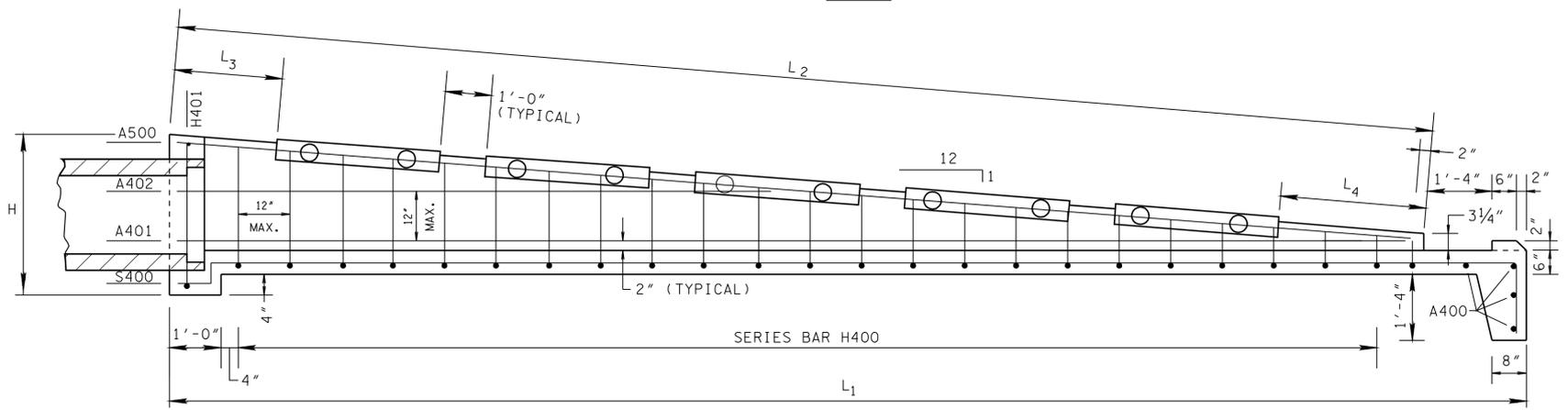
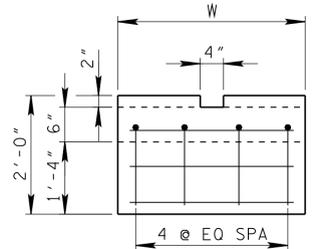


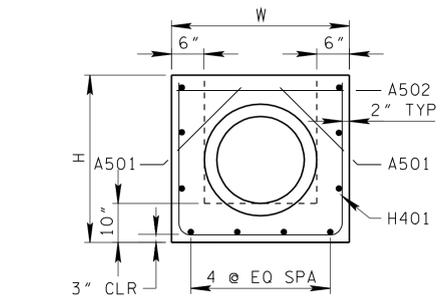
PLAN



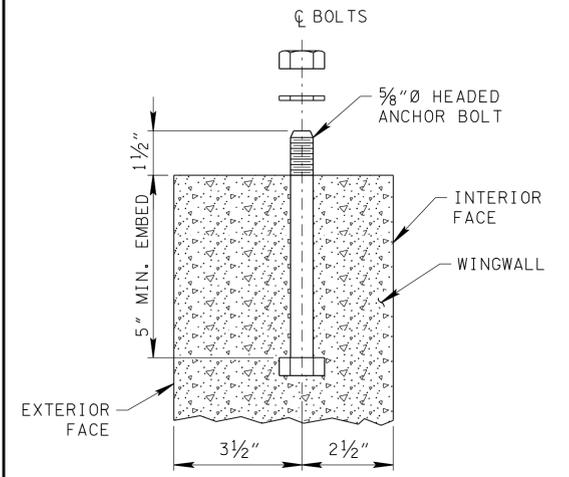
SECTION A-A



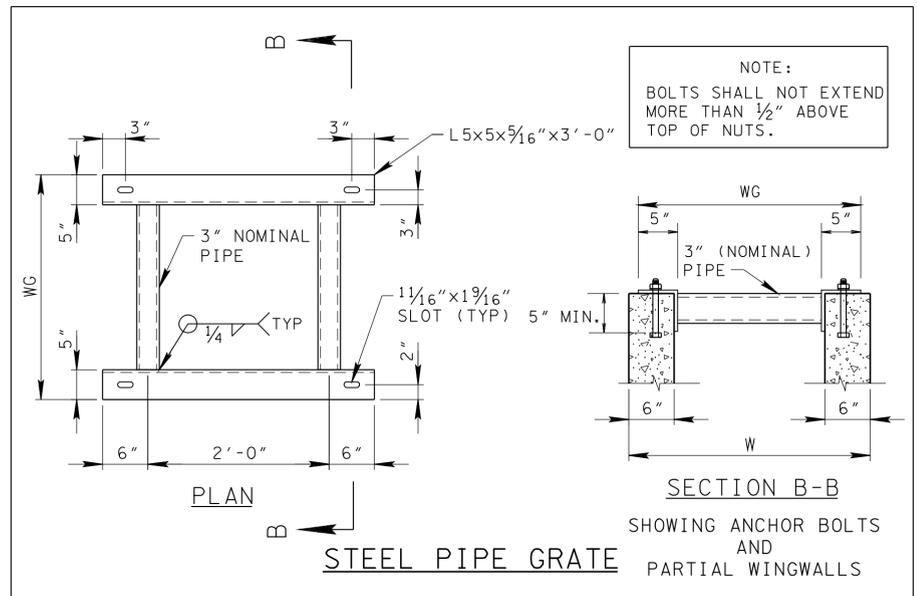
TOEWALL ELEVATION



HEADWALL ELEVATION



ANCHOR BOLT ASSEMBLY



STEEL PIPE GRATE

REINFORCING STEEL CODE

TYPE	SIZE	SERIES
A	5	06

DIMENSIONS SHOWN ON THIS SHEET ARE OUTSIDE TO OUTSIDE OF BAR.

STANDARD C.R.S.I. HOOK DETAILS SHALL APPLY, EXCEPT AS NOTED.

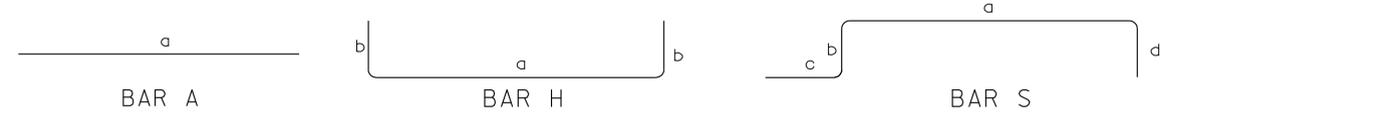
SPLICING OF REINFORCEMENT IS ACCEPTABLE PROVIDED THAT A MINIMUM 21" SPLICE LENGTH IS USED.

GENERAL NOTES

- CONCRETE ENDWALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS.
- THE MATERIALS, WELDING AND PAINTING FOR STRUCTURAL STEEL GRATE SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
 - (A) ANGLES ASTM A36
 - (B) STEEL PIPE ASTM A53, TYPE E, GRADE B, STANDARD WEIGHT (SW)
 - (C) WELDING AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)
 - (D) THE GRATE SHALL BE PAINTED BLACK, FEDERAL SPECIFICATION TT-E-489J, AFTER FABRICATION.
- THE MATERIAL AND GALVANIZING FOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
 - (A) BOLTS, NUTS AND WASHERS ASTM F1554 GRADE 36
 - (B) GALVANIZING ASTM A153
- 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 PIPE ENDWALL.
- PIPE OPENINGS FOR HEADWALLS ARE BASED ON REINFORCED CONCRETE PIPE WITH TYPE "B" WALL THICKNESS (AASHTO M170).
- PAYMENT WILL BE MADE UNDER:
 - ITEM NUMBER 611-07.01, CLASS "A" CONCRETE (PIPE ENDWALLS)----CUBIC YARD.
 - ITEM NUMBER 611-07.02, STEEL BAR REINFORCING (PIPE ENDWALLS)----POUND.
 - ITEM NUMBER 611-07.03, STRUCTURAL STEEL (PIPE ENDWALLS)----POUND.

BILL OF STEEL

		15" PIPE						18" PIPE						
		BENDING DIMENSIONS				NO. REQ'D.	LENGTH	BENDING DIMENSIONS				NO. REQ'D.	LENGTH	
		a	b	c	d			a	b	c	d			
A400	TOEWALL	4	2'-6"	---	---	---	4	2'-9"	---	---	---	4	2'-9"	
A401	WINGWALLS	4	19'-1"	---	---	---	2	19'-1"	10'-0 1/2"	---	---	2	10'-0 1/2"	
A402	WINGWALLS	4	7'-1"	---	---	---	2	7'-1"	22'-0"	---	---	2	22'-0"	
A500	WINGWALLS	5	20'-9"	---	---	---	2	20'-9"	23'-8"	---	---	2	23'-8"	
A501	HEADWALL	5	1'-7 1/4"	---	---	---	2	1'-7 1/4"	1'-8 5/8"	---	---	2	1'-8 5/8"	
A502	HEADWALL	5	2'-6"	---	---	---	1	2'-6"	2'-9"	---	---	1	2'-9"	
H400	BOTTOM SLAB AND WINGWALL	4	2'-6"	*	---	---	1	97'-11"	2'-9"	*	---	1	102'-11"	
		*DIMENSION "b" VARIES FROM 1'-11 1/8" TO 0'-4 7/8" IN INCREMENTS OF 0'-1" (20 BARS)						*DIMENSION "b" VARIES FROM 2'-2 7/8" TO 0'-4 7/8" IN INCREMENTS OF 0'-1" (23 BARS)						
H401	BOTTOM SLAB AND HEADWALL	4	2'-6"	2'-4 7/8"	---	---	1	7'-3 3/4"	2'-9"	2'-7 7/8"	---	---	1	8'-0 3/4"
S400	BOTTOM SLAB AND TOEWALL	4	21'-11"	0'-4 1/2"	0'-8"	1'-4"	4	24'-3 1/2"	24'-10"	0'-4 1/2"	0'-8"	1'-4"	4	27'-2 1/2"



REINFORCING STEEL LEGEND

DIMENSIONS AND QUANTITIES FOR ONE ENDWALL

PIPE CULV. DIA.	CONCRETE ENDWALL DIMENSIONS						STRUCTURAL STEEL GRATE DIMENSION AND QUANTITY		ESTIMATED QUANTITIES		
	H	L1	L2	L3	L4	W	WG	NO. REQ'D	CLASS "A" CONCRETE CU. YD.	STEEL BAR REINF. LB.	STRUCT. STEEL LB.
15"	2'-10 1/4"	23'-0"	21'-0 7/8"	2'-2"	3'-10 7/8"	2'-10"	2'-7"	4	2.32	224	354
18"	3'-1 1/4"	25'-11"	24'-0"	2'-2"	2'-10"	3'-1"	2'-10"	5	2.84	253	461

NOT TO SCALE

REV. 7-28-84: CHANGED MATERIAL SPECIFICATIONS FOR STRUCTURAL STEEL PIPES AND PAINT SPECIFICATIONS.

REV. 3-20-86: CHANGED FEDERAL PAINT SPECIFICATION.

REV. 7-29-92: REDREW, RENAMED AND REORGANIZED SHEET. CHANGED SHEET NUMBER FROM D-PE-12 TO D-SEW-12D. CHANGED ENDWALL FROM TYPE "U" TO TYPE "SD". UPDATED SPECIFICATIONS IN THE GENERAL NOTES. CORRECTED DIMENSIONS AND ESTIMATED QUANTITIES IN THE DIMENSION AND QUANTITY BLOCK. CORRECTED DIMENSIONS IN BILL OF STEEL.

REV. 10-26-95: IN GENERAL NOTE (2) CHANGED MINIMUM WALL THICKNESS FROM 0.25" TO 0.216".

REV. 1-19-97: CHANGED WEIGHT OF STRUCTURAL STEEL GRATES.

REV. 5-27-99: CHANGED PAINT SPECIFICATION TO TT-E-489J.

REV. 4-15-00: MODIFIED TOE WALL AND CLASS "A" CONCRETE QUANTITIES.

REV. 5-27-01: CHANGED DESCRIPTION FOR ITEM NO. 611-07.03.

REV. 6-1-09: ADDED GENERAL NOTE (6)

REV. 7-19-10: DELETED GENERAL NOTE (6)

REV. 3-1-12: REVISED REINFORCING STEEL, BILL OF STEEL, REINFORCING STEEL LEGEND, STEEL GRATE, ANCHOR BOLT DETAIL, ESTIMATED QUANTITIES FOR CLASS "A" CONCRETE, STEEL BAR REINF. & STRUCTURAL STEEL. REVISED GENERAL NOTES AND NOTE FOR ALTERNATE DRILLED IN ANCHORS.

REV. 4-20-12: REVISED DIMENSIONS L3 AND L4 FOR BOTH 15" AND 18" ENDWALL.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

CONCRETE ENDWALL TYPE "SD" WITH STEEL PIPE GRATE FOR 15" & 18" PIPES 12:1 SLOPE

D-SEW-12D

ALTERNATE ANCHORS FOR STRUCTURAL STEEL GRATES
 CERTIFICATION: DRILLED-IN EPOXY ANCHORS OR CAST-IN THREADED INSERTS MAY BE UTILIZED IN LIEU OF CAST-IN HEADED ANCHOR BOLTS PROVIDED THAT THE CONTRACTOR FURNISHES CERTIFIED ANCHOR PULL OUT DATA FROM AN INDEPENDENT TESTING LABORATORY USING CLASS "A" CONCRETE AS PRESCRIBED BY TENNESSEE HIGHWAY SPECIFICATIONS. THE REQUIRED ULTIMATE LOAD FOR 3/4" DIAMETER ANCHORS IS 10,000 POUNDS.