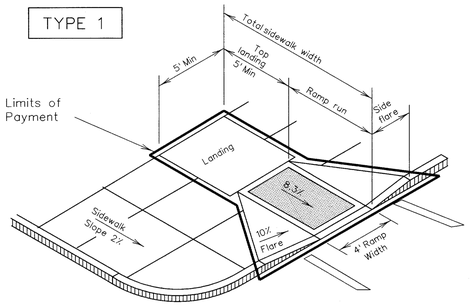
LEVELS DISPLAYED

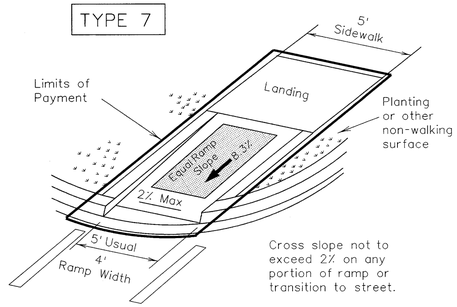
1									B2

TYPE 1



PERPENDICULAR CURB RAMP

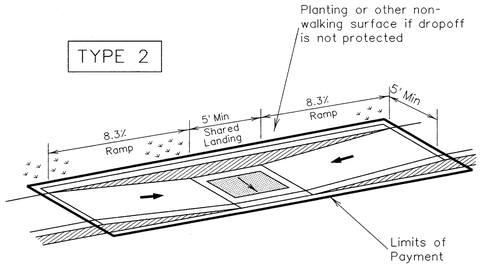
TYPE 7



Cross slope not to exceed 2% on any portion of ramp or transition to street.

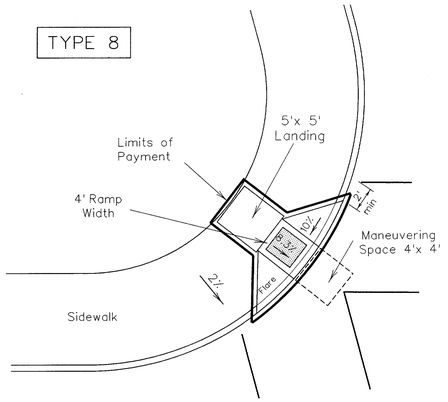
DIRECTIONAL RAMP WITHIN RADIUS

TYPE 2



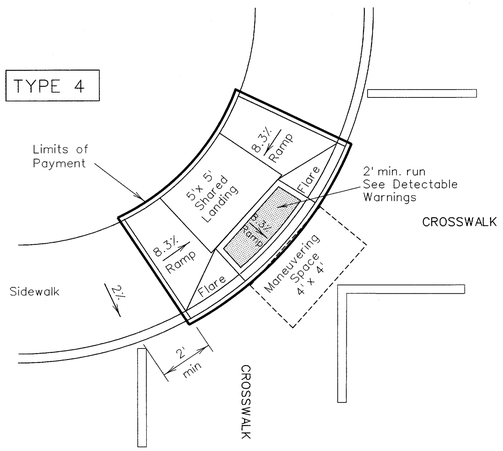
PARALLEL CURB RAMP

TYPE 8



DIAGONAL CURB RAMP (FLARED SIDES)

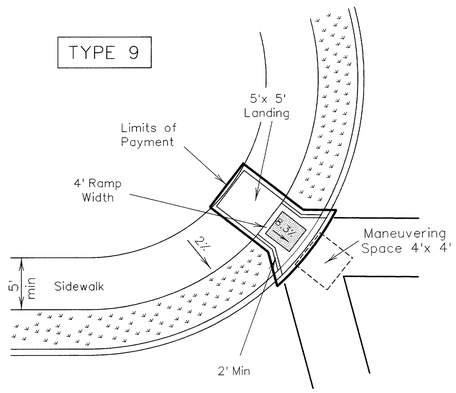
TYPE 4



DIAGONAL COMBINATION CURB RAMP

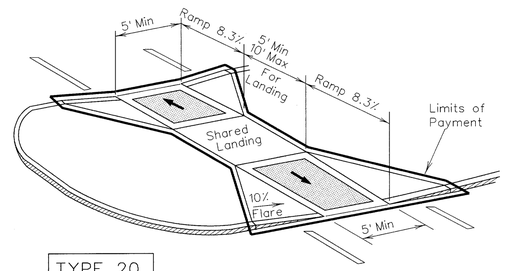
Perpendicular to the Tangent of the Curb Radius and Contained in Crosswalk

TYPE 9

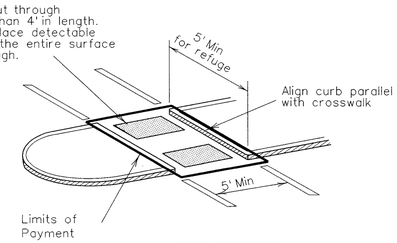


DIAGONAL CURB RAMP (RETURNED CURB)

TYPE 20

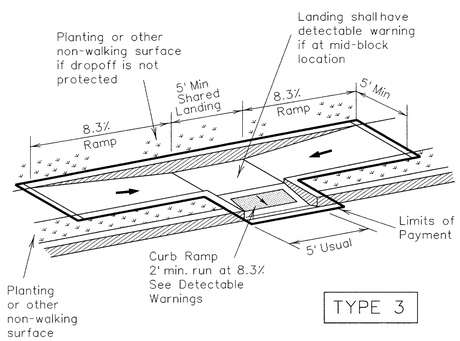


TYPE 21

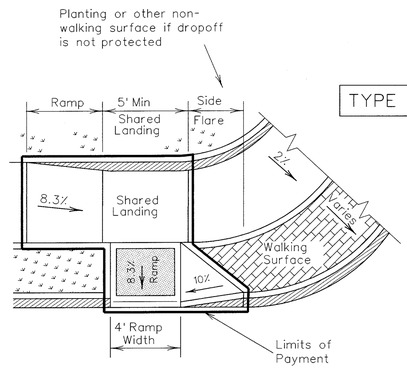


CURB RAMPS AT MEDIAN ISLANDS

TYPE 3

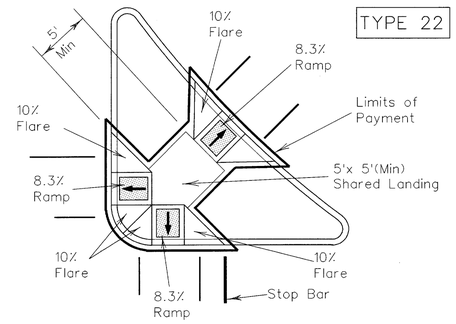


TYPE 6



COMBINATION CURB RAMPS

TYPE 22



COMBINATION ISLAND RAMPS

General Notes

All slopes are maximum allowable. The least possible slope that will still drain properly should be used. Ramp length or grade of approach sidewalks may be adjusted as directed by the Engineer.

The minimum sidewalk width is 5'. Where a 5' sidewalk can not be provided due to site constraints, a minimum 3' sidewalk with 5'x 5' passing areas at intervals not to exceed 200 ft is required.

Landings shall be 5'x 5' minimum with a maximum 2% slope in any direction.

Maneuvering space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.

Maximum allowable cross slope on sidewalk and ramp surfaces is 2%.

Curb ramps with returned curbs may be used only where pedestrians would not normally walk across the ramp. Otherwise, flared sides shall be provided.

All concrete surfaces shall receive a light broom finish unless noted otherwise in the plans.

Ramp textures must consist of truncated domed surfaces. Textures are required to be detectable underfoot. Surfaces that would allow water to accumulate are prohibited.

Additional information on curb ramp location, design, light reflective value and texture may be found in the current edition of the Texas Accessibility Standards (TAS) prepared and administered by the Texas Department of Licensing and Regulation (TDLR).

Raised medians separate opposing directions of traffic and provide a refuge area for pedestrians unable to cross the entire roadway in the allotted signal phase. To serve as a refuge area, the median should be a minimum of 5' wide. Medians should be designed to provide accessible passage over or through them.

Small channelization islands, which can not provide a minimum 5'x 5' landing at the top of ramps, shall be cut through level with the surface of the street.

Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, ramps shall be aligned with theoretical crosswalks, or as directed by the Engineer.

Existing features that comply with TAS may remain in place unless otherwise shown on the plans.

Handrails are not required on curb ramps. Curb ramps shall be provided wherever on accessible route crosses (penetrates) a curb.

Shaded areas indicate locations of detectable warnings. (Color / light reflective value and texture contrast)

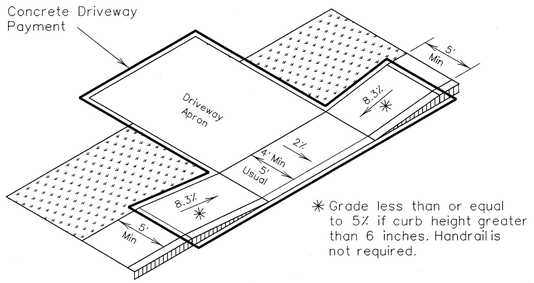
Curb ramps and landings shall be constructed and paid for in accordance with Item, "Curb ramp and Landing". Street curb transitions and curb bevels will be paid for in accordance with Item, "Concrete Curb, Gutter and Combined Curb and Gutter".

Texas Department of Transportation
Design Division (Roadway)

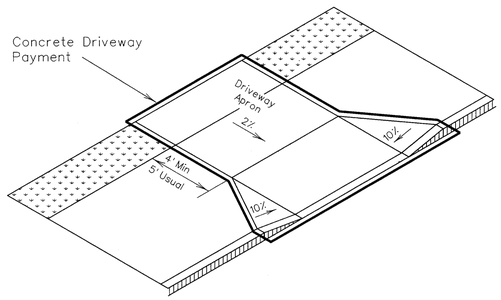
PEDESTRIAN FACILITIES
CURB RAMPS
PED-02

SHEET 1 OF 3

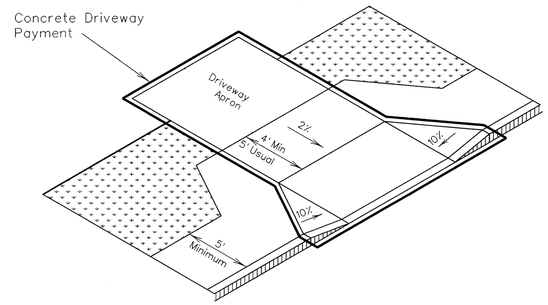
FILE: ped02.dgn	DN: MAM	CK: MAM	DW: BGD	CK:	
©TxDOT March 2002	DIST	FED.REG	FEDERAL AID PROJECT	•	SHEET
REVISIONS		6			16
	COUNTY		CONTROL	SECT	JOB	HIGHWAY



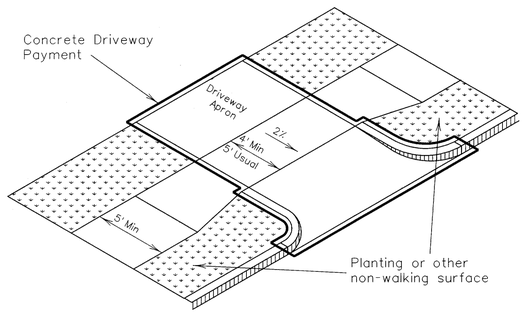
Ramp sidewalk



Wide sidewalk

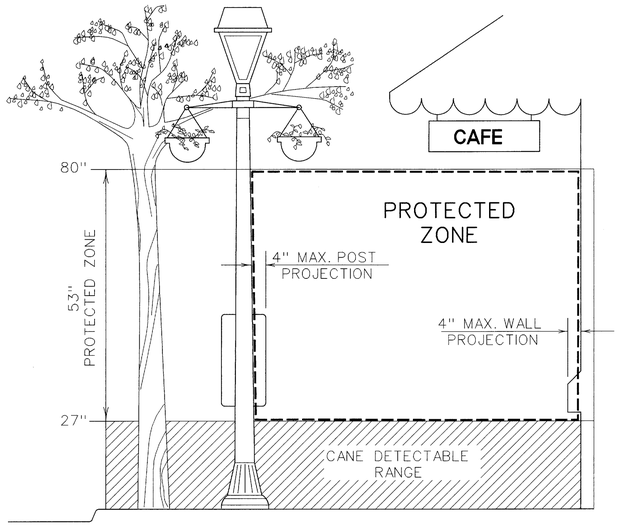


Apron offset sidewalk



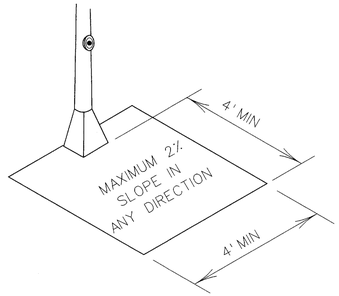
Setback sidewalk

SIDEWALK TREATMENT AT DRIVEWAYS

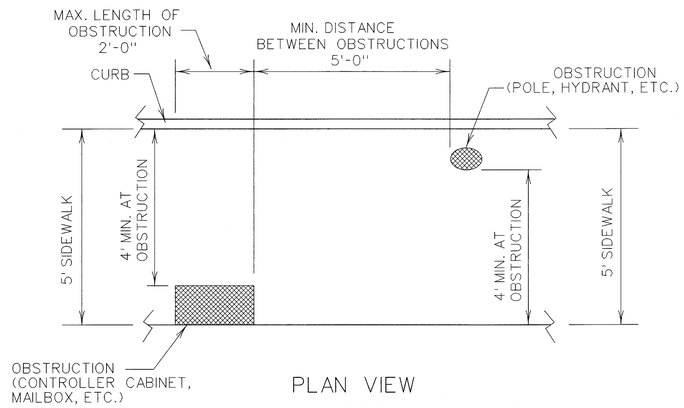


PROTECTED ZONE

In pedestrian circulation area, maximum 4" projection for post or wall mounted objects between 27"and 80" above the surface.



CLEAR GROUND SPACE AT PEDESTRIAN PUSH BUTTON



PLAN VIEW

PLACEMENT OF STREET FIXTURES

(ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)

General Notes

All slopes are maximum allowable. The least possible slope that will still drain properly should be used.

Traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items shall be placed so not to obstruct the accessible route.

Usual sidewalk cross slope equals 1.5%. The maximum allowable sidewalk cross slope equals 2%.

Street grades and cross slopes shall be as shown elsewhere in the plans.

Existing features that comply with TAS may remain in place unless otherwise shown on the plans.

Changes in level greater than $\frac{1}{4}$ inch are not permitted.

Any part of the accessible route with a slope greater than 1:20 (5%) shall be considered a ramp. If a ramp has a rise greater than 6 inches or a horizontal projection greater than 72 inches, then it shall have handrails on both sides, with the following exceptions:

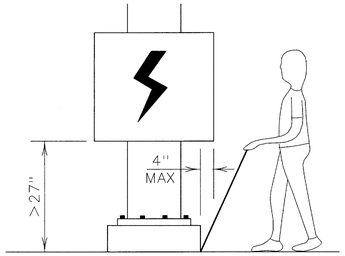
At ramp sidewalks shown at far left.

Handrails are not required on curb ramps. Curb ramps shall be provided wherever an accessible route crosses (penetrates) a curb.

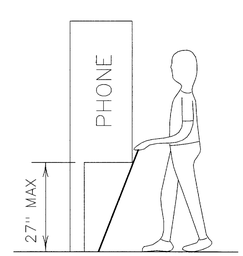
The least possible grade should be used to maximize accessibility. Where structurally impractical to achieve TAS compliance, the running slope of sidewalks and crosswalks, within the public right of way, may follow the grade of the parallel roadway without invoking Texas Accessibility Standards (TAS) variances for landings or handrails. Where a continuous grade greater than 5% must be provided, handrails may be desirable on one or both sides of the sidewalk to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions.

Parabolic crowns may require adjustment in crosswalk areas to limit the crosswalk grade to 5%.

Driveways and turnouts shall be constructed and paid for in accordance with Item, "Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".



When an obstruction of a height greater than 27" from the surface would create a protrusion of more than 4" into the pedestrian circulation area, construct additional curb or foundation at the bottom to provide a maximum 4" overhang.



Protruding objects of a height ⩽27" are detectable by cane and do not require additional treatment.

DETECTION BARRIER FOR VERTICAL CLEARANCE ⩽80"

LEVELS DISPLAYED

1 62

Texas Department of Transportation
Design Division (Roadway)

PEDESTRIAN FACILITIES
SIDEWALKS

PED-02

SHEET 2 OF 3

FILE: ped02.dgn	DN: MAM	CK: MAM	DW: BGD	CK:
©TxDOT March 2002	DIST	FED.REG	FEDERAL AID PROJECT	#	SHEET
REVISIONS		6			16A
	COUNTY		CONTROL	SECT	JOB	HIGHWAY

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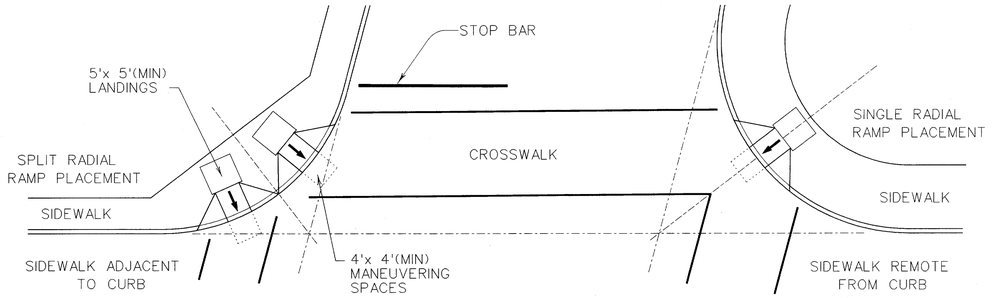
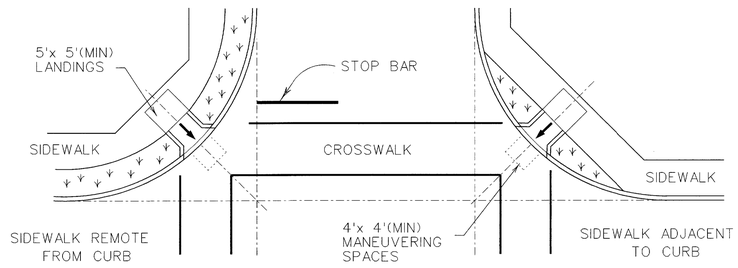


SKEWED INTERSECTION WITH "LARGE" RADIUS



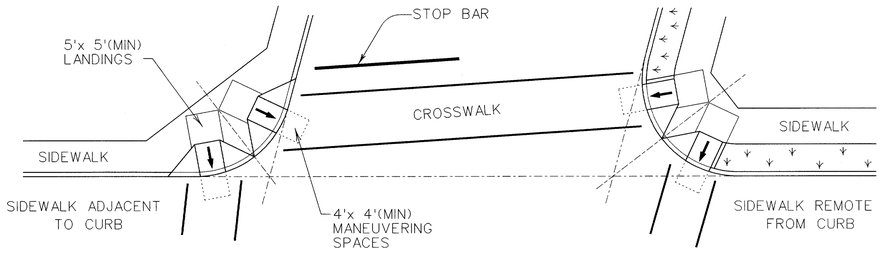
NORMAL INTERSECTION WITH "LARGE" RADIUS

General Notes

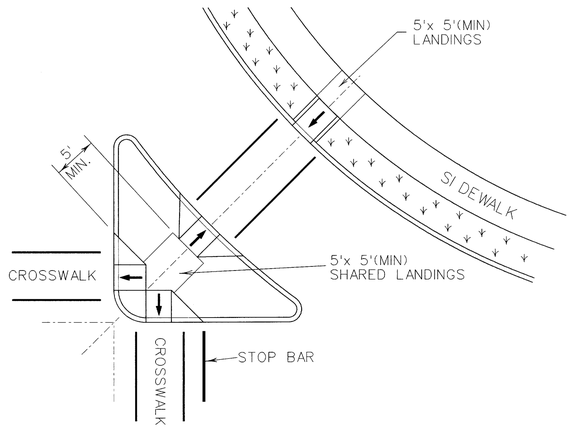
Street grades and cross slopes shall be as shown elsewhere in the plans.

Ramps are shown here without detectable warnings for simplicity. Detectable warnings are required at the locations shown on the PED Standard (Sheet 1 of 3) and in accordance with the details shown below.

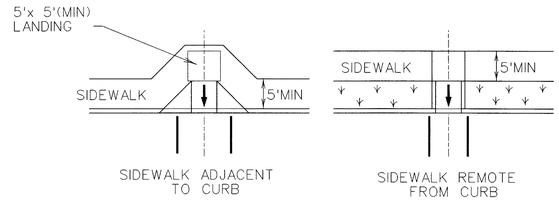
Small channelization islands, which can not provide a minimum 5' x 5' landing at the top of ramps, shall be cut through level with the surface of the street.



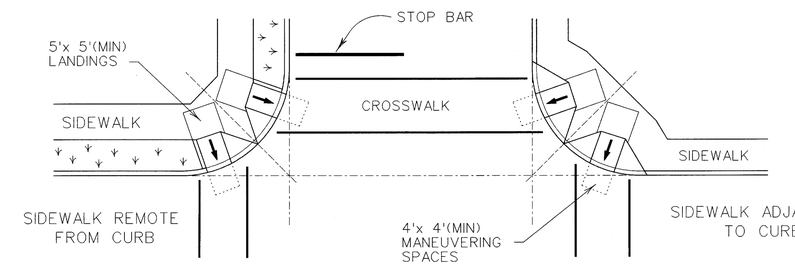
SKEWED INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



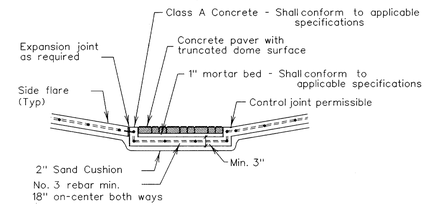
MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS



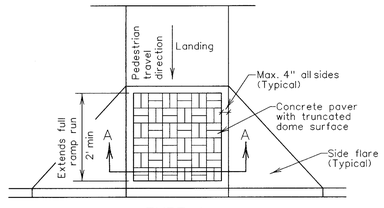
NORMAL INTERSECTION WITH "SMALL" RADIUS

TYPICAL CROSSING LAYOUTS

SEE SHEET 1 OF 3 FOR DETAILS AND DIMENSIONS

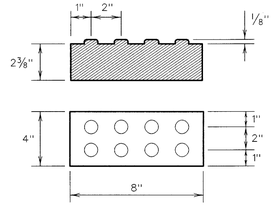


Section A-A



TYPE A
Truncated Dome Pattern Curb Ramp

DETECTABLE WARNINGS



Concrete paver with truncated dome surface

General Notes

Concrete paver units shall meet all requirements of ASTM C-936, C-33, and shall be laid in a two by two unit basket weave pattern, unless shown otherwise in the plans.

Domes shall be aligned in the direction of pedestrian travel.

Concrete paver units shall have a truncated dome top surface for detectable warning to pedestrians.

Concrete paver unit color for the ramp shall be a contrasting color that provides a light reflective value that significantly contrasts with the adjacent surfaces. The color of the concrete paver units shall be shown elsewhere in the plans. (Adjacent surfaces include side flares).

Concrete paver units shall be saw cut only and any cut unit shall not be less than 25 percent of a full unit.

LEVELS DISPLAYED

Texas Department of Transportation
Design Division (Roadway)

PEDESTRIAN FACILITIES

INTERSECTION LAYOUTS
AND
DETECTABLE WARNINGS

PED-02

SHEET 3 OF 3

FILE: ped02.dgn	DN: MAM	CK: MAM	DW: BGD	CK:
© TxDOT March 2002	DIST	FED REG	FEDERAL AID PROJECT	• SHEET
REVISIONS		6		168
	COUNTY		CONTROL SECT JOB	HIGHWAY

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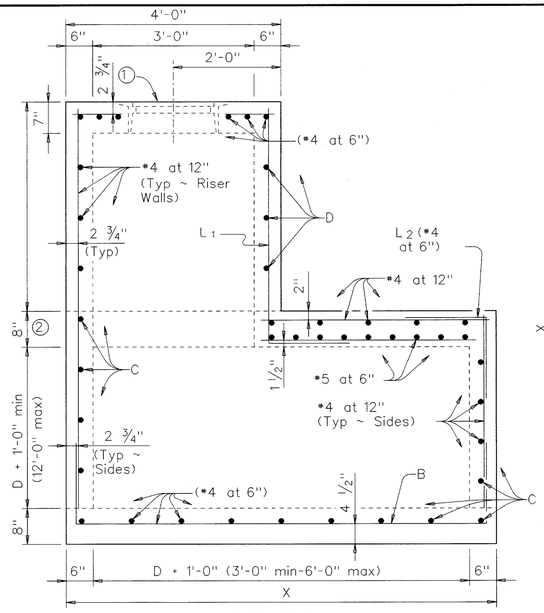
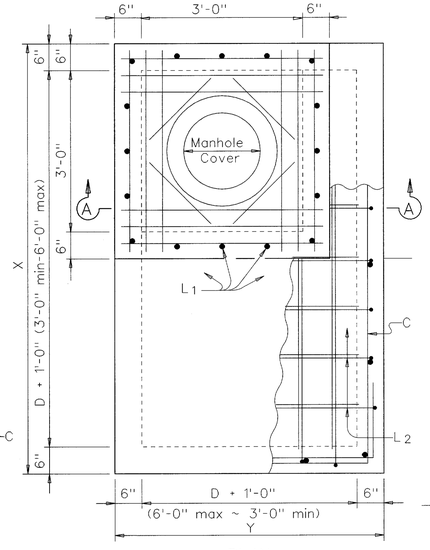
File: MH-MESTD

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

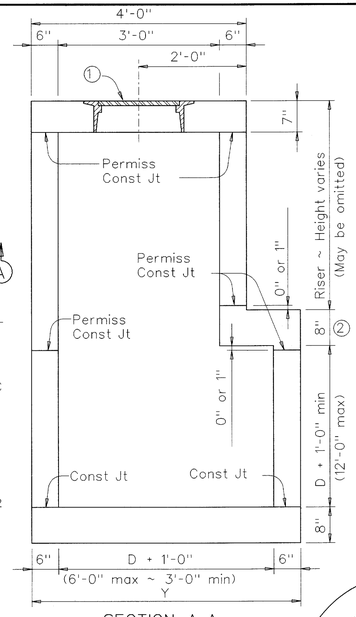


ELEVATION

D = maximum inside diameter of any Pipe entering the side shown or the opposite side



PLAN

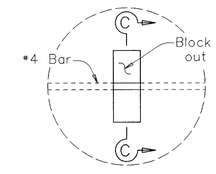


SECTION A-A

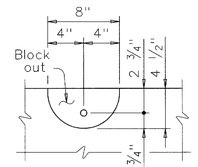
MANHOLE WITH CAST-IN-PLACE RISER

① See Ring and Cover Details

② for 0'-15' of Fill

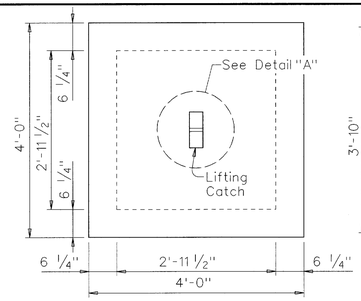


DETAIL "A"

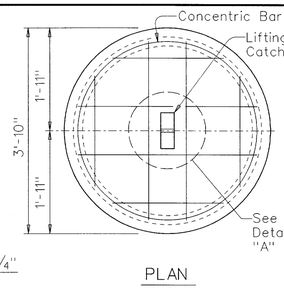


SECTION C-C

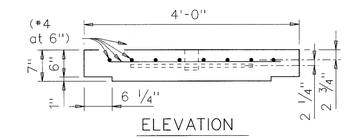
LIFTING CATCH



PLAN

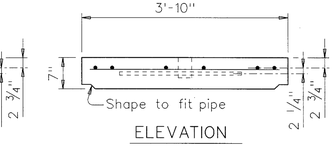


PLAN



ELEVATION

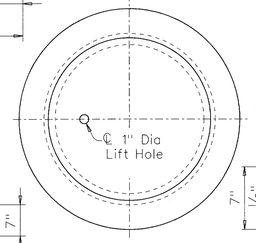
CAST-IN-PLACE RISER COVER

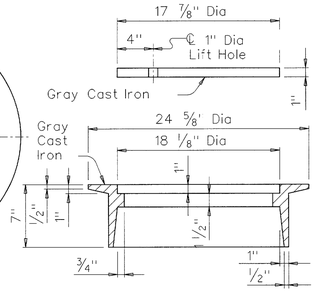


ELEVATION

CONCRETE PIPE RISER COVER

OPTIONAL PRECAST CONCRETE LIFT-OFF COVERS

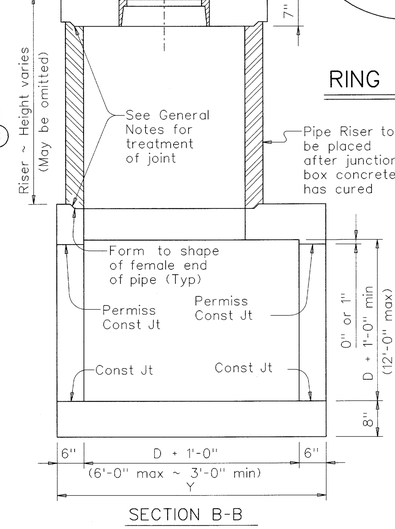




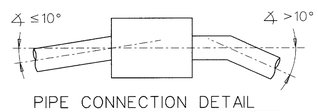
RING AND COVER DETAILS (TYPE C)

Approximate Weight = 200 lb ③

③ Rings and covers of slightly different dimensions but approximately the same weight may be substituted if approved by the Engineer.

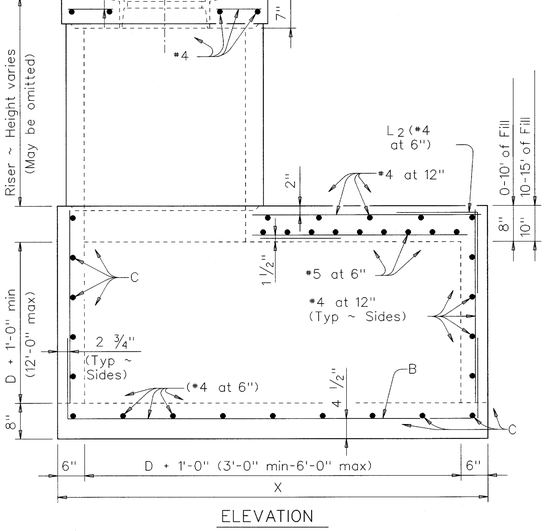


SECTION B-B



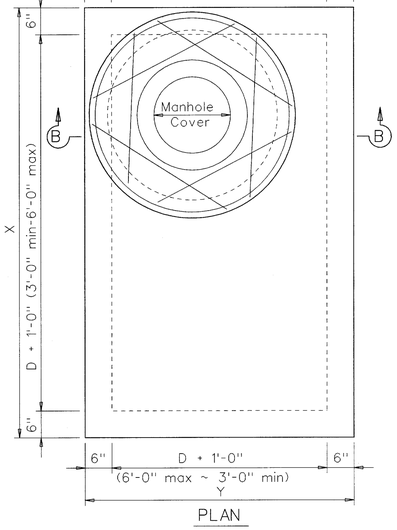
PIPE CONNECTION DETAIL

Connecting pipes should enter within 10° of normal to inlet wall. If necessary, pipe elbow or curved approach alignment should be used to stay within this limit.



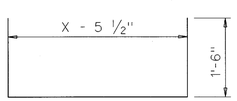
ELEVATION

D = maximum inside diameter of any Pipe entering the side shown or the opposite side

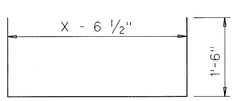


PLAN

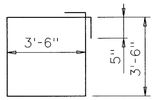
OPTIONAL MANHOLE WITH CONCRETE PIPE RISER



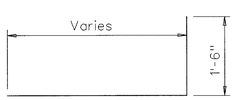
BARS B



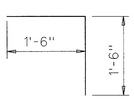
BARS C



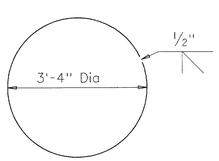
BARS D



BARS L_1



BARS L_2



CONCENTRIC BAR

GENERAL NOTES:

Unless otherwise shown in the plans, payment will be made for each manhole of the Type M.

Exposed edges shall be chamfered ¾".

Alternate design drawings bearing the seal of a registered professional engineer will be acceptable for precast construction of the manholes.

Shop drawings will not be required.

The Contractor may with the approval of the Engineer furnish manholes of equivalent structural design.

In areas of conflict between reinforcing steel, blockouts, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.

The riser may be constructed of reinforced concrete as shown or of Reinforced Concrete Pipe , Class III, in accordance with ASTM Designation C-76. If pipe is used, joints shall conform to the Item "Reinforced Concrete Pipe Culverts". Precast Concrete Lift Off Cover may be substituted for "Ring and Cover".

The riser, either cast-in-place or concrete pipe, may be located in any corner.

All reinforcing steel shall be *4 unless otherwise noted.

Pipes may enter any or all walls. The maximum size of pipe that can be accomodated is 60". More than one pipe may enter a side, subject to the maximum box dimension shown. The clear distance between adjacent pipes should be 9" minimum.

LEVELS DISPLAYED (LV=1,2 for English)

Texas Department of Transportation
Design Division (Bridge)

MANHOLE TYPE M
(JUNCT ON BOX WITH ACCESS)

MH-M

FILE: mh-mestd.dgn	DN: TXDOT	CK: TER	DW: MCB	CK: TER	STD: B483
ORIG DATE: SEPTEMBER 1996	DIST	FED REG	FEDERAL AID PROJECT	•	SHEET
REVISIONS		6			17
	COUNTY		CONTROL	SECT	JOB	HIGHWAY

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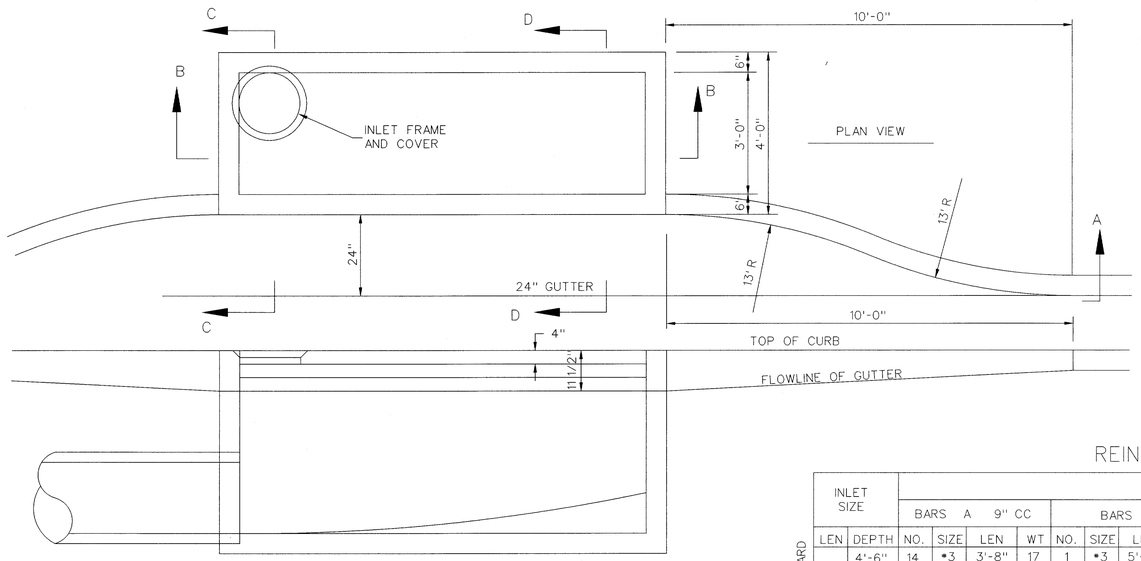
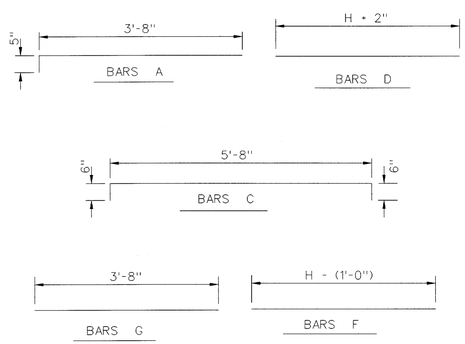
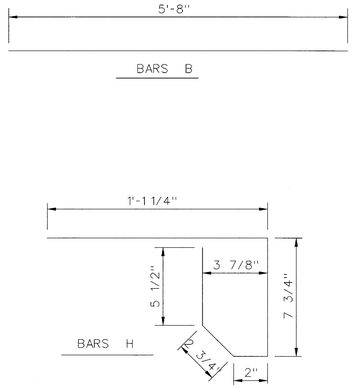


SECTION A - A

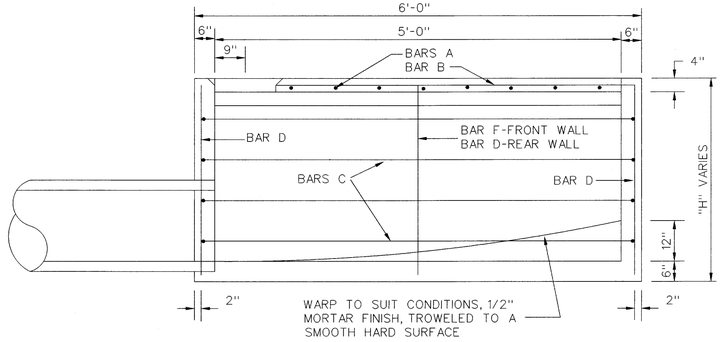




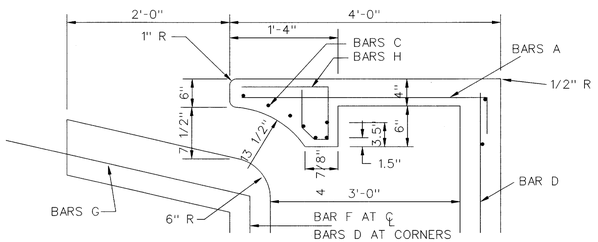
REINFORCING STEEL AND CONCRETE (RECESSED CURB INLET)

	INLET SIZE		STEEL																										* TOTALS		5" I10*
			BARS A 9" CC				BARS B				BARS C 12" CC				BARS D				BARS F				BARS G				BARS H 18" CC						
	LEN	DEPTH	NO.	SIZE	LEN	WT	NO.	SIZE	LEN	WT	NO.	SIZE	LEN	WT	NO.	SIZE	LEN	WT	NO.	SIZE	LEN	WT	NO.	SIZE	LEN	WT	NO.	SIZE	LEN	WT	REINF. (LBS)	CONC. (CY)	
STANDARD	5'	4'-6"	14	#3	3'-8"	17	1	#3	5'-8"	3	12	#4	5'-8"	94	5	#4	4'-8"	16	1	#4	3'-6"	2	5	#3	3'-8"	6					138	3.36	
		5'-0"	14	#3	3'-8"	17	1	#3	5'-8"	3	14	#4	5'-8"	109	5	#4	5'-2"	17	1	#4	4'-0"	3	5	#3	3'-8"	6					155	3.60	108#
		5'-6"	14	#3	3'-8"	17	1	#3	5'-8"	3	14	#4	5'-8"	109	5	#4	5'-8"	19	1	#4	4'-6"	3	5	#3	3'-8"	6					157	3.84	
ALTERNATE	5'	4'-6"	14	#3	3'-8"	17	1	#3	5'-8"	3	15	#4	5'-8"	117	5	#4	4'-8"	16	1	#4	3'-6"	2	5	#3	3'-8"	6	6	#3	2'-7"	6	167	3.42	
		5'-0"	14	#3	3'-8"	17	1	#3	5'-8"	3	17	#4	5'-8"	132	5	#4	5'-2"	17	1	#4	4'-0"	3	5	#3	3'-8"	6	6	#3	2'-7"	6	184	3.66	
		5'-6"	14	#3	3'-8"	17	1	#3	5'-8"	3	17	#4	5'-8"	132	5	#4	5'-8"	19	1	#4	4'-6"	3	5	#3	3'-8"	6	6	#3	2'-7"	6	186	3.90	

* FOR CONTRACTOR'S INFORMATION ONLY

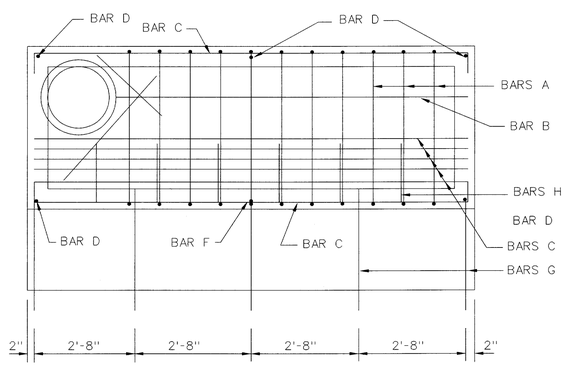


SECTION B - B



SECTION D - D ALTERNATE

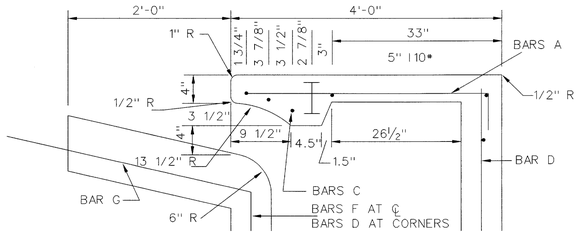
SEE STANDARD SECTION D-D AT RIGHT



REINFORCING PLAN ALTERNATE

CONCRETE TO BE DEDUCTED FOR PIPE

PIPE SIZE	CONC. CY
18"	0.05
21"	0.07
24"	0.09
27"	0.11
30"	0.14
36"	0.17



SECTION D - D

STANDARD INLET

GENERAL NOTES :

1. ALL CONCRETE SHALL BE 3000 PSI.
2. LATERAL PIPE MAY ENTER THE INLET AT ANY LOCATION.
3. THE 24" GUTTER IN THE FRONT OF THE INLET IS CONSIDERED PART OF THE INLET AND SHALL BE CONSTRUCTED WITH THE INLET.
4. THE TOP OF INLET CROSS SLOPE SHALL CONFORM TO THE ADJACENT PARKWAY (2%)
5. THE DIMENSIONS RELATING TO THE REINFORCING STEEL ARE TO THE CENTER OF THE BARS.
5. FOR INLETS WITH A DEPTH LESS THAN 4' - 6", THE CONTRACTOR SHALL MODIFY THE LENGTH OF STEEL BARS.

STATE OF TEXAS
WEIDONG LI
84718
LICENSED PROFESSIONAL ENGINEER
Weidong Li
5/12/03

PARSONS
15770 N. DALLAS PARKWAY, SUITE 500, DALLAS, TEXAS 75248 (972)991-1900

INLET DETAILS

INWOOD CONNECTION

DEPARTMENT OF PUBLIC WORKS

TOWN OF ADDISON, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NUMBER
D.J.S.	E.C.S.	05/12/03				18

File : INLET-DET

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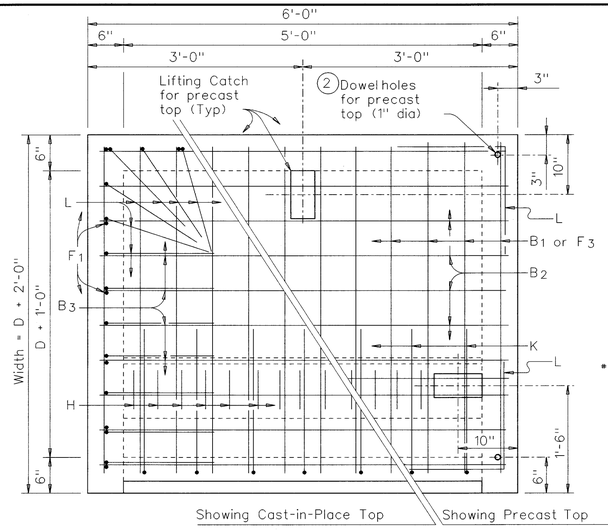
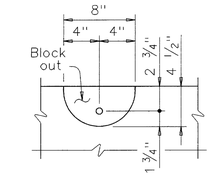
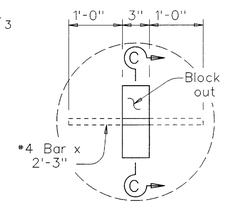


PLAN

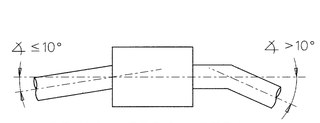


SECTION C-C



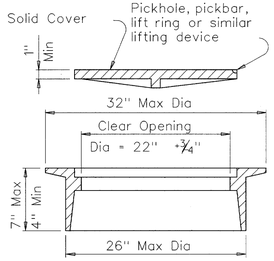
PLAN

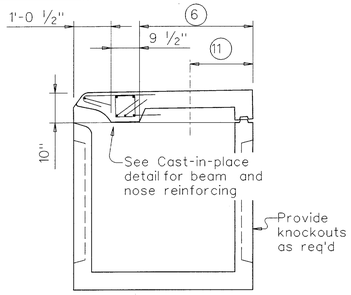
LIFTING CATCH



PIPE CONNECTION DETAIL

Connecting pipes should enter within 10° of normal to inlet wall. If necessary, pipe elbow or curved approach alignment should be used to stay within this limit.





PREFABRICATED INLET

(6) For reinforcing steel and dimensions not shown, see fabricators design drawing. Structure shall be of the size required to accommodate size of pipe shown elsewhere in the plans. Length of inlet = 5'-0"

ESTIMATED QUANTITIES (8)

Pipe Size = D	Height	For 4 Foot Width		Per 6 Inch Add'l Width		Per 1 Foot Add'l Height (7)	
		Cl "A" Conc	Reinf Steel	Cl "A" Conc	Reinf Steel	Cl "A" Conc	Reinf Steel
In	Ft	CY	Lb	CY	Lb	CY	Lb
18"	3'-7"	1.6	315	--	--	.33	32
24"	4'-1"	2.0	329	--	--	.33	32
30"	4'-7"	2.4	347	.18	19	.35	33
36"	5'-1"	2.7	361	.19	20	.37	35
42"	5'-7"	3.1	379	.20	21	.39	36
48"	6'-1"	3.5	393	.21	21	.41	38

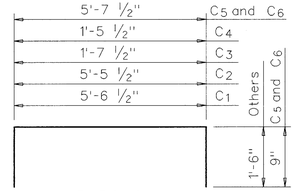
(7) For Width (4'-0" Min) = D + 2'-0"

(8) Does not apply to prefabricated inlets

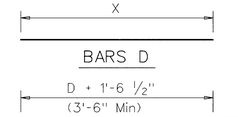
REINF STEEL

Bar	Size	Spacing
B_1	#4	6"
B_2	#5	6"
B_3	#4	6"
C_{1-2}	#4	12"
C_{3-4}	#4	(9)
C_5	#6	(9)
C_6	#4	(9)
D	#4	(9)
E	#4	12"
F_{1-3}	#4	12"
G	#4	6"
H	#3	4"
K	#4	9"
L	#4	6"

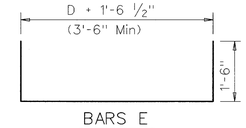
(9) As shown



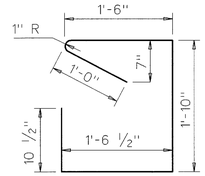
BARS C



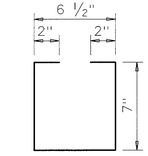
BARS D



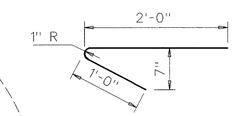
BARS E



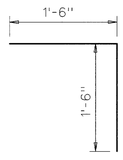
BARS G



BARS H



BARS K



BARS L

GENERAL NOTES:

Quantities shown herein are for Contractor's information only. Unless otherwise shown in the plans, payment will be made for each inlet of the type specified and for each extension. Each five foot curb opening of extension is considered "one extension" regardless of whether placed monolithically or precast. Extension length shall be in multiples of 5 feet.

Engineer has the option of specifying cast-in-place top with ring and cover or removable precast top as specified elsewhere in plans.

Alternate design drawings bearing the seal of a registered professional engineer will be acceptable for precast construction of inlets.

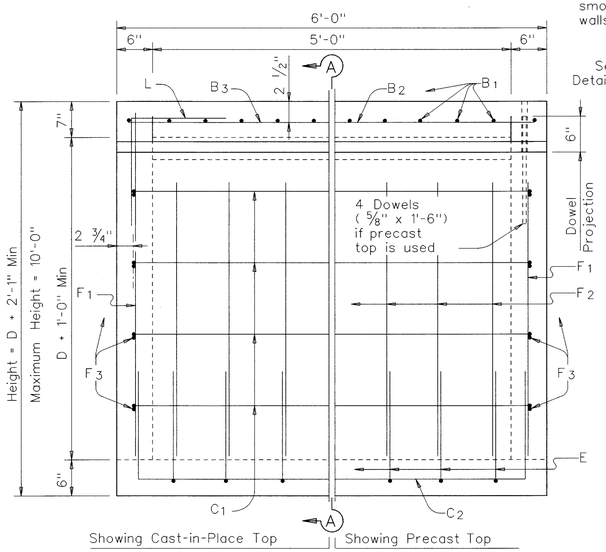
When approved by the Engineer opening configurations of equivalent hydraulic design may be furnished.

Shop drawings will not be required.

The Contractor may with the approval of the Engineer furnish inlets of equivalent structural design.

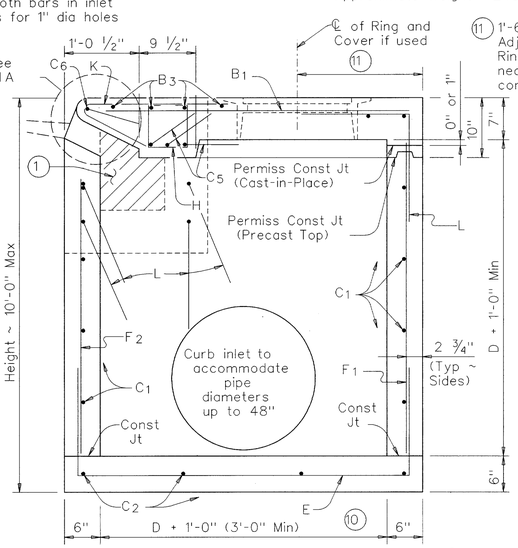
In areas of conflict between reinforcing steel, blockouts, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.

Ring and cover shall conform to the requirements of AASHTO M306, "Standard Specification for Drainage Structure Castings". Materials shall conform to ASTM A48, Class 35B for gray iron castings or ASTM A536, Grade 65-45-12 for ductile iron castings. Aluminum alloy castings shall not be permitted.



ELEVATION

(2) If precast top is used, provide 4 ~ 5/8" dia x 1'-6" smooth bars in inlet walls for 1" dia holes

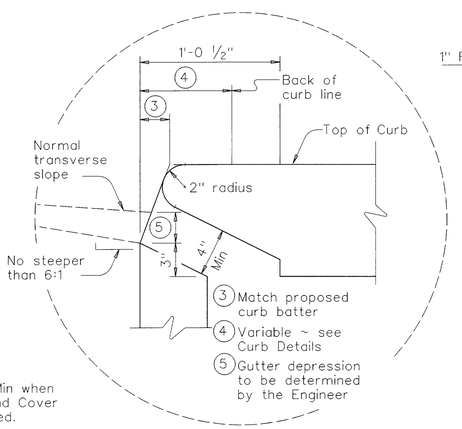


SECTION A-A

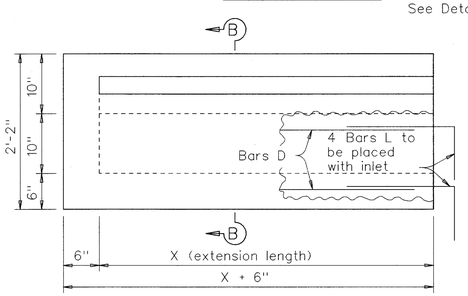
(11) 1'-6" Min, 1'-9" Max Adjust placement of Ring and Cover as necessary to avoid conflict with Bars H.

(1) Block out to accommodate extension if used and to place 4 Bars L

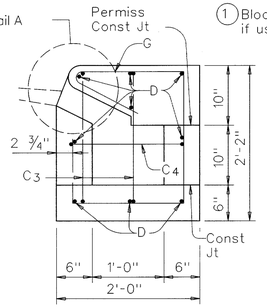
(10) 3'-6" Min when Ring and Cover are used.



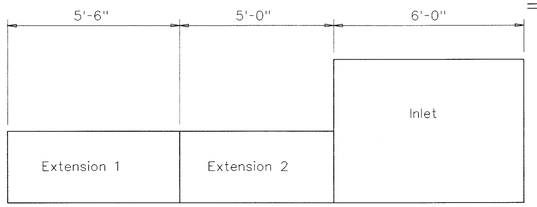
DETAIL A



EXTENSION ELEVATION



SECTION B-B



Note: If more than one extension is required, they should all be located on one side as indicated above. No slope is required in flowline of extension.

EXTENSION PLACEMENT

EXTENSION QUANTITIES

Ext	"X"	Cl "A" Conc	Reinf Steel
No.	Ft	CY	Lb
1	5	0.7	104
2	10	1.2	190
3	15	1.8	277
4	20	2.4	366

Texas Department of Transportation
Bridge Division

CURB INLET TYPE C AND EXTENSION TYPE E (5'-0" INLET)

IL-C

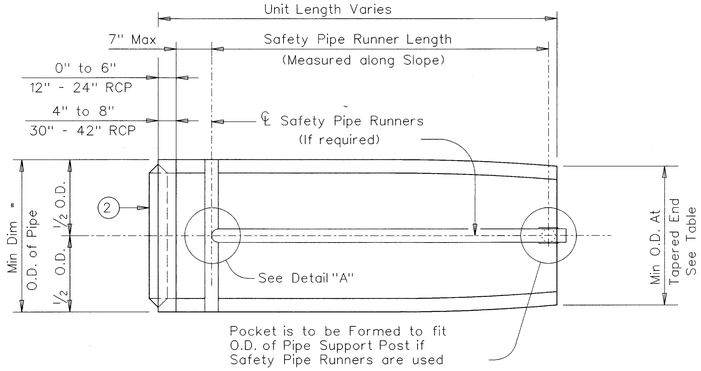
FILE: il-cstde.dgn	DN: TxDOT	CK: TER	DW: MCB	CK: TER/GAF
© TxDOT September 2000	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				18A
	COUNTY	CONTROL	SECT	JOB	HIGHWAY

LEVELS DISPLAYED
PATH:

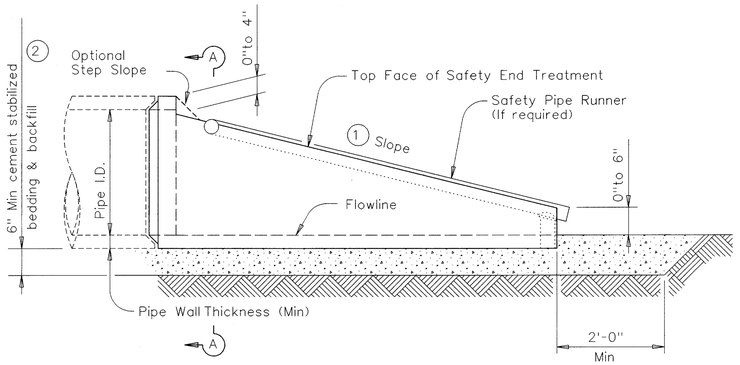
ACC:

LEVELS DISPLAYED

1



PLAN VIEW



LONGITUDINAL ELEVATION

Maximum Safety Pipe Runner Lengths & Required Safety Pipe Runner Sizes			
Maximum Safety Pipe Runner Length	Required Pipe Runner Size		
	Pipe Size	Pipe O.D.	Pipe I.D.
11'- 2"	3" STD	3.500"	3.068"
15'- 6"	3 ½" STD	4.000"	3.548"
20'-10"	4" STD	4.500"	4.026"
35'- 4"	5" STD	5.563"	5.047"

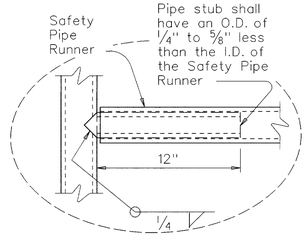
(1) Slope as shown elsewhere in the plans. Slope of 3:1 or flatter is required for vehicle safety.

(2) Cement stabilized bedding and backfill shall be in accordance with the Item, "Excavation and Backfill for Structures". Bedding and backfill shall be considered subsidiary to the Item "Safety End Treatment". When concrete riprap is specified around the Safety End Treatment backfill shall be as directed by Engineer.

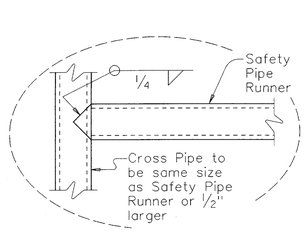
(3) The top 4" of void between Precast End Treatments shall be filled with concrete Riprap and shall be considered subsidiary to Safety End Treatment.

(4) Clear distance between pipes shall be adjusted to provide for the minimum distance between safety end treatments.

PIPE I.D.	MINIMUM WALL THICKNESS	MINIMUM O.D.	MIN O.D. AT TAPERED END	MIN REINF REQUIREMENTS (Sq in/ft of pipe)	SLOPE	MINIMUM LENGTH OF UNIT	SINGLE PIPE		MULTIPLE PIPE	
							SKEW	PIPE RUNNERS REQUIRED	SKEW	PIPE RUNNERS REQUIRED
12"	2"	16"	16"	0.07 CIRC.	3:1	2'-0"	<=45 deg	No	<=45 deg	No
					4:1	2'-8"				
					6:1	4'-0"				
15"	2 ¼"	19 ½"	19"	0.07 CIRC.	3:1	2'-10"	<=45 deg	No	<=45 deg	No
					4:1	3'-9"				
					6:1	5'-8"				
18"	2 ½"	23"	21 ½"	0.07 CIRC.	3:1	3'-8"	<=45 deg	No	<=45 deg	No
					4:1	4'-10"				
					6:1	7'-3"				
24"	3"	30"	27"	0.07 CIRC.	3:1	5'-3"	<=45 deg	No	<=30 deg	No
					4:1	7'-0"			>30 deg	Yes
					6:1	10'-6"				
30"	3 ½"	37"	31"	0.18 CIRC.	3:1	6'-3"	<=15 deg	No	<=15 deg	No
					4:1	8'-2"	>15 deg	Yes	>15 deg	Yes
					6:1	12'-1"				
36"	4"	44"	36"	0.19 ELIP.	3:1	7'-10"	=0 deg	No	=>0 deg	Yes
					4:1	10'-4"	>0 deg	Yes		
					6:1	15'-4"				
42"	4 ½"	51"	41 ½"	0.23 ELIP.	3:1	9'-6"	=>0 deg	Yes	=>0 deg	Yes
					4:1	12'-6"				
					6:1	18'-7"				



OPTION A



OPTION B

DETAIL A

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When Precast Safety End Treatment is used as a Contractor's alternate to mitered RCP, Riprap will not be required unless noted otherwise on the plans.

All precast concrete end sections shall be manufactured in accordance with Item "Reinforced Concrete Pipe Culverts" and in accordance with ASTM Specification C-76, Class III, Wall B for circular pipe.

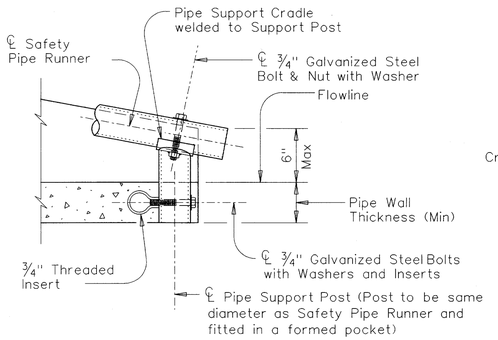
Precast concrete end sections shall be provided with a spigot or bell end for compatibility to upstream or downstream end conditions with sufficient annular space to allow for mortar, cold applied asphalt joint compound or pre-formed plastic gasket material.

Methods of lifting shall be provided by the manufacturer for ease of loading, unloading and installation.

Pipe Runners are designed for a traversing load of 1,800 Lbs at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

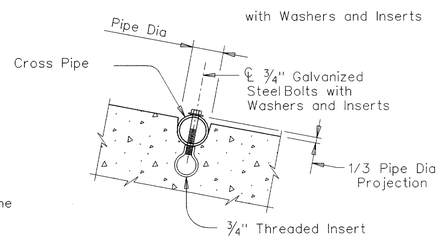
Safety Pipe Runners, Cross Pipes, Pipe Support Posts, and Pipe Stubs shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

All steel components except reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.



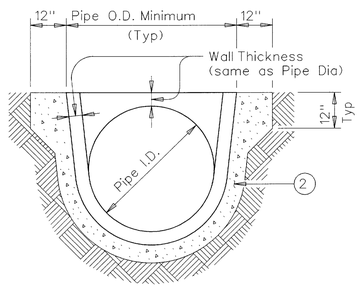
END DETAIL FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

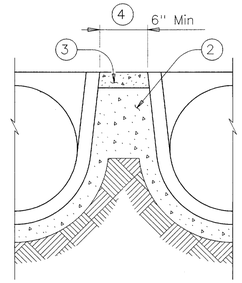


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



SECTION A-A



MULTIPLE PIPE INSTALLATION

Texas Department of Transportation
Bridge Division

PRECAST SAFETY END TREATMENT

TYPE II ~ CROSS DRAINAGE

PSET-RC

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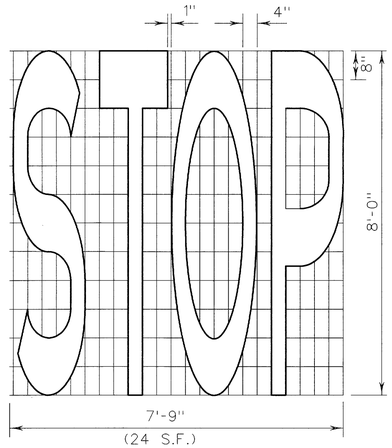
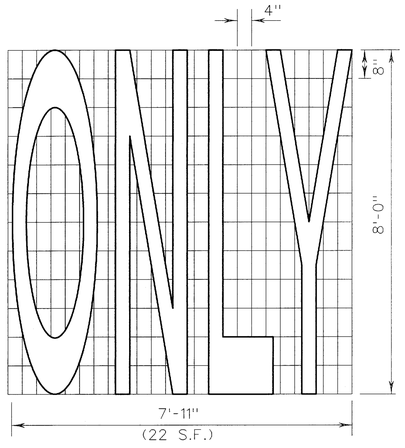
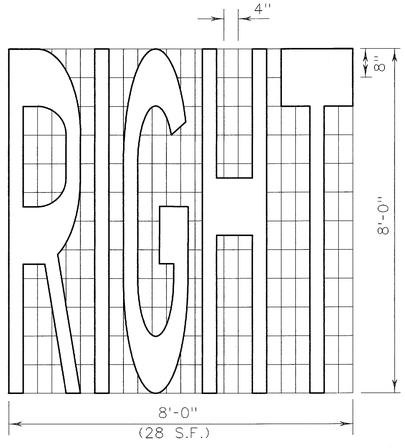
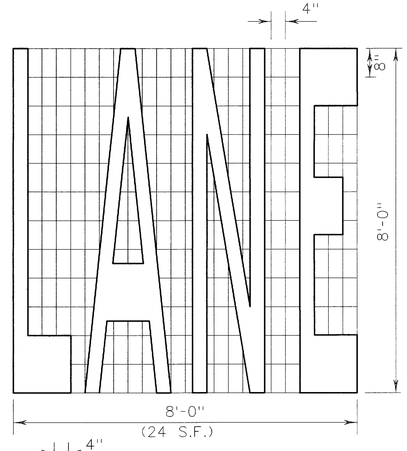
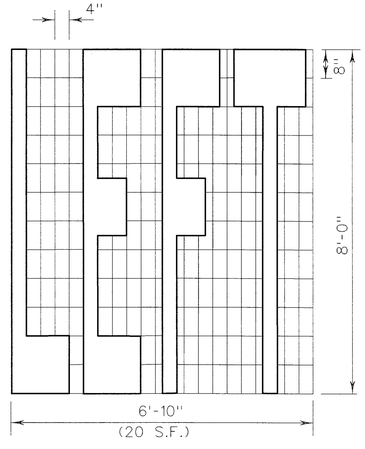
©TxDOT September 2000	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS Nov 2001- Added General Note about Riprap.				19
	COUNTY	CONTROL	SECT	JOB	HIGHWAY

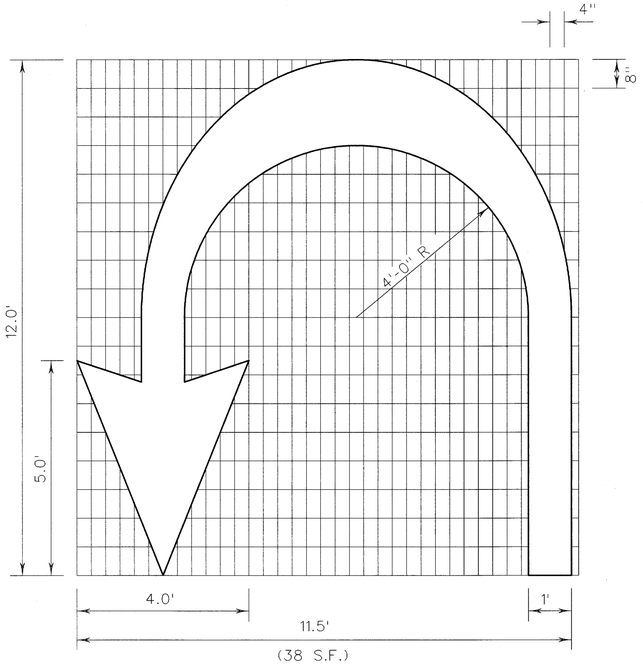


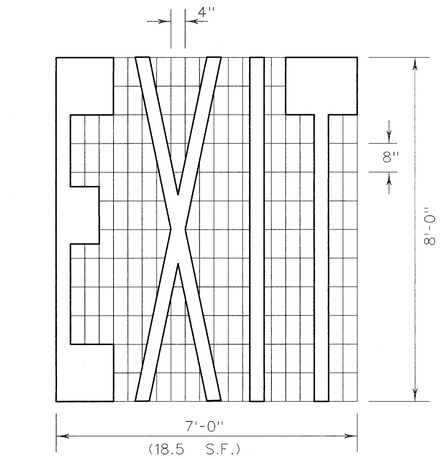


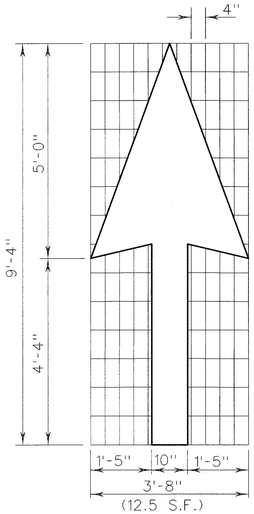


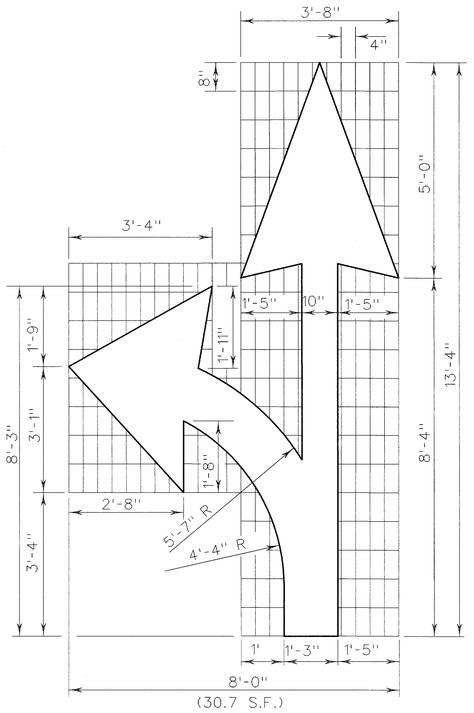


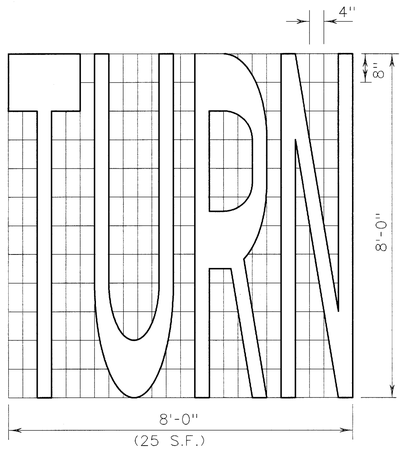


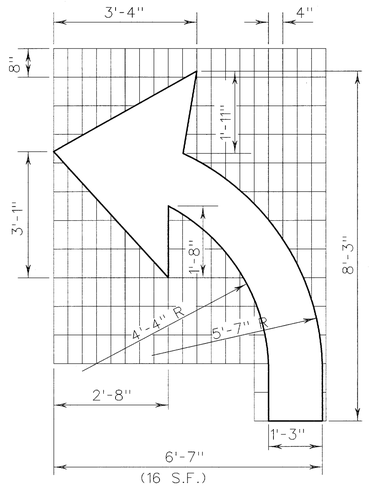












TEXAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKINGS

(WORDS and ARROWS) (FTW)

PM-WA(FTW) SHEET 1 of 1

DRAWN	FED.RD. DIV.NO.	STATE	STATE PROJECT NO.				HIGHWAY NO.
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TRACED	STATE DIST.NO.	COUNTY		CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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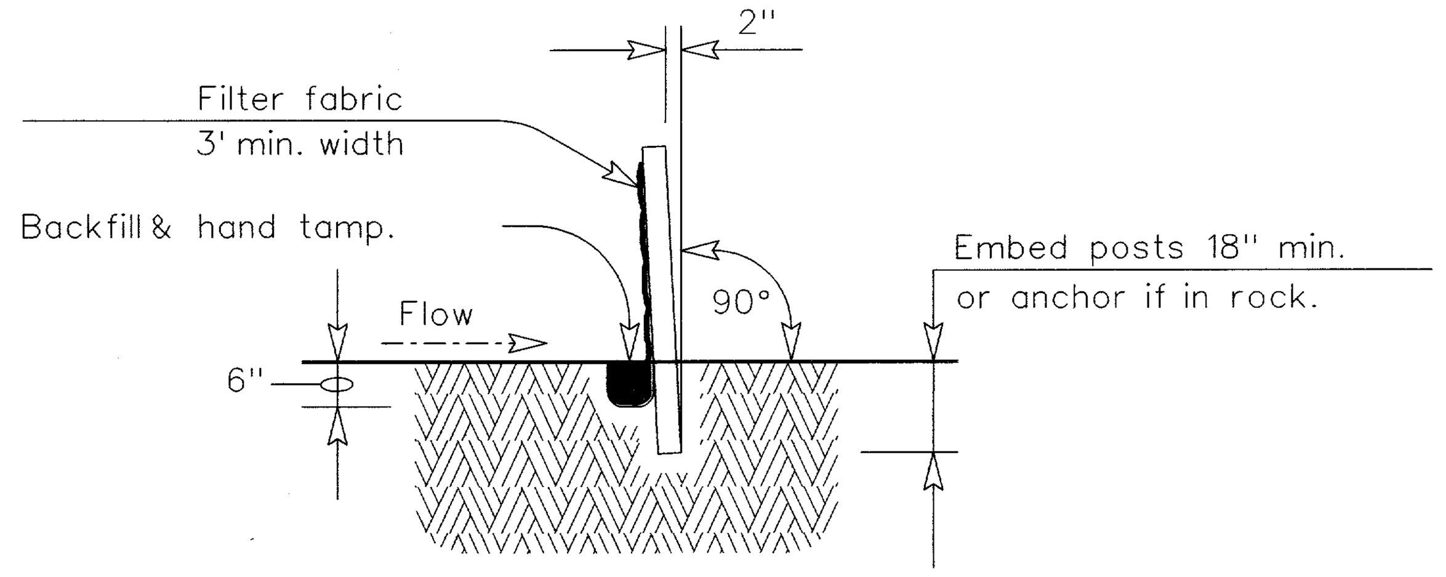


SECTION A-A

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

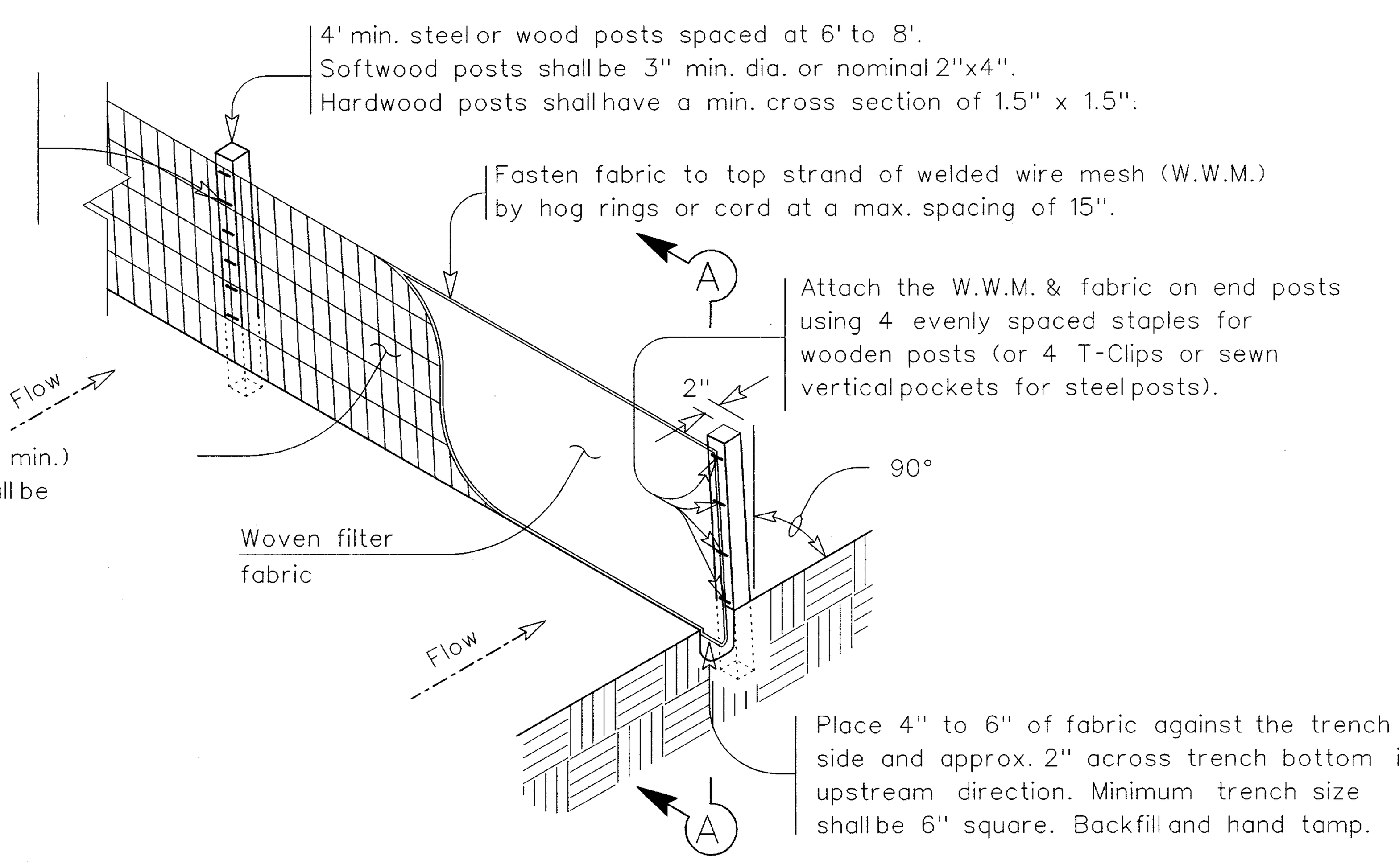
Sediment control fence should be sized to filter a max. flow through rate of 100 GPM/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

PLAN SHEET LEGEND

Sediment Control Fence —(SCF)—

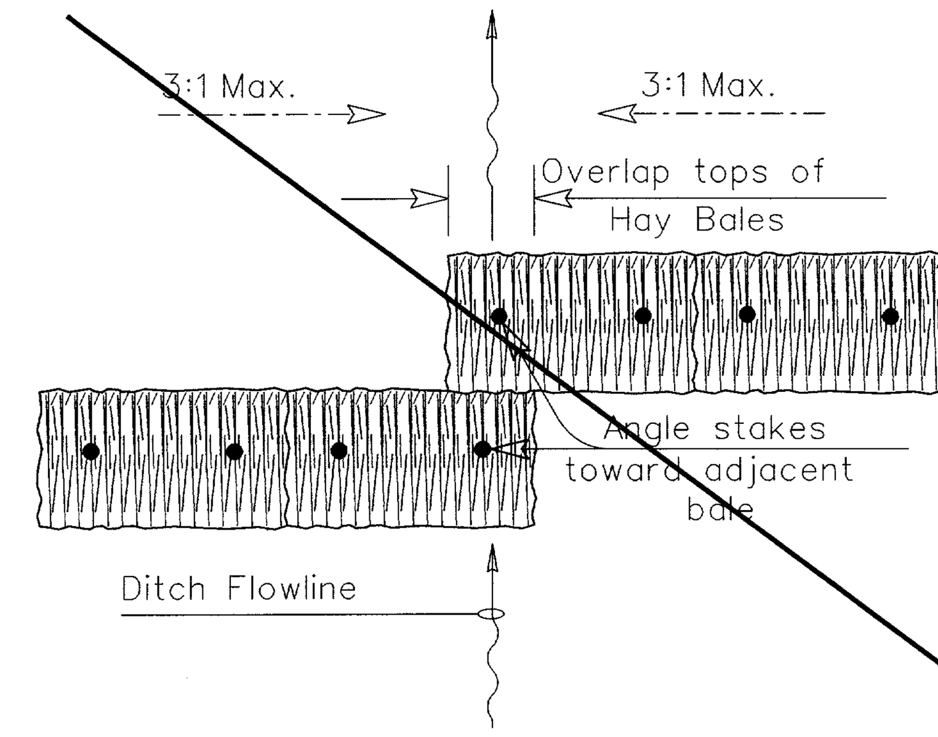
GENERAL NOTES

1. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

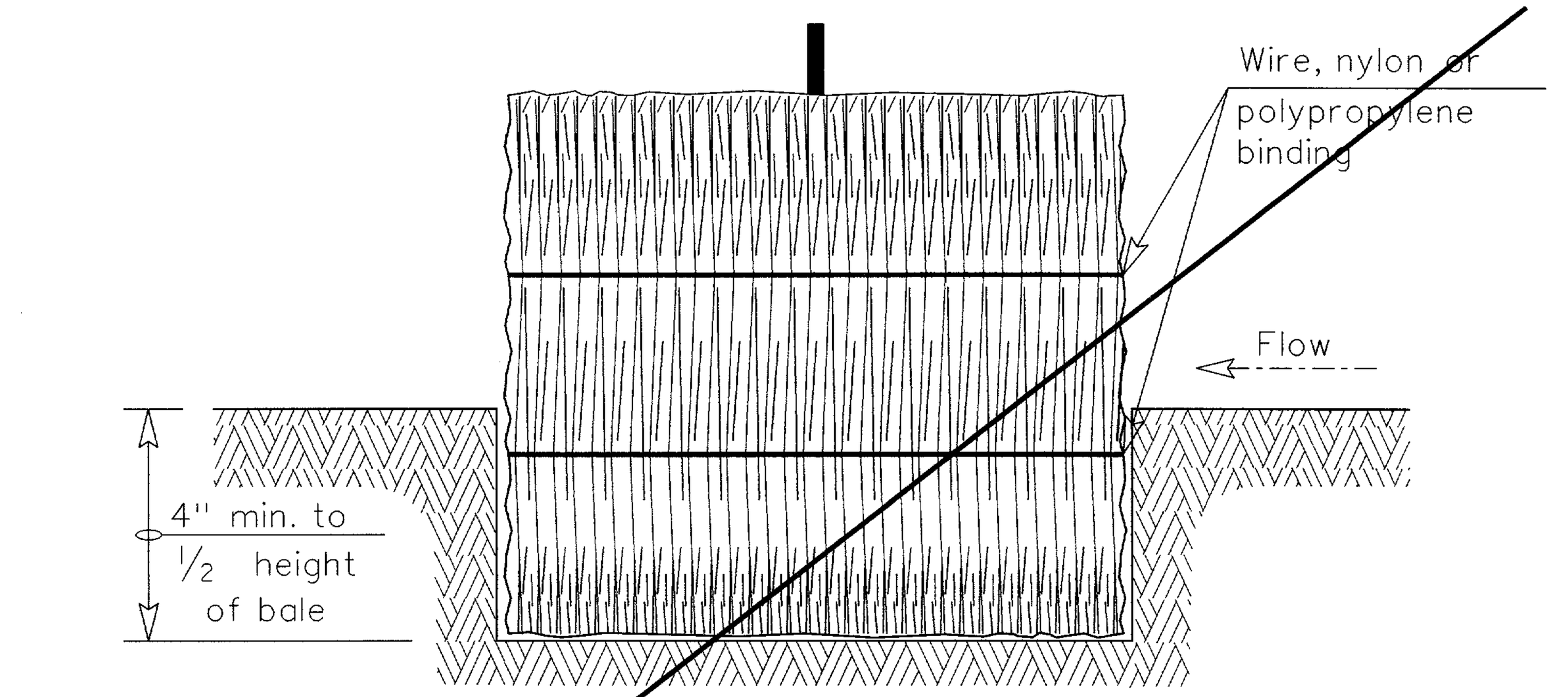


TEMPORARY SEDIMENT CONTROL FENCE

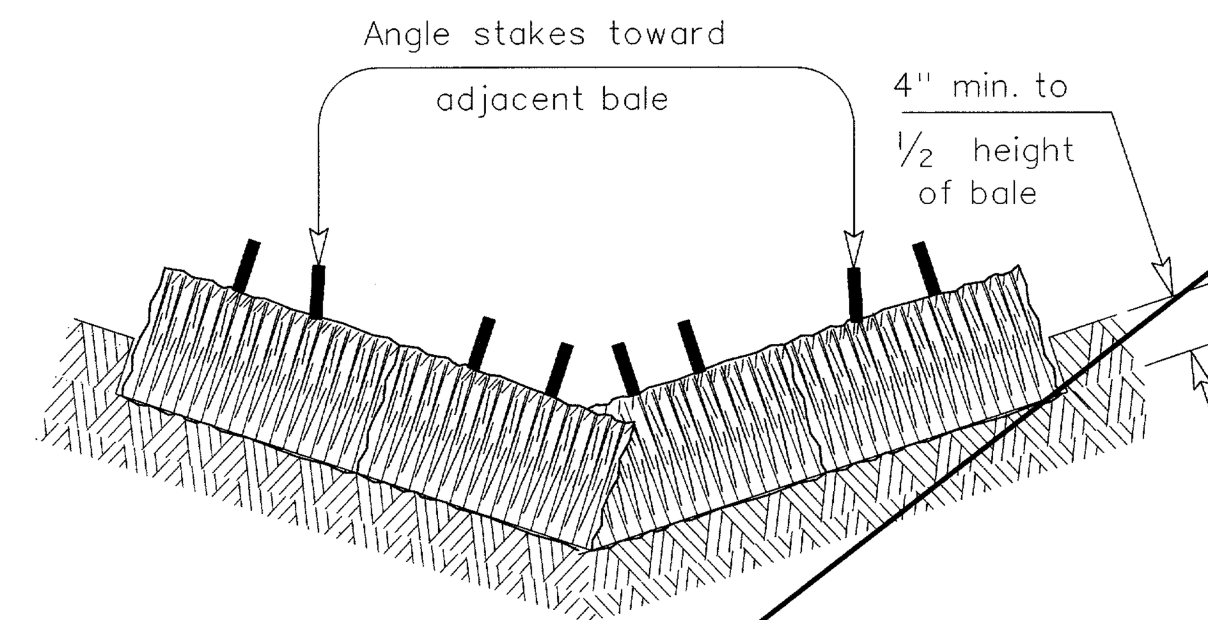
—(SCF)—



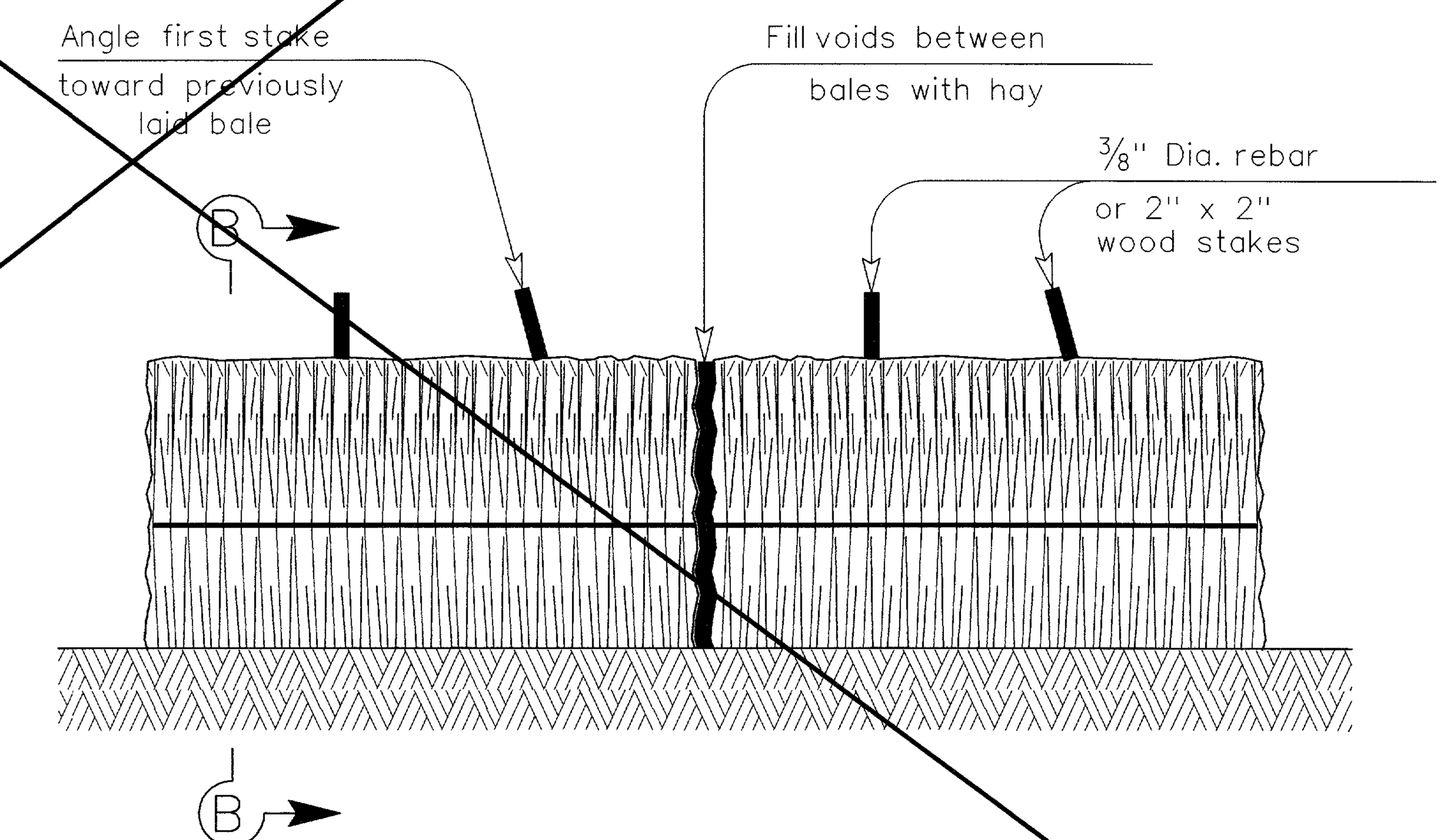
PLAN VIEW



SECTION B-B



PROFILE VIEW



BALED HAY FOR EROSION CONTROL

—(BH)—

PLANS SHEET LEGEND

Baled Hay —(BH)—

GENERAL NOTES

1. Hay bales shall be a minimum of 30" in length and weigh a minimum of 50 Lbs.
2. Hay bales shall be bound by either wire or nylon or polypropylene string. The bales shall be composed entirely of vegetative matter.
3. Hay bales shall be embedded in the soil a minimum of 4" and where possible 1/2 the height of the bale.
4. Hay bales shall be placed in a row with ends tightly abutting the adjacent bales. The bales shall be placed with bindings parallel to the ground.
5. Hay bales shall be securely anchored in place with 3/8" Dia. rebar or 2" x 2" wood stakes, driven through the bales. The first stake shall be angled towards the previously laid bale to force the bales together.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

BALED HAY USAGE GUIDELINES

A Baled Hay installation may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A two year storm frequency may be used to calculate the flow rate to be filtered. The installation should be sized to filter a maximum flow thru rate of 5 GPM/FT² of cross sectional area. Baled hay may be used at the following locations:

1. Where the runoff approaching the baled hay flows over disturbed soil for less than 100'. If the slope of the disturbed soil exceeds 10%, the length of slope upstream the baled hay should be less than 50'.
2. Where the installation will be required for less than 3 months.
3. Where the contributing drainage area is less than 1/2 acre.

For Baled Hay installations in small ditches, the additional following considerations apply:

1. The ditch sideslopes should be graded as flat as possible to maximize the drainage flowrate thru the hay.
2. The ditch should be graded large enough to contain the overtopping drainage when sediment has filled to the top of the baled hay.

Bales should be replaced usually every 2 months or more often during wet weather when loss of structural integrity is accelerated.

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LEVELS DISPLAYED

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49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	

Texas Department of Transportation
Design Division (Roadway)

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCED & BALED HAY

EC(1)-93

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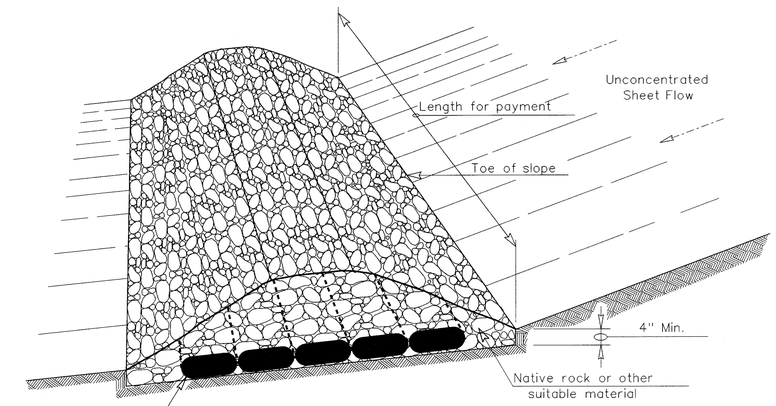
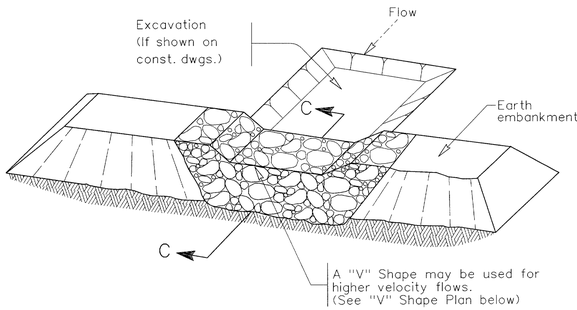


FILTER DAM AT TOE OF SLOPE

RFD1

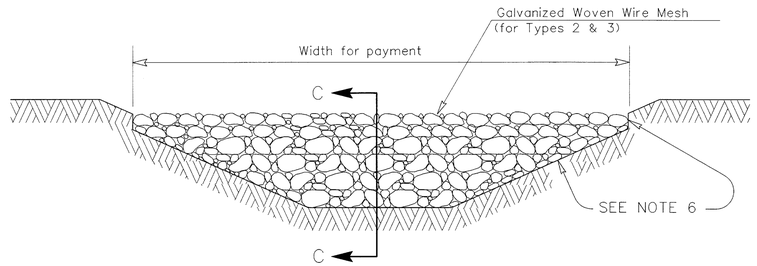
TYPE 1



FILTER DAM AT SEDIMENT TRAP

RFD1 — OR — RFD2

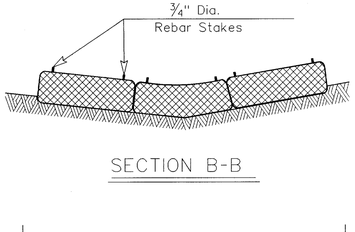
TYPE 1 OR TYPE 2



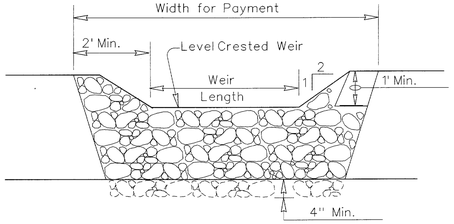
FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

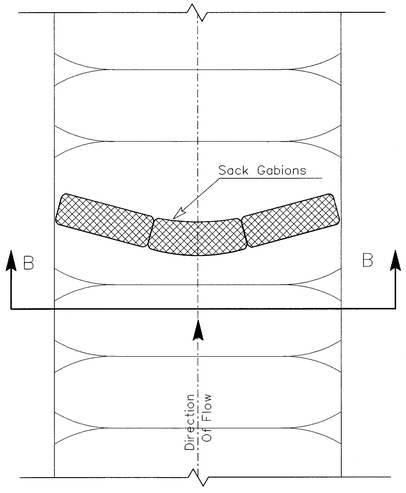
TYPE 1 OR TYPE 2



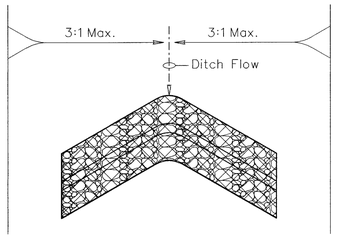
SECTION B-B



PROFILE

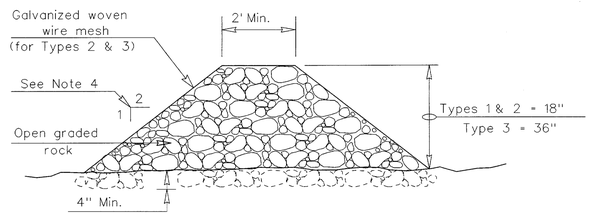


PLAN VIEW



"V" SHAPE

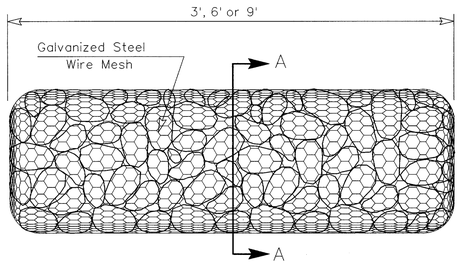
(Plan View)



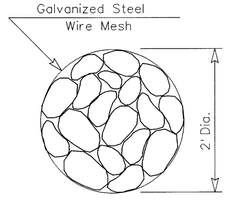
SECTION C-C

PLANS SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3



TYPE 4 (SACK GABIONS)



SECTION A-A

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approx. 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. In stream use the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes.
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

LEVELS DISPLAYED

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Texas Department of Transportation
Design Division (Roadway)

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-93

FILE: EC293.DGN	DN: HEJ	CK: HEJ	DW: BGD	CK:
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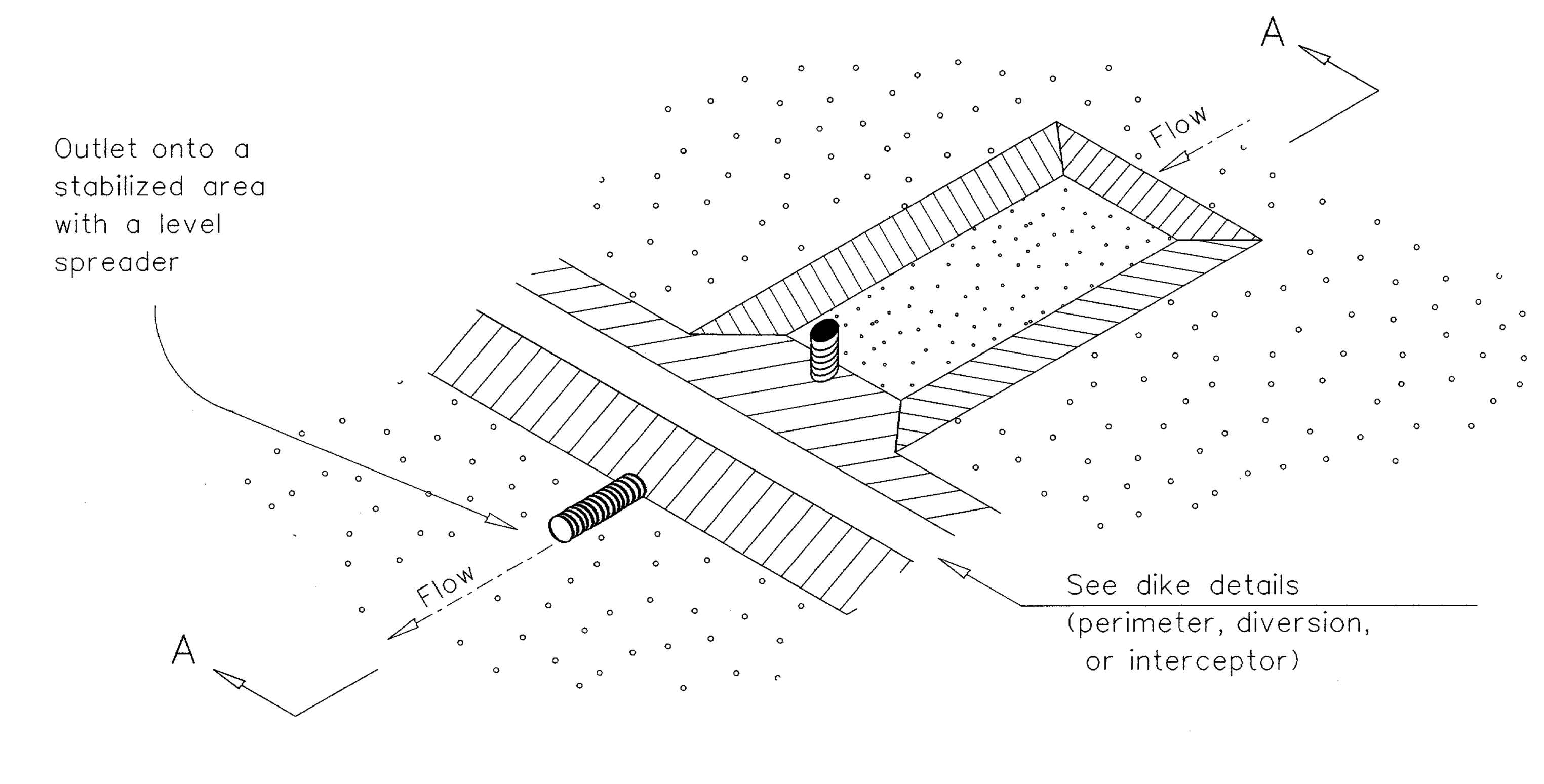
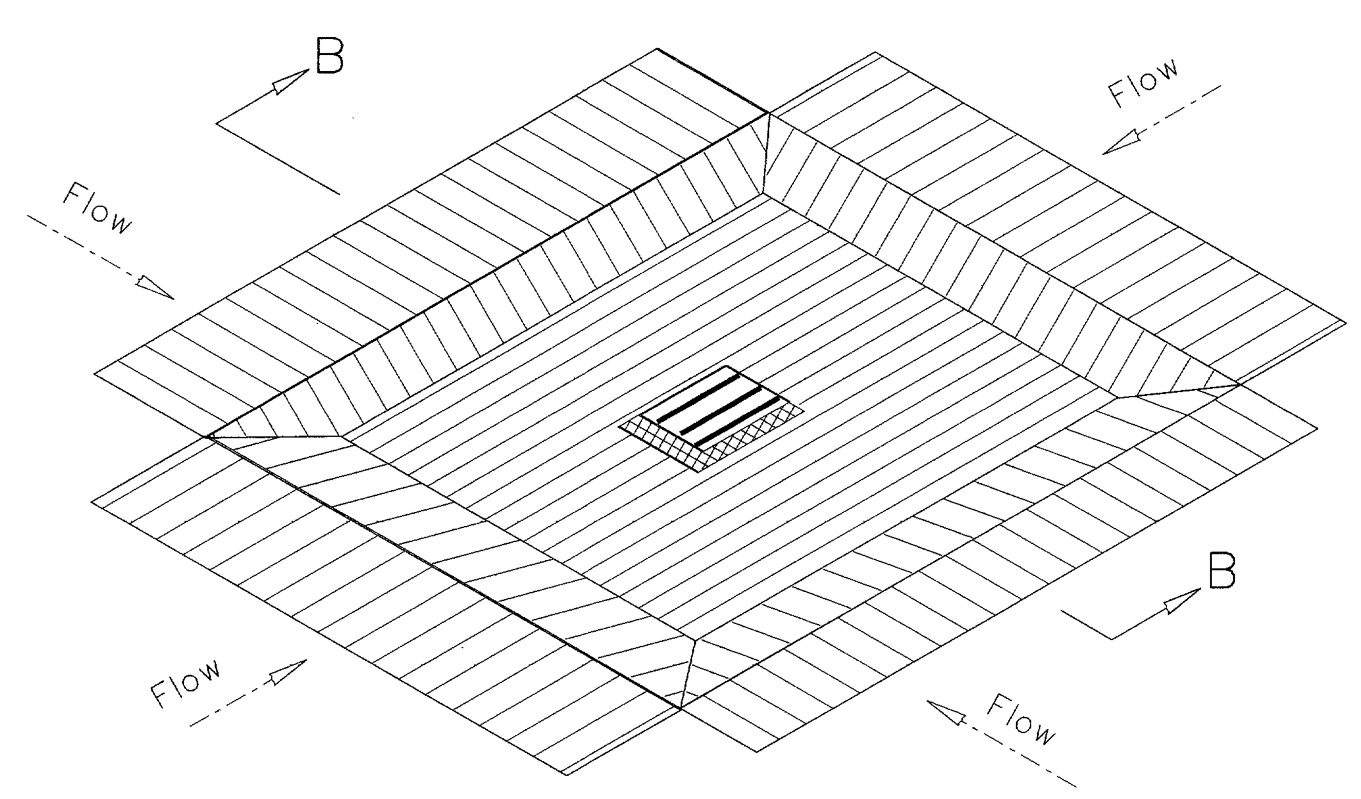
	COUNTY	CONTROL	SECT	JOB	HIGHWAY



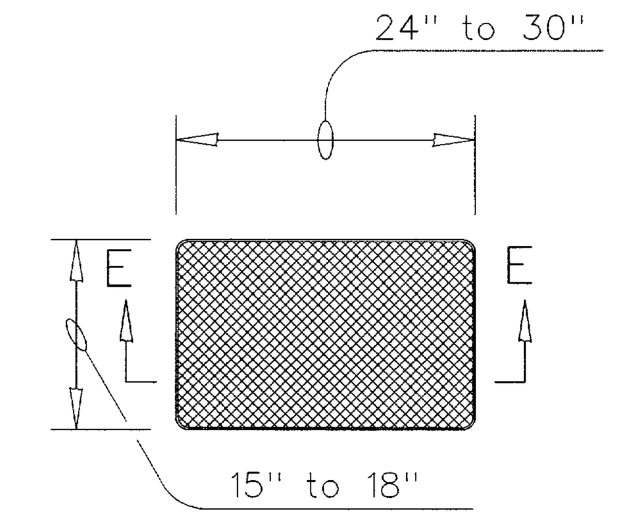
SEDIMENT BASIN AND/OR TRAP WITH PIPE OUTLET

(ST/PO)

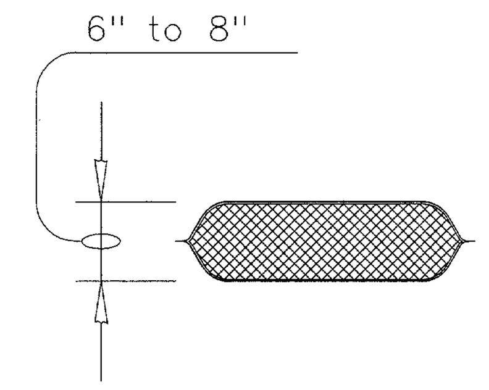


DROP INLET SEDIMENT TRAP

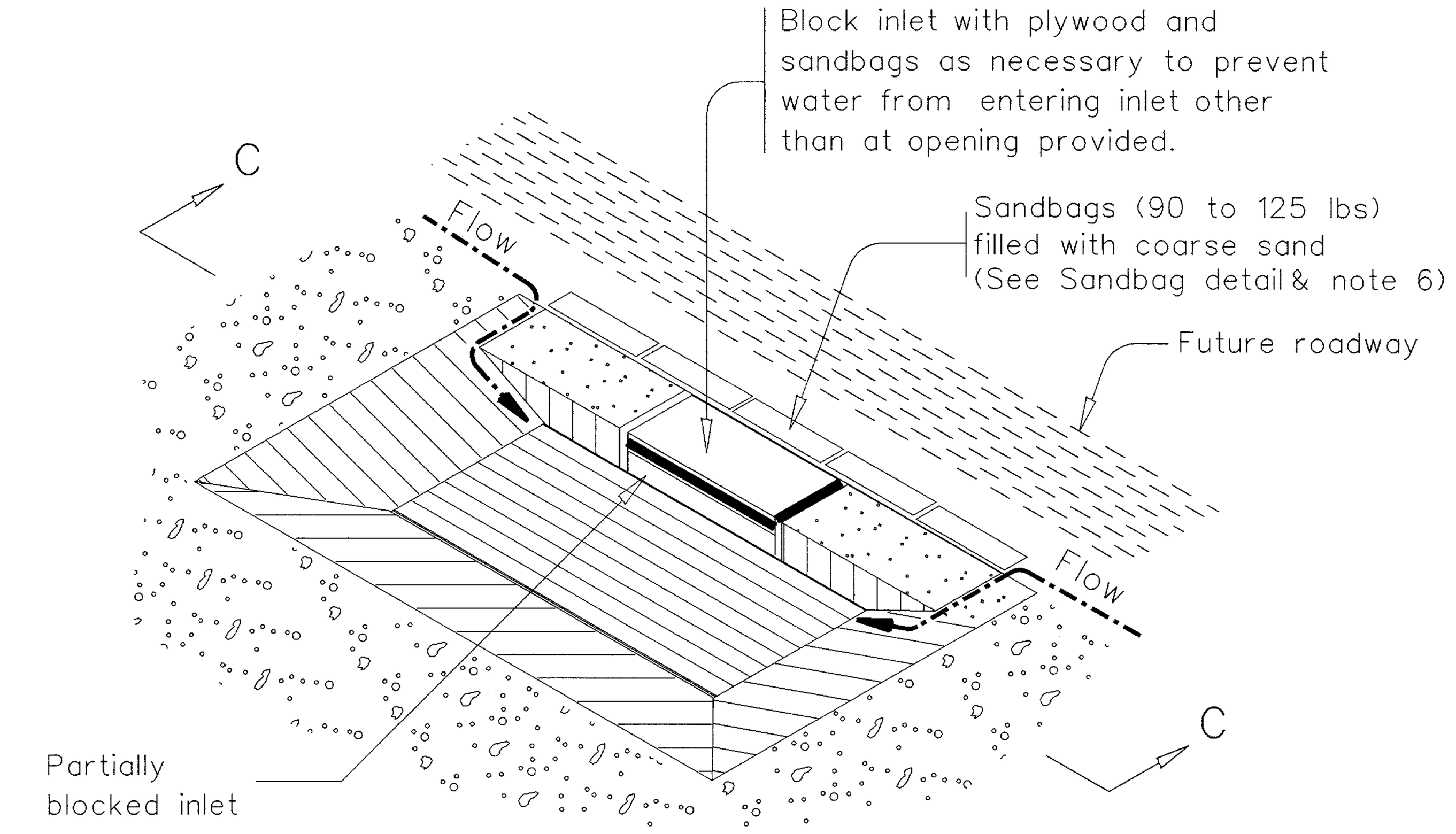
(ST-DI)



SANDBAG DETAIL

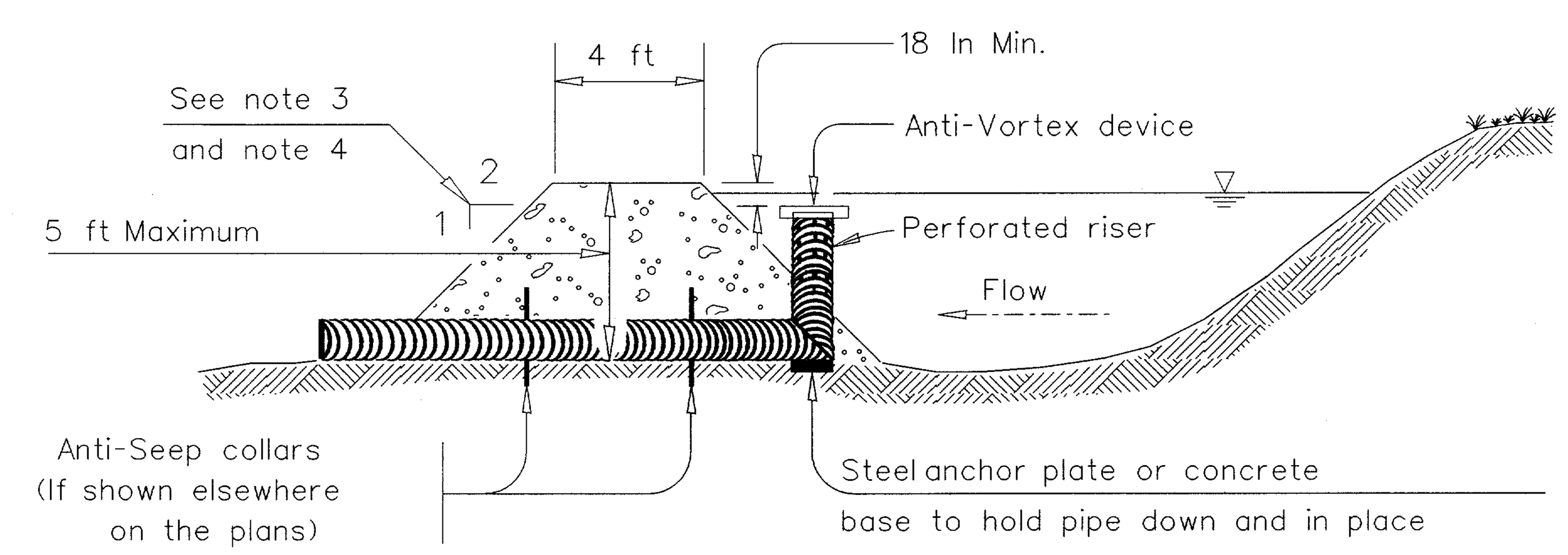


SECTION E-E

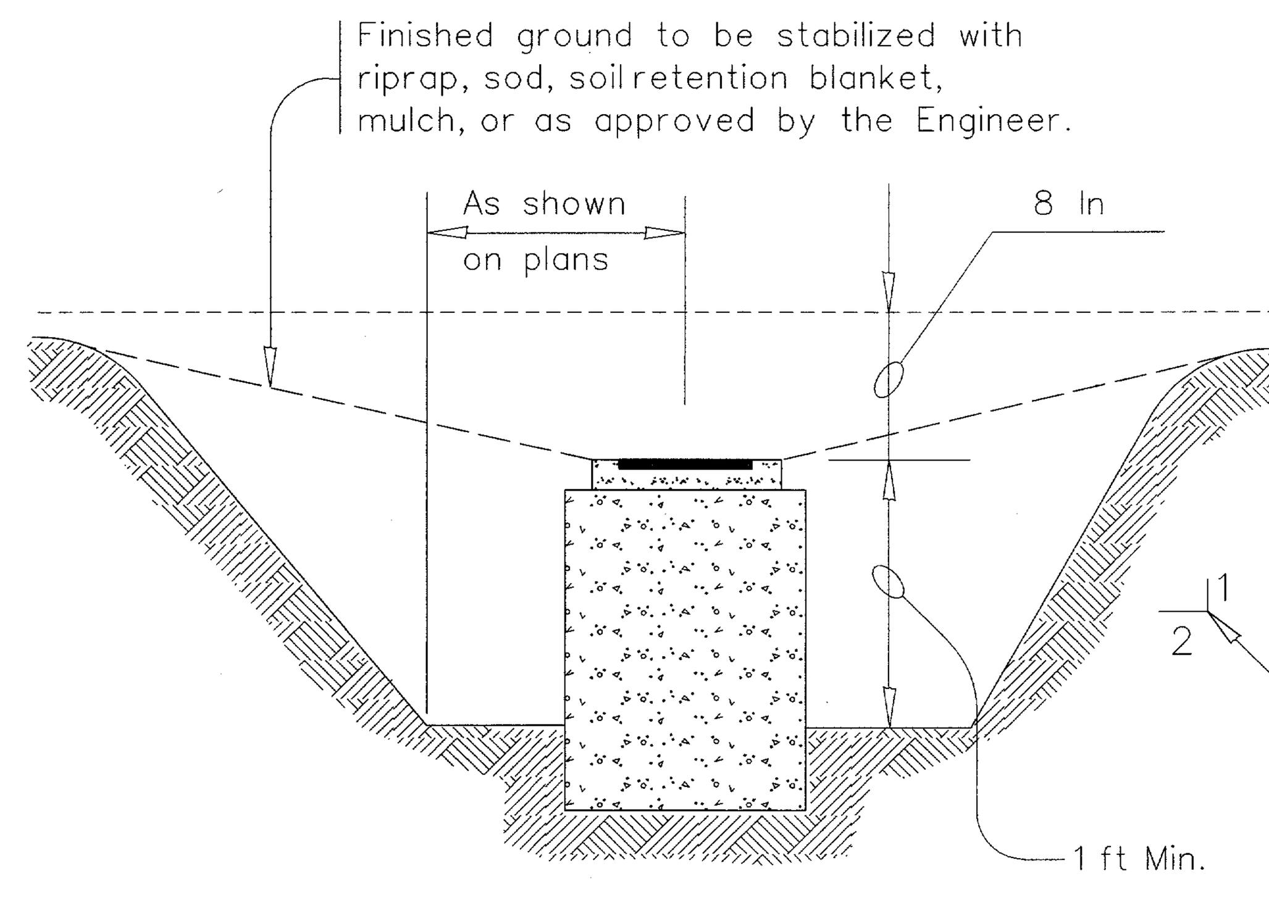


CURB INLET SEDIMENT TRAP

(ST-CI)



SECTION A-A



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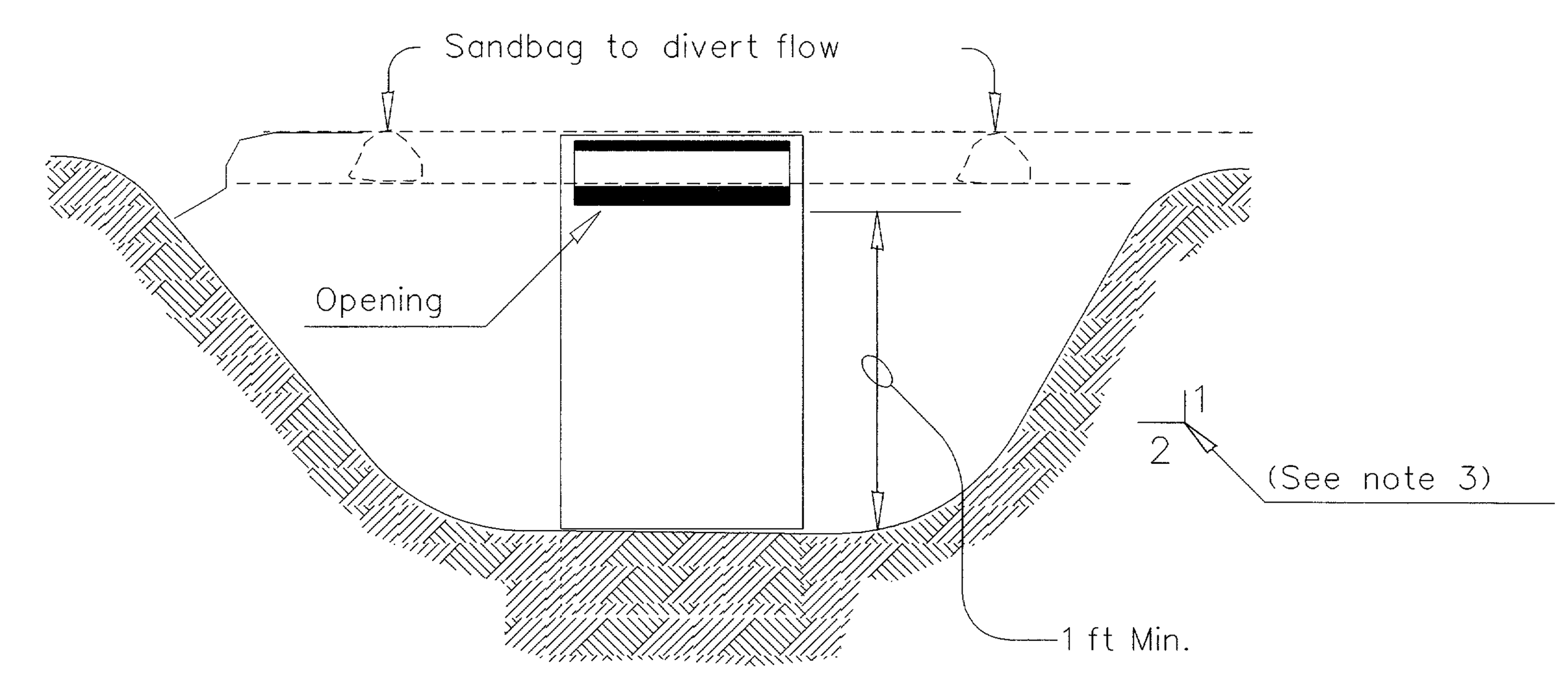
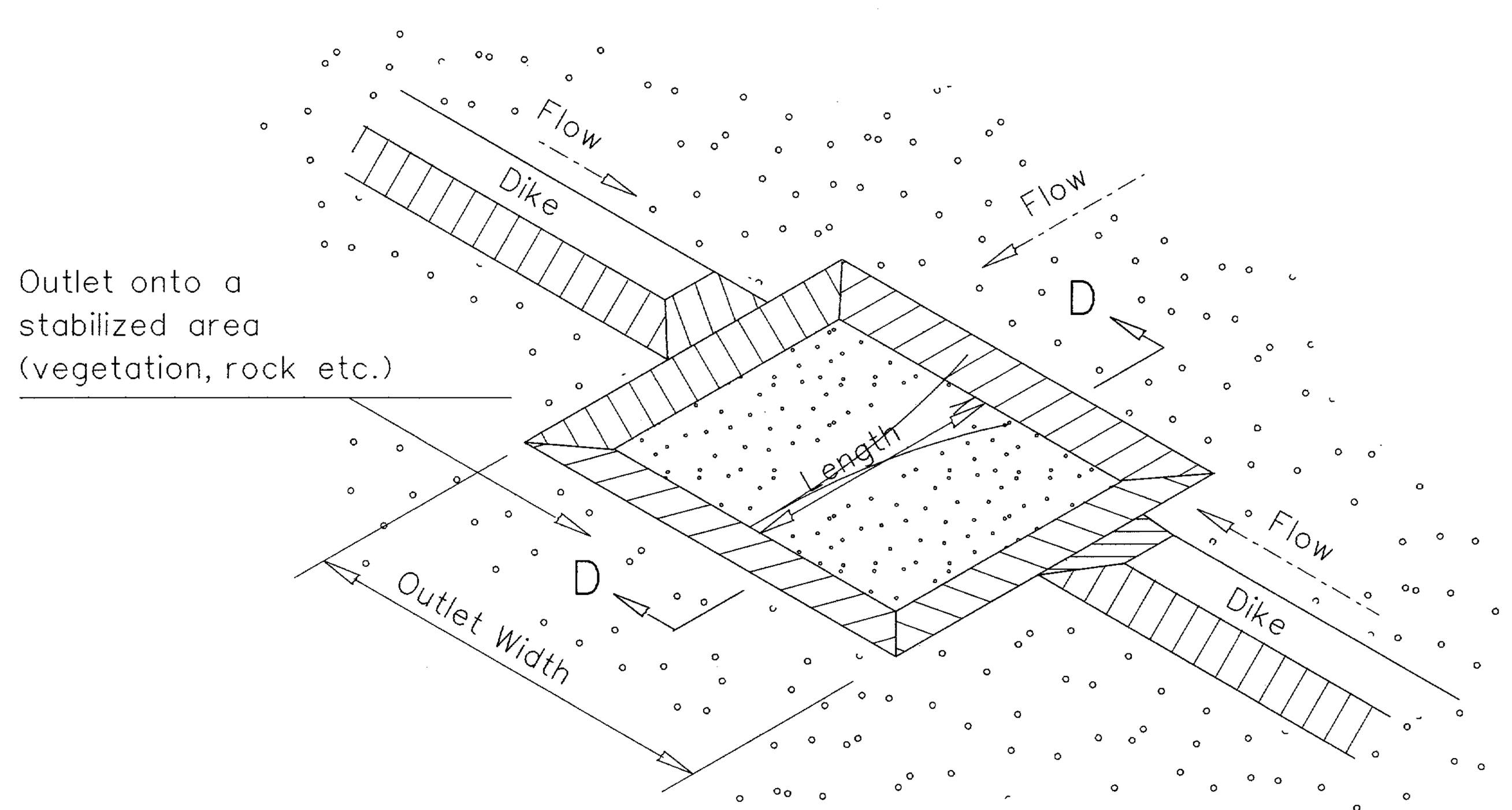
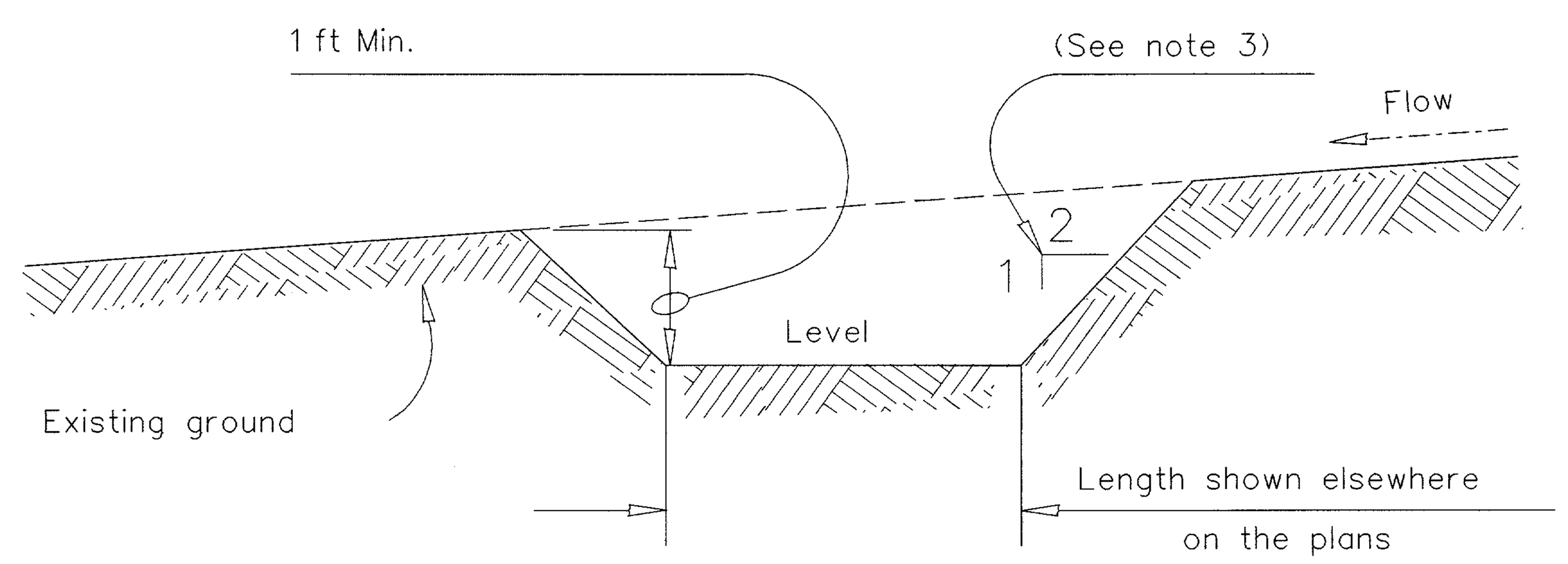


SECTION C-C



SEDIMENT TRAP WITH LEVEL STABILIZED OUTLET

(ST)



SECTION D-D

PLANS SHEET LEGEND

(ST/PO) **Sediment Basin and/or Trap with Pipe Outlet**

(ST-DI) **Drop Inlet Sediment Trap**

(ST-CI) **Curb Inlet Sediment Trap**

(ST) **Sediment Trap with Level Stabilized Outlet**

SEDIMENT BASIN & TRAP USAGE GUIDELINES

A sediment basin and/or trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

Basins: The drainage area for a sediment basin should not exceed 100 acres. The basin capacity shall be at least 1800 CF/Acre of drainage area (0.5" over the drainage area). If the disturbed area draining to the basin is larger than 10 acres, the basin capacity should be 3600 CF/Acre (1.0" over the drainage area).

The basin should have a 40 hour draw-down time with an emergency spillway. The spillway may be designed to pass the peak rate of runoff from a 25 year frequency storm. The 100 year storm should be investigated to consider possible flooding impacts.

The entrance into the basin should be protected from erosion. The basin should be cleaned when the capacity has been reduced by 1/3.

Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Sediment traps should be placed in the following locations:
1. Within drainage ditches spaced @ 500' on center
2. Immediately preceding ditch inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way

The trap outlet may either be through a perforated riser and pipe assembly designed to achieve a 40 hour draw-down time or over a level stabilized area (vegetation, rock, etc.).

The trap should be cleaned when the capacity has been reduced by 1/2 or the sediment has accumulated to a depth of 1', whichever is less.

GENERAL NOTES

1. Pipe outlet material shall conform to the Item "Pipe Underdrains" or as accepted by the Engineer.
2. All pipe connections shall be watertight.
3. Side slopes within the safety clear zone of a roadway shall be 6:1 or flatter. Protect the traveling public from inlet stacks within the clear zone.
4. Sediment basins shall have side slopes of 3:1 or flatter.
5. The dimensions and limits of excavation for sediment basins and traps will be as shown elsewhere on the plans.
6. The sandbag material shall be made of polypropylene, polyethylene or polyamide woven fabric, min. unit weight 4 ounces/SY, Mullen burst strength exceeding 300 psi and ultraviolet stability exeeding 70%.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

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LEVELS DISPLAYED

Texas Department of Transportation
Design Division (Roadway)

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

SEDIMENT BASINS AND TRAPS (EARTHWORK FOR EROSION CONTROL)

EC(6)-93

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