

WEST END  
OF BOX

**ELEVATION**  
LOOKING NORTH

EAST END  
OF BOX

NO.		DATE		REVISION		BY	
				<b>BUREAU OF</b> <b>STRUCTURES</b>			
ACCEPTED <i>William C. Dieker</i> <sup>SEB</sup>				6/23/17			
CHIEF STRUCTURES DESIGN ENGINEER				DATE			
<b>STRUCTURE C-67-88</b>							
WAUKESHA BYPASS OVER GLACIAL DRUMLIN TRAIL							
COUNTY		WAUKESHA		CITY		WAUKESHA	
DESIGN SPEC. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS							
DESIGNED BY		SAD		DESIGNED C'D.		NAR	
DRAWN BY		SAD		PLANS C'D.		NAR	
<b>GENERAL PLAN &amp; ELEVATION 1</b>				SHEET 1 OF 8			
				(Empty space for notes or additional information)			



(12) INDICATES WING NUMBER

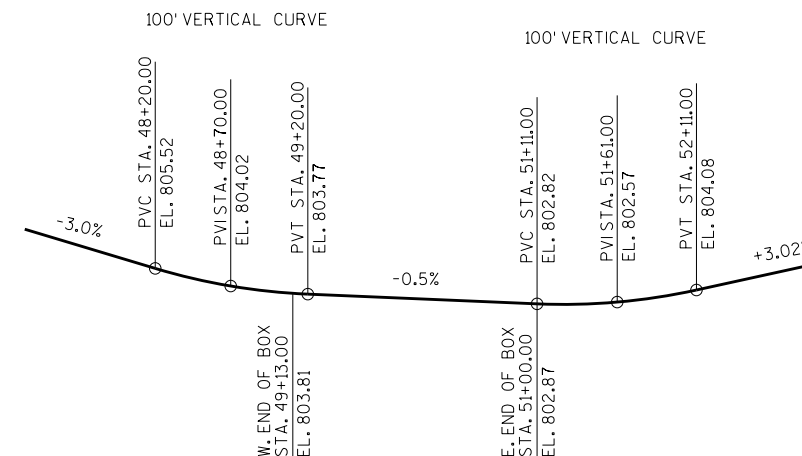
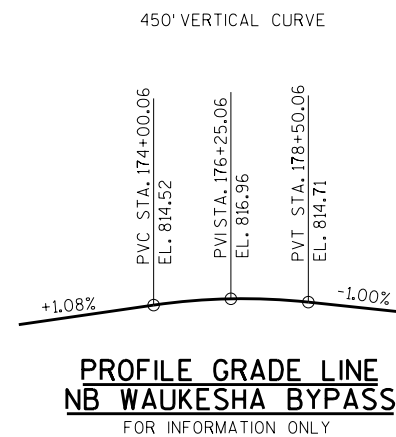
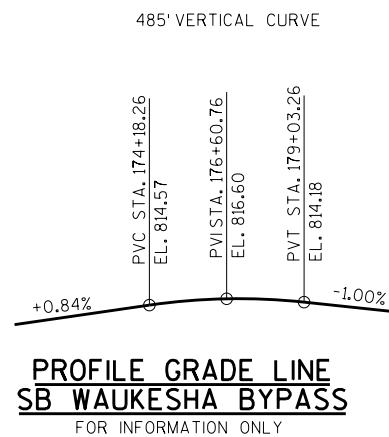
■ ADJUST FENCING BEHIND WING WALLS TO MAINTAIN 4" CLEAR BETWEEN OVERHANG POST ON HEADER AND FIRST POST OF FENCING BEHIND WING WALL.

\* MEASURED ALONG FRONT FACE OF WING WALL @ FINISHED GRADE

▲ SEE "CHAIN LINK FENCE DETAILS" SHEET FOR DETAILS.

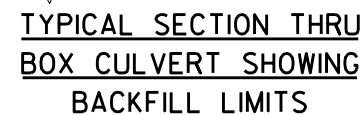
● SEE "WING WALL DETAILS" SHEET FOR DETAILS.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DESIGN SECTION			
STRUCTURE C-67-88			
DRAWN BY		SAD	PLANS CK'D. <b>NAR</b>
GENERAL PLAN & ELEVATION 2		SHEET 2	



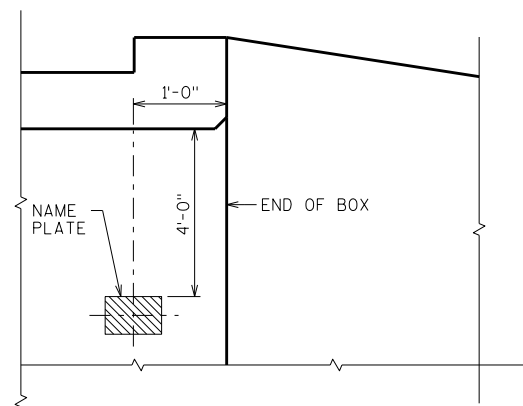
(A15) PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE.  
RODENT SHIELD REQUIRED.

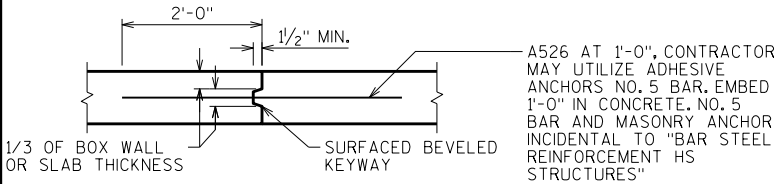
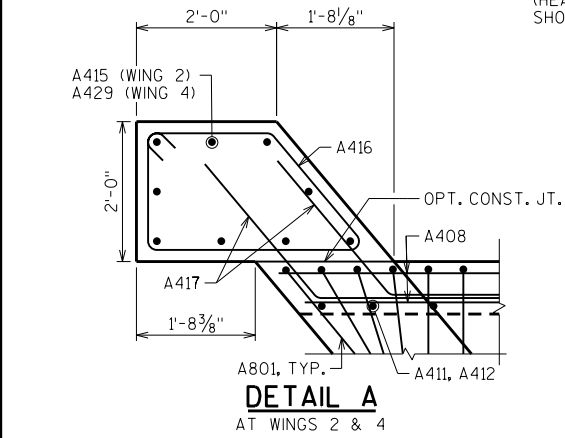
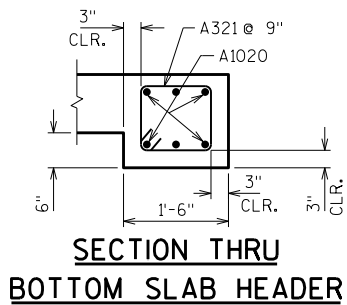
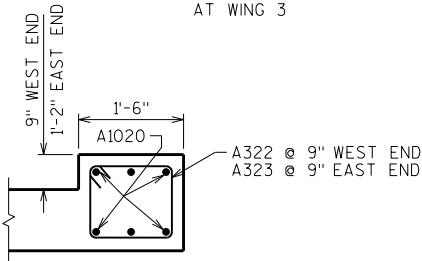
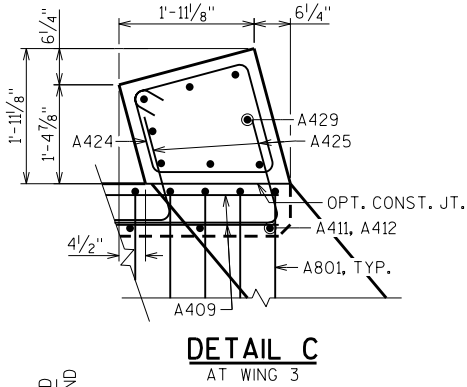
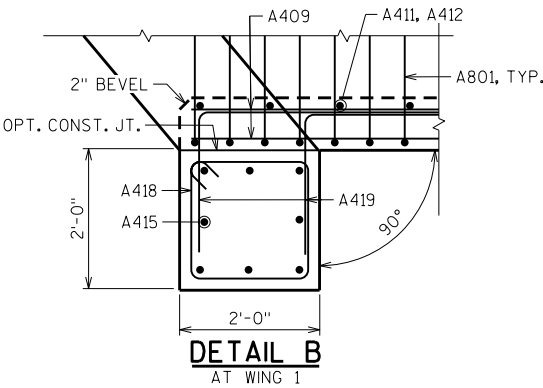
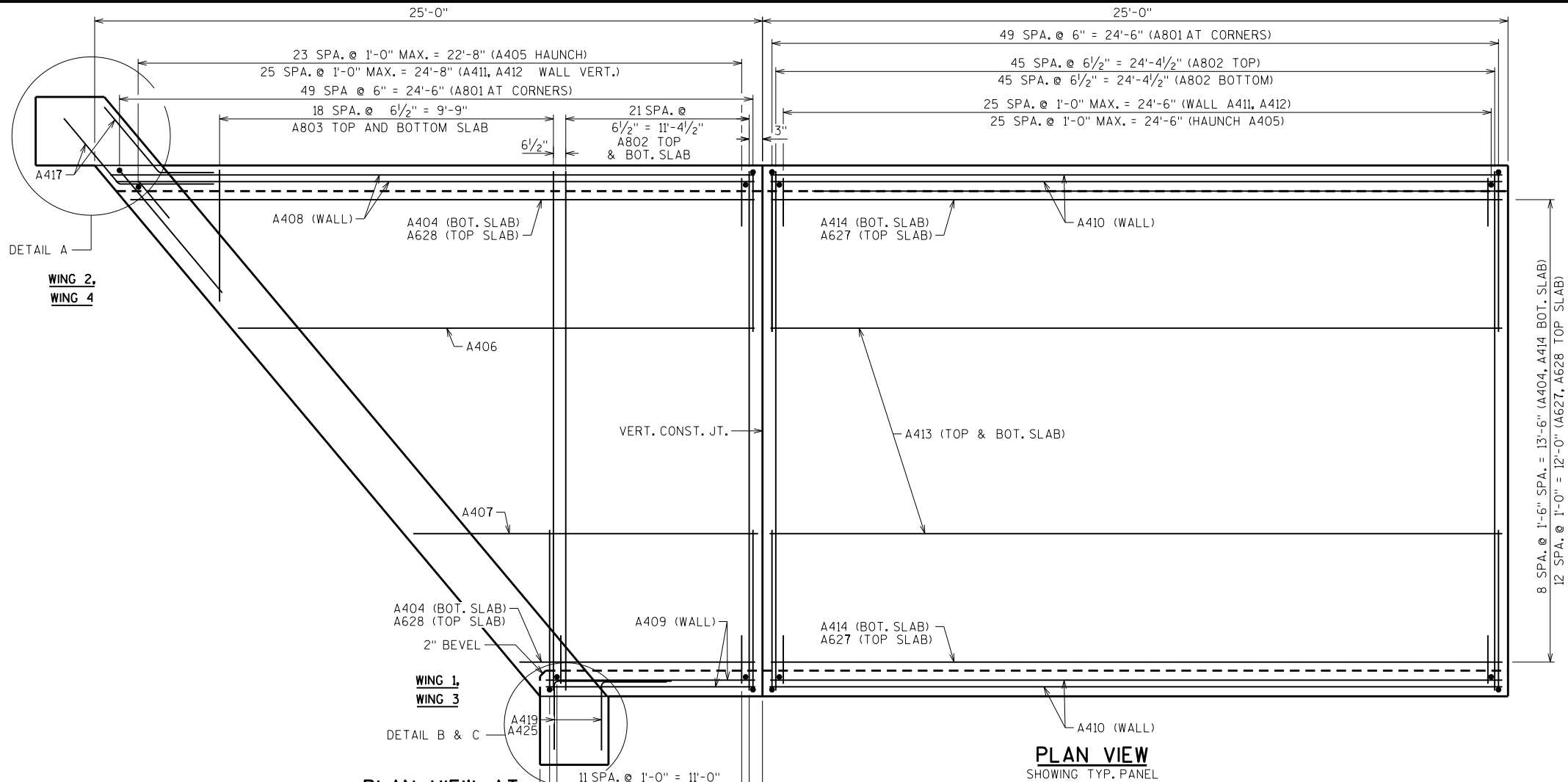
NO.	DATE	REVISION			BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION <b>STRUCTURES DESIGN SECTION</b>					
<b>STRUCTURE C-67-88</b>					
		DRAWN BY	SAD	PLANS C/K'D.	<b>NAR</b>
<b>QUANTITIES &amp; GENERAL NOTES</b>			SHEET 3		

BID ITEMS

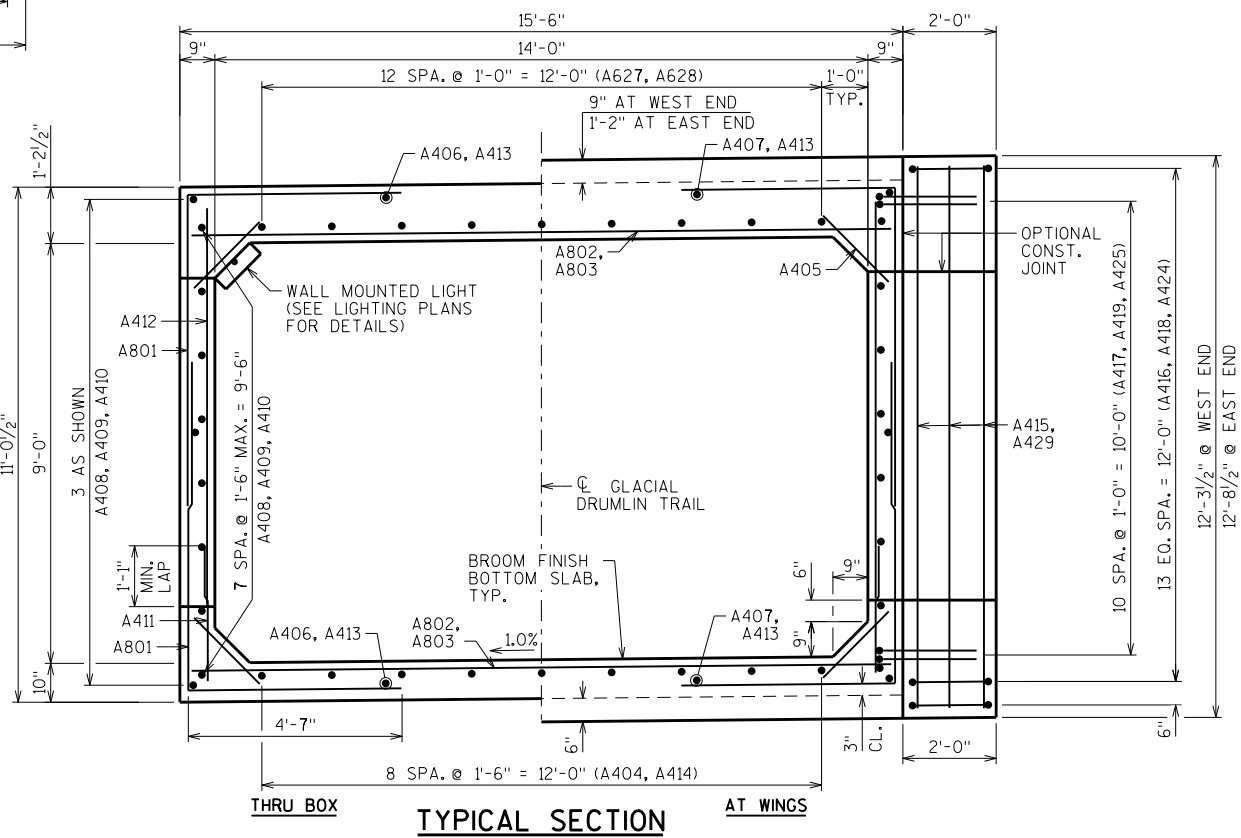
206.2000	EXCAVATION FOR STRUCTURES CULVERTS C-67-88	1	LS
210.2500	BACKFILL STRUCTURE TYPE B	920	TON
311.0115	BREAKER RUN	154	CY
501.1000.S	ICE HOT WEATHER CONCRETING	2475	LB
504.0100	CONCRETE MASONRY CULVERTS	332	CY
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	86,470	LB
511.1200	TEMPORARY SHORING C-67-88	425	SF
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	22	SY
516.0610.S	SHEET MEMBRANE WATERPROOFING FOR TOP SLAB C-67-88	426	SY
612.0206	PIPE UNDERDRAIN UNPERFORATED 6-INCH	40	LF
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	690	LF
645.0105	GEOTEXTILE TYPE C	500	SY
SPV.0090.03	FENCE CHAIN LINK POLYMER-COATED 6-FT.	365	LF
SPV.0165.01	WALL MODULAR BLOCK MECHANICALLY STABILIZED EARTH LRFD/QMP	2370	SF

NAME PLATE LOCATION  
WING 1

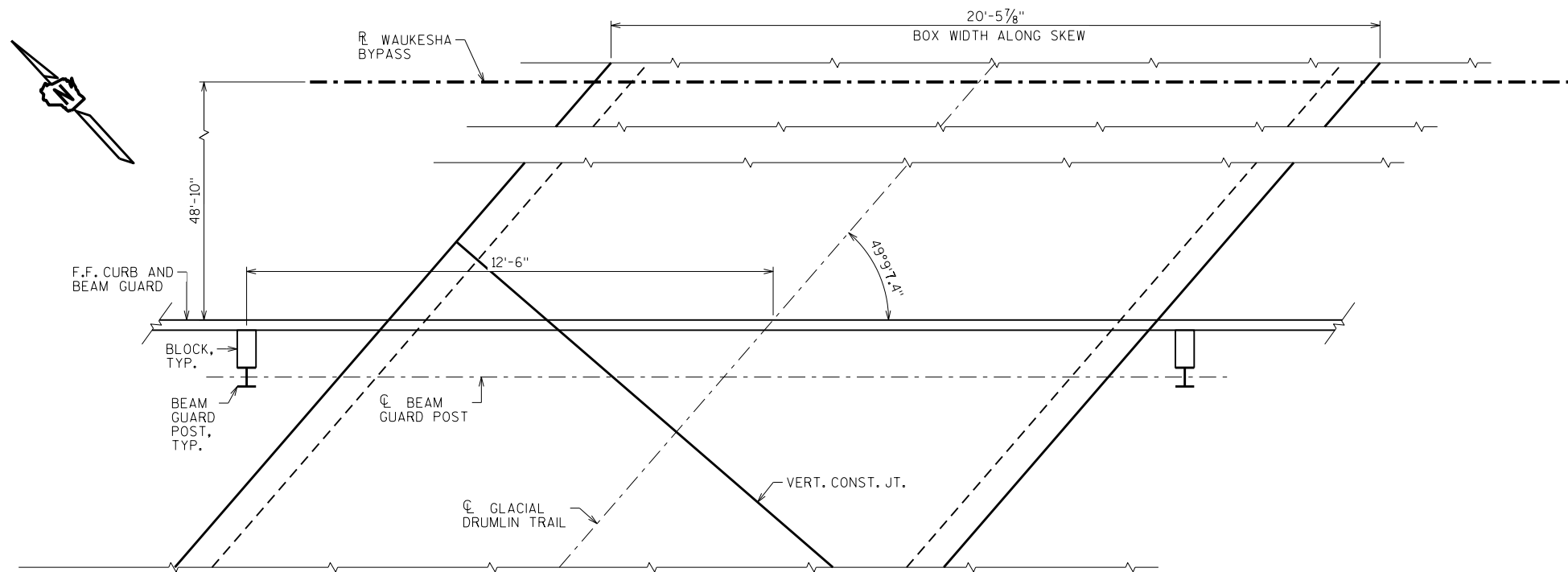




2" DEEP SAW CUT WITHIN 12 HOURS AFTER POURING MAY BE USED IN LIEU OF CONST. JT. IN BOTTOM SLAB.



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BOX DETAILS 1		SHEET 4		



BEAM GUARD LAYOUT  
SEE ROADWAY PLANS FOR DETAILS

NOTE: THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES THE BAR SIZE

STATE PROJECT NUMBER

2788-00-71

BILL OF BARS

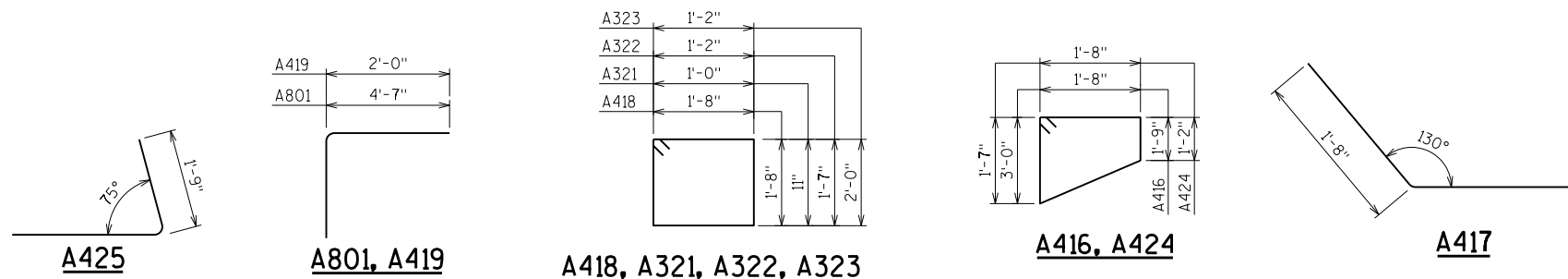
BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
A801	X	1496	12'-5"	X		CORNERS
A802	X	640	15'-2"			TRANS. - TOP & BOTTOM
A803	X	76	9'-0"		▲	TRANS. - TOP & BOTTOM - END
A404	X	18	18'-2"		▲	LONGIT. - BOTTOM - END
A405	X	768	2'-0"			HAUNCH
A406	X	4	21'-0"			LONGIT. - TOP & BOTTOM - END
A407	X	4	15'-0"			LONGIT. - TOP & BOTTOM - END
A408	X	22	24'-8"			LONGIT. - WALLS - END
A409	X	22	11'-8"			LONGIT. - WALLS - END
A410	X	110	24'-8"			LONGIT. - WALLS
A411	X	388	2'-11"			VERT. - WALL DOWEL
A412	X	388	8'-9"			VERT. - WALLS
A413	X	24	24'-8"			LONGIT. - TOP & BOTTOM
A414	X	54	24'-8"			LONGIT. - BOTTOM
A415	X	17	11'-10"			VERT. - WING COLUMNS 1 & 2
A416	X	28	9'-3"	X		STIRRUP - WING 2 & 4 COLUMN
A417	X	22	5'-5"	X		HORIZ. - WING 2 & 4 COLUMN
A418	X	15	7'-2"	X		STIRRUP - WING 1 COLUMN
A419	X	11	4'-11"	X		HORIZ. - WING 1 COLUMN
A1020	X	12	19'-9"			HORIZ. - SLAB HEADER TOP & BOTTOM
A321	X	52	4'-3"	X		STIRRUP - BOTTOM SLAB HEADER
A322	X	26	5'-11"	X		STIRRUP - TOP SLAB HEADER WEST END
A323	X	26	6'-9"	X		STIRRUP - TOP SLAB HEADER EAST END
A424	X	16	6'-8"			STIRRUP - WING 3 COLUMN
A425	X	11	4'-8"	X		HORIZ. - WING 3 COLUMN
A526	X	336	2'-0"	X		VERT. - CONST. JT.
A627	X	78	24'-8"	X		LONGIT. - TOP
A628	X	26	18'-2"	X	▲	LONGIT. - TOP
A429	X	17	12'-3"	X		VERT. - WING COLUMNS 3 & 4

▲ LENGTH SHOWN FOR BAR IS AN AVERAGE LENGTH AND SHOULD ONLY BE USED FOR BAR WEIGHT CALCULATIONS. SEE BAR SERIES TABLE FOR ACTUAL LENGTHS.

BAR SERIES TABLE

BAR MARK	NO. REQ'D.	LENGTH
A803	4 SERIES OF 19	3'-2" TO 14'-10"
A404	2 SERIES OF 9	13'-1" TO 23'-2"
A628	2 SERIES OF 13	13'-1" TO 23'-2"

BUNDLE AND TAG EACH SERIES SEPARATELY.



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DRAWN BY		SAD	PLANS CK'D. NAR
BOX DETAILS 2		SHEET 5	

SCALE = 1/8" = 1'-0"

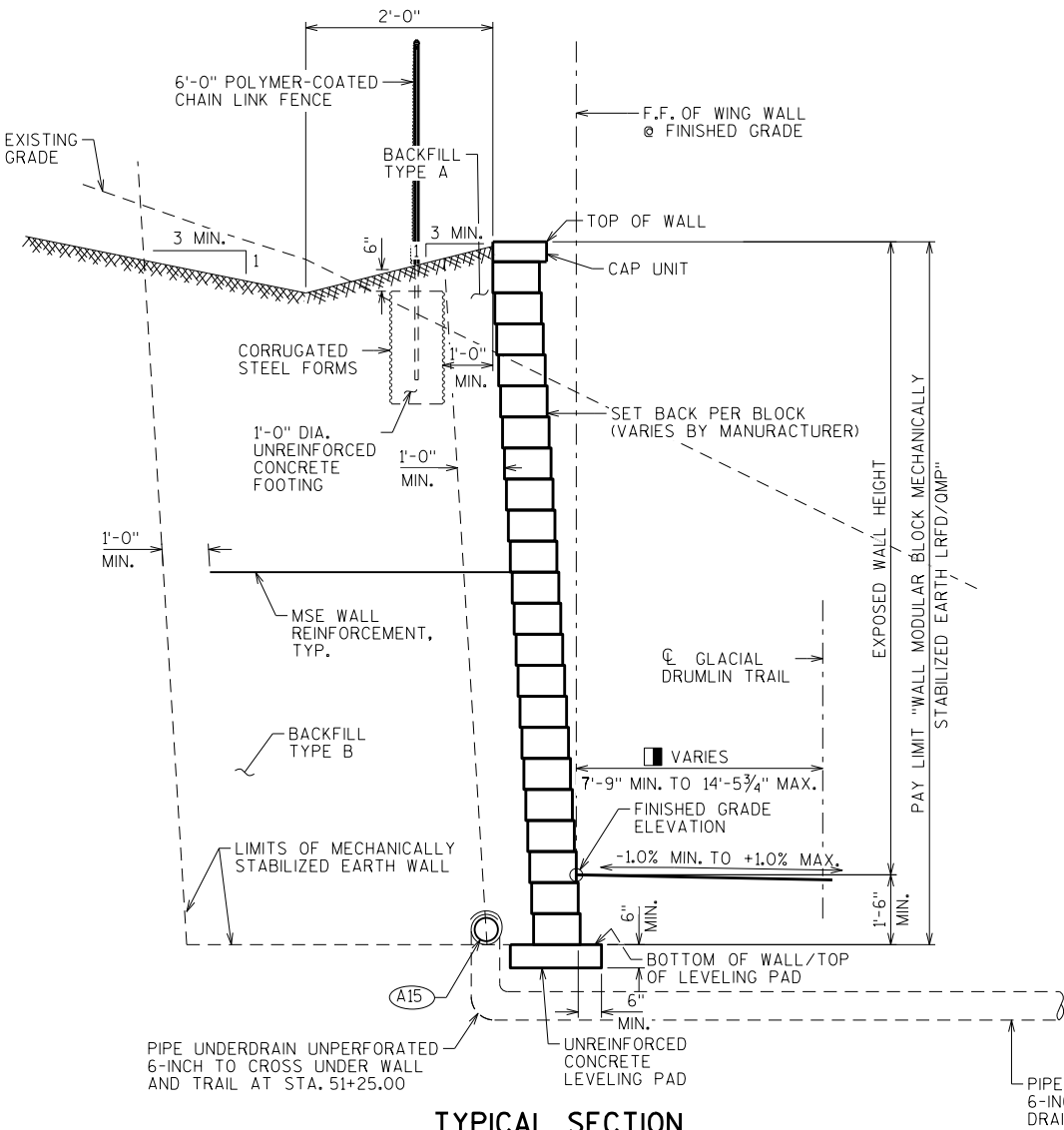
GEOMETRY TABLE

WING NUMBER	GDT STATION	OFFSET TO F.F. WALL	TOP OF WALL ELEV.	FINISHED GRADE ELEV.	EXISTING GRADE ELEV.
1	48+49.89	14.48 RT	806.12	804.87	809.42
1	48+75.00	7.75 RT	809.32	804.33	810.53
1	49+19.50	7.75 RT	814.81	803.85	812.00
2	48+34.89	9.93 LT	806.29	805.04	809.00
2	48+59.80	7.75 LT	809.32	804.44	810.00
2	49+04.78	7.75 LT	814.76	803.80	811.40
3	50+93.50	7.75 LT	814.21	802.83	808.78
3	51+15.23	13.57 LT	803.91	802.66	806.84
4	51+08.22	7.75 RT	814.29	802.91	808.51
4	52+24.74	7.68 RT	808.29	804.57	807.00
4	52+54.63	10.25 RT	806.75	805.50	806.86

GDT = GLACIAL DRUMLIN TRAIL

- MEASURED NORMAL TO CL GLACIAL DRUMLIN TRAIL
- A15

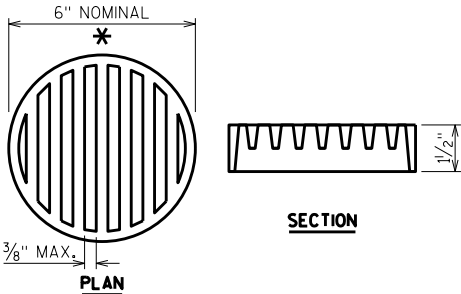
PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. RODENT SHIELD REQUIRED.



TYPICAL SECTION  
TYP. @ ALL WING WALLS

WALL EXTERNAL & OVERALL  
STABILITY EVALUATION

DIMENSIONS	
WALL HEIGHT (FEET) <sup>1</sup>	12.9
EXPOSED WALL HEIGHT (FEET)	11.4
MINIMUM LENGTH OF REINFORCEMENT (FEET)	9.0
LENGTH OF REINFORCEMENT TO HEIGHT RATIO	0.7
BORING LOCATION USED	B-2
APPROXIMATE GDT STATION	51+08
BACK SLOPE ABOVE WALL	3:1
CAPACITY TO DEMAND RATIO (CDR) <sup>2</sup>	
SLIDING (CDR > 1.0)	1.4
ECCENTRICITY (CDR > 1.0)	1.6
OVERALL STABILITY (CDR > 1.0)	1.2
BEARING RESISTANCE (CDR > 1.0)	1.3
FACTORED BEARING RESISTANCE (PSF)	4,000
NOTES: 1. THE WALL HEIGHT INCLUDES EMBEDMENT OF 1'-6". 2. CDR REQUIREMENTS AND LOAD AND RESISTANCE FACTORS ARE PRESENTED IN CHAPTER 14 OF THE BRIDGE MANUAL. 3. NA NOT APPLICABLE, GLOBAL SLOPE STABILITY WAS EVALUATED AT THE CRITICAL WALL LOCATION.	



RODENT SHIELD DETAIL

\* DIMENSIONS ARE APPROXIMATE. THE GRATE IS SIZED TO FIT INTO A PIPE COUPLING. ORIENT SO SLOTS ARE VERTICAL.

THE RODENT SHIELD, PIPE COUPLING AND SCREWS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH" AND "PIPE UNDERDRAIN UNPERFORATED 6-INCH".

THE RODENT SHIELD SHALL BE A PVC GRATE SIMILAR TO THIS DETAIL. THE GRATE IS COMMERCIALY AVAILABLE AS A FLOOR STRAINER. A PIPE COUPLING IS REQUIRED FOR THE ATTACHEMENT OF THIS SHIELD TO THE EXPOSED END OF THE PIPE UNDERDRAIN. THE SHIELD SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO. 10 X 1-INCH STAINLESS STEEL SHEET METAL SCREWS.

SOIL PARAMETERS

SOIL DESCRIPTION	FRICTION ANGLE (DEGREES)	COHESION (PSF)	UNIT WEIGHT (PCF)
GRANULAR BACKFILL BEHIND THE WALL IN THE REINFORCING ZONE	30	0	120
FILL, GRANULAR BEHIND THE THE REINFORCING ZONE	30	0	120
BOR-1 - STA. 48+92 ON CL GLACIAL DRUMLIN TRAIL			
BREAKER RUN EL. 800.8 TO EL. 799.8	30	0	120
SILT, BROWN, SOME FINE SAND, LITTLE FINE TO COARSE GRAVEL EL. 799.8 TO EL. 798.0	0	1,500	120
GRAVEL, FINE TO COARSE, AND SAND, FINE TO MEDIUM, BROWN, SOME SILT EL. 798.0 TO EL. 796.5	34	0	120
GRAVEL AND SAND, BROWN, FINE TO COARSE EL. 796.5 TO EL. 790.5	35	0	125
SILT, SOME FINE SAND, SOME FINE TO MEDIUM GRAVEL EL. 790.5 AND BELOW	0	4,500	135
BOR-2 - STA. 51+00 - 4' RT OF CL GLACIAL DRUMLIN TRAIL			
BREAKER EL. 799.9 TO EL. 798.4	30	0	120
SILT, BROWN, SOME FINE TO MEDIUM SAND AND GRAVEL EL. 798.4 TO EL. 796.4	30	0	120
CLAY, BROWN, SOME SILT, SOME COARSE GRAVEL, LITTLE SAND EL. 796.4 TO EL. 795.4	0	500	115
CLAY, BROWN, SOME SILT, LITTLE SAND EL. 795.4 TO EL. 792.4	0	1,500	120
SILT, BROWN, SOME SAND, LITTLE FINE TO MEDIUM GRAVEL EL. 792.4 AND BELOW	30	0	120

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WING WALL DETAILS		SHEET 6		

NOTES

POSTS ARE TO BE SET VERTICAL.

ALL FENCE COMPONENTS SHALL BE GALVANIZED STEEL WITH A COLORED POLYMER-COATING ON THE OUTSIDE.

FABRIC SHALL CONFORM TO ASTM F668, CLASS 2B. STEEL RAILS, POSTS AND POST SLEEVES SHALL CONFORM TO ASTM F1083, STANDARD WEIGHT PIPE (SCHEDULE 40). FITTINGS SHALL CONFORM TO ASTM F626. SEE THE "BRIDGE SPECIAL PROVISIONS" FOR ADDITIONAL DETAILS.

THE COLOR OF POLYMER-COATING FOR THIS STRUCTURE SHALL BE BLACK IN ACCORDANCE WITH ASTM F934.

THE BID ITEM SHALL BE "FENCE CHAIN LINK POLYMER-COATED 6 FT.", L.F.

COMPLETE ANY REQUIRED WELDING OF COMPONENTS BEFORE GALVANIZING.

POST BASE PLATES SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUT.

BASE PLATES, ANCHOR PLATES AND SHIMS SHALL BE ASTM A709, GRADE 36.

ALL POST SPACINGS ARE MEASURED HORIZONTALLY ALONG THE C/L OF THE POST.

CAULK AROUND PERIMETER OF BASE PLATE AND FILL PORTION OF SLOTTED HOLE AROUND ANCHOR BOLT IN SHIM WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

ALTERNATE TO DOUBLE CLAMP: USE LINE RAIL CLAMP (BOULEVARD) OR 180° BRACE BAND, WHICH MAY BE USED WHEN THE POSTS ARE EITHER BOLTED TO THE POST SLEEVES OR DIRECTLY WELDED TO THE BASE PLATE.

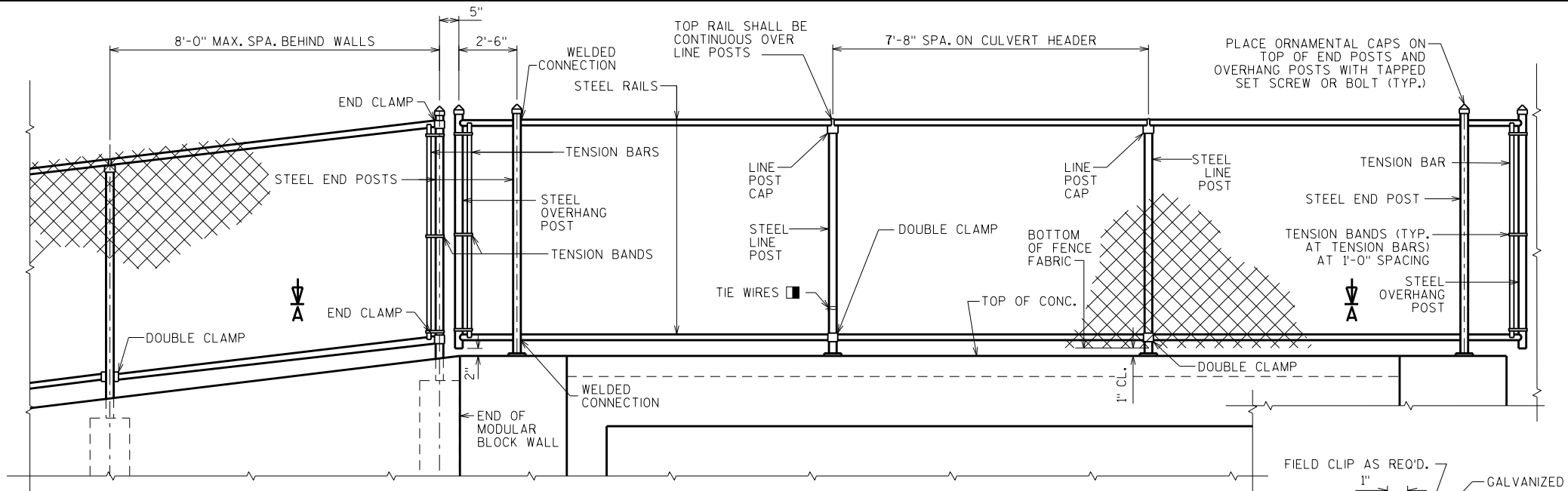
1/2" DIA. X 6 7/8" LONG GALVANIZED HEX BOLT WITH NUT & WASHER.

ALTERNATIVE ANCHORAGE: CONCRETE ADHESIVE ANCHORS 1/2", EMBED 7" IN CONCRTE. ADHESIVE ANCHORS SHALL CONFORM TO SECTION 502.2.12 OF THE STANDARD SPECIFICATIONS.

ATTACH FABRIC TO RAILS, AND TO POSTS WITHOUT TENSION BANDS, WITH TIE WIRES (ROUND, 9-GAGE) SPACED AT 1'-0".

BOLT RAIL TO RAIL END TO SECURE OVERHANG SECTION. ALTERNATE IS TO WELD RAIL DIRECTLY TO END POST.

MINIMUM LENGTH OF TOP RAIL BETWEEN SPLICES SHALL BE 20'-0". LOCATE SPLICES NEAR 1/4" POINT OF POST SPACING.

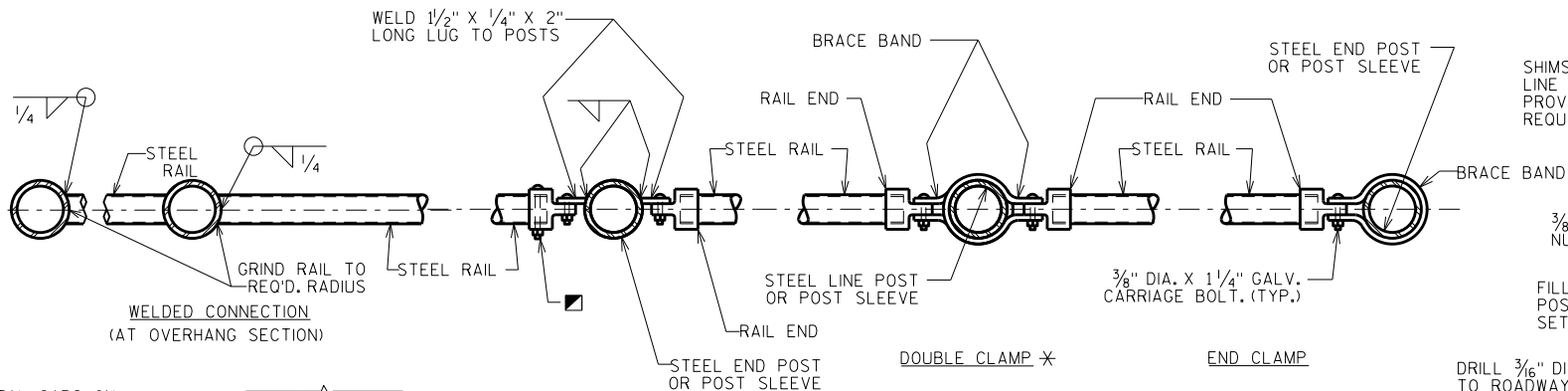


FENCE MEMBER SIZE & WEIGHT

STEEL FENCE MEMBER	OUTSIDE DIAMETER (INCHES)	WEIGHT (LB/FT)
RAILS	1.660	2.27
END POST	2.875	5.80
OVERHANG POST	2.875	5.80
LINE POST	2.375	3.65
POST SLEEVE	4.000	9.12

FENCE PART ELEVATION

VIEWING F.F. WING WALL AND END OF BOX



POST SHIM DETAILS

SHIMS REQUIRED ONLY WHEN END POSTS AND LINE POSTS ARE WELDED TO BASE PLATES. PROVIDE 4 SHIMS PER POST. USE WHERE REQUIRED FOR ALIGNMENT.

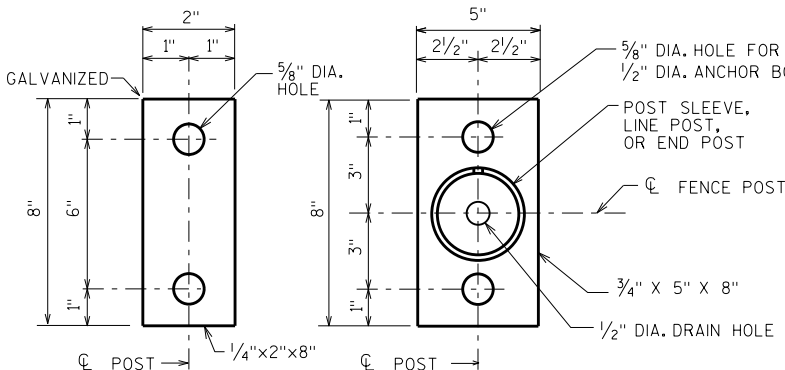
3/8" DIA. GALV. CARRIAGE BOLT WITH LOCKING NUT. (TO BE SUPPLIED WITH ASSEMBLY)

FILL SLEEVE AND BEVEL AWAY FROM POST WITH NON-SHRINK GROUT AFTER SETTING POST. (LEAVE NO VOIDS)

DRILL 3/16" DIA. DRAIN HOLE PARALLEL TO ROADWAY IMMEDIATELY ABOVE GROUT IN POST. SLEEVE LOCATIONS ONLY.

SECTION A-A

NOTE: PLACE ALL BOLT HEADS ON SIDE OF FENCE ADJACENT TO PEDESTRIANS

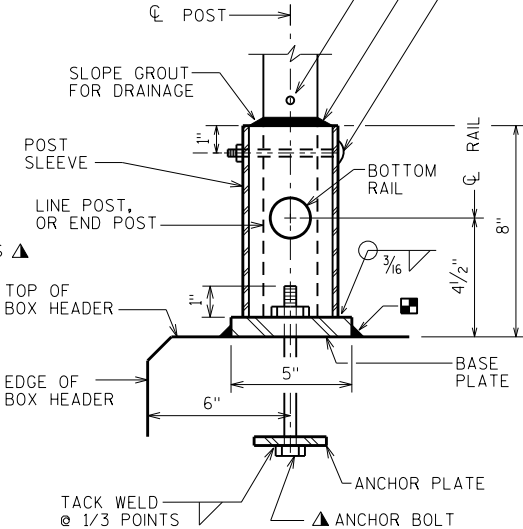


ANCHOR PLATE

8 REQ'D.

BASE PLATE

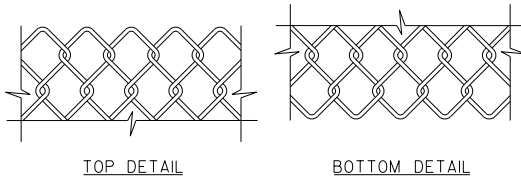
8 REQ'D.



DETAIL 'A'

UNIT SHALL BE GALVANIZED AFTER FABRICATION

NOTE: IN LIEU OF USING THE POST SLEEVE, THE FENCE POST MAY BE WELDED TO THE BASE PLATE.

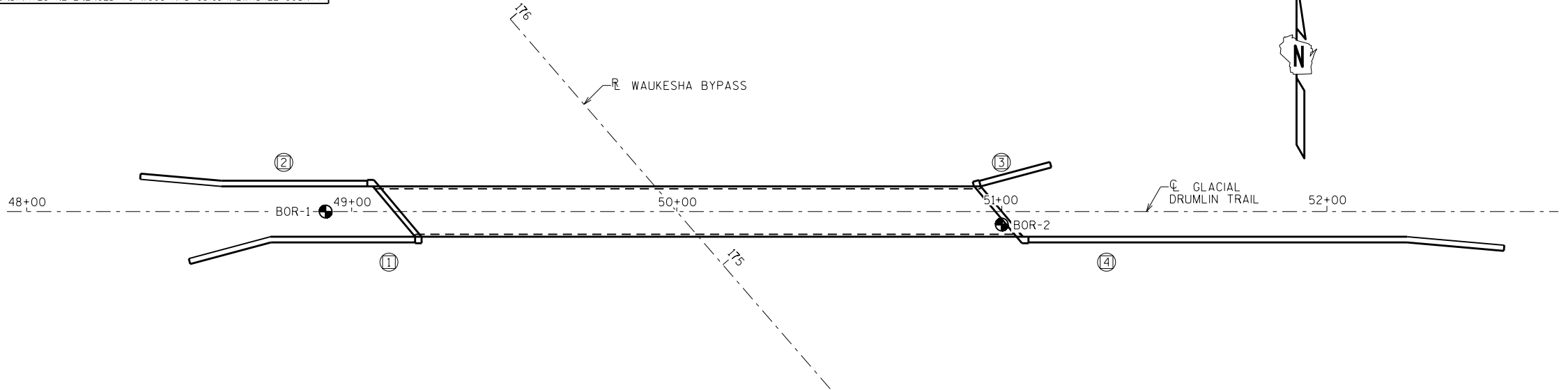


FENCE FABRIC

FENCE FABRIC WOVEN OF 9-GAGE WIRE IN 2" DIAMOND PATTERN MESH WITH BOTH THE TOP AND BOTTOM SELVAGES KNUCKLED.

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STRUCTURE C-67-88			
DRAWN BY		SAD	PLANS CK'D. NAR
CHAIN LINK FENCE DETAILS		SHEET 7	

BORING #	DATE COMPLETED	NORTHING (Y)	EASTING (X)
1	03/02/2016	154452.987	667665.206
2	03/03/2016	154472.991	667872.280
BORINGS COMPLETED BY: WISDOT			
REPORT COMPLETED BY: WISDOT			
ALL COORDINATES REFERENCED TO WCCS NAD 83(91) MILWAUKEE COUNTY			



STATE PROJECT NUMBER		
2788-00-71		
MATERIAL SYMBOLS		
ASPHALT	TOPSOIL	PEAT
CONCRETE	FILL	GRAVEL
SAND	CLAY	SILT
BOULDERS OR COBBLES	LIMESTONE	BEDROCK (UNKNOWN)
SHALE	SANDSTONE	IGNEOUS/META

LEGEND OF BORING

(1) UNCONFINED STRENGTH, AS DETERMINED BY A POCKET PENETROMETER (TSF)

(2) UNLESS OTHERWISE, SPECIFIED THE SPT 'N' VALUE IS BASED ON AASHTO T-206, STANDARD PENETRATION TEST. THE SPT 'N' VALUE PRESENTED HAS NOT BEEN CORRECTED FOR OVERBURDEN PRESSURE OR HAMMER EFFICIENCY.

GROUND WATER ELEVATION

▽ AT TIME OF DRILLING

▼ END OF DRILLING

▽ AFTER DRILLING

ABBREVIATIONS

F-FINE M-MEDIUM C-COARSE ST-SHELBY TUBE

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

BORINGS WERE COMPLETED AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING TO OBTAIN INFORMATION CONCERNING THE CHARACTER OF SUBSURFACE MATERIALS FOUND AT THE SITE. BECAUSE THE INVESTIGATED DEPTHS ARE LIMITED AND THE AREA OF THE BORINGS IS VERY SMALL IN RELATION TO THE ENTIRE SITE, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT SIMILAR SUBSURFACE CONDITIONS BELOW, BETWEEN, OR BEYOND THESE BORINGS. VARIATIONS IN SOIL CONDITIONS SHOULD BE EXPECTED AND FLUCTUATIONS IN GROUNDWATER LEVELS MAY OCCUR.

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DRAWN BY		SAD	PLANS CK'D. NAR
SUBSURFACE EXPLORATION		SHEET 8	

\* THE GROUND WATER ELEVATION WAS DETERMINED FROM WHERE THE SOIL SAMPLE WAS DESCRIBED AS WET.