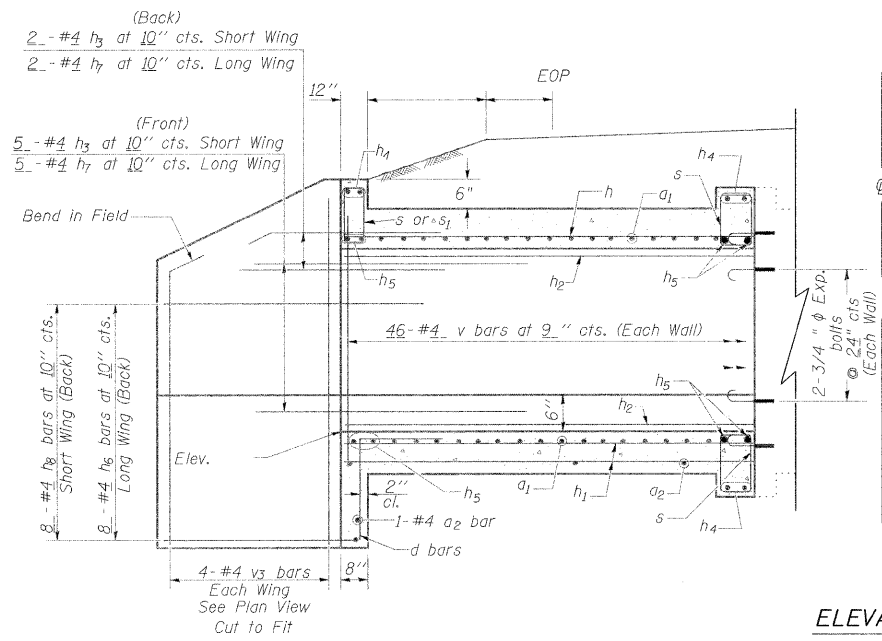
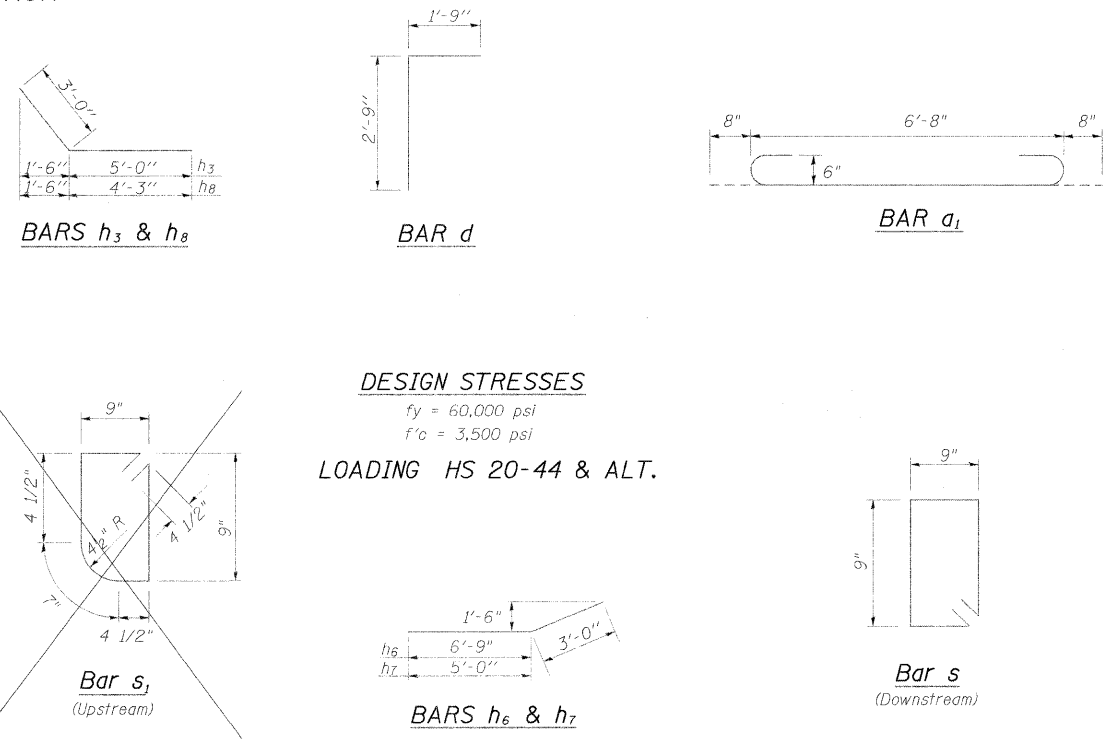
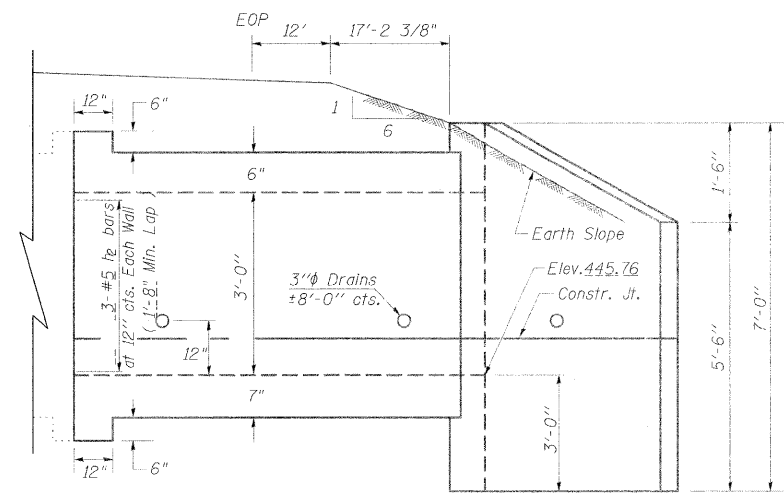


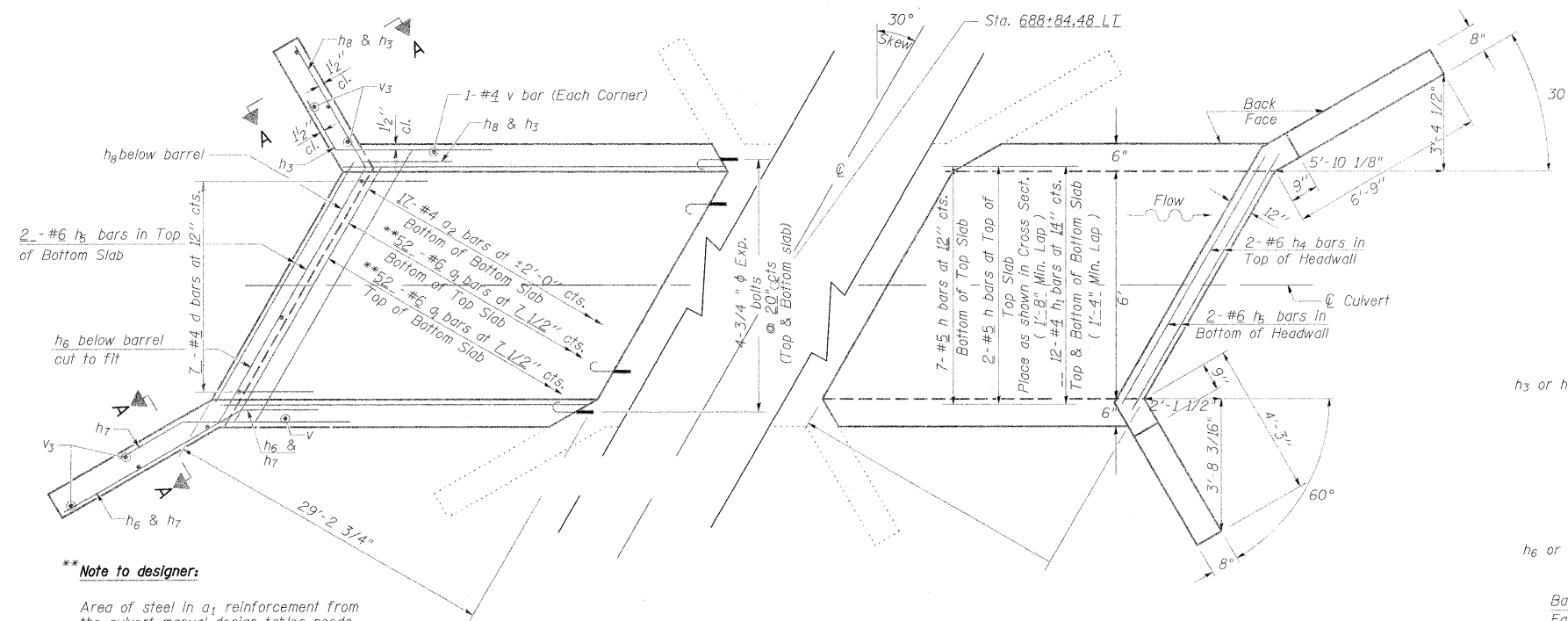
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION



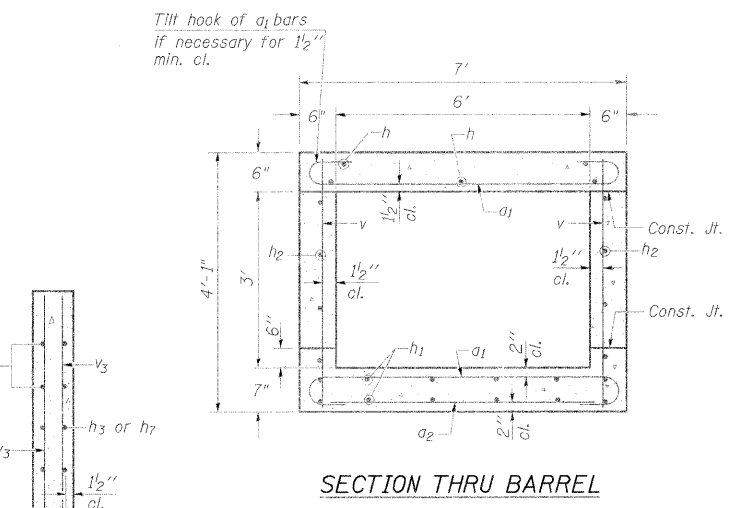
**ELEVATION**  
Dimensions at Rt. L's to  $\phi$  Roadway



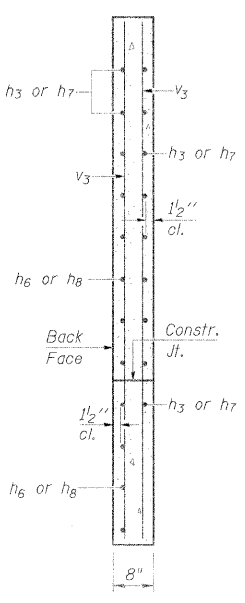
**DESIGN STRESSES**  
 $f_y = 60,000 \text{ psi}$   
 $f'_c = 3,500 \text{ psi}$   
**LOADING HS 20-44 & ALT.**



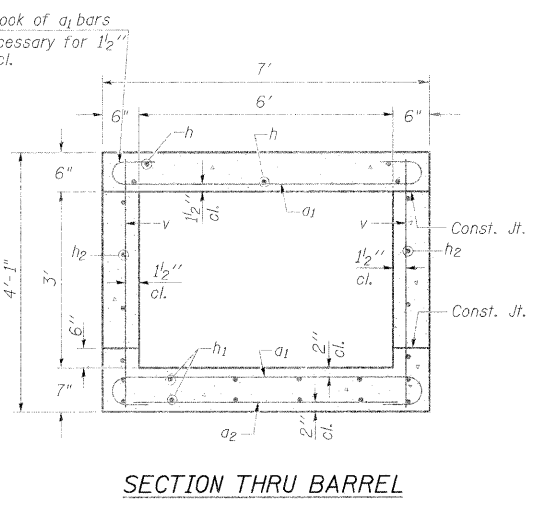
**PLAN**



**SECTION THRU BARREL**



**SECTION A-A**



**SECTION THRU HEADWALL**  
(Up Stream End Only)

**BILL OF MATERIAL**

Bar	No.	Size	Length	Shape
a1	104	#6	8'-0"	U
a2	18	#4	6'-6"	U
d	7	#4	4'-6"	L
h	9	#5	33'-6"	—
h1	12	#4	33'-6"	—
h2	6	#5	33'-6"	—
h3	7	#4	8'-0"	—
h4	6	#6	7'-9"	—
h5	8	#6	8'-4"	—
h6	8	#4	9'-9"	—
h7	7	#4	8'-0"	—
h8	8	#4	7'-3"	—
s	24	#4	3'-9"	—
s1	0	#4	—	—
v	94	#4	3'-9"	—
v3	8	#4	6'-0"	—

Concrete Box Culverts	Cu. Yd.	16.2
Reinforcement Bars	Pound	2810
3/4" Expansion bolts	Each	12

**Note to designer:**

Area of steel in  $a_1$  reinforcement from the culvert manual design tables needs to be multiplied by  $\sec^2 \theta$  to incorporate the skew.

**REVISIONS**

NO.	DATE	DESCRIPTION
DRAWN	2-04	
REVISED	5-09	SHT CELL
REVISED		
REVISED		

Reinforcement Bars shall conform to the requirements of AASHTO M-31, M-42 or M-53, Grade 60.  
 Bars indicated thus 12 x 4-#5 etc. indicates 12 lines of bars with 4 lengths per line.  
 A distance of half the length of the wingwall but not less than six feet of the barrel shall be poured monolithically with the wingwalls.

**NOTES**

All construction joints shall be bonded.  
 Expansion bolts shall be 3/4"  $\phi$  x 12" hooked bolts. Hooked bolts shall extend a minimum of 9" into new concrete and have a minimum certified proof load of 4,080 lbs.  
 $s, s_1$  bars @ 12" centers