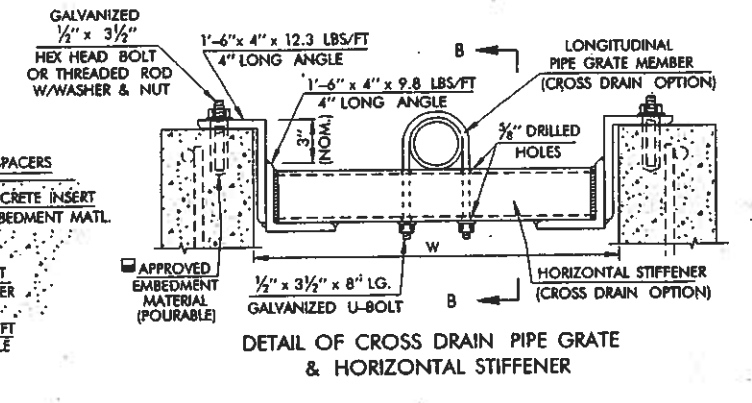
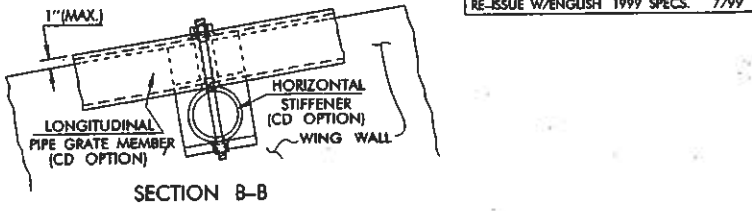
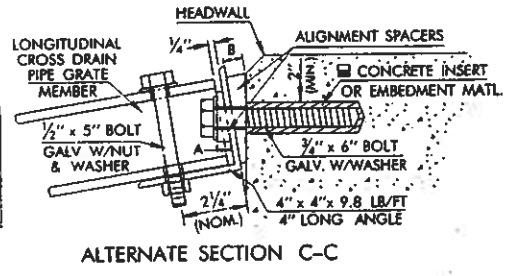
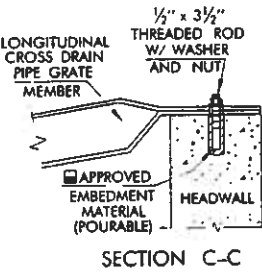
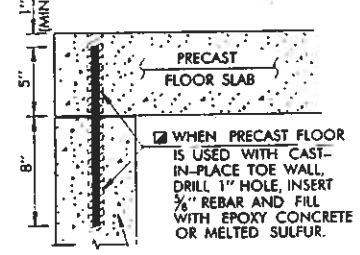
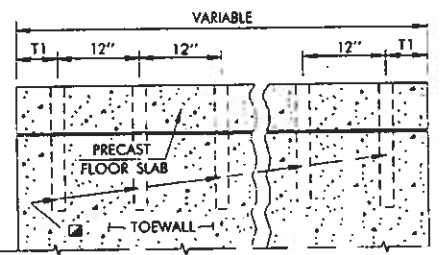


S.C.E.S. END SECTION TYPES	ROUND CULV. SIZE	END SECTION DIMENSIONS										SUMMARY-QUANTITIES										
		1:4 SLOPE					1:6 SLOPE					1:4 SLOPE		1:6 SLOPE								
		W	T1	T2	T3	H	LO	L	G	B	W	L	G	B	SCES TYPE	CLASS A CONC. CU. YD.	REINF. STEEL LBS.	SCES TYPE	CLASS A CONC. CU. YD.	REINF. STEEL LBS.		
A4	A6	18"	3'-0"	4"	6"	6"	2'-0"	2'-9 3/4"	1	1	6'-8"	7'-0"	4	10'-0"	11'-0"	6	A4	0.88	335	A6	1.19	445
B4	B6	24"	3'-0"	4"	6"	6"	2'-8"	2'-9 3/4"	1	1	9'-4"	10'-2"	6	14'-0"	14'-9"	8	B4	1.28	465	B6	1.78	622
C4	C6	30"	4'-0"	4"	8"	8"	3'-2"	3'-9 3/4"	1	1	14'-0"	14'-10"	8	17'-0"	17'-9"	9	C4	2.65	723	C6	3.10	862
D4	D6	36"	4'-0"	4"	8"	8"	3'-10"	3'-9 3/4"	1	1	14'-0"	15'-0"	8	21'-0"	21'-10"	11	D4	2.79	777	D6	3.94	1108
E4	E6	42"	6'-0"	6"	8"	8"	5'-0"	5'-9 3/4"	2	2	18'-8"	19'-9"	10	28'-0"	28'-11"	15	E4	6.00	1330	E6	8.51	1840
F4	F6	48"	6'-0"	6"	8"	8"	5'-0"	5'-9 3/4"	2	2	19'-9"	19'-9"	10	28'-0"	28'-11"	15	F4	5.89	1330	F6	8.40	1840

DESIGN NUMBER OF HORIZONTAL GRATE MEMBERS WHEN REQUIRED, (SIDE DRAIN OPTION).
 DESIGN NUMBER OF LONGITUDINAL GRATE MEMBERS FOR BOTH CROSS DRAIN SLOPE OPTIONS.
 DESIGN NUMBER OF HORIZONTAL STIFFENER(S) EVENLY SPACED, (CROSS DRAIN OPTION, SEC B-B).
 MINIMUM T1 FOR CAST-IN-PLACE OPTION SHALL BE 6 INCHES.



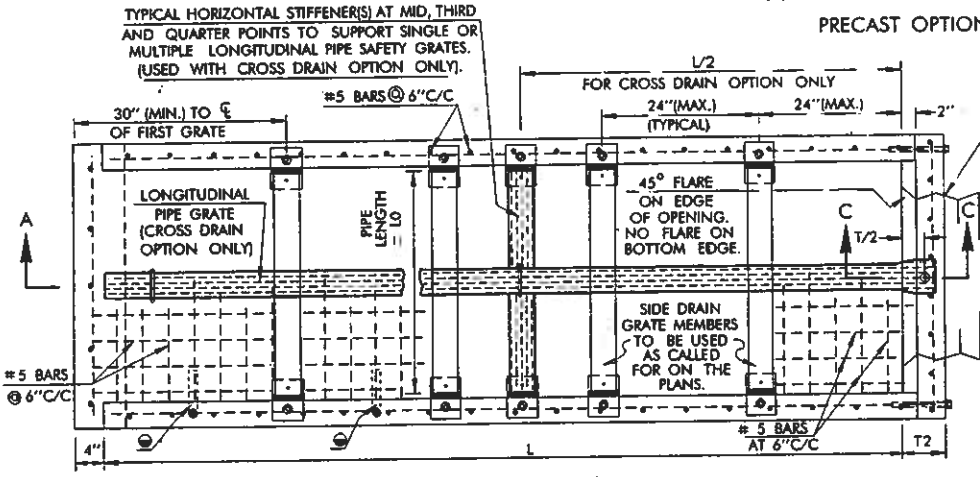
SECTION OF GRATE MEMBER AT WINGWALL

TOE WALL PLACEMENT DETAILS

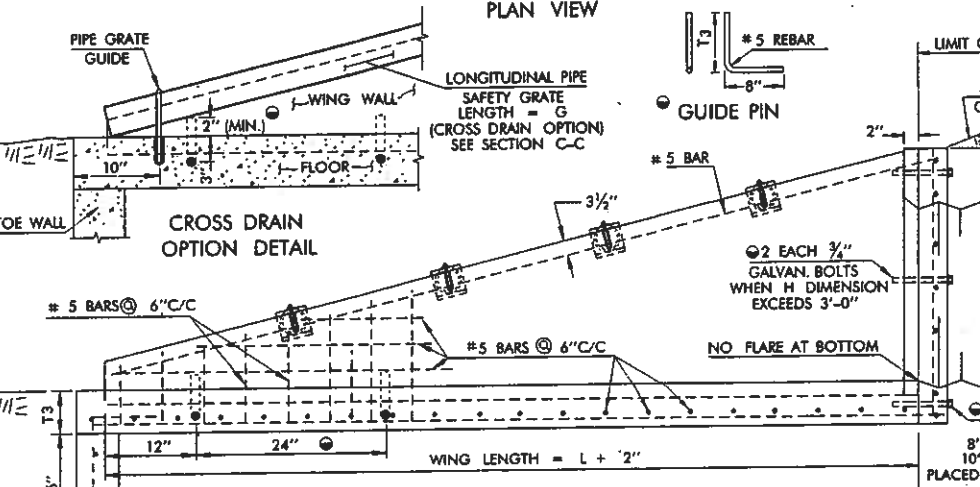
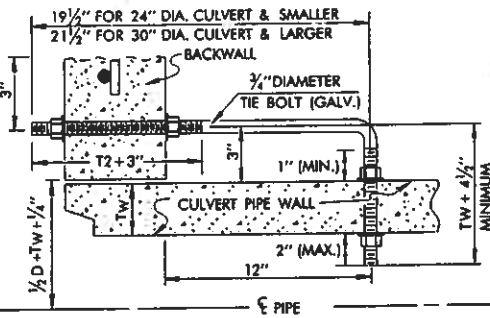
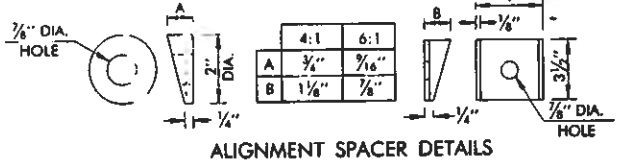
SECTION C-C

ALTERNATE SECTION C-C

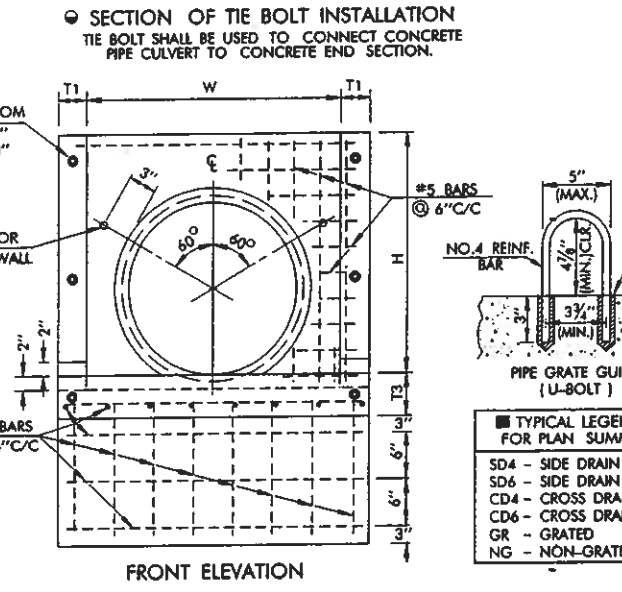
DETAIL OF CROSS DRAIN PIPE GRATE & HORIZONTAL STIFFENER



WHEN CONCRETE PIPE CULVERT IS USED, CAST APPROPRIATE JOINT CONFIGURATION INTO BACK OF BACKWALL USE GROOVE END ON OUTLET END SECTION AND TONGUE END ON INLET END SECTION.
 LIMIT OF PAYMENT FOR METAL PIPE
 12" (MIN.) FOR CORRUGATED METAL PIPE CULVERT ONLY



LIMIT OF PAYMENT FOR CONCRETE PIPE - BOTH OPTIONS
 SLOPE AS SPECIFIED ON TYPICAL SECTION.
 3/8" BOLTS TOP & BOTTOM
 8" LONG FOR T2 = 6"
 10" LONG FOR T2 = 8"
 PLACED INTO CONCRETE INSERTS.
 1" DIA. HOLES CAST OR DRILLED INTO BACKWALL AS SHOWN WHEN CONCRETE PIPE CULVERT IS USED.



- GENERAL NOTES
- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 1999 ENGLISH STANDARD SPECIFICATIONS.
 - ALL NOTES DESIGNATED THUS (C) APPLY ONLY TO PRECAST OPTION.
 - QUANTITIES SHOWN ARE FOR ONE END ONLY. CONCRETE SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF SECTION 509 OF THE 1999 ENGLISH STANDARD SPECIFICATIONS. CLASS P CONCRETE, HAVING MINIMUM STRENGTH OF 5000 PSI, SHALL BE USED ON PRECAST UNITS. CLASS A CONCRETE SHALL BE USED ON CAST-IN-PLACE UNITS.
 - DIMENSIONS SHOWN ARE MINIMUM. ACTUAL DIMENSIONS MAY VARY WITH FABRICATOR AND WITHIN INDUSTRY ACCEPTED TOLERANCES.
 - UNITS SHALL BE ASSEMBLED USING BOLTS, AS SHOWN, AND EPOXY RESIN ADHESIVE CONFORMING TO AASHTO M 235, CLASS 111, AT ALL JOINTS.
 - FABRICATOR SHALL SUBMIT TO THE ENGINEER, FOR APPROVAL, PROVISIONS FOR LIFTING COMPONENT PARTS INTO PLACE.
 - WHEN SHOWN ON PLANS, PIPE ARCH (METAL OR CONCRETE) OR ELLIPTICAL PIPE MAY BE USED IN LIEU OF FULL CIRCLE PIPE. WHEN USING ARCH OR ELLIPTICAL PIPE AS A SUBSTITUTE FOR FULL CIRCLE PIPE, THE RESPECTIVE INSIDE SPAN PLUS TWO WALL THICKNESSES MAY NOT EXCEED ANY W DIMENSION SHOWN IN THE TABLE OF END SECTION DIMENSIONS.
 - SHARP EDGES ON PRECAST OR CAST-IN-PLACE UNITS MUST BE CHAMFERED OR ROUNDED TO THE POINT OF SAFE HANDLING. THE CHAMFER SHOULD BE 12" MINIMUM, OR ROUNDED WITH AN EDGING TOOL.
 - WHEN GRATE MEMBERS ARE REQUIRED, ALL BOLTS, NUTS, WASHERS, BRACKETS, AND STEEL PIPE ARE CONSIDERED PARTS OF THE END SECTION. PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN BID PRICE FOR THE END SECTION.
 - PIPE FOR SAFETY GRATES SHALL BE 3" x 7.58 LBS./FT. STANDARD WEIGHT STEEL PIPE, SCHEDULE 40. IT SHALL BE FURNISHED GALVANIZED, PLAIN END AND SHALL MEET THE MINIMUM REQUIREMENTS OF ASTM A-53. HYDROSTATIC TESTS MAY BE WAIVED FOR PIPE SAFETY GRATE MEMBERS.
 - ANY GALVANIZED AREA(S) OF METAL PIPE DISTRESSED DURING THE POST FABRICATION AND/OR HANDLING PROCESS SHALL BE COATED WITH AN APPROVED ZINC RICH PAINT.
 - THREADED ROD, BOLT AND NUTS SHALL CONFORM TO ASTM A-307.
 - ALIGNMENT SPACER HARDWARE SHALL CONFORM TO ASTM A-36.
 - ALL EXPOSED STEEL SHALL BE GALVANIZED OR PAINTED IN ACCORDANCE WITH SECTION 725A OF THE 1999 ENGLISH STANDARD SPECIFICATIONS.
 - ALL REINFORCING STEEL TO BE 5/8" BARS AT 6" CENTERS, WITH 12" OVERLAPPING REINFORCING STEEL BETWEEN ADJACENT WALLS, WINGS, TOE WALL AND FLOOR.
 - CRITERIA FOR USE OF PIPE SAFETY GRATE MEMBERS:
 (A) ALL SIDE DRAIN AND CROSS DRAIN INSTALLATIONS INSIDE THE CLEARZONE.
 (B) ALL INSTALLATIONS OUTSIDE THE CLEARZONE WHERE HAZARD POTENTIAL IS HIGH BASED ON TRAFFIC DIRECTION, SPEED, CLASS, VOLUME AND SIZE OF CULVERT.
 NOTE: ANALYZE HYDRAULIC PERFORMANCE AT VARYING DEGREES OF CLOGGING AND APPLY RISK ASSESSMENT BEFORE USING GRATES.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
613.06(MM)	(C) SLOPED CONCRETE END SECTION	EA.

SPECIFY TYPE (EXAMPLE: TYPE A4 SLOPED CONC. END SECTION)
 S. C. E. S. ORIENTATION, GRATED OR NON-GRATED SHALL BE SHOWN IN PLAN SUMMARIES.

APPROVED BY ROADWAY ENGINEER *C.M. Sankharia* DATE 9/1/99

OKLAHOMA DEPT. OF TRANSPORTATION
 ROADWAY STANDARD (ENGLISH)
 SLOPED CONCRETE
 END SECTIONS

1999 SPECIFICATIONS SCES-2 OOE
 R-81E