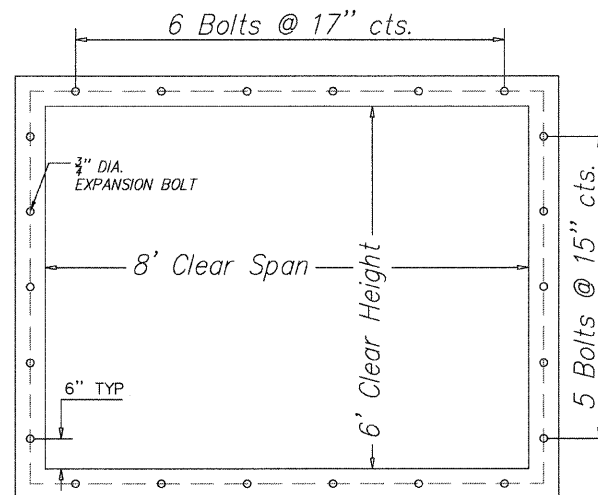


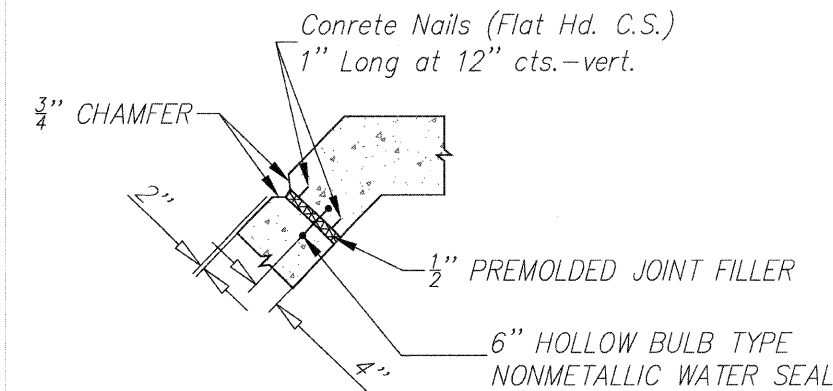
**BILL OF MATERIALS**

Bar	No.	Size	Length
a1	40	#8	10'-10"
a2	5	#4	8'-3"
d	9	#4	4'-6"
h	9	#6	14'-5"
h1	12	#5	14'-5"
h2	12	#5	14'-5"
h3	18	#4	8'-9"
h4	6	#6	8'-3"
v	38	#5	7'-4"
v2	26	#4	5'-9"
v3	10	#4	4'-0"
v4	10	#4	5'-6"
w	12	#5	13'-6"
z	28	#5	7'-9"
CONCRETE HEADWALL REMOVAL			CY 6.7
3/4" DIA. EXPANSION BOLTS			EACH 22
CONCRETE BOX CULVERT			CY 18.9
REINFORCEMENT BARS			LBS 2,790

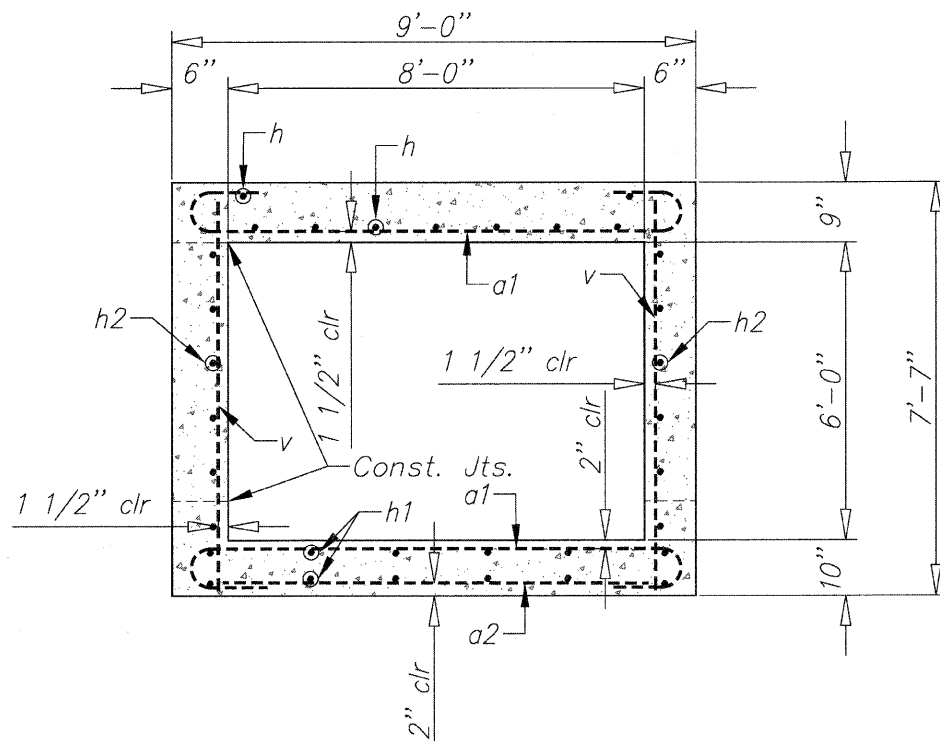


**EXPANSION BOLTS  
LAYOUT DETAIL**

NOTE:  
Expansion Bolts shall be  $\frac{3}{4}$ " diameter hooked bolts. Hooked bolts shall extend a minimum of 9" into new concrete.



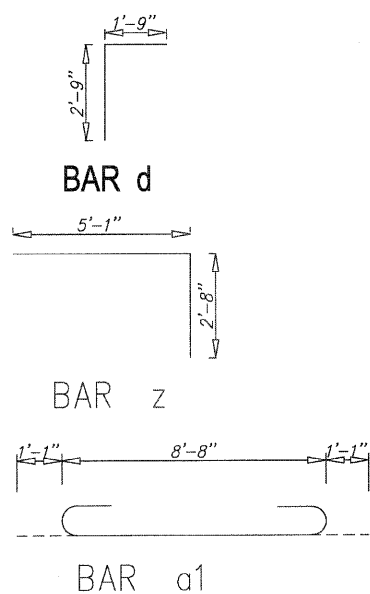
**CORNER DETAIL**



**SECTION THRU BARREL**

$f_s = 20,000 \text{ psi}$   
 $f_c = 1400 \text{ psi barrel}$   
 $f_c = 1000 \text{ psi wings}$   
 $v = 90 \text{ psi barrel}$   
 $v = 75 \text{ psi footing}$   
 $n = 10$

**LOADING HS-20**



**GENERAL NOTES:**

- Class Sl Concrete shall be used throughout.
- Exposed edges shall be beveled  $\frac{3}{4}$ ".
- For backfilling and embankment see section 502 of St'd. Specs. Structure Excavation will not be paid separately and will be incidental to CONCRETE BOX CULVERT.
- All bars shall be lapped 20 diameters unless otherwise specified.
- Nonmetallic water seal used in the wing wall joints shall extend from the top of the footing to within 6" of the top of the headwall.
- Tilt hook of "a1" bars, if necessary, to obtain  $1 \frac{1}{2}$ " minimum clearance at top of hook.