I	S	M	N	O	P	Q	T
4.0' to 7.0'	10"	12"	10"	5/8" @ 10"	3/4" @ 10"	5/8" @ 20"	3/4" @ 10"	5/8" @ 10"	5/8" @ 20"
7.0' to 10.0	12"	14"	10"	5/8" @ 8"	3/4" @ 8"	5/8" @ 16"	3/4" @ 8"	5/8" @ 8"	5/8" @ 16"
10.0' to 13.0	15"	18"	12"	7/8" @ 6"	1" @ 6"	5/8" @ 12"	1" @ 6"	7/8" @ 6"	5/8" @ 12"
13.0' to 16.0	18"	21"	15"	1" @ 6"	1" @ 6"	5/8" @ 12"	1" @ 6"	1" @ 6"	5/8" @ 12"
SEE ITEM 5.4 - GENERAL SPEC.				LONG BARS 5/8" @ 15" ALL SECTIONS					

SIZE AND SPACING OF REINFORCING STEEL AS INDICATED IN THE TABLE SHALL BE SELECTED FOR THE RESPECTIVE INCREMENTS OF SPAN, AS SCALED FROM THE CONTRACT DRAWINGS OF THE JUNCTION CHAMBER.

ALL REINFORCING STEEL TO BE ROUND DEFORMED BARS

STEEL TO HAVE A MINIMUM COVER OF TWO (2) INCHES EXCEPT IN BOTTOM SLAB, WHICH IS TO HAVE A COVER OF 2½ INCHES IN EACH FACE.

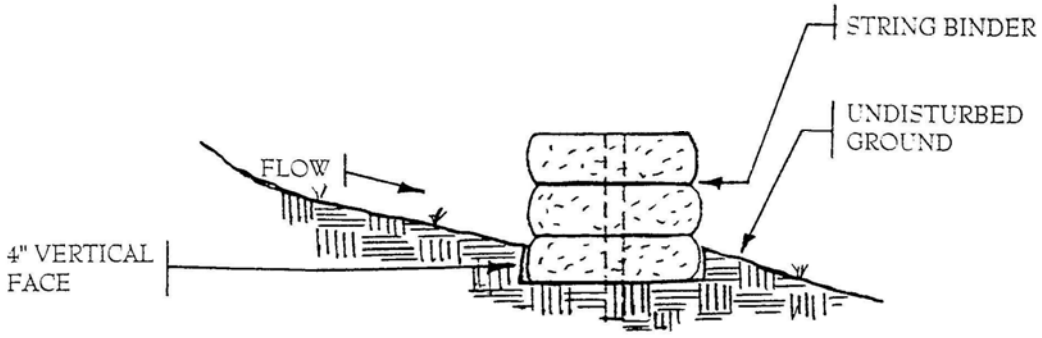
THIS STANDARD TYPIFIES THE STRUCTURAL DEMENSIONS AND REINFORCING DETAILS FOR A CONCRETE JUNCTION CHAMBER, WHICH THE CONTRACTOR MAY ELECT TO BUILD AS A ALTERNATIVE TO THAT OF BRICK MASONRY. THE CHARACTERISTICS OF THE INVERT SHALL BE THE SAME AS INDICATED ON THE CONTRACT DRAWING FOR THE JUNCTION CHAMBER.

REINF. CONC. JUNCTION CHAMBER

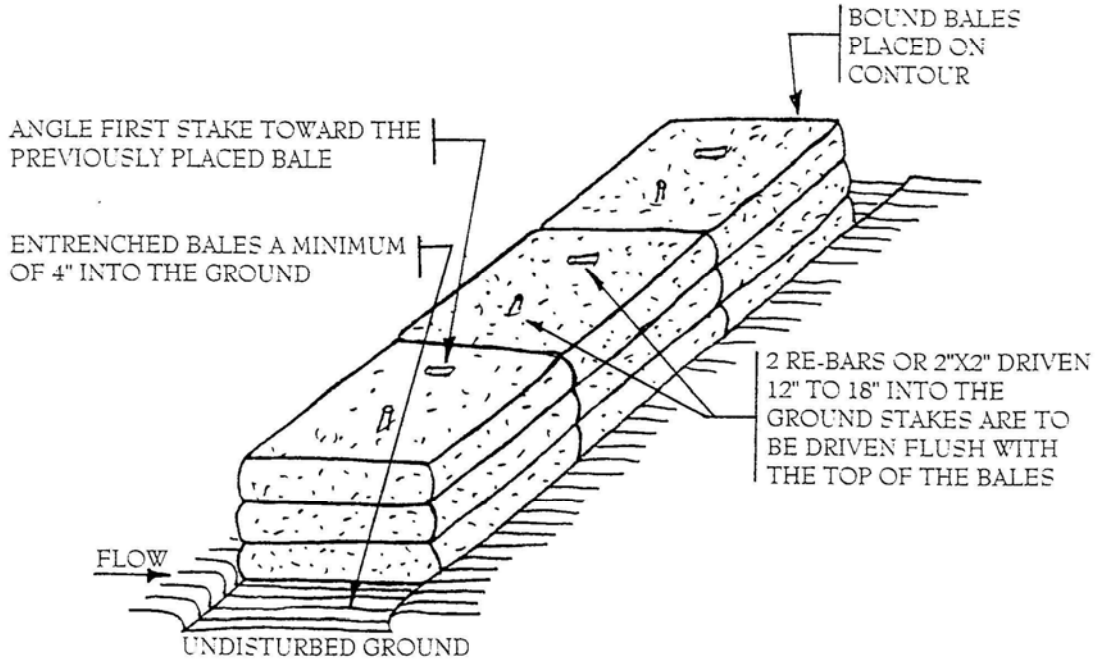
PLATE 2

C-6

STRAW BALE DIKE

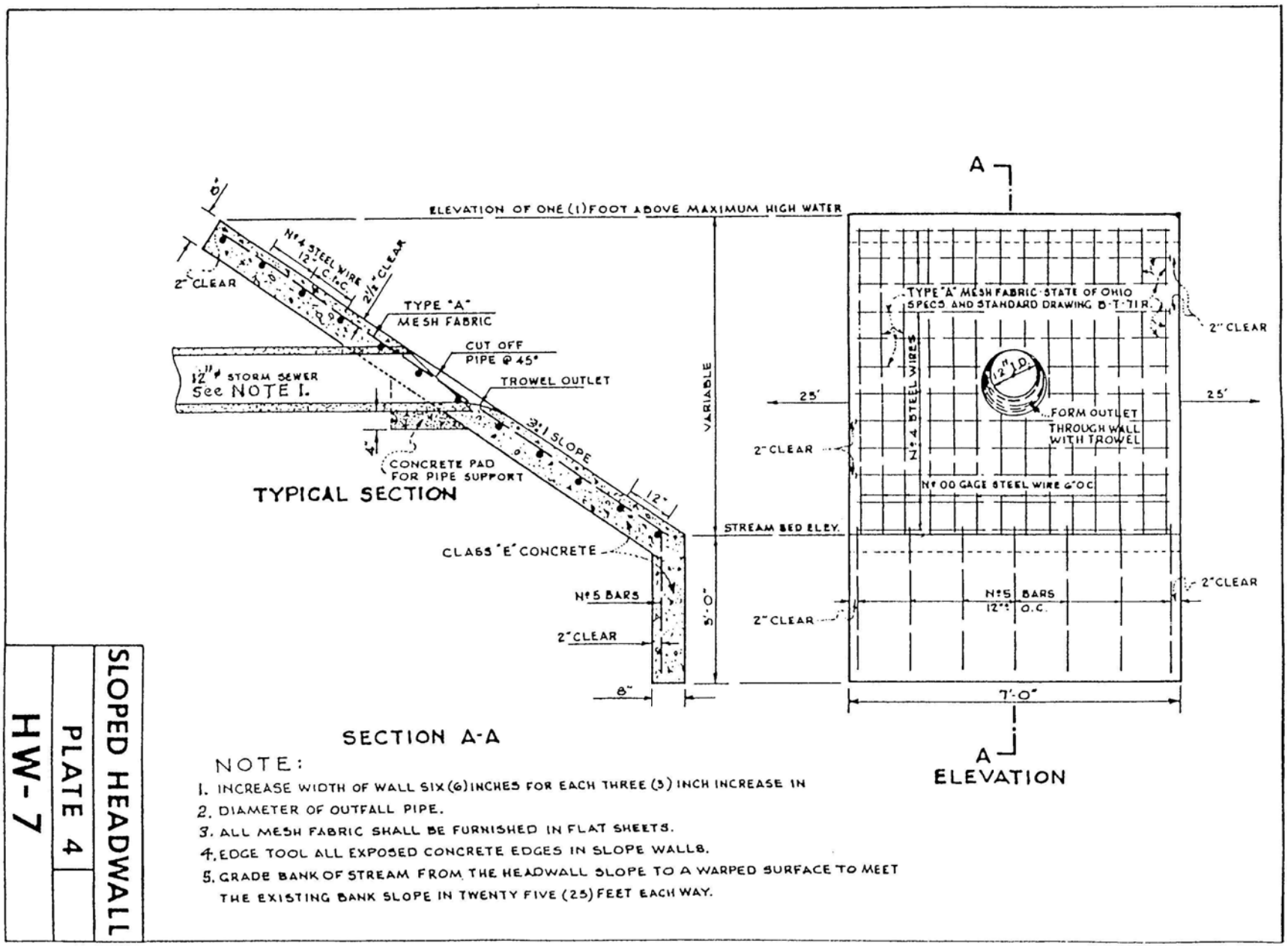


BEDDING DETAIL



ANCHORING DETAIL

STRAW BALE DIKE
PLATE #3



NOTE:

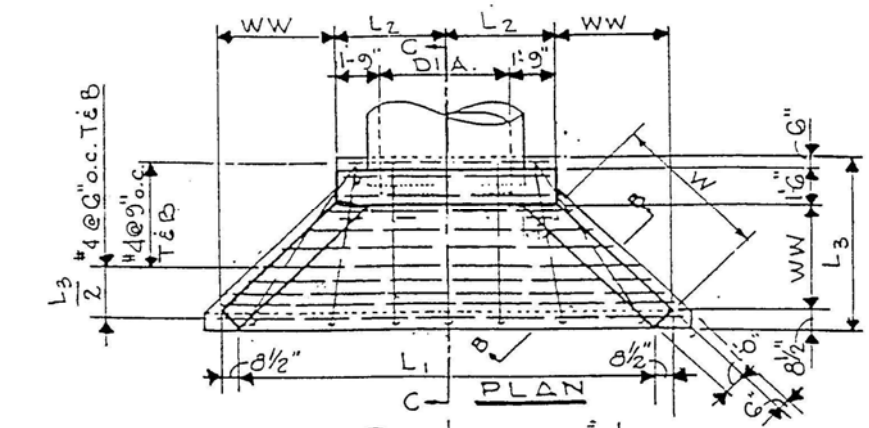
1. INCREASE WIDTH OF WALL SIX (6) INCHES FOR EACH THREE (3) INCH INCREASE IN
2. DIAMETER OF OUTFALL PIPE.
3. ALL MESH FABRIC SHALL BE FURNISHED IN FLAT SHEETS.
4. EDGE TOOL ALL EXPOSED CONCRETE EDGES IN SLOPE WALLS.
5. GRADE BANK OF STREAM FROM THE HEADWALL SLOPE TO A WARPED SURFACE TO MEET THE EXISTING BANK SLOPE IN TWENTY FIVE (25) FEET EACH WAY.

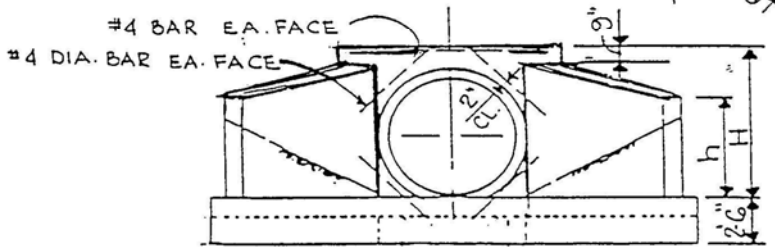
SLOPED HEADWALL

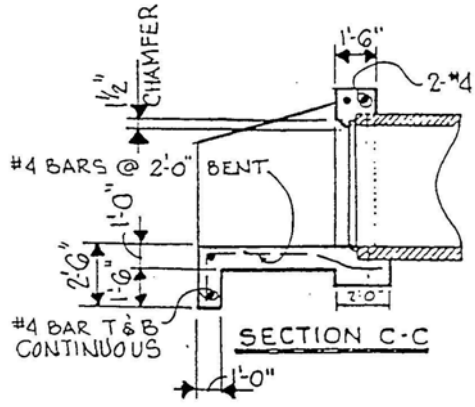
PLATE 4

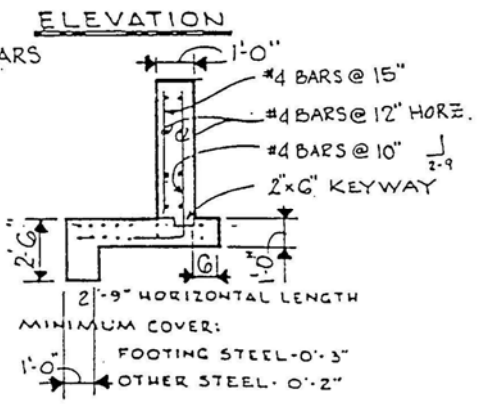
HW-7

TYPICAL WINGWALL DETAILS









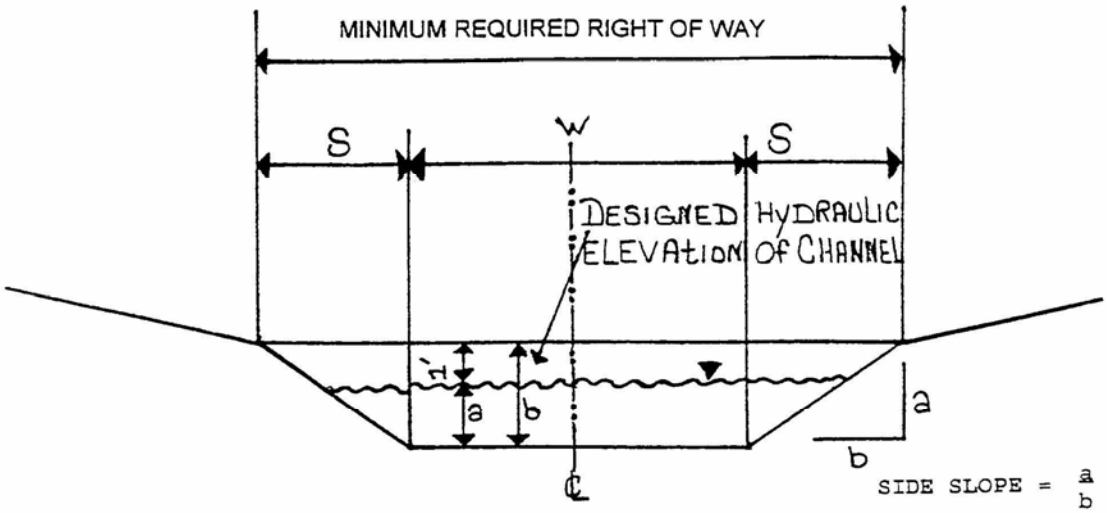
DIA.	H	W	h	WW	L_1	L_2	L_3
12"	2'-4"	2'-0"	1'-4"	1'-5"	5'-11"	2'-3"	4'-2"
18"	2'-9"	2'-6"	1'-10"	1'-9"	7'-1"	2'-6"	4'-6"
24"	3'-3"	2'-10"	2'-3"	2'-0"	8'-1"	2'-9"	4'-8"
30"	3'-10"	3'-2"	2'-9"	2'-3"	9'-1"	3'-0"	5'-0"
36"	4'-4"	3'-6"	3'-1"	2'-6"	10'-1"	3'-3"	5'-3"
42"	4'-11"	4'-2"	3'-6"	3'-0"	11'-7"	3'-6"	5'-9"
48"	5'-5"	4'-11"	3'-8"	3'-6"	13'-1"	3'-9"	6'-3"
54"	6'-0"	5'-0"	4'-0"	4'-0"	14'-7"	4'-0"	6'-9"
60"	6'-6"	6'-3"	4'-3"	4'-6"	16'-1"	4'-3"	7'-3"
66"	7'-7"	7'-3"	4'-6"	5'-0"	17'-7"	4'-6"	7'-9"
72"	7'-7"	7'-11"	4'-10"	5'-6"	19'-1"	4'-9"	8'-3"

NOTE: FOR PIPE SIZE NOT SHOWN, USE HEADWALL DATA FOR THE NEXT LARGER PIPE SIZE.

WINGWALL

PLATE 5

REQUIREMENTS FOR STORMWATER CHANNELS



TYPICAL CROSS SECTION OF STORMWATER CHANNELS

No fence shall be placed within right of way.

W = bottom width of channel to be determined by design requirements.
S = horizontal projection of channel side slope from top of bank to toe of slope at channel flowline.

Value of paved channel side slope

$\frac{a}{b}$ = 1 Vertical to 3 horizontal

Value of sodded channel side slope

$\frac{a}{b}$ = 1 Vertical to 3 horizontal

Value of seeded channel side slope

$\frac{a}{b}$ = 1 Vertical to 3 horizontal

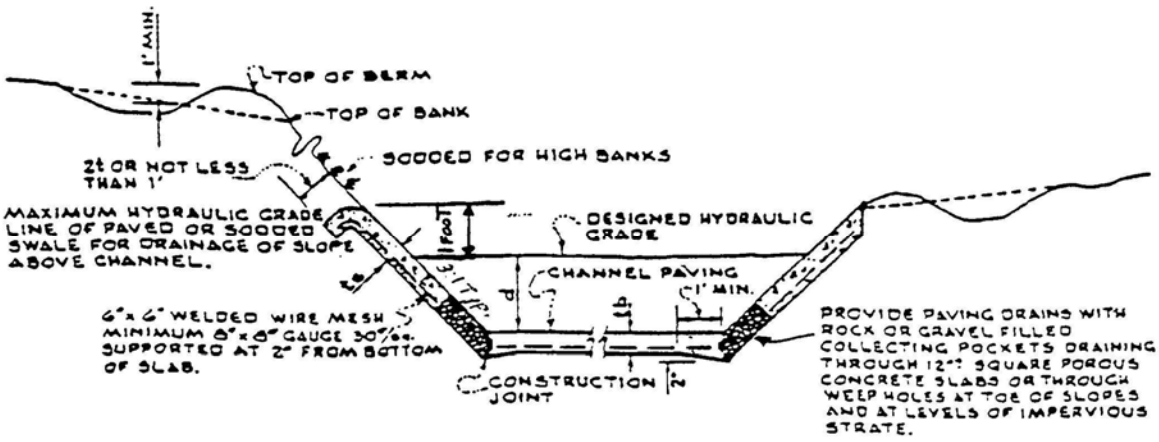
Where possible, existing stable banks should not be disturbed unless unavoidable.

Where earth in a newly constructed lined or unlined channel bank will be unstable at the given maximum value of side slope, the value of side slope shall be revised, as recommended by a soils engineer, to a value required for a stable bank for each soil type encountered along the channel.

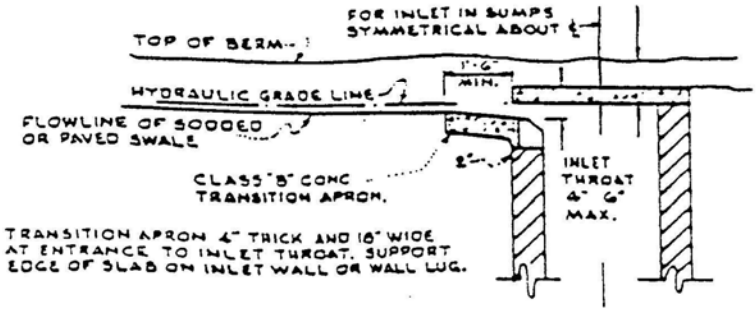
HAMILTON COUNTY
STORM DRAINAGE STANDARDS
PLATE 6
SUBDIVISION STANDARDS

NOTE: SWALE PAVING WILL BE REQUIRED TO CONTROL EROSION WHEN THE ALLOWABLE DITCH VELOCITIES ARE EXCEEDED PER ST805(a) 3.

PROVIDE CUTOFF WALLS AT END OF PAVING.

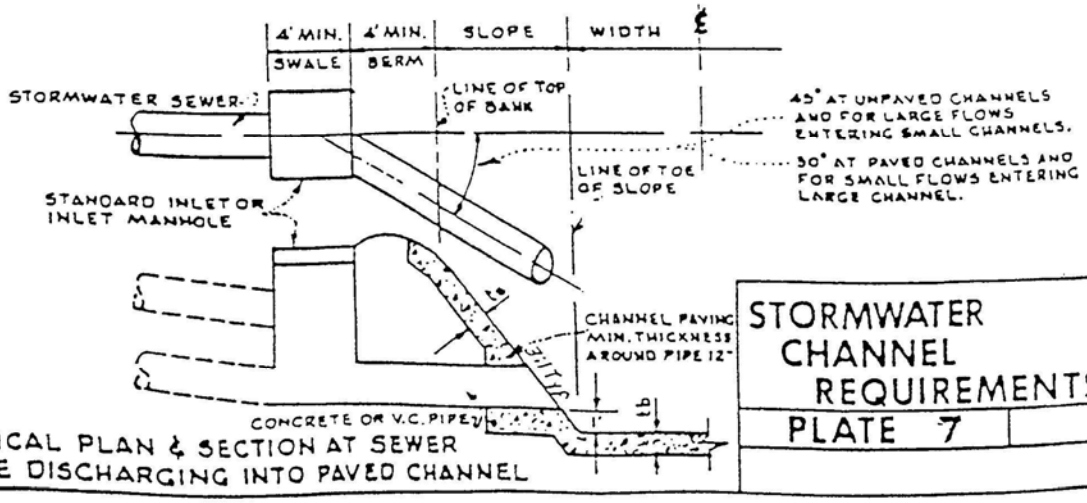


TYPICAL SECTION FOR PAVED CHANNEL



WIDTH	ts	tb
LESS THAN 6'	4"	4"
6' to 18'	4"	5"
18' to 24'	5"	6"
MORE THAN 24'	6"	7"

TYPICAL SECTION THROUGH SWALE AT INLET

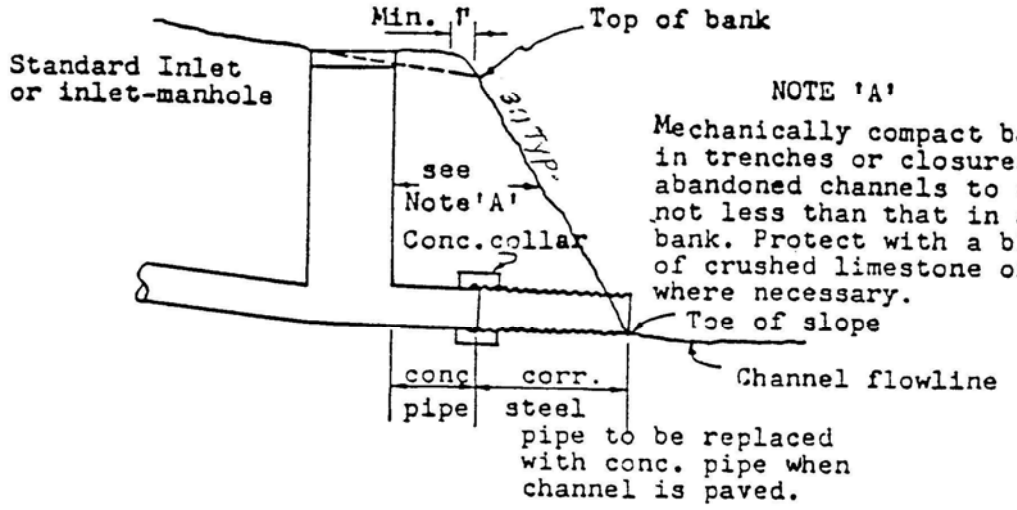


TYPICAL PLAN & SECTION AT SEWER LINE DISCHARGING INTO PAVED CHANNEL

STORMWATER CHANNEL REQUIREMENTS

PLATE 7

REQUIREMENTS FOR STORMWATER CHANNELS



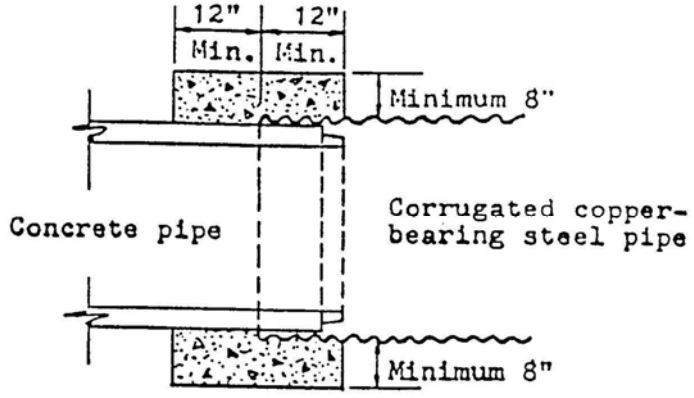
NOTE 'A'

Mechanically compact backfill in trenches or closures of abandoned channels to density not less than that in adjacent bank. Protect with a blanket of crushed limestone or paving where necessary.

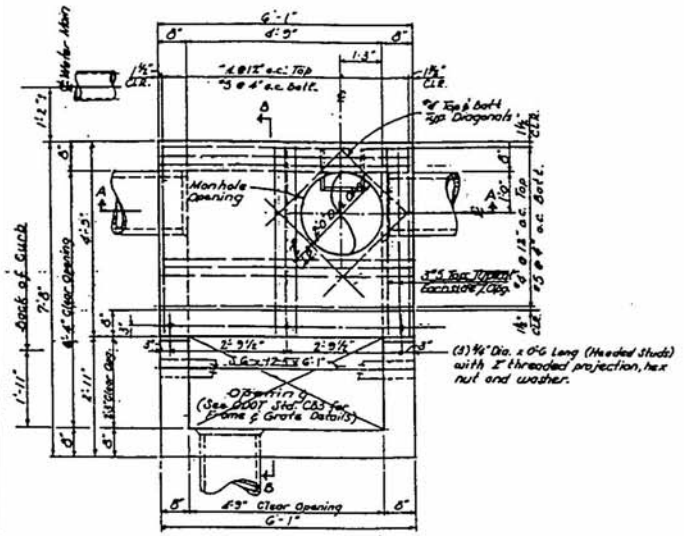
NOTE 'B'

Channel paving or bank paving or both may be required to prevent erosion at curves in alignment or at locations of possible erosion due to discharge of large flows.

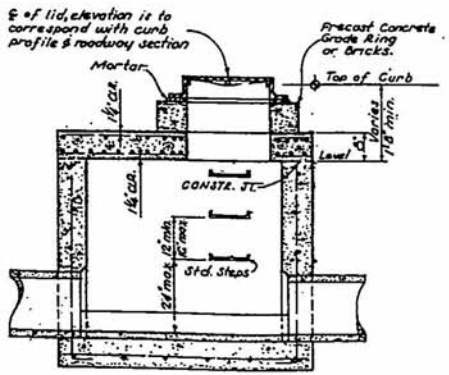
TYPICAL SECTION AT SEWER LINE DISCHARGING INTO UNPAVED CHANNEL



HAMILTON COUNTY
STORM DRAINAGE STANDARDS
PLATE 8
SUBDIVISION STANDARD



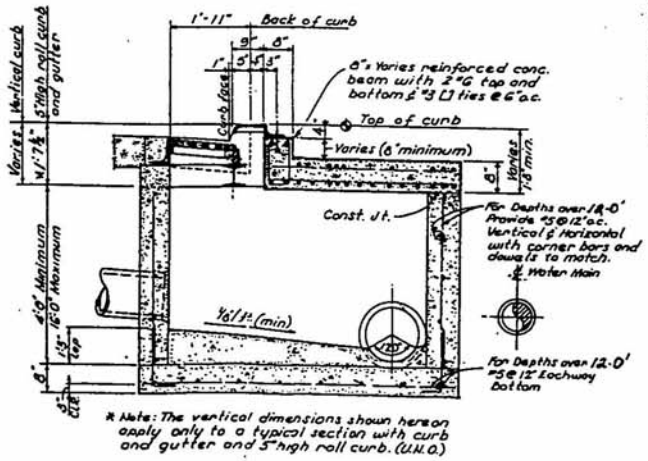
PLAN VIEW



SECTION A-A

NOTES

CONCRETE SLAB: May be precast concrete with lift holes. Provide reinforcement as shown on Plan View, Section A-A & Section B-B
INLET CHAMBER: Shall be built of Non-reinforced concrete or brick masonry in accordance with Item 604 for depths of 12'-0" or less. Interchambers shall be precast concrete or cast in place concrete in accordance with Item 604.08 for depths greater than 12'-0". Reinforcement shall be in accordance with Section B-B.
PAVEMENT DETAIL: Shall be in accordance with agency having jurisdiction where variance from State of Ohio Std. Constr. Dwg. CB-3 occurs.
STANDARD GRATE: As shown on State of Ohio Std. Constr. Dwg. CB-3 shall be provided unless the plans specifically requires grate "V". Place grate so that the diagonal bars direct drainage flow toward the curb. All bar edges to be rounded 1/8" radius.
CASTING: Shall be as shown on State of Ohio Std. Constr. Dwg. CB-3.
STEPS: Shall be provided for full height of inlet chamber. They shall meet the requirements of the State of Ohio Std. Ccnstr. Dwg. MH-1.



* Note: The vertical dimensions shown hereon apply only to a typical section with curb and gutter and 5" high roll curb. (U.N.O.)

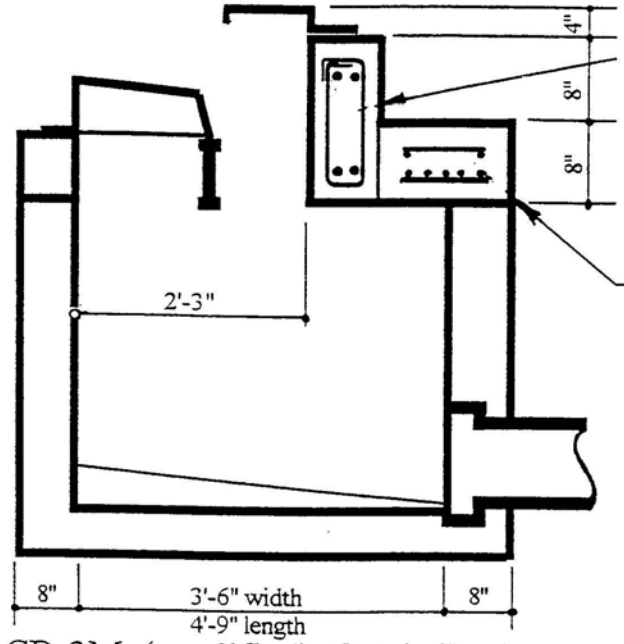
SECTION B-B

BEARING AREAS: For frame and grate shall be so fitted and finished, without projections, as to provide a firm and even seat for all portions of the grate in the frame without rocking.
BRICK OR CONCRETE MASONRY UNITS: Side walls, when used in place of concrete, shall be 8" normal thickness.
PRECAST CONSTRUCTION: is permitted, concrete shall meet requirements of 706.13. Precast concrete walls shall have a minimum thickness of 6" and reinforcement shall be sufficient to permit shipping and placement without damage. However, precast concrete slabs shall be as shown hereon.
OPENINGS IN PRECAST CONCRETE WALLS: For 18" diameter and smaller, inlet pipes may be prefabricated or cut in field provided the sides of the pipe at the springline do not project into the manhole.
BASES: as shown on State of Ohio Std. Constr. Dwg. MH-3 is permitted. It may be precast monolithic with the walls a permissible alternate is to cast and ship the base and walls separately. Openings for inlet and outlet pipes shall be provided either when the unit is cast or later, to meet field conditions. Bottom channels may be formed of concrete precast in the base or by field construction as shown on MH-1.
PRECAST SECTIONS: Shall be cast and assembled with either all tongue or all groove ends up. Lift holes may be provided in each section for handling.
MANHOLE OPENINGS: Shall be located to meet field conditions. Also, to clear pipe penetrations so that standard manhole steps can be installed full height.

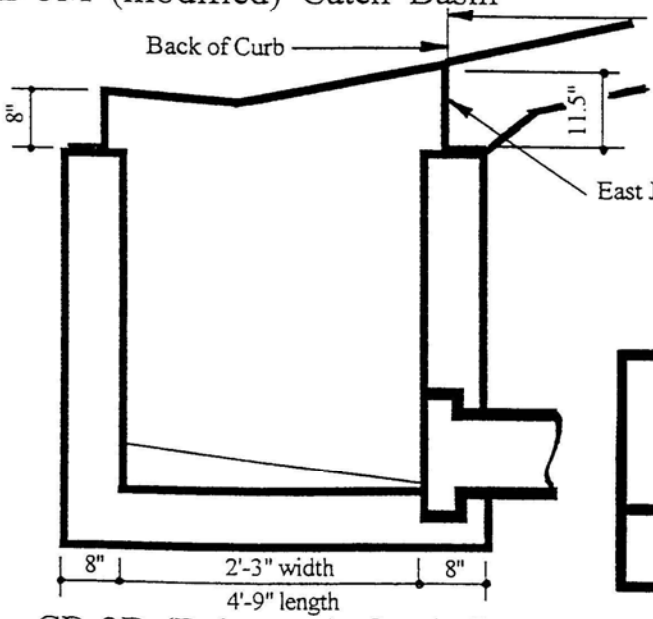
PLATE 9

CB-3MH CATCH BASIN

STANDARD CONSTRUCTION DRAWING



CB-3M (modified) Catch Basin

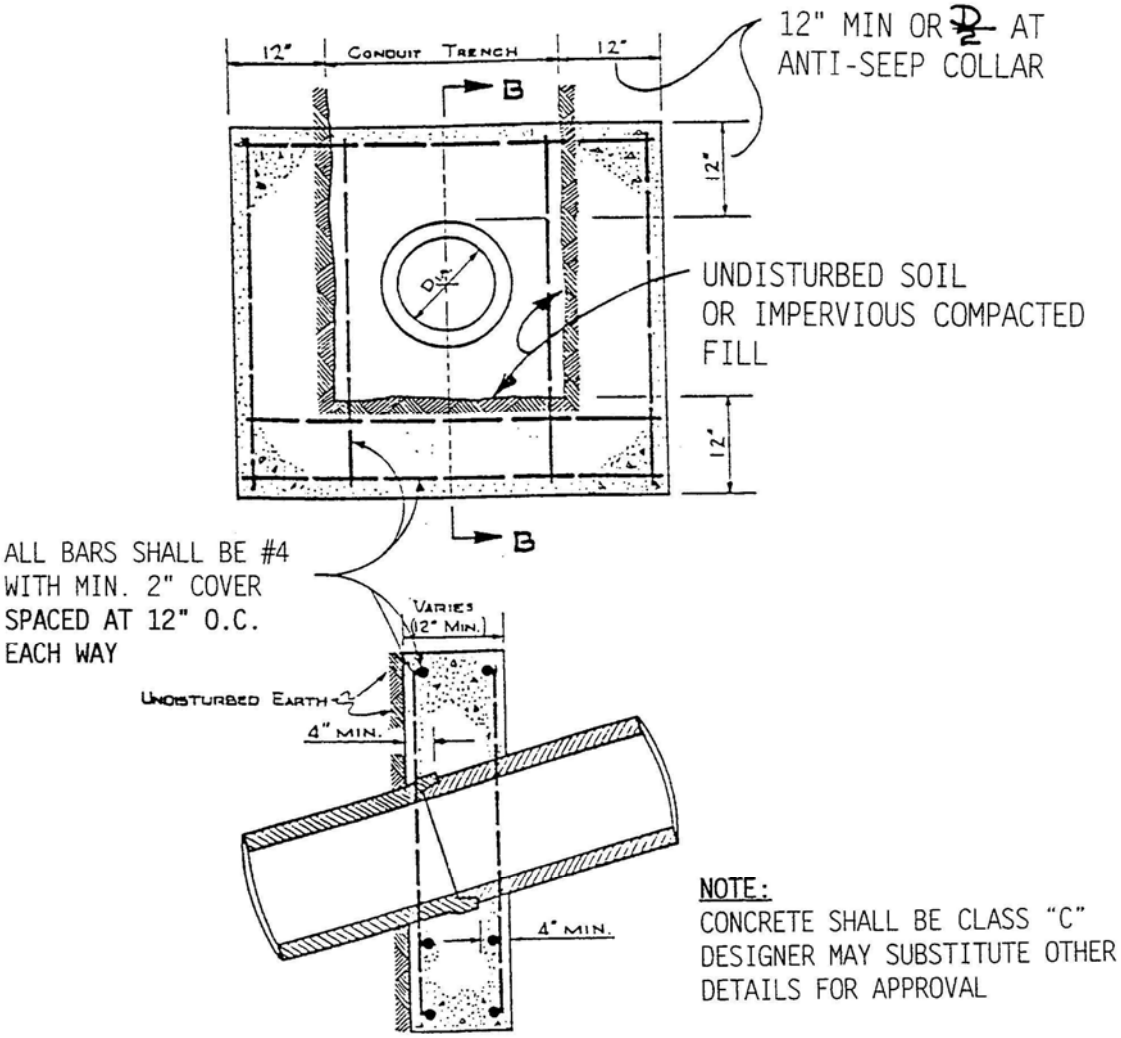


CB-3D (Driveway) Catch Basin

HAMILTON COUNTY
DEPARTMENT OF PUBLIC WORKS
STORM DRAINAGE
STANDARD PLATE 10

STD DWG CB-3M
STD DWG CB-3D

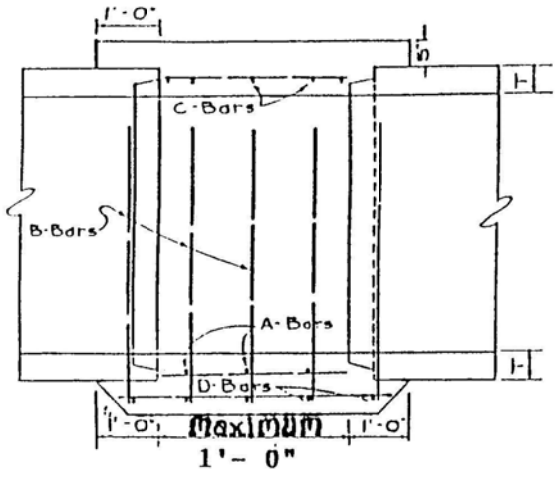
1.) For CB-3M and CB-3D specifications and construction, refer to ODOT Standard Construction Drawing CB-3.
2.) CB-3M refer to section ST 710 (g) 1
3.) CB-3D used to solve difficult field problem where no other practical solution is available and the amount of flow is insignificant. Refer to section ST 710 (g) 2.



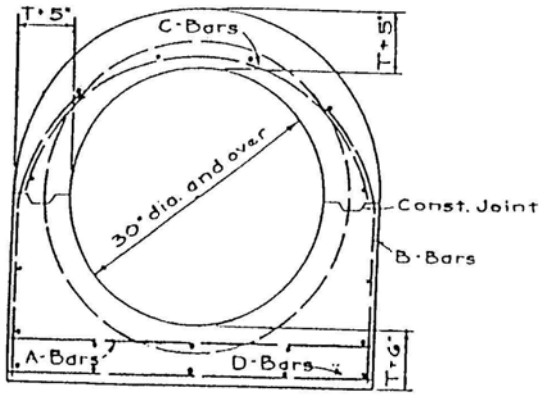
NOTE:
CONCRETE SHALL BE CLASS "C"
DESIGNER MAY SUBSTITUTE OTHER
DETAILS FOR APPROVAL

SECTION B-B
TYPE "B"

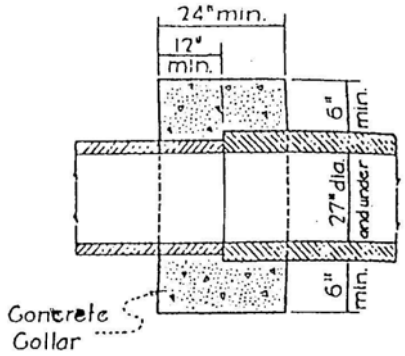
PLATE 11
KEY BLOCK
AS SHOWN
ANTI-SEEP COLLAR
AS NOTED



SECTION A-A



OPTIONAL
SECTION B-B



TYPE "A"

A-B-C- and D Bars @ 12" O.C.

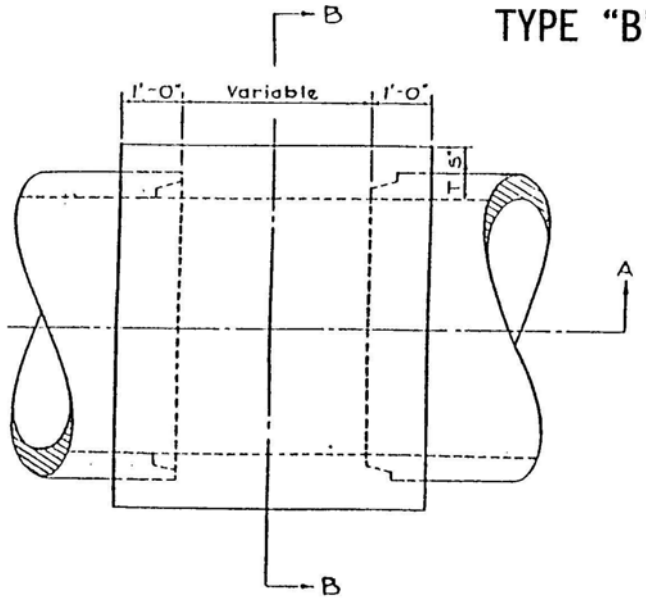
A-B-C- { #5 Bars for 30" to 60" Sewers
#6 Bars for 66" to 78" Sewers
#7 Bars for 84" to 108" Sewers

D-Bar #5 Bars for 30" to 108" Sewers
Not less than 3 transverse bars in any gap.
All longitudinal steel #5 Bars @ 18" O.C.

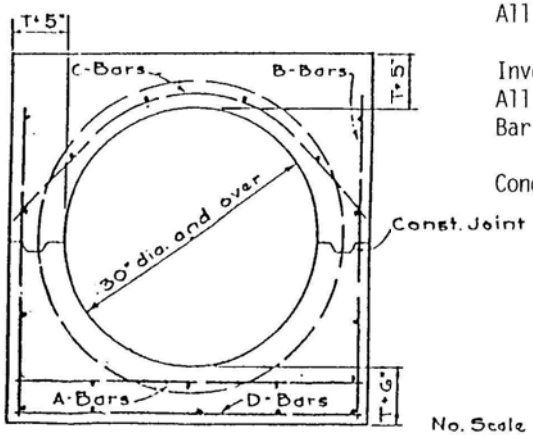
Invert Steel - 3" cl.
All other Steel - 2" cl.
Bar Lap - 30 times the bar diameter

Concrete shall be Class "C"

TYPE "B"



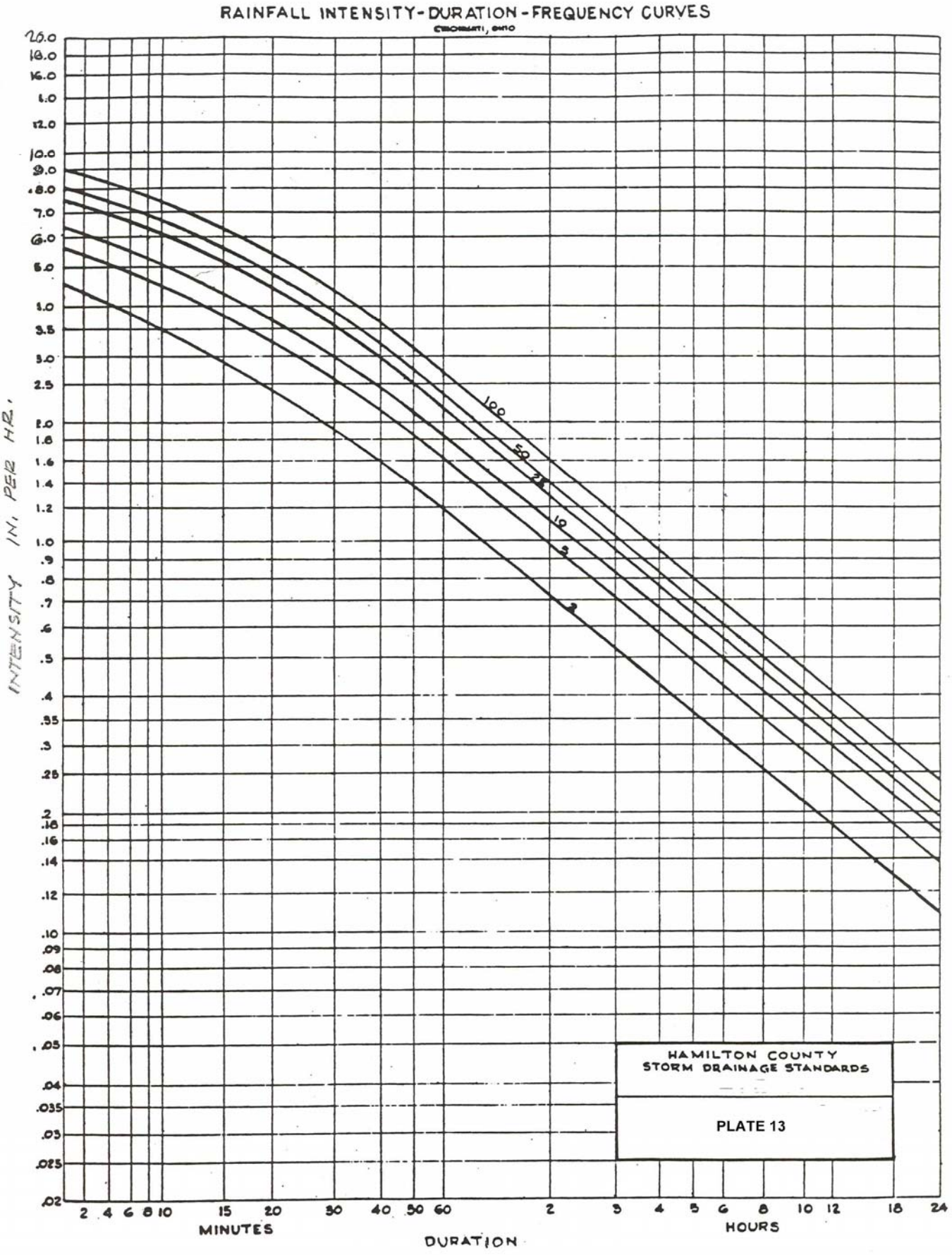
PLAN



No. Scale

SECTION B-B

PLATE 12
CONCRETE COLLARS
ON
CONDUITS


RAINFALL INTENSITY-DURATION-FREQUENCY CURVES
CINCINNATI, OHIO
INTENSITY IN, PER HR.
100
50
25
10
5
2
MINUTES
HOURS
DURATION
HAMILTON COUNTY
STORM DRAINAGE STANDARDS
PLATE 13