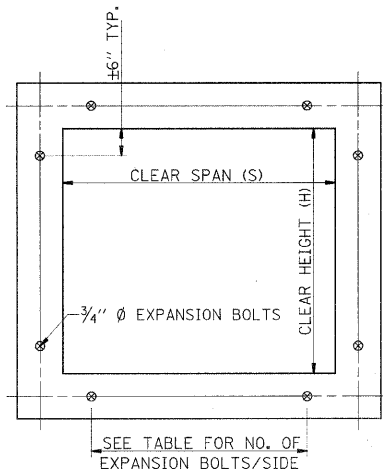


F.A.P. RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
*	**	***	304	162
STA.		TO STA.		
FED. ROAD DIST. NO.		ILLINOIS	FED. AID PROJECT	

* FAU 9481, FAS 2887 (IL 37)
 ** (12.12X)RS-3:12B-1,12B1-1
 *** FRANKLIN AND WILLIAMSON

EXPANSION BOLTS REQUIRED FOR CULVERT EXTENSIONS



EXPANSION BOLTS SHALL CONSIST OF SELF DRILLING EXPANSION SHIELDS AND 3/4" Ø HOOKED BOLTS. HOOKED BOLTS SHALL EXTEND A MINIMUM OF 9" INTO NEW CONCRETE.

MINIMUM CERTIFIED PROOF LOAD=7,500 LBS.

BOLTS SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH FOR EXPANSION BOLTS, 3/4 INCH.

H OR S	EXTENSION < 15'		EXTENSION > 15'	
	NO.	SPACING	NO.	SPACING
2.0	*	*	*	*
2.5	2	18"	2	18"
3.0	2	24"	2	24"
4.0	3	18"	3	18"
5.0	4	16"	3	24"
6.0	5	15"	4	20"
7.0	5	18"	4	24"
8.0	6	17"	5	21"
9.0	6	19"	5	24"
10.0	7	18"	6	21"
11.0	8	17"	6	24"
12.0	8	19"	7	22"

* NOTE: USE MINIMUM OF 1 EXPANSION BOLT AT EACH CORNER.

EXAMPLE:

6' X 4' BOX CULVERT TO BE EXTENDED 18' AT ONE END ONLY.
 FROM TABLE FIND
 6' SIDE REQUIRES (4)-3/4" Ø EXPANSION BOLTS AT 20" CENTERS
 4' SIDE REQUIRES (3)-3/4" Ø EXPANSION BOLTS AT 18" CENTERS
 TOTAL NO. REQUIRED
 (4+3)2 = (14)-3/4" Ø EXPAN. BOLTS

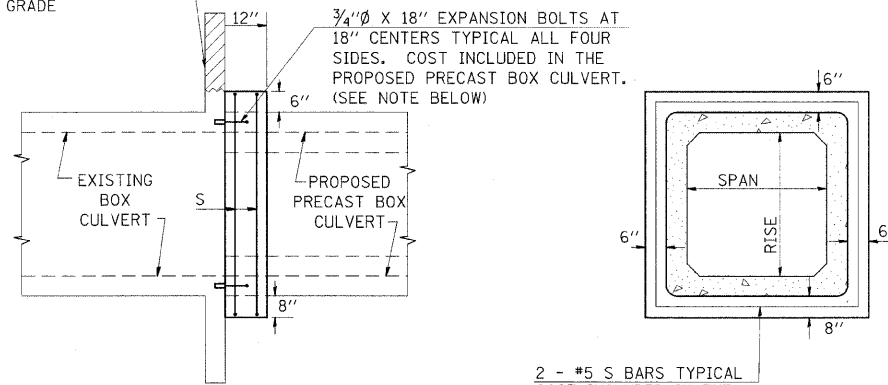
CROSS SECTION THRU BARREL

FOR ANCHOR BOLT REQUIREMENTS, SEE ARTICLE 1006.09 OF THE STANDARD SPECIFICATIONS.



DETAILS OF CONCRETE COLLAR FOR PRECAST BOX CULVERT

REMOVE PORTION OF EXISTING HEADWALL DOWN TO 12" BELOW FINISHED GRADE



3/4" Ø X 18" EXPANSION BOLTS AT 18" CENTERS TYPICAL ALL FOUR SIDES. COST INCLUDED IN THE PROPOSED PRECAST BOX CULVERT. (SEE NOTE BELOW)

2 - #5 S BARS TYPICAL COST INCLUDED IN THE PROPOSED PRECAST BOX CULVERT.

TABULATION (FOR INFORMATION PURPOSES ONLY)

SPAN X RISE	CLASS SI CONC. CU. YD. (EST.)
2' X 2'	0.26
3' X 2'	0.30
3' X 3'	0.34
4' X 2'	0.36
4' X 3'	0.39
4' X 4'	0.43
5' X 2'	0.41
5' X 3'	0.45
5' X 4'	0.49
6' X 2'	0.47
6' X 3'	0.51
6' X 4'	0.54
10' X 4'	0.76

THE CONCRETE COLLAR SHALL BE CONSIDERED INCLUDED IN PRECAST CONCRETE BOX CULVERT, WHICH PRICE SHALL INCLUDE THE REMOVAL OF SUCH PORTIONS OF THE EXISTING HEADWALLS AS MAY BE REQUIRED. CLASS SI CONCRETE SHALL BE USED THROUGHOUT.

NOTE: ANCHOR BOLTS, MEETING THE REQUIREMENTS OF ARTICLE 1006.09 OF THE STANDARD SPECIFICATIONS, SHALL EXTEND A MINIMUM OF 9 INCHES INTO THE NEW CONCRETE. EXPANSION SHIELDS SHALL PROVIDE A MINIMUM CERTIFIED PROOF LOAD OF 4080 POUNDS.



ILLINOIS DEPARTMENT OF TRANSPORTATION																									
DETAILS:																									
EXPANSION BOLTS REQUIRED FOR CULVERT EXTENSIONS; CONCRETE COLLAR FOR PRECAST BOX CULVERT;																									
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