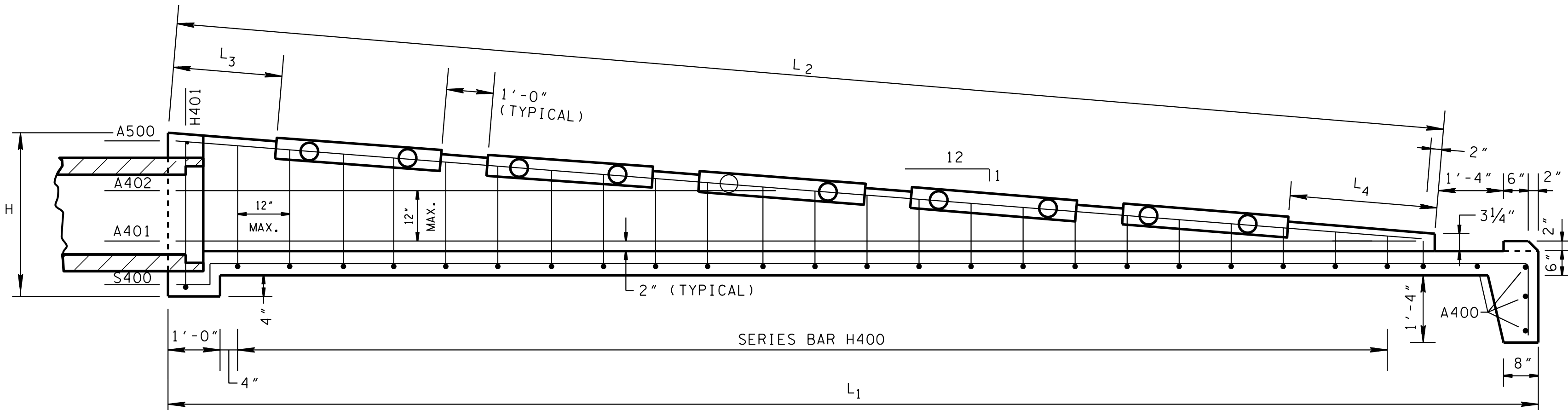
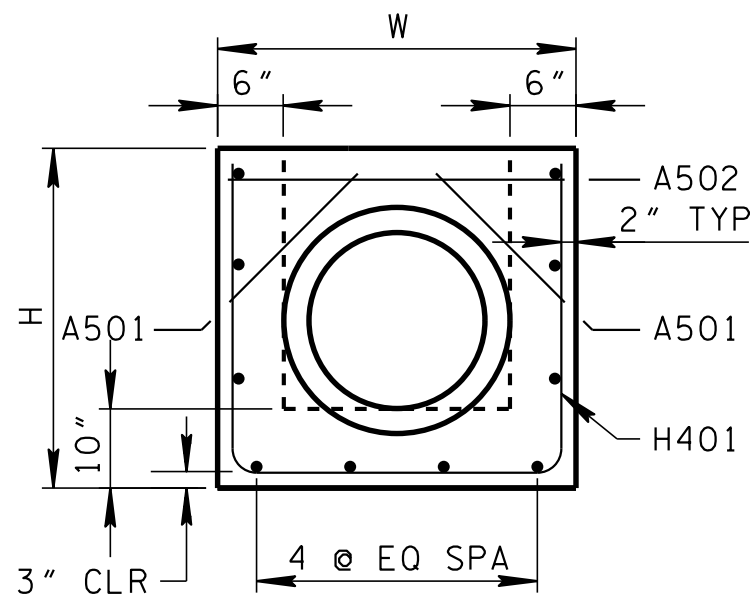


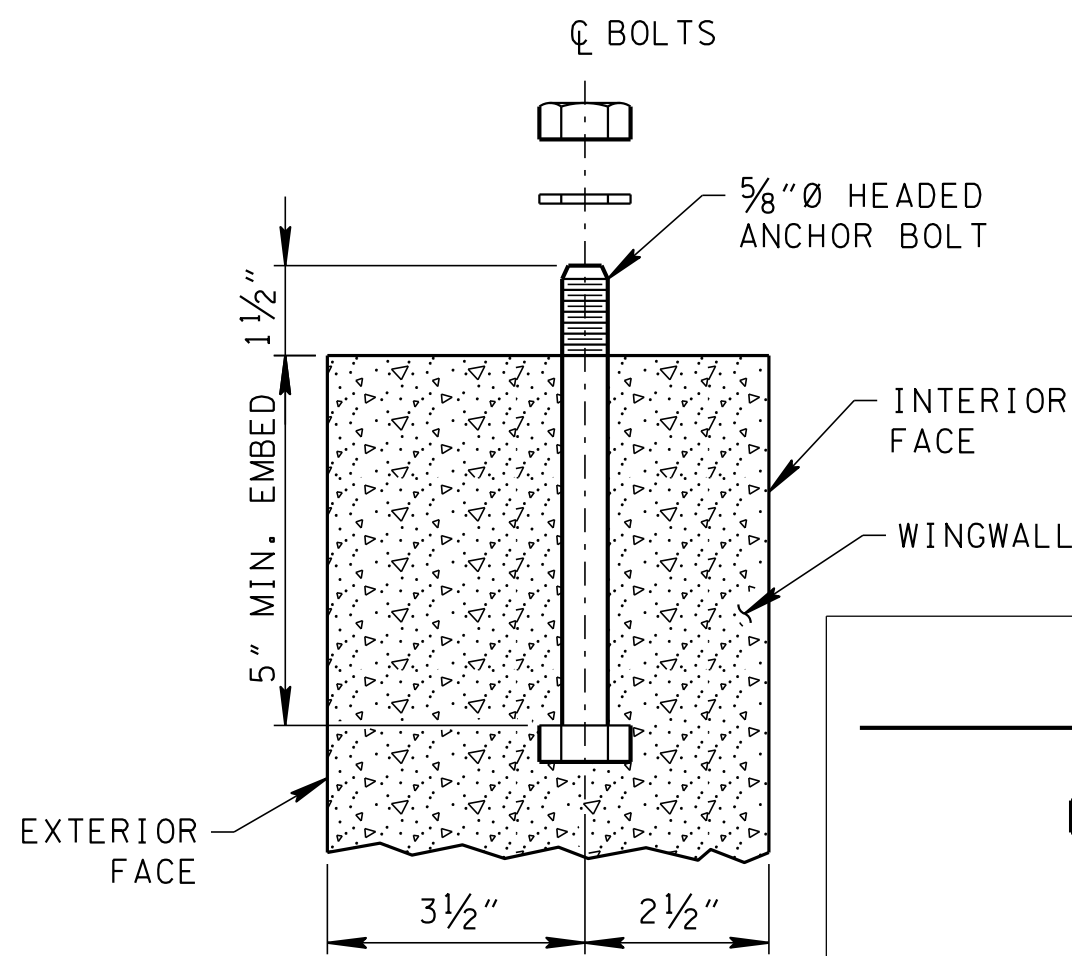
PLAN



SECTION A-A



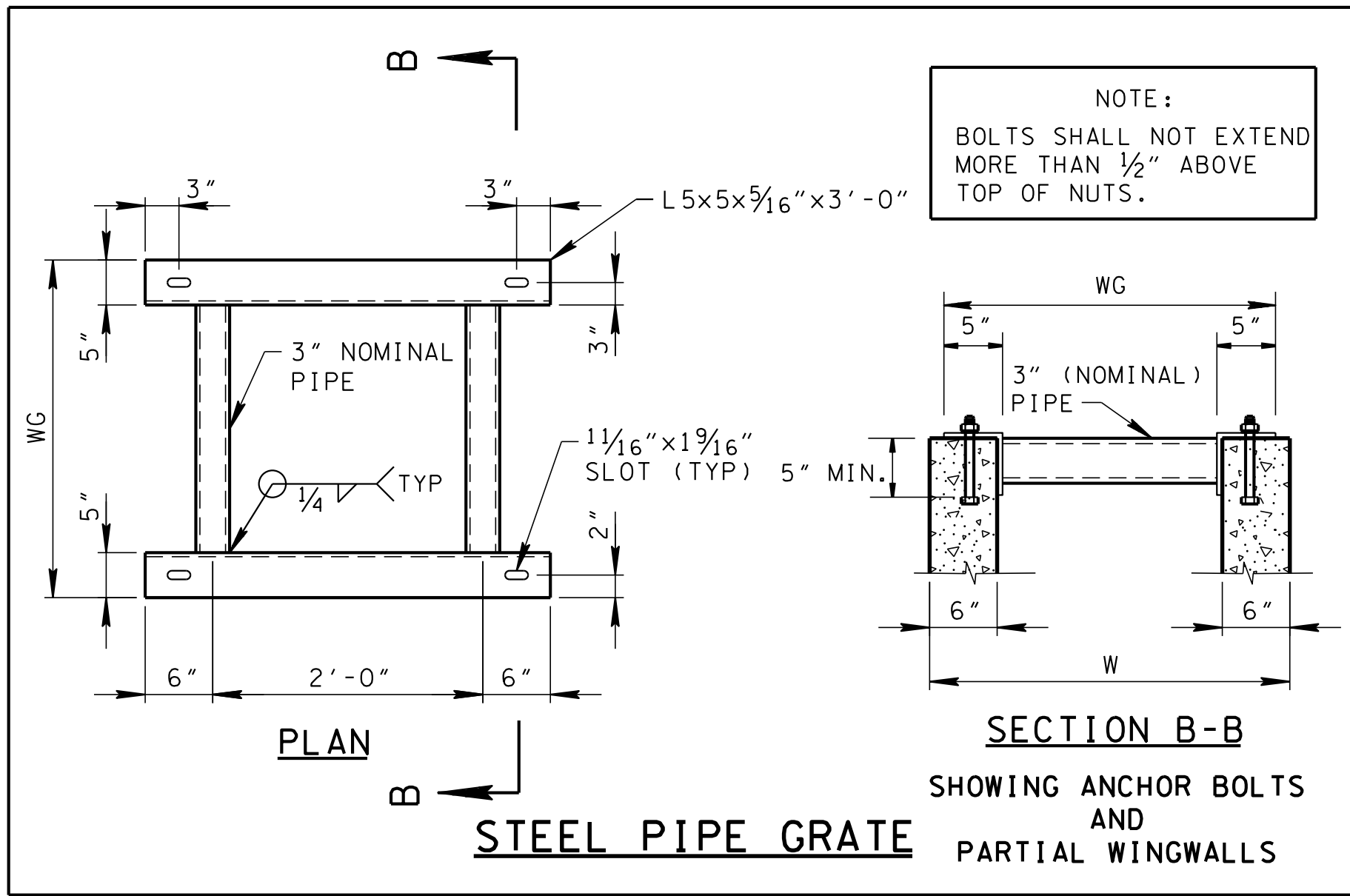
HEADWALL ELEVATION



ANCHOR BOLT ASSEMBLY

ALTERNATE ANCHORS FOR STRUCTURAL STEEL GRATES

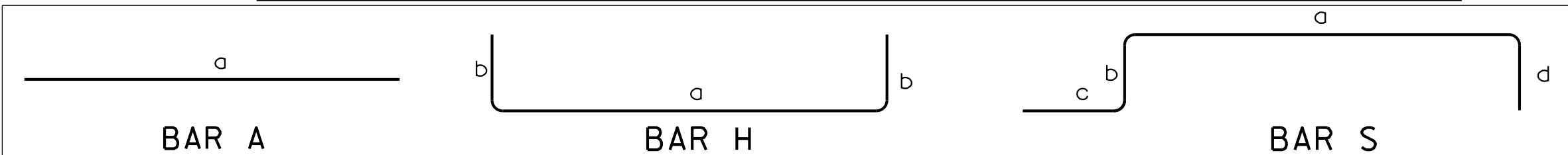
CERTIFICATION: DRILLED-IN EPOXY ANCHORS OR CAST-IN THREADED INSERTS MAY BE UTILIZED IN LIEU OF CAST-IN HEADED ANCHOR BOLTS PROVIDED THAT THE CONTRACTOR FURNISHES CERTIFIED ANCHOR PULL OUT DATA FROM AN INDEPENDENT TESTING LABORATORY USING CLASS "A" CONCRETE AS PRESCRIBED BY TENNESSEE HIGHWAY SPECIFICATIONS.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



SECTION B-B

SHOWING ANCHOR BOLTS AND PARTIAL WINGWALLS

STEEL PIPE GRATE



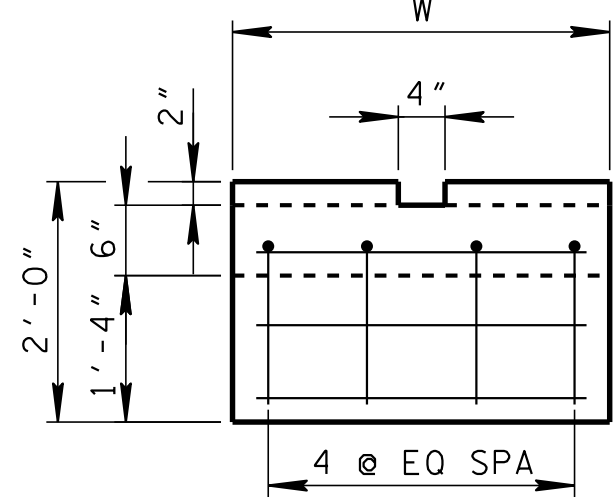
REINFORCING STEEL LEGEND

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.



TOEWALL ELEVATION

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:
 - ANGLES ASTM A36
 - STEEL PIPE ASTM A53, TYPE E, GRADE B, STANDARD WEIGHT (SW)
 - WELDING AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)
 - 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:
 - BOLTS, NUTS AND WASHERS ASTM F1554 GRADE 36
 - 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:

611-07.72 15IN ENDWALL (MEDIAN DRAIN)

611-07.73 18IN ENDWALL (MEDIAN DRAIN)
- THE CONTRACTOR MAY ELECT TO SUBSTITUTE AN APPROVED ALTERNATIVE DESIGN
- DIMENSIONAL AND REINFORCING TOLERANCES WILL BE AS SHOWN IN STANDARD OPERATING PROCEDURE (SOP) 5-3.

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'-6"	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"

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

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"	1'-10"	1'-10"	2'-10"	2'-7"	4	2.32	224	354
18"	3'-1 1/4"	25'-11"	24'-0"	0'-10"	0'-10"	3'-1"	2'-10"	5	2.84	253	461

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

CONCRETE ENDWALL
TYPE "SD" WITH
STEEL PIPE GRATE

FOR 15" & 18" PIPES
12:1 SLOPE

NOT TO SCALE

D-SEW-12D

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. 6-14-13: REVISED GENERAL NOTE ⑥. ADDED NOTES ⑦ AND ⑧.