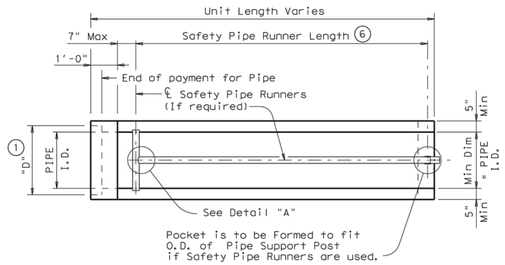
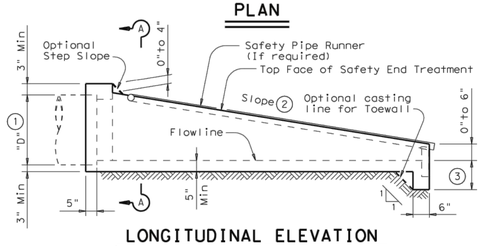
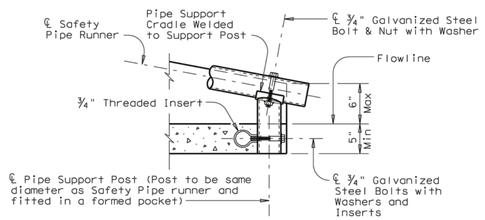
PIPE I.D.	PIPE WALL "B" THICKNESS	"D" (1)	SLOPE	MINIMUM LENGTH OF UNIT	SINGLE PIPE SKEW	SINGLE PIPE RUNNERS REQUIRED	MULTIPLE PIPE SKEW	MULTIPLE PIPE RUNNERS REQUIRED
12"	2"	17"	3:1	2'-11"	<=45 deg	No	<=45 deg	No
			4:1	3'-6"				
			6:1	4'-9"				
15"	2 1/4"	20 1/2"	3:1	3'-8"	<=45 deg	No	<=45 deg	No
			4:1	4'-7"				
			6:1	6'-5"				
18"	2 1/2"	24"	3:1	4'-6"	<=45 deg	No	<=45 deg	No
			4:1	5'-8"				
			6:1	8'-0"				
24"	3"	31"	3:1	6'-2"	<=45 deg	No	<=30 deg	No
			4:1	7'-10"			>30 deg	Yes
			6:1	11'-3"				
30"	3 1/2"	38 1/2"	3:1	7'-10"	<=15 deg	No	<=15 deg	No
			4:1	10'-1"	>15 deg	Yes	>15 deg	Yes
			6:1	14'-8"				
36"	4"	45 1/2"	3:1	9'-5"	=0 deg	No	=>0 deg	Yes
			4:1	12'-3"	>0 deg	Yes		
			6:1	17'-11"				
42"	4 1/2"	52 1/2"	3:1	11'-1"	=>0 deg	Yes	=>0 deg	Yes
			4:1	14'-5"				
			6:1	21'-2"				



PLAN

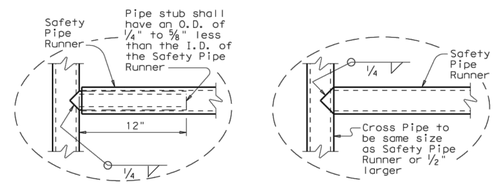


LONGITUDINAL ELEVATION



END DETAIL FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

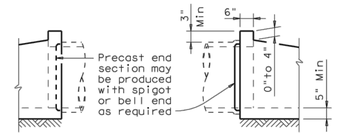


OPTION A

DETAIL A

(If required)

OPTION B



OPTIONAL JOINT

(Showing joint between RCP and Precast Safety End Treatment)

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 1/2" STD	4.000"	3.548"
20'-10"	4" STD	4.500"	4.026"
35'- 4"	5" STD	5.563"	5.047"

(1) Dimension "D" is based on ASTM C-76, Class III, Wall thickness "B". If any other wall thickness is used, dimension "D" must be adjusted accordingly.

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

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) The top 4" of void between precast end treatments shall be filled with concrete riprap and shall be considered subsidiary to Safety End Treatment.

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

(6) Measured along Slope.

(7) 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.

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.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture of this product shall conform to requirements of Item "Safety End Treatment" except as noted below :

A. (8) Minimum 4,000 psi concrete at all drainage structures.
   or #4 at 9" (Grade 60) each way or 6 x 6 - W12 x W12 or 5 x 5 - W10 x W10 welded wire fabric.

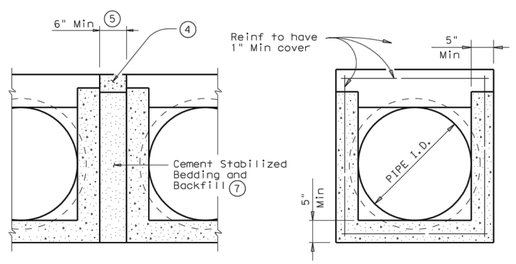
B. Concrete for precast (steel formed) sections shall be Class "C" with a minimum compressive strength of 3600 psi.

At the option and expense of the Contractor the next larger size of Safety End Treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.

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.

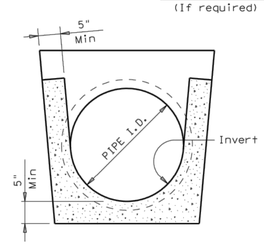
All steel components except reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.



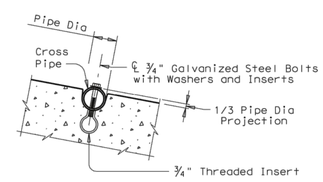
MULTIPLE PIPE INSTALLATION

OPTION WITH SQUARE BOTTOM

SECTION A-A



OPTION WITH INVERT BOTTOM



INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

Texas Department of Transportation
Bridge Division

PRECAST SAFETY END TREATMENT

TYPE II ~ CROSS DRAINAGE

PSET-SC

FILE: psetscse.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 11-10: Add note for synthetic fibers.	COUNTY		CONTROL SECT JOB	HIGHWAY

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". Any modification or alteration of this standard is prohibited by law. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

LEVELS DISPLAYED
ACC:

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

AS-BUILT

THIS RECORD DRAWING IS COMPILATION OF A COPY OF THE SEALED ENGINEERING DRAWING FOR THIS PROJECT; MODIFIED BY ADDENDA, CHANGE ORDERS, AND INFORMATION FURNISHED BY THE CONTRACTOR. THE INFORMATION SHOWN ON THE RECORD DRAWINGS IS PROVIDED BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR OR OTHERS NOT ASSOCIATED WITH THE DESIGN ENGINEER. THE ORIGINAL SEALED DRAWING ARE ON FILE AT THE OFFICES OF WINKELMANN AND ASSOCIATES, INC.

Maria L. Bonilla — 10-19-2016
WINKELMANN AND ASSOCIATES, INC. — DATE

No.	DATE	REVISION	APPROV.
6.			
5.			
4.			
3.	12/18/2015	ISSUE FOR CONSTRUCTION	M.B.
2.	12/09/2015	BULLETIN #1	M.B.

LAST SAVED BY: MARIAHOLLAND October 20, 2016

Winkelmann & Associates, Inc.
CONSULTING CIVIL ENGINEERS ■ SURVEYORS
2001 HALDERET PLAZA DRIVE, SUITE 325
DALLAS, TEXAS 75230 (972) 490-1099 FAX
Texas Engineers Registration No. F-2966
Texas Surveyors Registration No. 10064-00

COPYRIGHT © 2016, Winkelmann & Associates, Inc.

Maria L. Bonilla

STATE OF TEXAS — MARIA C. BONILLA-NICHOLLS — 100106 — LICENSED — PROFESSIONAL ENGINEER

10-19-2016

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MARIA C. BONILLA-NICHOLLS P.E. # 100106

CIVIL DETAILS
SEC N. GOLIAD ST. AND E.QUAIL RUN RD.
ROCKWALL, TEXAS

17585.00

C-15.02

DAL574

G:\17\1585\ENVNEERING\Construction Plans\17585-CIVIL DETAILS.dwg