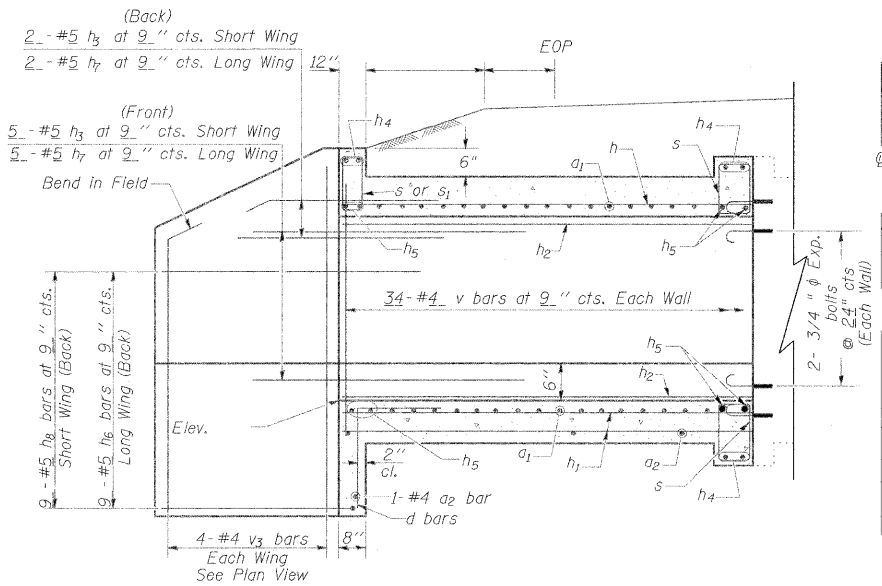
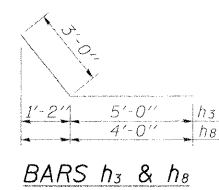
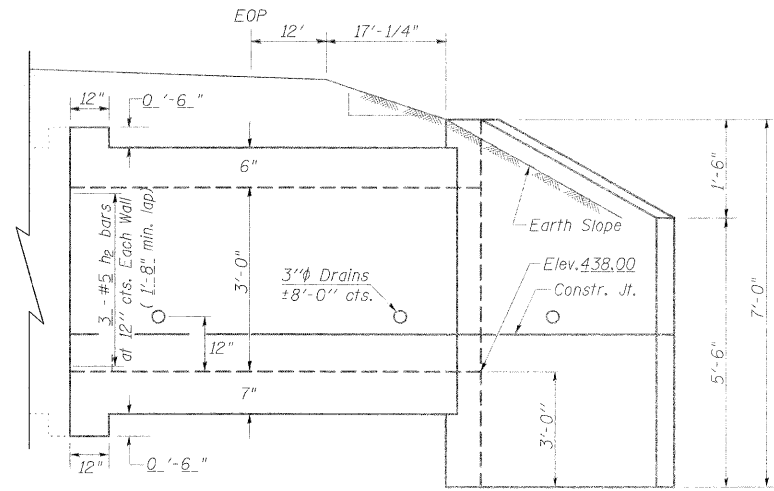


STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

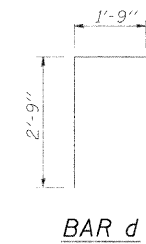


ELEVATION

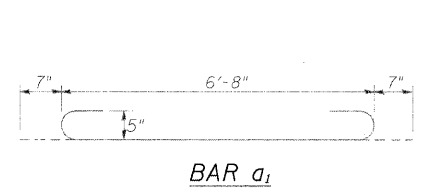
Dimensions at Rt. L's to ϕ Roadway



BARS h_3 & h_8

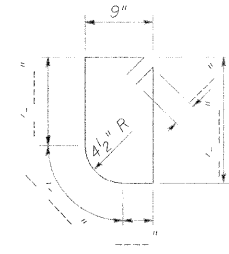


BAR d

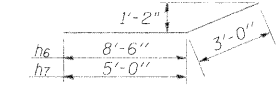


BAR a_1

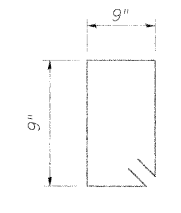
DESIGN STRESSES
 $f_y = 60,000$ psi
 $f'_c = 3,500$ psi
LOADING HS 20-44 & ALT.



Bar s_1
(Upstream)

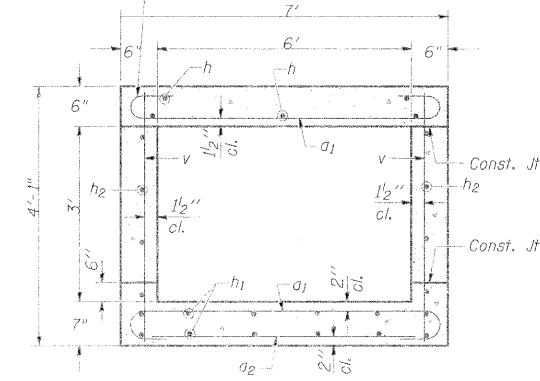


BARS h_6 & h_7

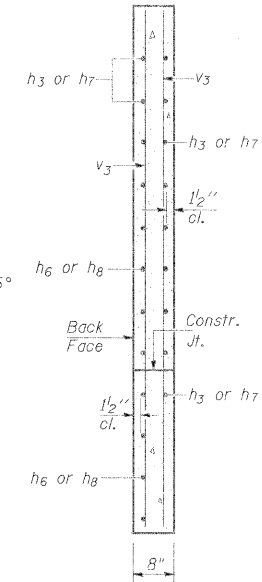


Bar s
(Downstream)

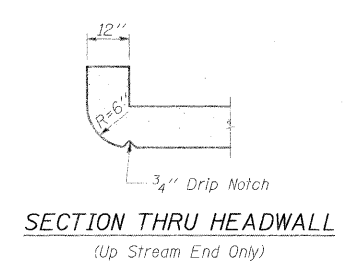
Tilt hook of a_1 bars
if necessary for 1 1/2" min. cl.



SECTION THRU BARREL



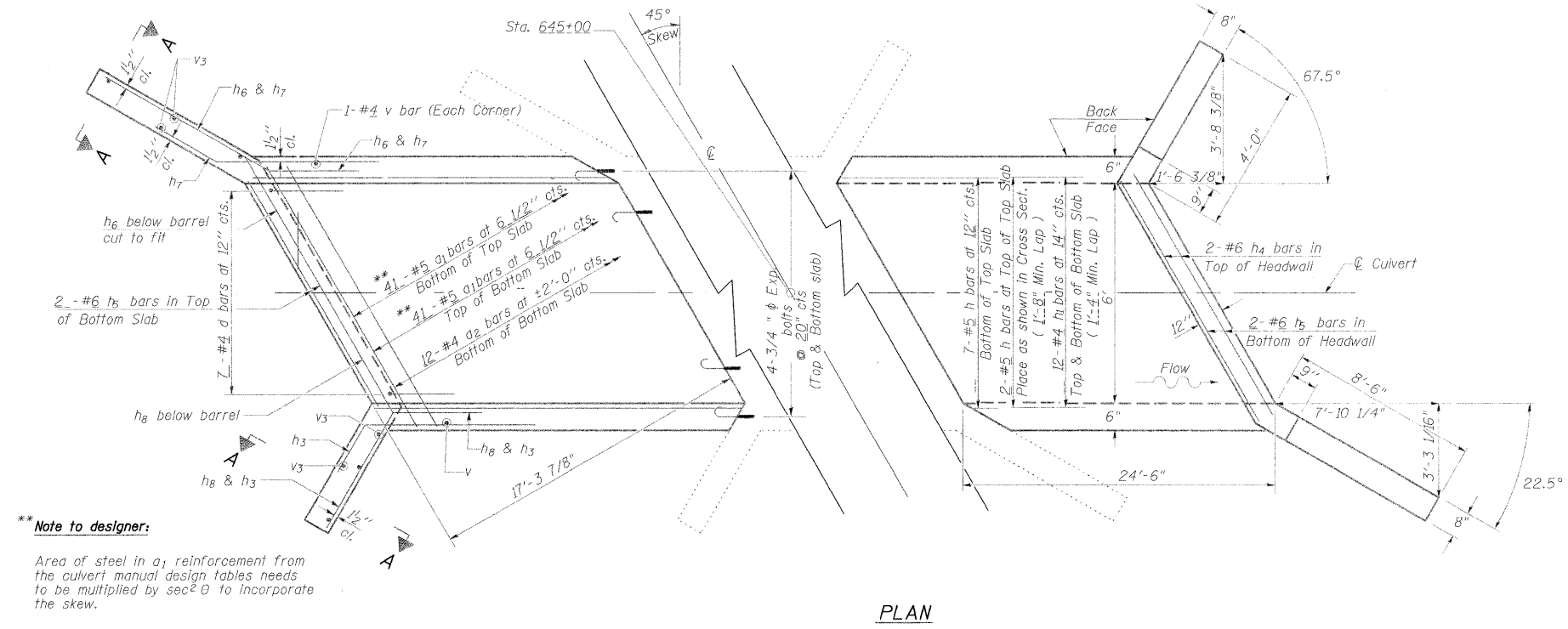
SECTION A-A



SECTION THRU HEADWALL
(Up Stream End Only)

BILL OF MATERIAL

| Bar | No. | Size | Length | Shape |
|-----------------------|-----|------|---------|-------|
| a_1 | 82 | #5 | 7'-10" | |
| a_2 | 13 | #4 | 6'-6" | |
| d | 7 | #4 | 4'-6" | |
| h | 9 | #5 | 24'-3" | |
| h_1 | 12 | #4 | 24'-3" | |
| h_2 | 6 | #5 | 24'-3" | |
| h_3 | 7 | #5 | 8'-0" | |
| h_4 | 6 | #6 | 9'-3" | |
| h_5 | 8 | #6 | 9'-10" | |
| h_6 | 9 | #5 | 11'-6" | |
| h_7 | 7 | #5 | 8'-0" | |
| h_8 | 9 | #5 | 7'-0" | |
| s | 30 | #4 | 3'-9" | |
| s_1 | 0 | #4 | | |
| v | 70 | #4 | 3'-10" | |
| v_3 | 8 | #4 | 6'-0" | |
| Concrete Box Culverts | | | Cu. Yd. | 12.9 |
| Reinforcement Bars | | | Pound | 2100 |
| 3/4" Expansion bolts | | | Each | 12 |



PLAN

NOTES

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.
All construction joints shall be bonded.
Expansion bolts shall be 3/4" ϕ 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

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 | | |

BASED ON: SSB-H-L 6-1-2000