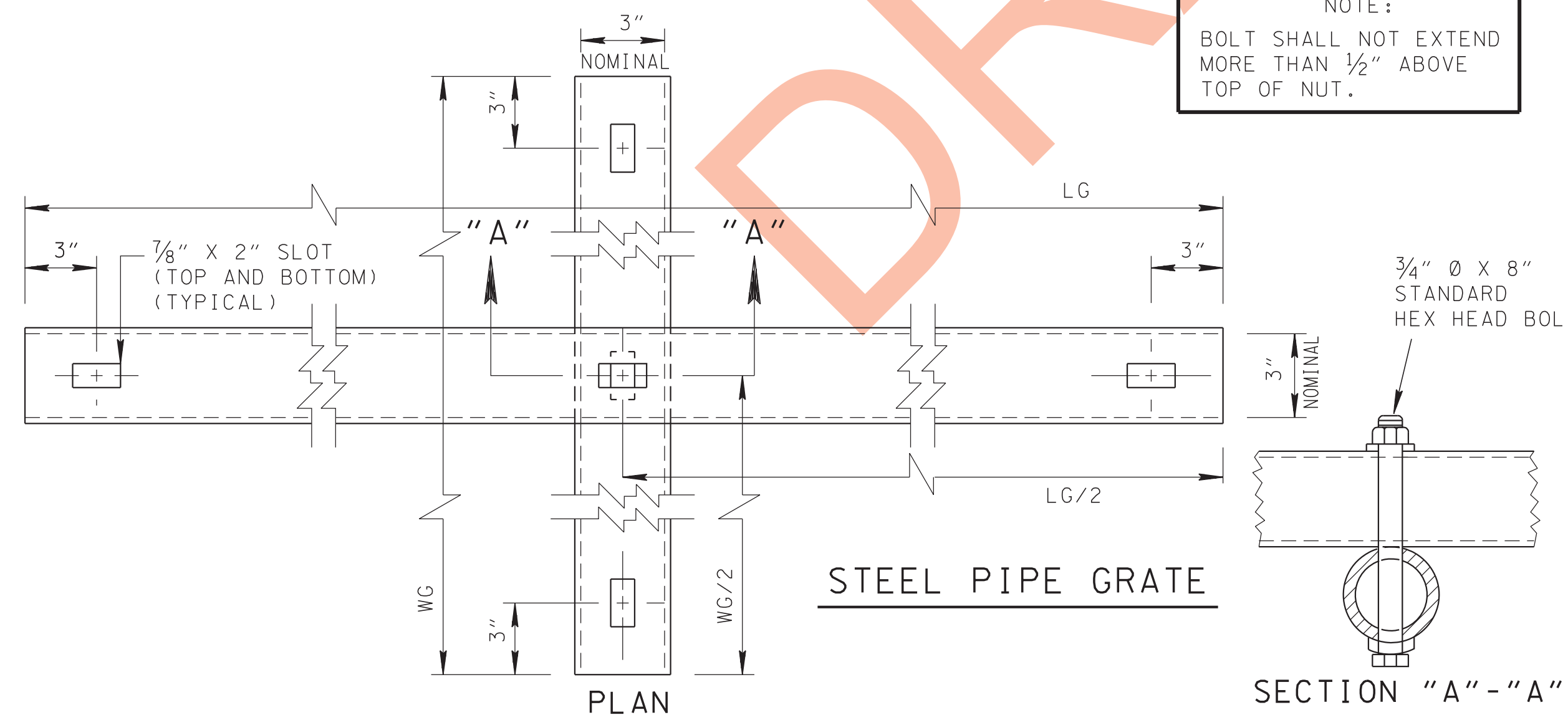
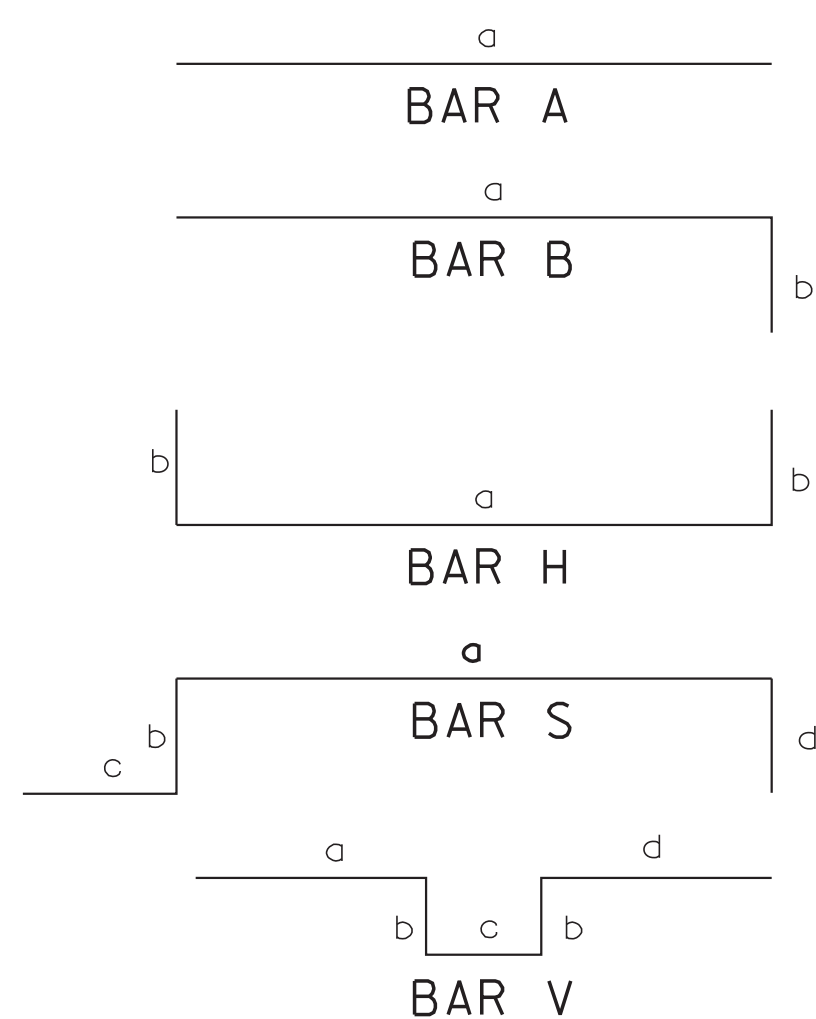


BILL OF STEEL

CODE NO.	LOCATION	BAR SIZE	18" PIPE						24" PIPE						30" PIPE						36" PIPE						42" PIPE						48" PIPE							
			BENDING DIMENSIONS				NO. REOD.	LENGTH	BENDING DIMENSIONS				NO. REOD.	LENGTH	BENDING DIMENSIONS				NO. REOD.	LENGTH	BENDING DIMENSIONS				NO. REOD.	LENGTH	BENDING DIMENSIONS				NO. REOD.	LENGTH								
			a	b	c	d			a	b	c	d			a	b	c	d			a	b	c	d			a	b	c	d			a	b	c	d				
A400	TOEWALL	4	2'-7"				3	2'-7"	3'-2"				3	3'-2"	3'-9"				3	3'-9"	4'-4"				3	4'-4"	4'-11"				3	4'-11"	5'-6"				3	5'-6"		
A401	WINGWALLS	4	5'-8"				2	5'-8"	7'-5"				2	7'-5"	9'-5"				2	9'-5"																				
A402	WINGWALLS	4							4'-5"				2	4'-5"	6'-5"				2	6'-5"	8'-2"				2	8'-2"	9'-8"				2	9'-8"	11'-5"				2	11'-5"		
A403	WINGWALLS	4																						2	5'-2"	6'-8"				2	6'-8"	8'-5"				2	8'-5"			
A404	WINGWALLS	4																																						
A405	WINGWALLS	4	2'-8"				2	2'-8"																																
A500	WINGWALLS	5	6'-0"				4	6'-0"	7'-10"				4	7'-10"																										
A700	HEADWALL	7																						2	2'-2"	2'-4"				2	2'-4"	2'-6"				2	2'-6"			
A701	HEADWALL	7	1'-5"				2	1'-5"	1'-10"				2	1'-10"	2'-3"				2	2'-3"	2'-6"				2	2'-6"	2'-11"				2	2'-11"	3'-0"				2	3'-0"		
A702	HEADWALL	7	1'-4"				2	1'-4"	1'-9"				2	1'-9"	2'-2"				2	2'-2"	2'-5"				2	2'-5"	2'-10"				2	2'-10"	2'-11"				2	2'-11"		
A703	HEADWALL	7	2'-7"				2	2'-7"	3'-2"				2	3'-2"																										
B400	BOTTOM SLAB & WINGWALL	4	1'-2"	1'-10"			2	3'-0"	1'-0"	2'-6"			2	3'-6"	1'-0"	3'-2"			2	4'-2"	1'-0"	3'-10"			2	4'-10"	1'-0"	4'-6"			2	5'-6"	1'-0"	4'-6"			2	5'-6"		
B401	BOTTOM SLAB & WINGWALL	4	1'-2"	0'-6"			2	1'-8"	1'-0"	1'-6"			2	2'-6"	1'-0"	1'-10"			2	2'-10"	1'-0"	2'-2"			2	3'-2"	1'-0"	3'-2"			2	4'-2"	1'-0"	3'-2"			2	4'-2"		
B402	BOTTOM SLAB & WINGWALL	4							1'-0"	0'-6"			2	1'-6"	1'-0"	0'-6"			2	1'-6"	1'-0"	0'-6"			2	1'-6"	1'-0"	1'-10"			2	2'-10"	1'-0"	1'-10"			2	2'-10"		
B403	BOTTOM SLAB & WINGWALL	4																																						
B404	HEADWALL & WINGWALL	4																																						
B405	HEADWALL & WINGWALL	4							1'-5"	0'-9"			2	2'-2"	3'-5"	0'-5"			2	3'-10"	2'-2"	1'-1"			2	3'-3"	3'-8"	0'-8"			2	4'-4"	2'-5"	1'-4"			2	3'-9"		
H400	BOTTOM SLAB & HEADWALL	4	2'-7"	2'-9"			1	8'-1"	3'-2"	3'-4"			1	9'-10"	3'-9"	4'-0"			1	11'-9"	4'-4"	4'-7"			1	13'-6"	4'-11"	5'-1"			1	15'-1"	5'-6"	5'-8"			1	16'-10"		
H401	BOTTOM SLAB & HEADWALL	4	2'-7"	2'-8"			1	7'-11"	3'-2"	3'-3"			1	9'-8"	3'-9"	3'-11"			1	11'-7"	4'-4"	4'-6"			1	13'-4"	4'-11"	5'-0"			1	14'-11"	5'-6"	5'-7"			1	16'-8"		
H402	BOTTOM SLAB & WINGWALL	4	2'-7"	2'-2"			1	6'-11"	3'-2"	2'-6"			1	8'-2"	3'-9"	3'-2"			1	10'-1"	4'-4"	3'-10"			1	12'-0"	4'-11"	4'-6"			1	13'-11"	5'-6"	4'-10"			1	15'-2"		
H403	BOTTOM SLAB & WINGWALL	4	2'-7"	1'-10"			1	6'-3"	3'-2"	2'-2"			1	7'-6"	3'-9"	2'-10"			1	9'-5"	4'-4"	3'-6"			1	11'-4"	4'-11"	4'-2"			1	13'-3"	5'-6"	4'-6"			1	14'-6"		
H404	BOTTOM SLAB & WINGWALL	4	2'-7"	1'-6"			1	5'-7"	3'-2"	1'-10"			1	6'-10"	3'-9"	2'-6"			1	8'-9"	4'-4"	3'-2"			1	10'-8"	4'-11"	3'-10"			1	12'-7"	5'-6"	4'-2"			1	13'-10"		
H405	BOTTOM SLAB & WINGWALL	4	2'-7"	1'-2"			1	4'-11"	3'-2"	1'-6"			1	6'-2"	3'-9"	2'-2"			1	8'-1"	4'-4"	2'-10"			1	10'-0"	4'-11"	3'-6"			1	11'-11"	5'-6"	3'-10"			1	13'-2"		
H406	BOTTOM SLAB & WINGWALL	4	2'-7"	0'-10"			1	4'-3"	3'-2"	1'-2"			1	5'-6"	3'-9"	1'-10"			1	7'-5"	4'-4"	2'-6"			1	9'-4"	4'-11"	3'-2"			1	11'-3"	5'-6"	3'-6"			1	12'-6"		
H407	BOTTOM SLAB & WINGWALL	4	2'-7"	0'-6"			1	3'-7"	3'-2"	0'-10"			1	4'-10"	3'-9"	1'-6"			1	6'-9"	4'-4"	2'-2"			1	8'-8"	4'-11"	2'-10"			1	10'-7"	5'-6"	3'-2"			1	11'-10"		
H408	BOTTOM SLAB & WINGWALL	4							3'-2"	0'-6"			1	4'-2"	3'-9"	1'-2"			1	6'-1"	4'-4"	1'-10"			1	8'-0"	4'-11"	2'-6"			1	9'-11"	5'-6"	2'-10"			1	11'-2"		
H409	BOTTOM SLAB & WINGWALL	4																																						
H410	BOTTOM SLAB & WINGWALL	4																																						
H411	BOTTOM SLAB & WINGWALL	4																																						
H412	BOTTOM SLAB & WINGWALL	4																																						
H413	BOTTOM SLAB & WINGWALL	4																																						
H414	BOTTOM SLAB & WINGWALL	4																																						
H415	BOTTOM SLAB & WINGWALL	4																																						
S400	BOTTOM SLAB & TOEWALL	4	5'-8"	0'-4"	0'-8"	1'-4"	5	8'-0"	7'-5"	0'-4"	0'-8"	1'-4"	6	9'-9"	9'-5"	0'-4"	0'-8"	1'-4"	7	11'-9"	11'-2"	0'-4"	0'-8"	1'-4"	7	13'-6"	12'-8"	0'-4"	0'-8"	1'-4"	8	15'-0"	14'-5"	0'-4"	0'-8"	1'-4"	8	16'-9"		
V500	WINGWALLS	5																																						
V700	HEADWALL	7																																						

REINFORCING STEEL LEGEND



NOTE:
BOLT SHALL NOT EXTEND MORE THAN 1/2" ABOVE TOP OF NUT.

GENERAL NOTES

- ① CONCRETE ENDWALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS.
- ② THE MATERIAL AND PAINTING FOR STRUCTURAL STEEL GRATE SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
 (A) STEEL PIPE ASTM A53, TYPE E OR S, GRADE A OR B, SCHEDULE 40.
 (B) THE GRATE SHALL BE PAINTED BLACK, FEDERAL SPECIFICATION TT-E-489J, AFTER FABRICATION.
- ③ THE MATERIAL AND GALVANIZING FOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
 (A) BOLTS, NUTS AND WASHERS ASTM A307
 (B) GALVANIZING ASTM A153
- ④ THE COST OF FURNISHING BOLTS, NUTS AND WASHERS, INCLUDING ALL MATERIALS, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION, SHALL BE INCLUDED IN THE PRICE BID FOR THE PIPE ENDWALL.
- ⑤ PAYMENT WILL BE MADE UNDER:
 ITEM NO. 611-07.01, CLASS "A" CONCRETE (PIPE ENDWALLS)----CU. YD.
 ITEM NO. 611-07.02, STEEL BAR REINFORCING (PIPE ENDWALLS)----LB.
 ITEM NO. 611-07.03, STRUCTURAL STEEL (PIPE ENDWALLS)----LB.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

TO BE USED ON CROSSDRAINS ONLY AT 90 DEGREE SKEW TO CENTERLINE

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

CONCRETE ENDWALL TYPE "U" WITH STEEL PIPE GRATE FOR 18" THRU 48" PIPES 3 : 1 SLOPE