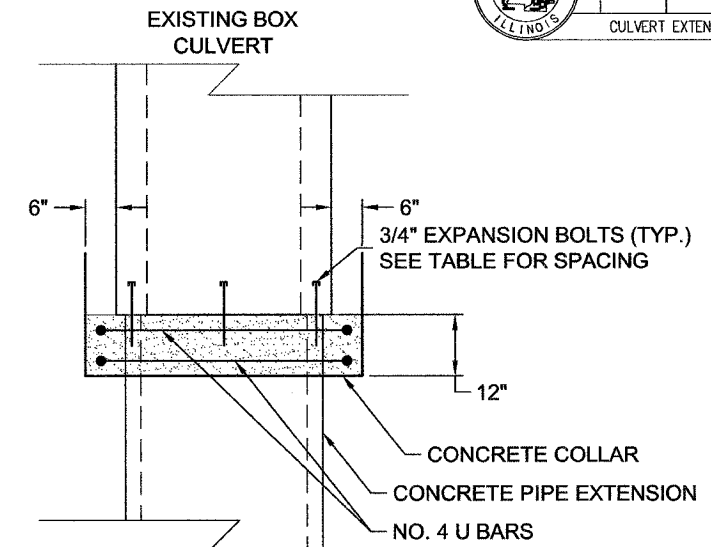
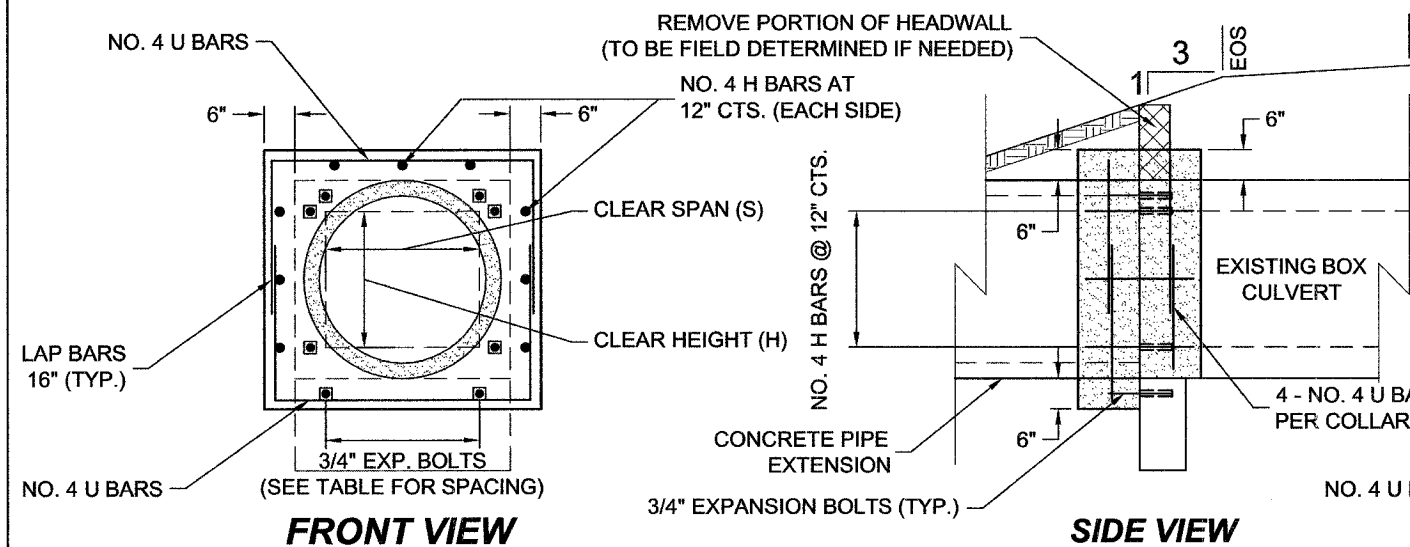


**PLAN OF CULVERT WITH ANGLED WING WALLS**

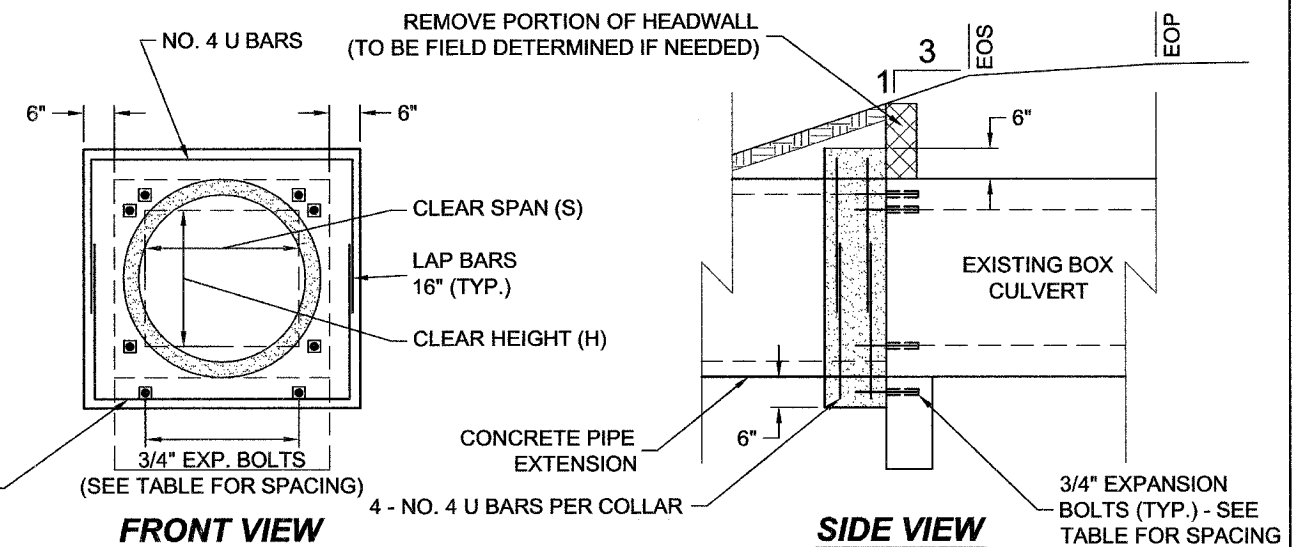


**PLAN OF CULVERT WITH STRAIGHT HEADWALL**



**FRONT VIEW**

**SIDE VIEW**



**FRONT VIEW**

**SIDE VIEW**

PLACEMENT DETAILS FOR EXPANSION BOLTS				
H or S (IN)	EXTENSIONS < 15'		EXTENSIONS > 15'	
	Number	Spacing (IN)	Number	Spacing (IN)
24	*		*	
30	2	18	2	18
36	2	24	2	24
48	3	18	3	18
60	4	16	3	24
72	5	15	4	20
84	5	18	4	24
96	6	15	5	21
108	6	19	5	24
120	7	18	6	21
132	8	17	6	24
144	8	19	7	22

BILL OF MATERIALS (FOR ESTIMATING PURPOSES ONLY - SEE NOTE 6)									
STA	PIPE EXT. DIA.	H BAR		U BAR DIMENSIONS				EXP. BOLTS NO.	CONC. COLLAR C.Y.
		NO.	LENGTH	NO.	X	Y	LENGTH		
112+01	30" EQRS	20	18"	8	44"	24"	92"	12	.5 CY
117+10	30"	10	18"	8	36"	26"	88"	16	.4 CY
296+21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
337+55	36" EQRS	28	18"	8	51"	26"	103"	20	.5 CY
346+60	36" EQRS	28	18"	8	51"	26"	103"	20	.5 CY

NOTE: DUE TO UNKNOWN CHARACTERISTICS OF THE EXISTING CULVERTS, SUCH AS WALL AND SLAB THICKNESS, THIS CHART IS INTENDED ONLY FOR ESTIMATING PURPOSES. FIELD CONDITIONS MAY CAUSE DIMENSIONS AND QUANTITIES TO BE ADJUSTED AS DETERMINED BY THE ENGINEER.

**GENERAL NOTES:**

- 1) CONCRETE COLLARS SHALL BE CONSTRUCTED OF CLASS SI CONCRETE IN ACCORDANCE WITH SECTION 503 OF THE STANDARD SPECIFICATIONS.
- 2) REINFORCEMENT BARS SHALL CONFORM TO SECTION 508 OF THE STANDARD SPECIFICATIONS.
- 3) EXPANSION BOLTS SHALL CONSIST OF SELF DRILLING EXPANSION SHIELDS AND 3/4" DIA. HOOK BOLTS.
- 4) HOOKED BOLTS SHALL EXTEND A MINIMUM OF 9" INTO NEW CONCRETE.
- 5) ALL H BARS SHALL BE 18" LONG.
- 6) COST OF ALL LABOR AND MATERIALS IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER FOOT OF PIPE CULVERTS OR STORM SEWER, OF THE TYPE AND SIZE SPECIFIED.