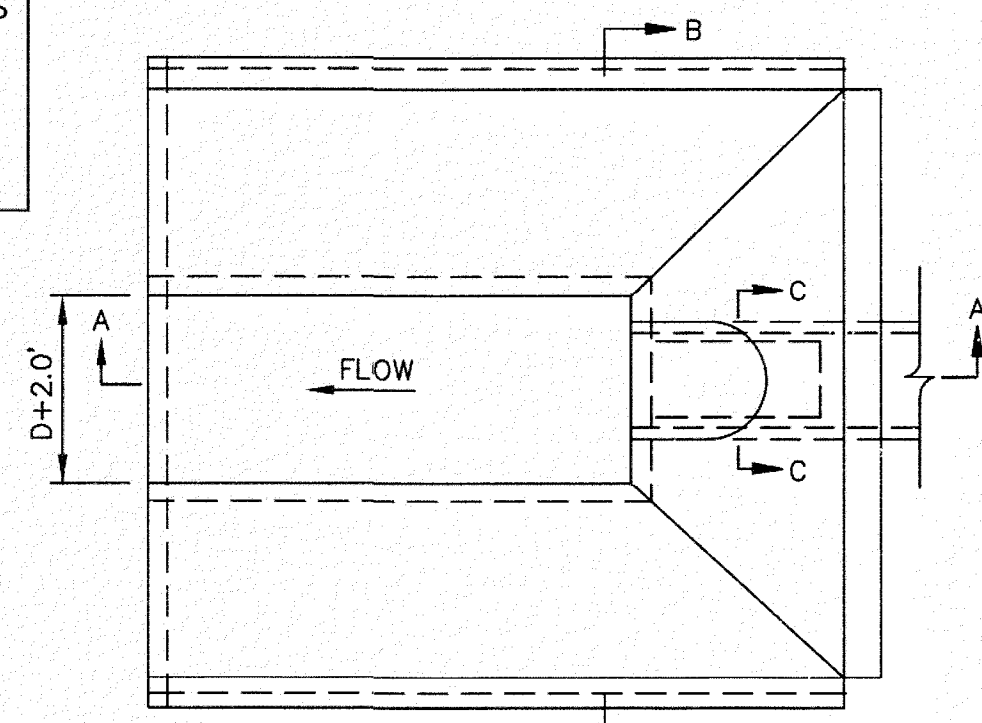
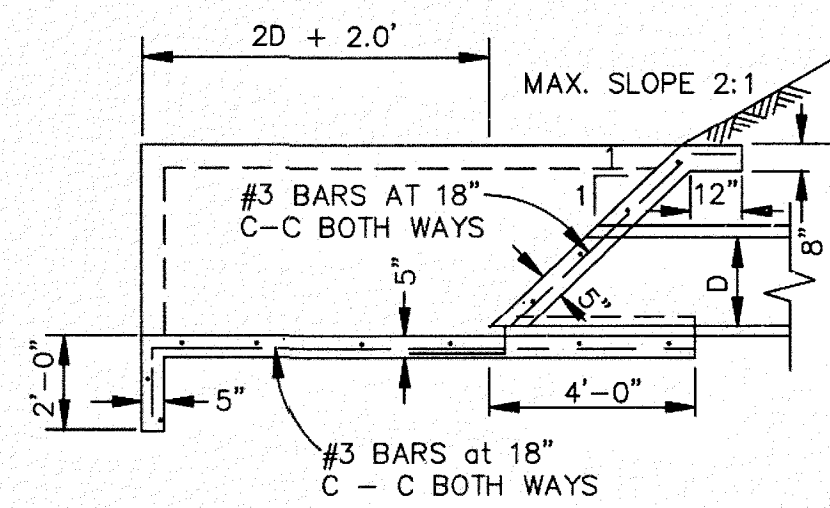


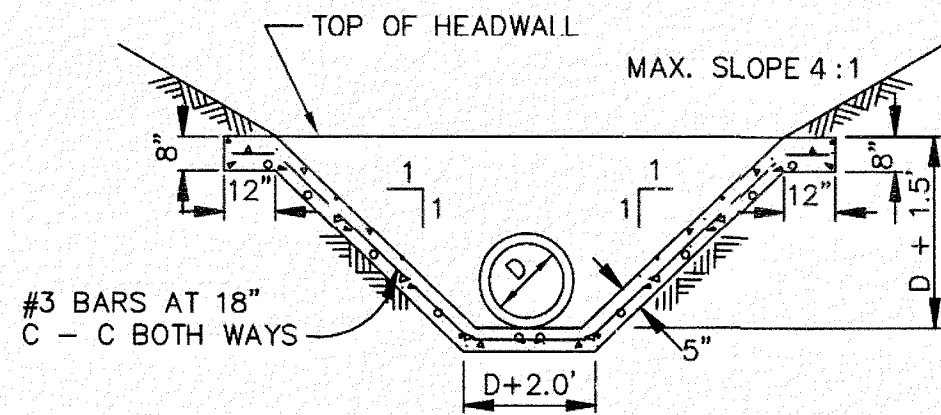
ALL CONCRETE STRUCTURES SHALL BE CLASS F (4200psi, MIN. 6.5 SACK CEMENT). NO FLY ASH IS ALLOWED IN CONCRETE STRUCTURES.



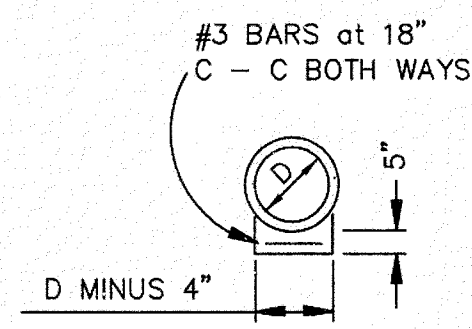
PLAN  
N.T.S.



SECTION A-A  
N.T.S.



SECTION B-B  
N.T.S.



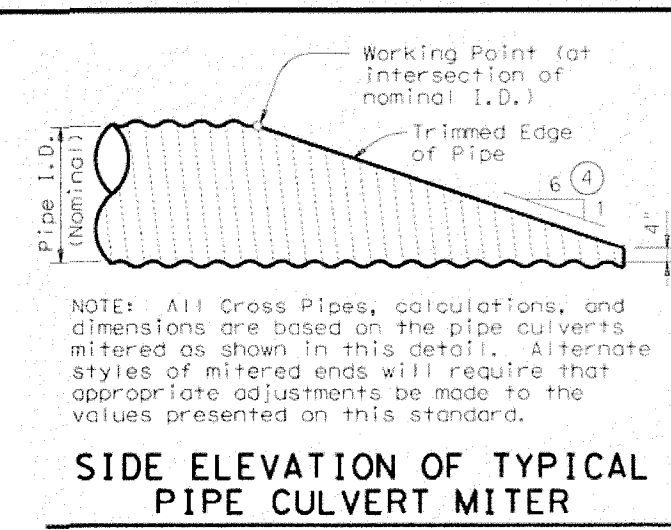
SECTION C-C  
N.T.S.

NOTE:  
CONCRETE SHALL BE CLASS "A".

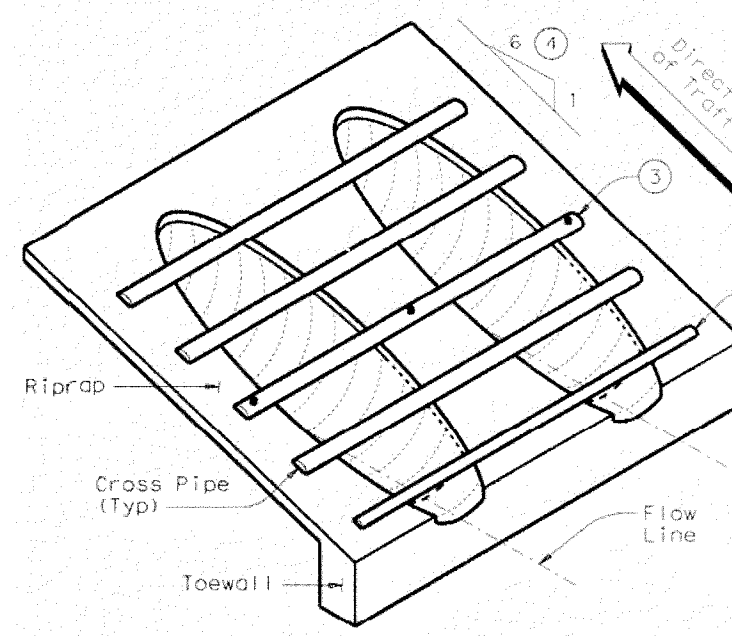
CONCRETE APRON  
SLOPING HEADWALL

CITY OF ROCKWALL

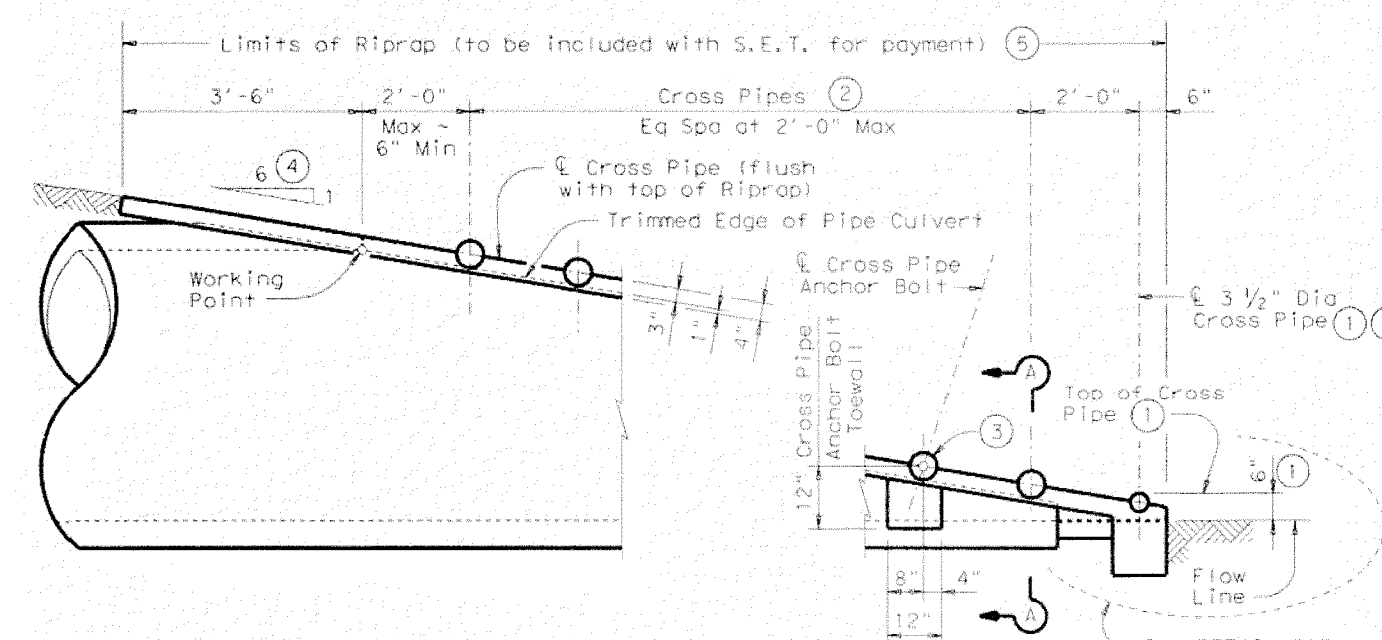
STANDARD SPECIFICATION REFERENCE  
803.3  
DATE  
Mar. 2018  
STANDARD DRAWING NO.  
R-6070



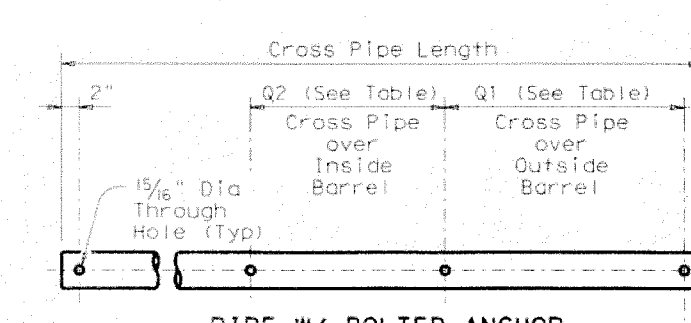
SIDE ELEVATION OF TYPICAL  
PIPE CULVERT MITER  
(Showing Corrugated Metal Pipe Culvert.)  
(Details of Concrete Pipe Culvert are similar.)



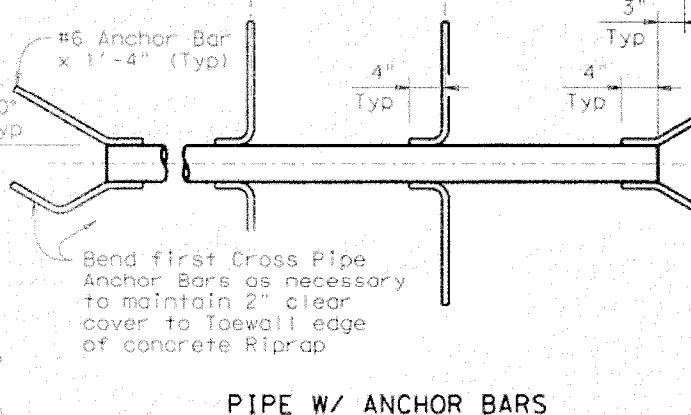
ISOMETRIC VIEW OF  
TYPICAL INSTALLATION



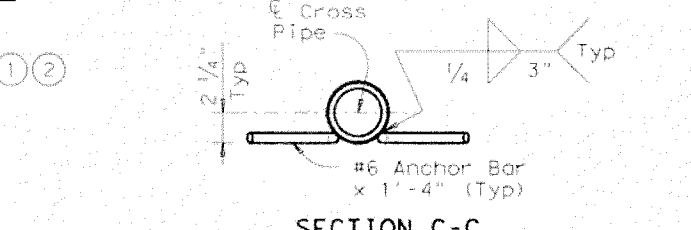
SIDE ELEVATION OF CAST-IN-PLACE CONCRETE  
(Showing Concrete Pipe Culvert.)  
(Details of Corrugated Metal Pipe Culvert are similar.)



PIPE W/ BOLTED ANCHOR

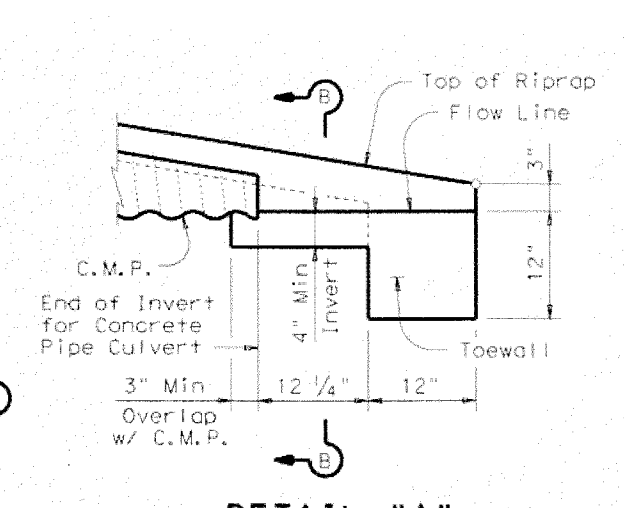


PIPE W/ ANCHOR BARS

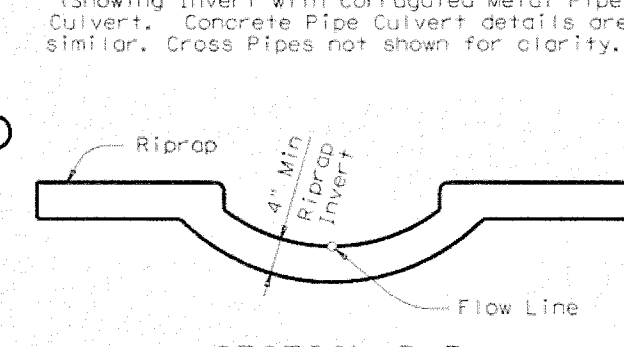


SECTION C-C

CROSS PIPE DETAILS

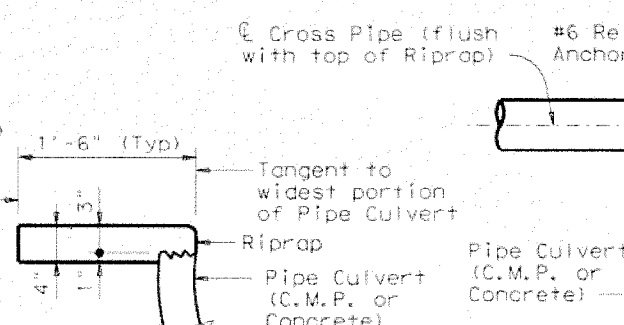


DETAIL "A"

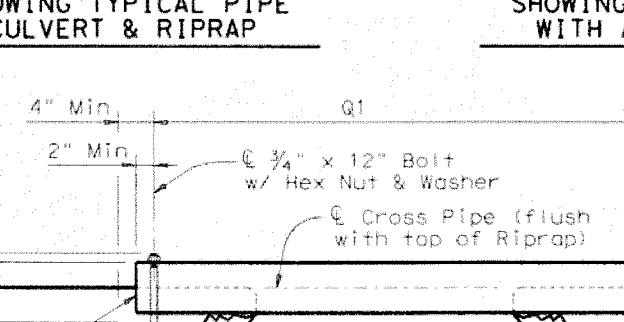


SECTION B-B

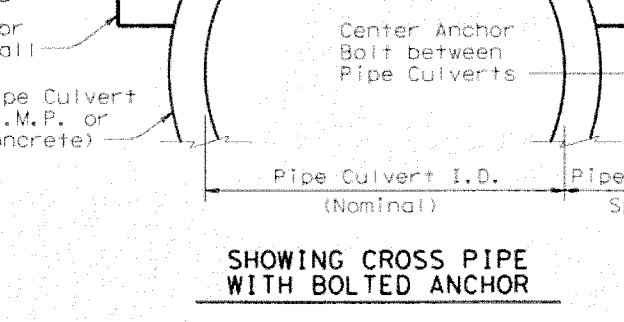
(Cross Pipes not shown for clarity.)



SHOWING TYPICAL PIPE  
CULVERT & RIPRAP



SHOWING CROSS PIPE  
WITH ANCHOR BAR



SECTION A-A

SHOWING CROSS PIPE  
WITH BOLTED ANCHOR

Nominal Culvert I.D.	Conc. Riprap (CY) (1)	Single Pipe Culvert Spacing (ft)	Multi-Bore (ft)	Q2	Conditions for Use of Cross Pipes	Cross Pipe Size
12"	0.6	9"	N/A	2'-11"	3 or more Pipe Culverts	3" Std (3,500' O.D.)
15"	0.7	11"	N/A	2'-5"	2 or more Pipe Culverts	3 1/2" Std (4,000' O.D.)
18"	0.8	1'-2"	N/A	2'-10"	3 or more Pipe Culverts	3" Std (3,500' O.D.)
21"	0.9	1'-4"	N/A	3'-2"	2 or more Pipe Culverts	3 1/2" Std (4,000' O.D.)
24"	0.9	1'-7"	N/A	3'-6"	All Pipe Culverts	4" Std (4,500' O.D.)
27"	1.0	1'-8"	N/A	3'-10"	3 or more Pipe Culverts	3 1/2" Std (4,000' O.D.)
30"	1.1	1'-10"	N/A	4'-2"	2 or more Pipe Culverts	4" Std (4,500' O.D.)
33"	1.2	1'-11"	4'-2"	4'-5"	All Pipe Culverts	4" Std (4,500' O.D.)
36"	1.3	2'-1"	4'-5"	4'-9"	All Pipe Culverts	4" Std (4,500' O.D.)
42"	1.5	2'-4"	4'-11"	5'-5"	All Pipe Culverts	4" Std (4,500' O.D.)
48"	1.7	2'-7"	5'-5"	6'-0"	All Pipe Culverts	4" Std (4,500' O.D.)
54"	2.0	3'-0"	5'-11"	6'-9"	All Pipe Culverts	5" Std (5,500' O.D.)
60"	2.2	3'-3"	6'-5"	7'-4"	All Pipe Culverts	5" Std (5,500' O.D.)
66"	2.4	3'-5"	6'-11"	7'-10"	All Pipe Culverts	5" Std (5,500' O.D.)
72"	2.7	3'-8"	7'-5"	8'-5"	All Pipe Culverts	5" Std (5,500' O.D.)

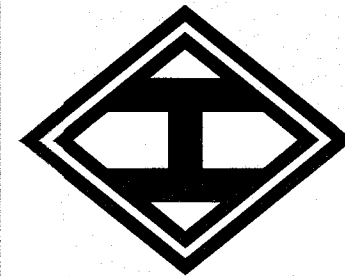
- The proper installation of the first Cross Pipe is critical for vehicle safety. The top of the first Cross Pipe must be placed at no more than 6" above the flow line.
- Size of Cross Pipes, except the first bottom pipe, shall be as shown in the PIPE SIZE table. The first bottom pipe shall be 3 1/2" Standard Pipe (4" O.D.).
- The third Cross Pipe from the bottom of the Culvert shall always be installed using a bolted connection. Care shall be taken to ensure that Riprap concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanup access. At the Contractor's option, all other Cross Pipes may also be installed using the bolted connection details.
- Match Cross Slope as shown elsewhere in the plans. Cross Slope of 6:1 or flatter is required for vehicle safety.
- Riprap placed beyond the limits shown will be paid as concrete Riprap in accordance with Item 432, "Riprap".
- Quantities shown are for one end of one reinforced Concrete Pipe Culvert. For multiple pipe culverts or for Corrugated Metal Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

GENERAL NOTES:  
Cross Pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 780-71, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.  
Safety End Treatments shown herein are intended for use in those installations where cut of control vehicles are likely to traverse the openings approximately perpendicular to the Cross Pipes.  
Riprap and all necessary inverts shall be Concrete Riprap conforming to the requirements of Item 432, "Riprap". 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.  
Payment for riprap and towall is included in the Price Bid for each Safety End Treatment.  
Cross Pipes shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52. Bolts and nuts shall conform to ASTM A307.  
All steel components, except concrete reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

Texas Department of Transportation  
Bridge Division Standard  
**SAFETY END TREATMENT**  
FOR 12" DIA TO 72" DIA  
PIPE CULVERTS  
TYPE II - PARALLEL DRAINAGE  
**SETP-PD**

REV	DESCRIPTION	DATE	BY	CHKD	APP'D
01	As Shown	03/2018			

**HOMMEYER**  
ENGINEERING, INC.  
TYPE FIRM REGISTRATION NO. F-8440  
P. O. BOX 294527 • LEWISVILLE, TEXAS • 75029  
972-906-9985 PHONE • 972-906-9987 FAX  
WWW.HEI.US.COM

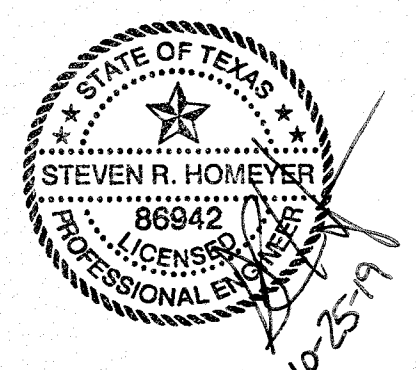


CANINE AND CO. RESORT  
1.21 ACRES  
CITY OF ROCKWALL  
ROCKWALL COUNTY, TEXAS

SAFETY END  
TREATMENT DETAILS

DRAWN: JAN  
DATE: 09/28/2018  
HEI #: 18-140

SHEET NO:  
C16



CASE NO. SP2019-017