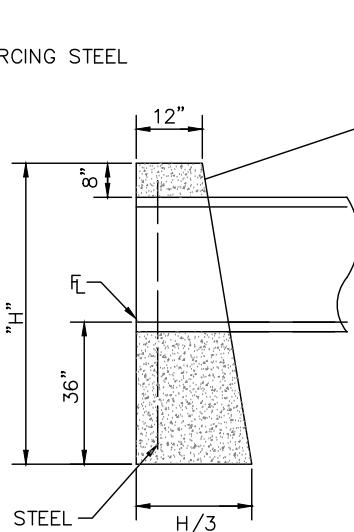


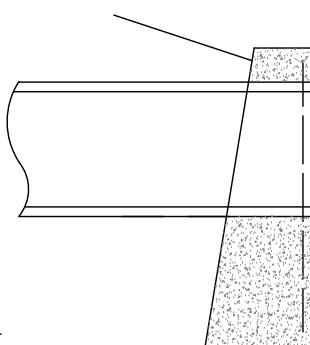
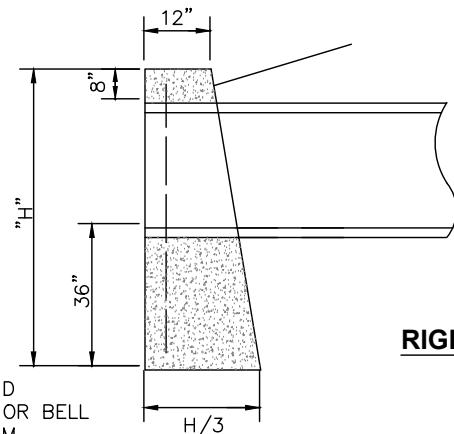
**ELEVATION**



**SECTION A-A**

**NOTES**

- A. THESE FULL HEIGHT HEADWALLS ARE FOR NONSKEWED CULVERTS HAVING A DIAMETER OR RISE OF 36" OR LESS.
- B. CONCRETE SHALL BE ODOT CLASS C. REINFORCED STEEL BARS SHALL BE 5/8" ROUND.
- C. DIMENSIONS AND QUANTITIES ARE SHOWN FOR CIRCULAR SECTIONS ONLY. IT WILL BE NECESSARY TO DETERMINE DIMENSIONS FOR THE HW-1 HEADWALL REQUIRED FOR REINFORCED ELLIPTICAL CONCRETE PIPE OR CORRUGATED METAL PIPE ARCHES IN ACCORDANCE WITH THE EQUATIONS LISTED ON THIS DRAWING.
- D. CHAMFER ALL EXPOSED CORNERS 3/4".
- E. WHERE THE SOIL BORINGS INDICATE A BEARING CAPACITY OF LESS THAN 2600 LBS. PER SQUARE FOOT, IT WILL BE NECESSARY TO INCREASE THE WIDTH OF THE BASE.
- F. MINIMUM COVER FOR REINFORCING STEEL SHALL BE 2".
- G. FOR PIPES HAVING A DIAMETER OR RISE OVER 36", REFERENCE ODOT HW-3 HEADWALLS FOR FULL HEIGHT HEADWALL.
- H. FOR SKEWED CULVERTS HAVING A DIAMETER OR RISE OF 36" OR LESS, REFERENCE ODOT HW-2 HEADWALLS.
- I. HEADWALLS MAY BE PRECAST CONCRETE CONSTRUCTED TO THE ABOVE REQUIREMENTS. GROUT AROUND PIPE AFTER INSTALLATION.



INLET END  
GROOVE OR BELL  
UPSTREAM

**FULL-HEIGHT HEADWALL**

DIMENSIONS			QUANTITIES ONE HEADWALL	
DIAMETER	HEIGHT	LENGTH	CONCRETE C.Y.	REINFORCING STEEL LBS.
15"	5'-2"	7'-0"	1.7	41
18"	5'-5"	8'-4"	2.2	57
21"	5'-8"	9'-8"	2.8	62
24"	5'-11"	11'-0"	3.3	69
30"	6'-5"	13'-8"	4.7	92
36"	7'-0"	16'-4"	6.5	105

L CIRCULAR SECTIONS =  $5D + 4T$

L ELLIPTICAL OR PIPE-ARCH =  $4R + 4T + S$

H CIRCULAR SECTIONS =  $D + T + 44"$

H ELLIPTICAL OR PIPE-ARCH =  $R + T + 44"$

D = DIAMETER OF PIPE

R = RISE OF PIPE

S = SPAN OF PIPE

T = THICKNESS OF BARREL

L = LENGTH OF HEADWALL

H = HEIGHT OF HEADWALL



CITY OF  
SIDNEY

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