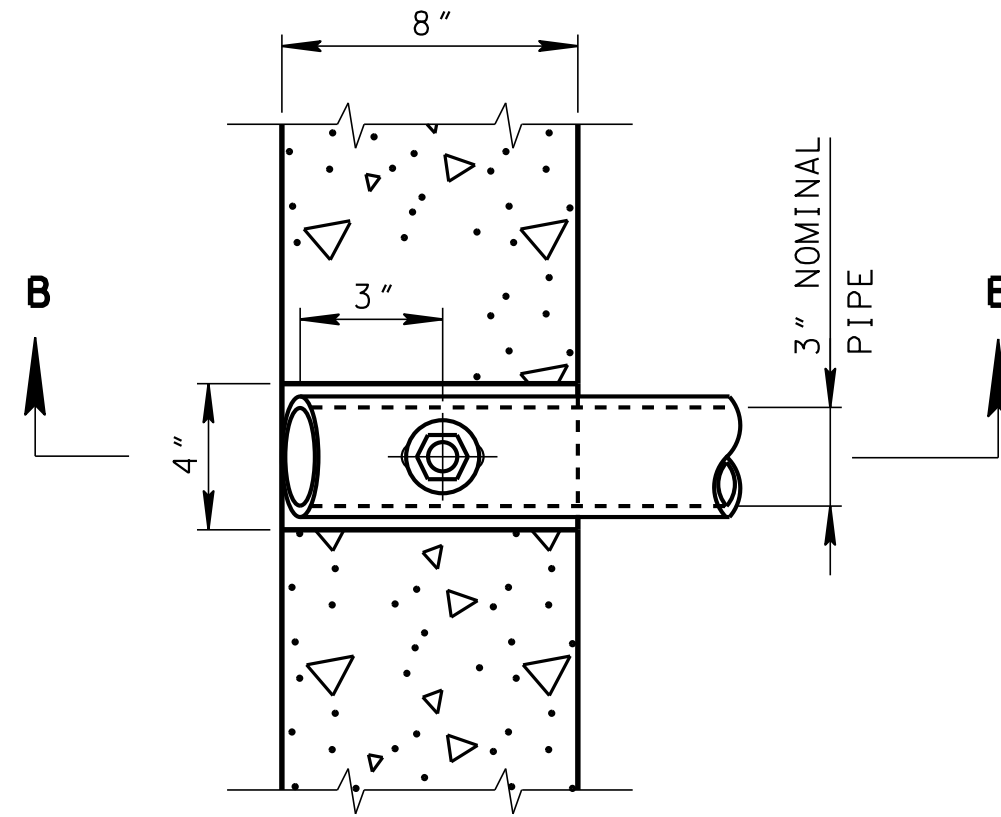
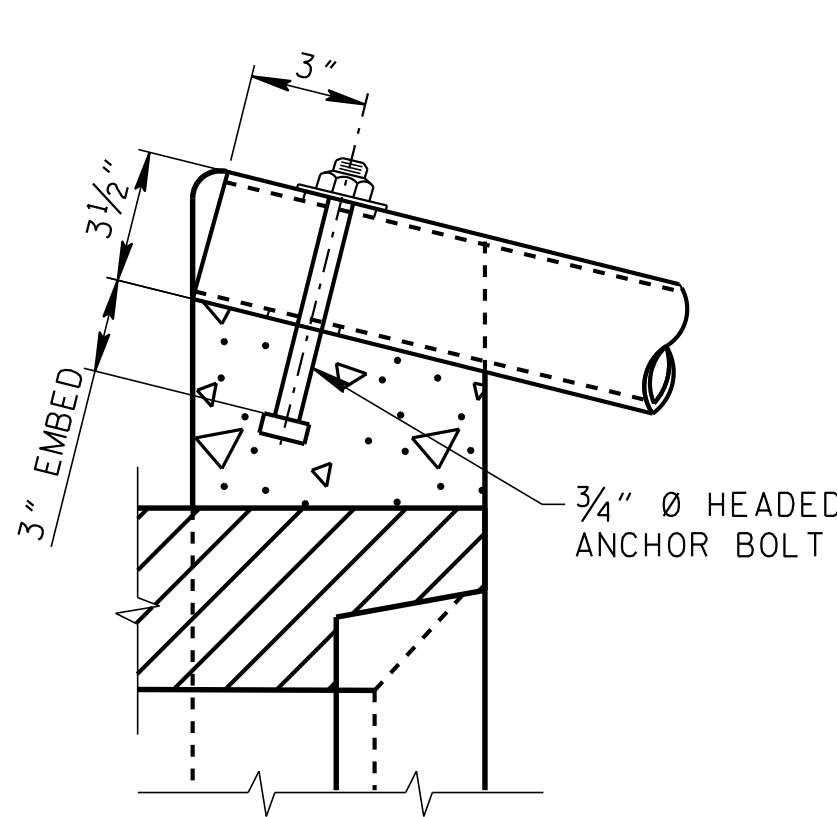


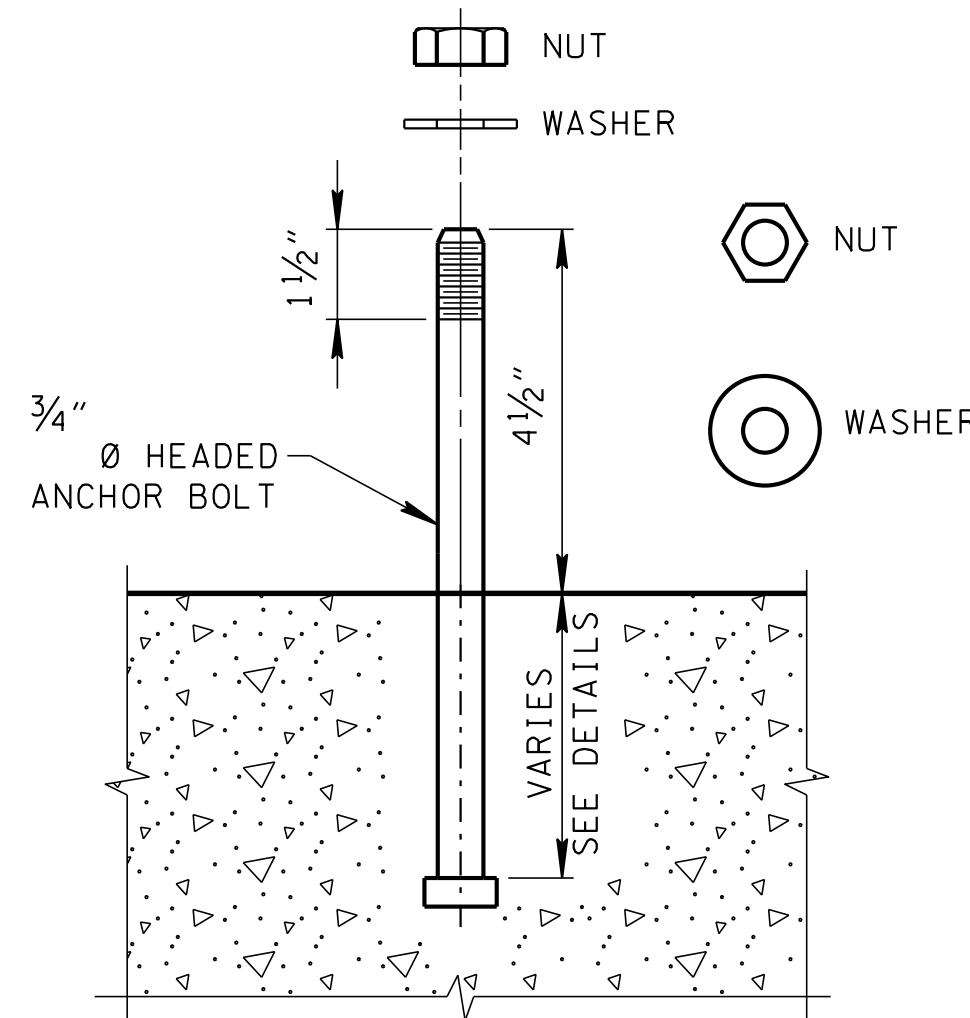
DETAIL PLAN AT WINGWALL



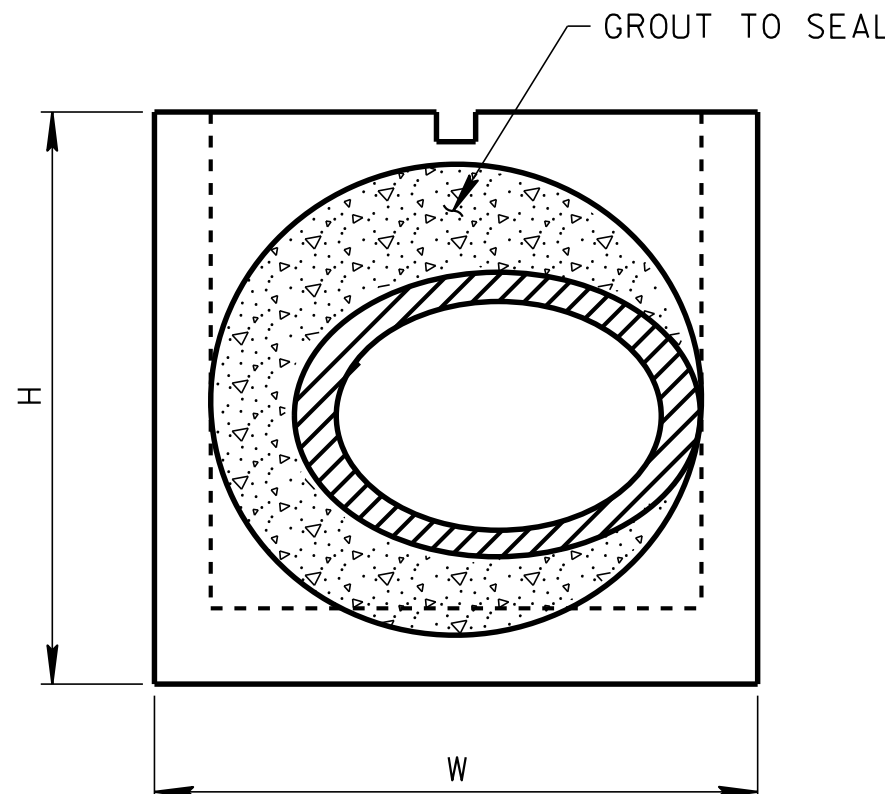
DETAIL PLAN AT HEADWALL



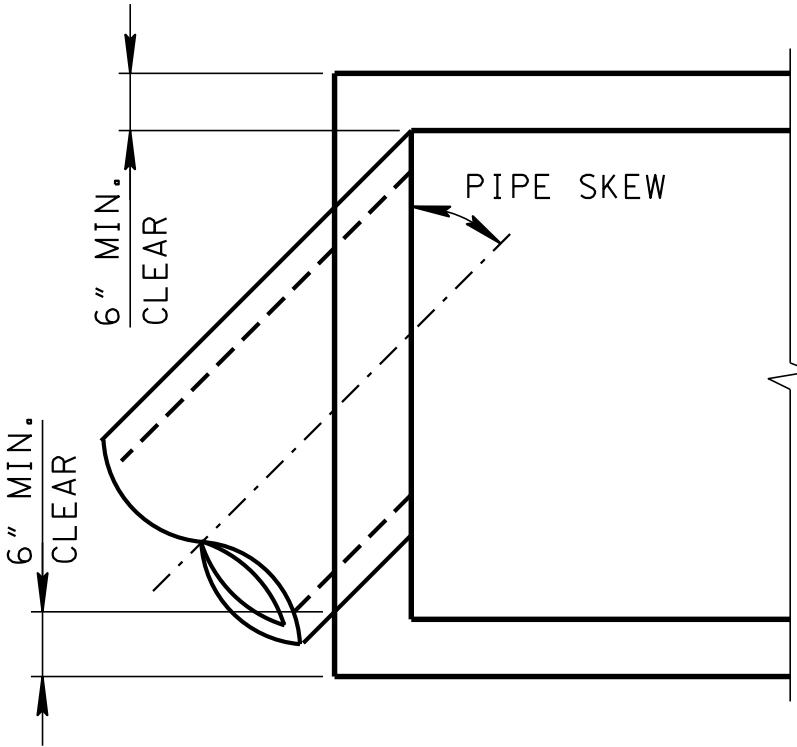
SECTION B-B THRU HEADWALL



ANCHOR BOLT ASSEMBLY



HEADWALL ELEVATION



PLAN

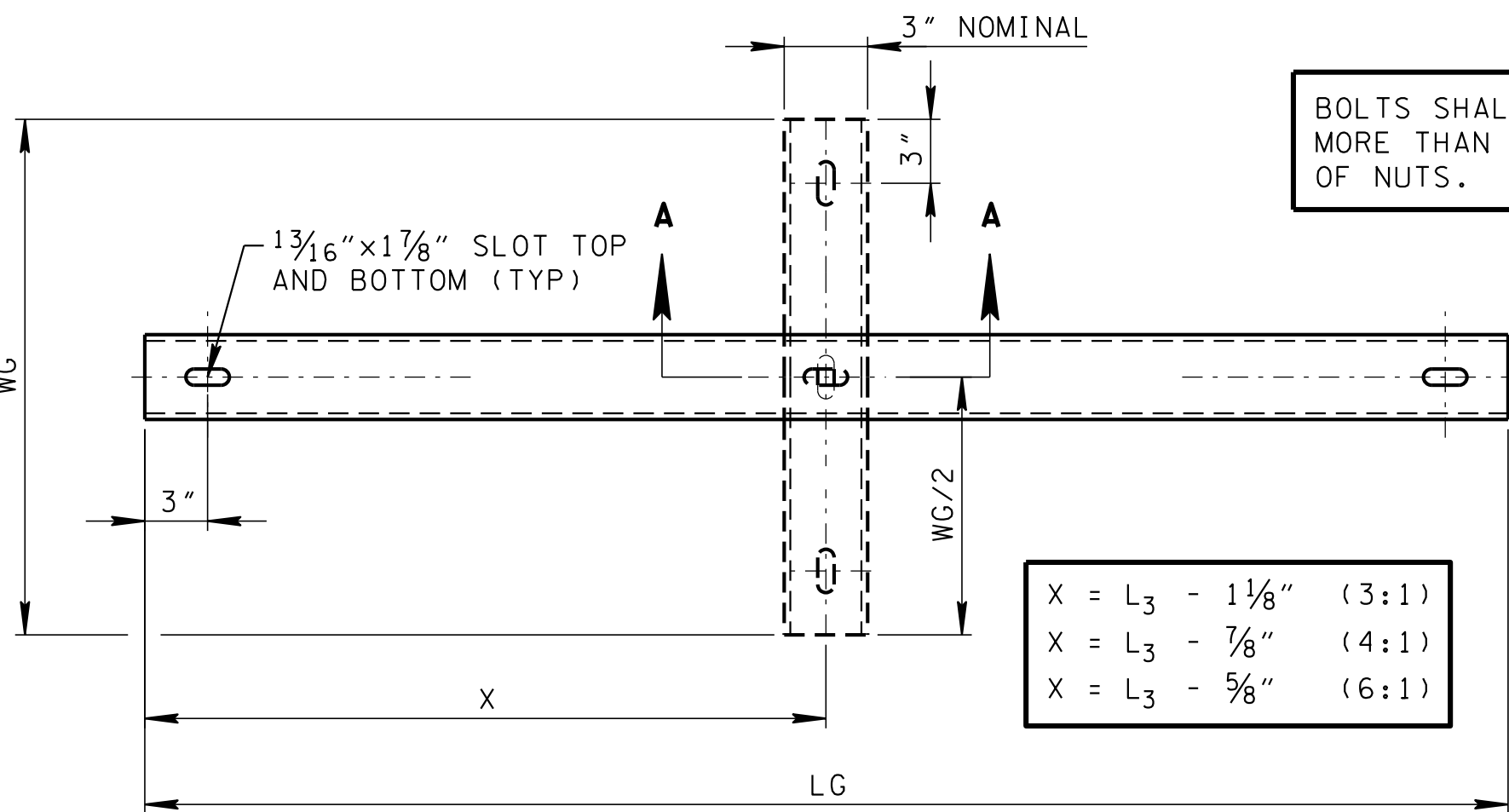
OVERSIZED TYPE "U" CONCRETE
END WALL TO BE USED TO
ACCOMMODATE THE SKEWED PIPE
(ASSUMES CONCRETE PIPE)

PIPE CULV. DIA.	PIPE SKEW		
	75°	60°	45°
18"	24"	24"	30"
24"	30"	36"	42"
30"	36"	42"	48"
36"	42"	48"	*
42"	48"	*	*
48"	*	*	*

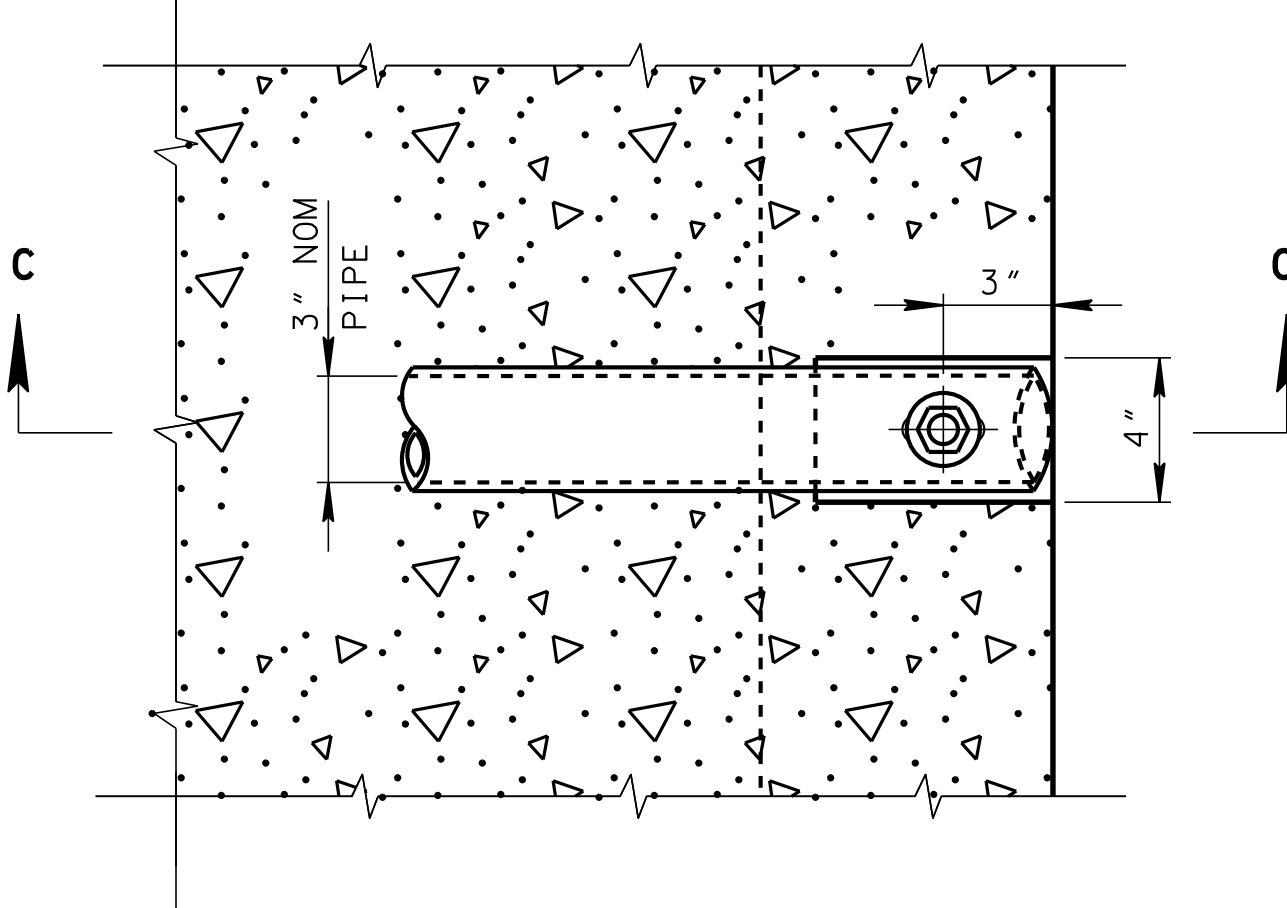
• EXCEEDS 48" TYPE "U"
ENDWALL OPENING

SKEWED CONNECTION DETAIL

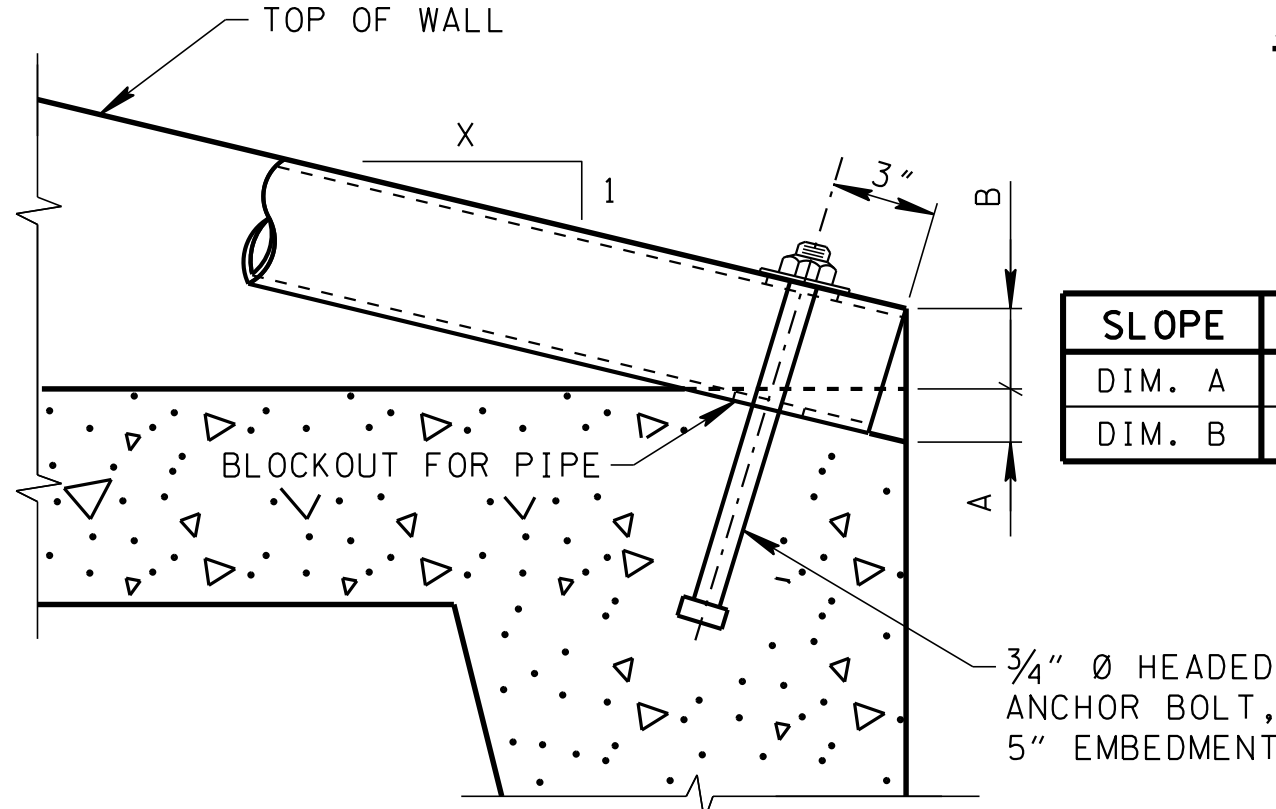
NOTE: TABLE VALUES PROVIDED ARE APPROXIMATE
ENGINEER SHALL VERIFY MINIMUM CLEARANCES



SECTION D-D THRU WINGWALL

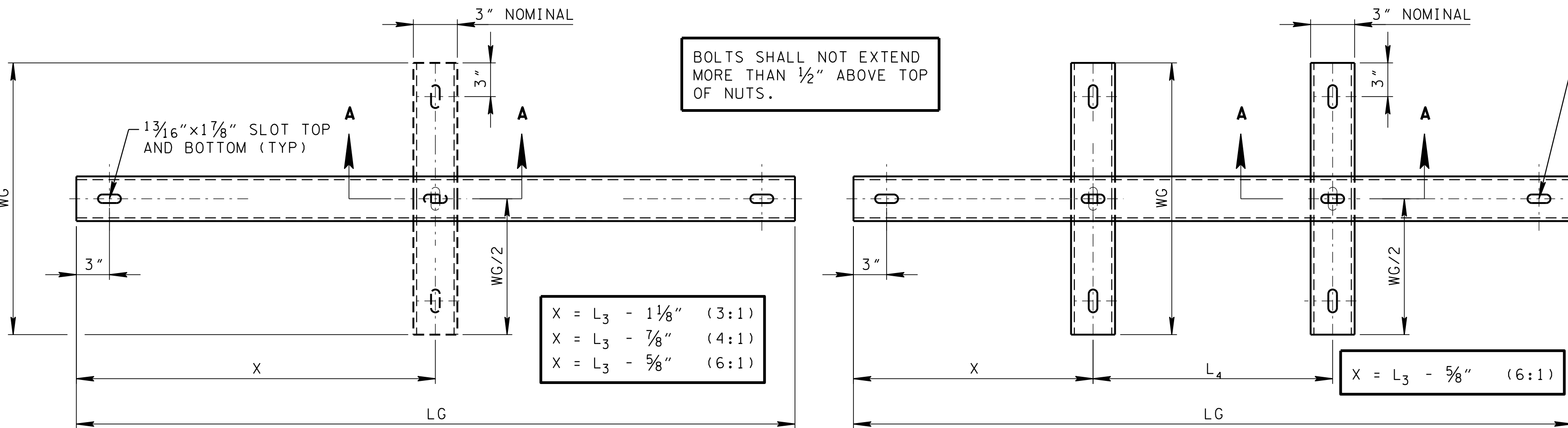


DETAIL PLAN AT TOEWALL



SECTION C-C THRU TOEWALL

SLOPE	3:1	4:1	6:1
DIM. A	2 3/8"	1 5/8"	7/8"
DIM. B	1 3/8"	2"	2 3/8"



STEEL PIPE GRATE PLANS

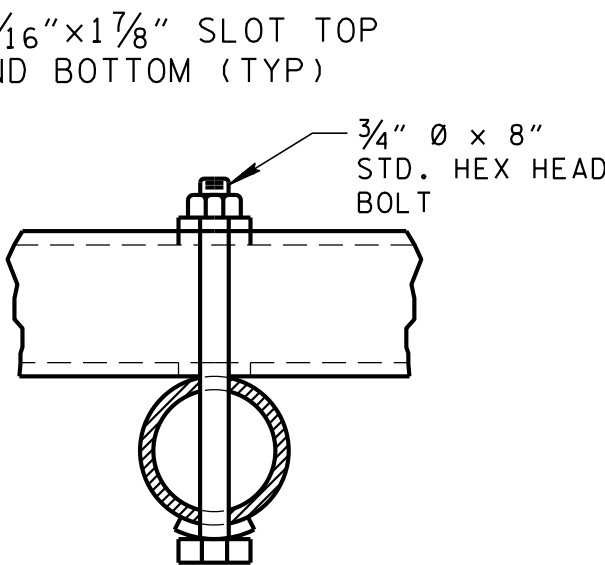
FOR L₃ AND L₄ DIMENSIONS SEE STD. DWGS.
D-PE-30A THROUGH D-PE-48A

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.

PIPE CULV. DIA.	ALL SLOPES	3:1	4:1	6:1
	WG	LG	LG	LG
30"	4'-1"	10'-10 5/8"	14'-0 1/8"	20'-4 3/4"
36"	4'-8"	12'-8 3/4"	16'-5"	23'-11 3/8"
42"	5'-3"	14'-3 3/4"	18'-5 3/4"	26'-11 7/8"
48"	5'-10"	16'-1 1/8"	20'-10 5/8"	30'-6 3/8"

SECTION A-A



GENERAL NOTES

- THE MATERIAL AND PAINTING FOR STRUCTURAL STEEL GRATE SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
A STEEL PIPE ASTM A53, TYPE E, GRADE B, SCHEDULE 40.
B 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 THE PIPE ENDWALL.
- PIPE GRATE TO BE INCLUDED IN THE PRICE OF THE ENDWALL.

MINOR REVISION -- FHWA
APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PIPE GRATE & SKEWED
CONNECTION DETAILS
FOR "U" ENDWALLS

(FOR 3:1, 4:1 & 6:1 SLOPES)