

ELEVATION

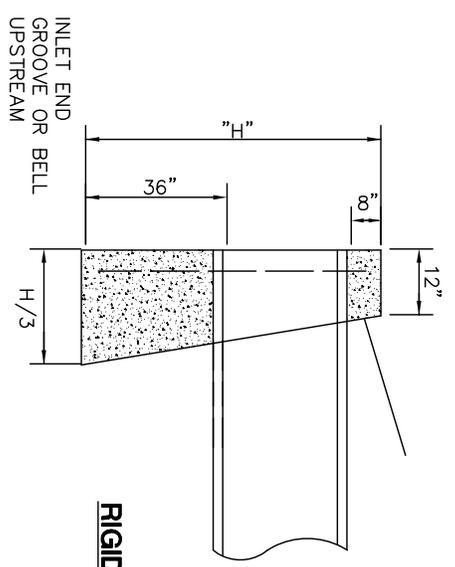
SECTION A-A

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.

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

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



RIGID PIPE

**OUTLET END
TONGUE OR SPIGOT
DOWNSTREAM**