

MAD

DECEMBER 2020

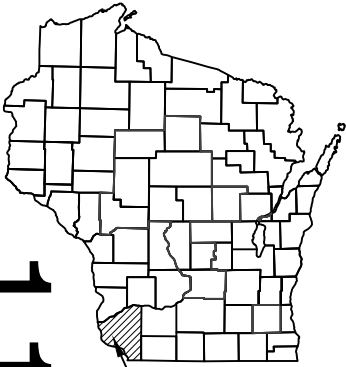
PROJECT ID: 5964-01-80

COUNTY: GRANT

ORDER OF SHEETS

Section No.	1	Title
Section No.	2	Typical Sections and Details
Section No.	3	Estimate of Quantities
Section No.	3	Miscellaneous Quantities
Section No.	4	Right of Way Plat
Section No.	5	Plan and Profile
Section No.	6	Standard Detail Drawings
Section No.	7	Sign Plates
Section No.	8	Structure Plans
Section No.	9	Computer Earthwork Data
Section No.	9	Cross Sections

TOTAL SHEETS = 86



PROJECT LOCATION



STRUCTURE NUMBER	C-22-231	C-22-230	C-22-229
A.A.D.T. 2021	= 910	910	1300
A.A.D.T. 2041	= 1100	1100	1500
D.H.V.	= 6.4	6.4	6.4
D.D.	= 60/40	60/40	60/40
T.	= 7.7%	7.7%	7.7%
DESIGN SPEED	= 60 MPH	60 MPH	60 MPH
ESALS	= 140,000	140,000	200,000

CONVENTIONAL SYMBOLS

PLAN	
CORPORATE LIMITS	
PROPERTY LINE	
LOT LINE	
LIMITED HIGHWAY EASEMENT	
EXISTING RIGHT OF WAY	
PROPOSED OR NEW R/W LINE	
SLOPE INTERCEPT	
REFERENCE LINE	
EXISTING CULVERT	
PROPOSED CULVERT (Box or Pipe)	
COMBUSTIBLE FLUIDS	
MARSH AREA	
WOODED OR SHRUB AREA	

PROFILE	
GRADE LINE	
ORIGINAL GROUND	
MARSH OR ROCK PROFILE (To be noted as such)	
SPECIAL DITCH	
GRADE ELEVATION	
CULVERT (Profile View)	
UTILITIES	
ELECTRIC	
FIBER OPTIC	
GAS	
SANITARY SEWER	
STORM SEWER	
TELEPHONE	
WATER	
UTILITY PEDESTAL	
POWER POLE	
TELEPHONE POLE	

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

CASSVILLE - PATCH GROVE

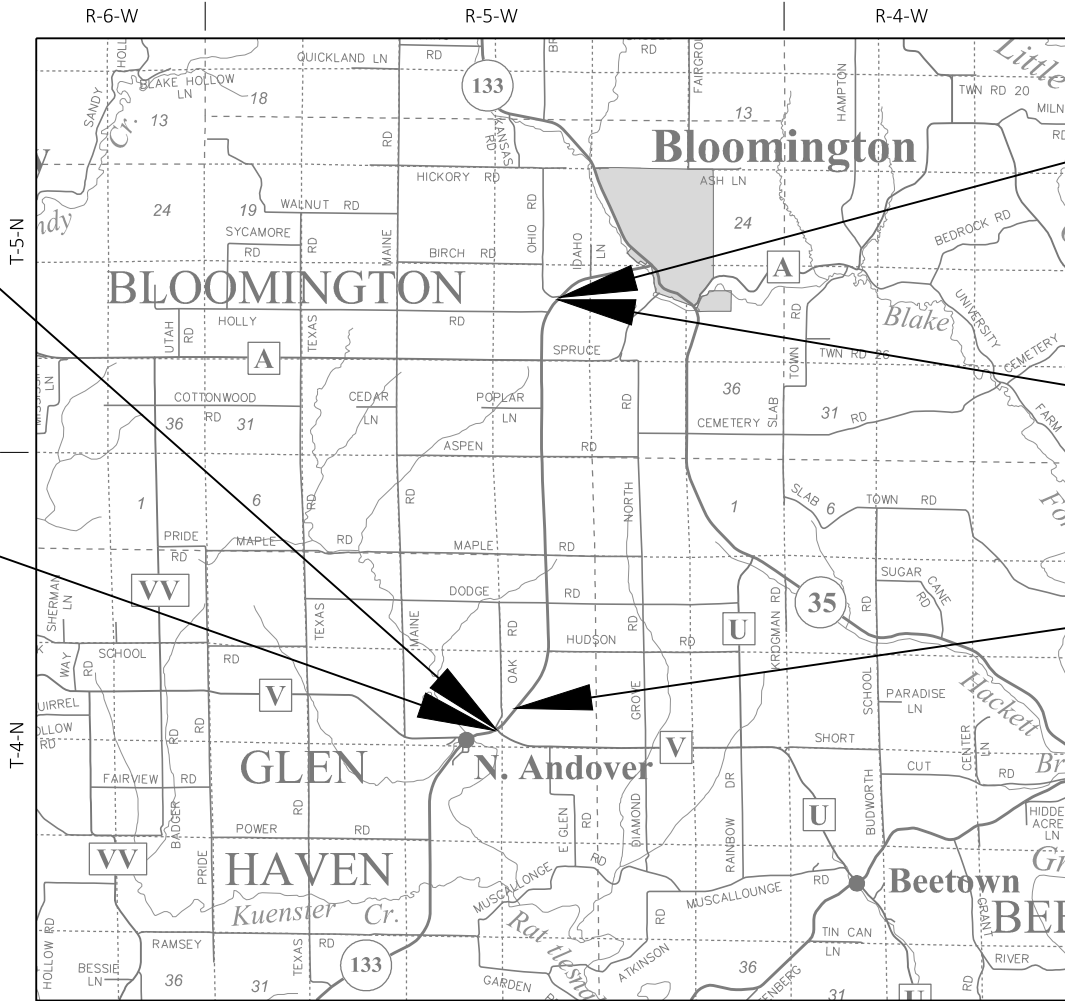
(STRUCTURES C-22-231, C-22-230, C-22-229)

STH 133

GRANT COUNTY

STATE PROJECT NUMBER

5964-01-80



STRUCTURE
C-22-231
STA 426+84

BEGIN PROJECT
STA 425+40
Y = 512,334.57
X = 751,878.04

END PROJECT
STA 678+55
Y = 536,286.80
X = 755,382.86

STRUCTURE
C-22-229
STA 677+01

STRUCTURE
C-22-230
STA 468+47

LAYOUT
SCALE 0 2 MI
TOTAL NET LENGTH OF CENTERLINE = 0.167 MI

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COORDINATE REFERENCE SYSTEM (WISCRS), GRANT COUNTY, NAD83 (2011), IN U.S. SURVEY FEET. POSITIONS SHOWN ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES ARE THE SAME AS GROUND DISTANCES. ELEVATIONS ARE REFERENCED TO NAVD 88 (2012). GPS DERIVED ELEVATIONS ARE BASED ON GEOID 18.

STATE PROJECT

5964-01-80

FEDERAL PROJECT

PROJECT

WISC 2021028

CONTRACT

1

ORIGINAL PLANS PREPARED BY



1702 PANKRATZ STREET MADISON, WI 53704
(608) 356-2771 www.msa-ps.com



7/23/2020

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY	MSA PROFESSIONAL SERVICES
Surveyor	MSA PROFESSIONAL SERVICES
Designer	MAMATA SHRESTHA
Project Manager	SW REGION
Regional Examiner	KIMBERLY SCHAUDER
Regional Supervisor	

APPROVED FOR THE DEPARTMENT
DATE: 2020.07.23 08:19:50-05'00' (Signature)

E

STANDARD ABBREVIATIONS

AC	ACRE	F/L	FLOW LINE	SALV	SALVAGED
AGG	AGGREGATE	FT	FOOT	SAN	SANITARY SEWER
<	ANGLE	GN	GRID NORTH	SECT	SECTION
ASPH	ASPHALTIC	HR	HANDICAP RAMP	SHLDR	SHOULDER
AC	ASPHALT CEMENT	HT	HEIGHT	SW	SIDEWALK
ADT	AVERAGE DAILY TRAFFIC	CWT	HUNDREDWEIGHT	S	SOUTH
B & B	BALLED AND BURLAPPED	HYD	HYDRANT	SB	SOUTHBOUND
BM	BENCH MARK	IN DIA	INCH DIAMETER	SPECS	SPECIFICATIONS
CB	CATCH BASIN	INL	INLET	SQ	SQUARE
` OR C/L	CENTER LINE	ID	INSIDE DIAMETER	SF OR SQ FT	SQUARE FEET
C-C	CENTER TO CENTER	I	INTERSECTION ANGLE	SY	SQUARE YARD
CONC	CONCRETE	IE	INVERT ELEVATION	SSPRC	STORM SEWER
CO	COUNTY	IP	IRON PIPE OR PIN		PIPE REINFORCED CONCRETE
CTH	COUNTY TRUNK HIGHWAY	JCT	JUNCTION	STD	STANDARD
CY	CUBIC YARD	L	LENGTH OF CURVE	SDD	STANDARD DETAIL DRAWINGS
CULV	CULVERT	LF	LINEAR FOOT	STH	STATE TRUNK HIGHWAYS
CP	CULVERT PIPE	LC	LONG CHORD OF CURVE	STA	STATION
CPRC	CULVERT PIPE	LCB	LONG CHORD BEARING	SS	STORM SEWER
	REINFORCED CONCRETE	LS	LUMP SUM	T	TANGENT
C & G	CURB AND GUTTER	MH	MANHOLE	TEL	TELEPHONE
D	DEGREE OF CURVE	N	NORTH	TEMP	TEMPORARY
DHV	DESIGN HOUR VOLUME	Y	NORTH GRID COORDINATE	TLE	TEMPORARY LIMITED EASEMENT
DIA OR	DIAMETER	OE	OUTLET ELEVATION	T	TON
DIST	DISTRICT	OL	OUT LOT	TC	TOP OF CURB
DWY	DRIVEWAY	OD	OUTSIDE DIAMETER	TN	TOWN
E	EAST	OH	OVERHEAD LINES	TRANS	TRANSITION
X	EAST GRID COORDINATE	PAVT	PAVEMENT	T	TRUCKS (percent of)
EB	EASTBOUND	PLE	PERMANENT LIMITED EASEMENT	TYP	TYPICAL
ELEC	ELECTRIC	PC	POINT OF CURVATURE	UNCL	UNCLASSIFIED
EL OR ELEV	ELEVATION	PI	POINT OF INTERSECTION	USH	UNITED STATES HIGHWAY
EMB	EMBANKMENT	PT	POINT OF TANGENCY	VAR	VARIABLE
EW	ENDWALL	PCC	PORTLAND CEMENT CONCRETE	VERT	VERTICAL
ESALS	EQUIVALENT SINGLE	LB	POUND	VC	VERTICAL CURVE
	AXLE LOADS	PE	PRIVATE ENTRANCE	VOL	VOLUME
EXC	EXCAVATION	R OR RAD	RADIUS	WM	WATER MAIN
EBS	EXCAVATION BELOW	RR	RAILROAD	WV	WATER VALVE
	SUBGRADE	R	RANGE	W	WEST
EXIST	EXISTING	~ OR R/L	REFERENCE LINE	WB	WESTBOUND
EXP	EXPANSION	REQD	REQUIRED	YD	YARD
F-F	FACE TO FACE	RT	RIGHT		
FERT	FERTILIZER	R / W	RIGHT-OF-WAY		
FE	FIELD ENTRANCE	RD	ROAD		

ORDER OF TYPICAL SECTION & DETAIL SHEETS

1.

GENERAL NOTES
2.

TYPICAL SECTIONS
3.

PROJECT CONTROL POINTS, TIES, AND COORDINATES
4.

CONSTRUCTION DETAILS
5.

TRAFFIC CONTROL DETOUR ROUTE

DNR LIASON

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
ATTN: ANDY BARTA
DNR SOUTH CENTRAL REGION HEADQUARTERS
3911 FISH HATCHERY ROAD
FITCHBURG, WI 53711
608-235-2955
ANDREW.BARTA@WISCONSIN.GOV

MSA DESIGN CONTACT

MSA PROFESSIONAL SERVICES
ATTN: JOSH SWENO, P.E.
1702 PANKRATZ STREET
MADISON, WI 53704
608-355-8852
JSWENO@MSA-PS.COM

WISDOT CONTACT

WISCONSIN DEPARTMENT OF TRANSPORTATION
ATTN: MAMATA SHRESTHA, PROJECT MANAGER
111 INTERSTATE BOULEVARD
EDGERTON, WI 53534
608-884-7124
MAMATA.SHRESTHA@DOT.WI.GOV

UTILITIES

OVERHEAD ELECTRIC:
ALLIANT ENERGY
ATTN: MARY MONTGOMERY
200 1ST STREET
CEDAR RAPIDS, IA 52401
319-786-4768
MARYMONTGOMERY@ALLIANTENERGY.COM

BURIED TELEPHONE/FIBER OPTIC:
THE FARMERS TELEPHONE COMPANY, LLC D/B/A TDS TELECOM
ATTN: MICHAEL HAMMEL
827 16TH AVENUE
MONROE, WI 53566
608-328-5262
MICHAEL.HAMMEL@TDSTELECOM.COM

BURIED TELEPHONE/FIBER OPTIC:
GRANTLAND TELECOM, LLC D/B/A TDS TELECOM
ATTN: MICHAEL HAMMEL
827 16TH AVENUE
MONROE, WI 53566
608-328-5262
MICHAEL.HAMMEL@TDSTELECOM.COM

OVERHEAD ELECTRIC:
SCENIC RIVERS ENERGY COOPERATIVE
ATTN: CHAD OLMSTEAD
231 NORTH SHERIDAN STREET
LANCASTER, WI 53813
608-723-2121 EXT. 561
COLMSTEAD@SREC.NET

RUNOFF COEFFICIENT TABLE

	HYDROLOGIC SOIL GROUP											
	A			B			C			D		
	SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)		
LAND USE:	0-2	2-6	6 & OVER	0-2	2-6	6 & OVER	0-2	2-6	6 & OVER	0-2	2-6	6 & OVER
ROW CROPS	.08	.16	.22	.12	.20	.27	.15	.24	.33	.19	.28	.38
	.22	.30	.38	.26	.34	.44	.30	.37	.50	.34	.41	.56
MEDIAN STRIP-TURF	.19	.20	.24	.19	.22	.26	.20	.23	.30	.20	.25	.30
	.24	.26	.30	.25	.28	.33	.26	.30	.37	.27	.32	.40
SIDE SLOPE-TURF			.25			.27			.28			.30
			.32			.34			.36			.38
PAVEMENT:												
ASPHALT						.70 - .95						
CONCRETE						.80 - .95						
BRICK						.70 - .80						
DRIVES, WALKS						.75 - .85						
ROOFS						.75 - .95						
GRAVEL ROADS, SHOULDERS						.40 - .60						

TOTAL PROJECT AREA = 1.46 ACRES
TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 1.46 ACRES

* NOT A DIGGERS HOTLINE MEMBER

DIGGERS

HOTLINE

Dial 811

or (800)242-8511

www.DiggersHotline.com

GENERAL NOTES

DISTURBED AREAS WITHIN THE RIGHT-OF-WAY, EXCEPT THE AREAS WITHIN THE FINISHED SHOULDER POINTS, SHALL BE SALVAGED TOPSOILED, FERTILIZED, SEEDED AND STABILIZED WITH EROSION MAT AS DIRECTED BY THE ENGINEER.

THE LOCATIONS OF EXISTING AND PROPOSED UTILITY INSTALLATIONS AS SHOWN ON THE PLANS ARE APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE AREA THAT ARE NOT SHOWN.

NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT APPROVAL OF THE ENGINEER.

THE 4" ASPHALTIC SURFACE SHALL CONSIST OF A 1 ¾" UPPER LAYER, AND A 2 ¼" LOWER LAYER. ASPHALTIC SURFACE WEIGHT CALCULATIONS ARE BASED ON 112 LB/SY/IN. APPLY TACK COAT AT A RATE OF 0.05 GAL/SY BETWEEN LAYERS OF ASPHALTIC SURFACE. THE CONTRACTOR'S PAVING OPERATION SHALL BE CONSISTENT WITH THE PLAN TYPICAL SECTIONS AND CONSTRUCTED TO PREVENT ASPHALT LONGITUDINAL JOINTS FROM BEING LOCATED WITHIN A DRIVING, TURNING, PASSING, OR PARKING LANE.

PLACE SILT FENCE AS SHOWN ON THE PLAN OR AS DIRECTED BY THE ENGINEER AND IN PLACE PRIOR TO CONSTRUCTION OR BRIDGE REMOVAL.

WETLANDS ARE PRESENT. AREAS OUTSIDE THE SLOPE INTERCEPTS SHALL NOT BE DISTURBED IN WETLAND AREAS.

EROSION CONTROL FEATURES AS SHOWN IN THE PLANS ARE AT SUGGESTED LOCATIONS. THE ENGINEER MAY MODIFY LOCATIONS AS NEEDED. ALL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL SUCH TIME AS THE ENGINEER DETERMINES THE MEASURE IS NO LONGER NECESSARY.

THE EROSION CONTROL FEATURES SHALL BE ADJUSTED TO ACCOMMODATE ADEQUATE EROSION CONTROL FOR THE CONTRACTORS CHOSEN METHOD FOR THE TEMPORARY WATER DIVERSION CULVERT AT EACH STRUCTURE LOCATION.

PROJECT NO: 5964-01-80

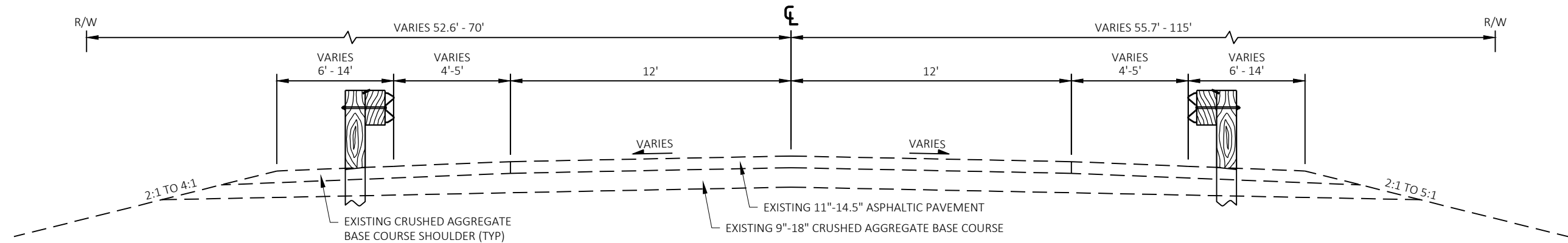
HWY: STH 133

COUNTY: GRANT

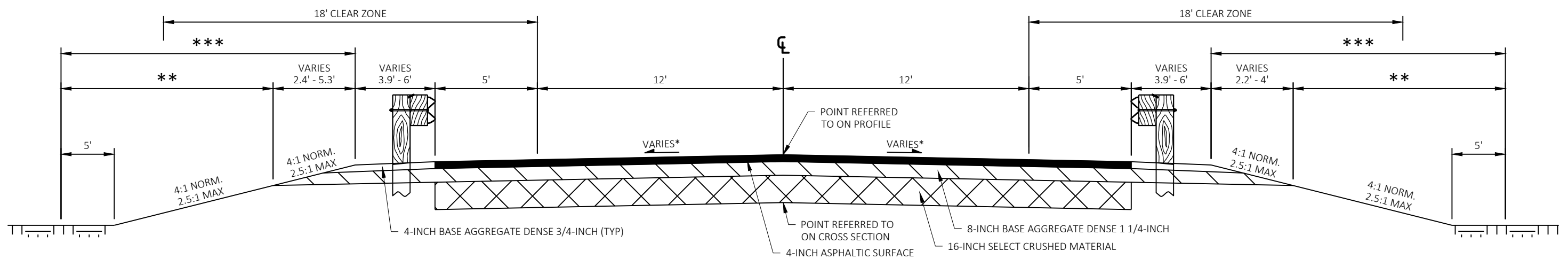
GENERAL NOTES

SHEET

E

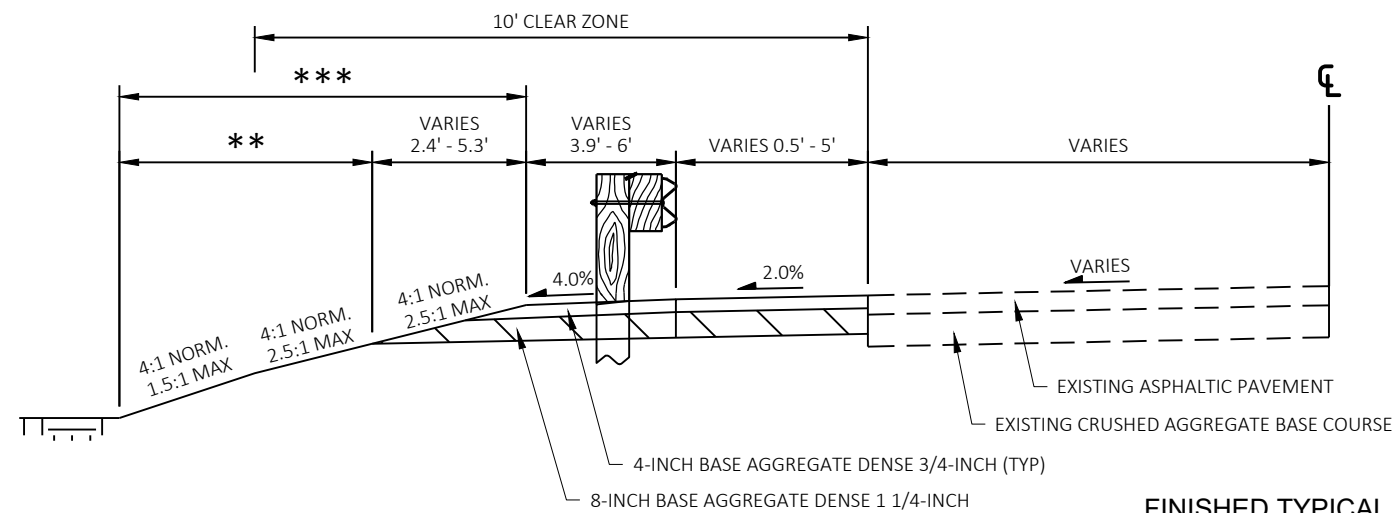
**EXISTING TYPICAL SECTION**

STA 425+40 - STA 428+48
STA 467+16 - STA 469+75
STA 675+35 - STA 678+55

**FINISHED TYPICAL SECTION**

STA 425+40 - STA 428+48
STA 467+16 - STA 469+75
STA 675+35 - STA 678+55

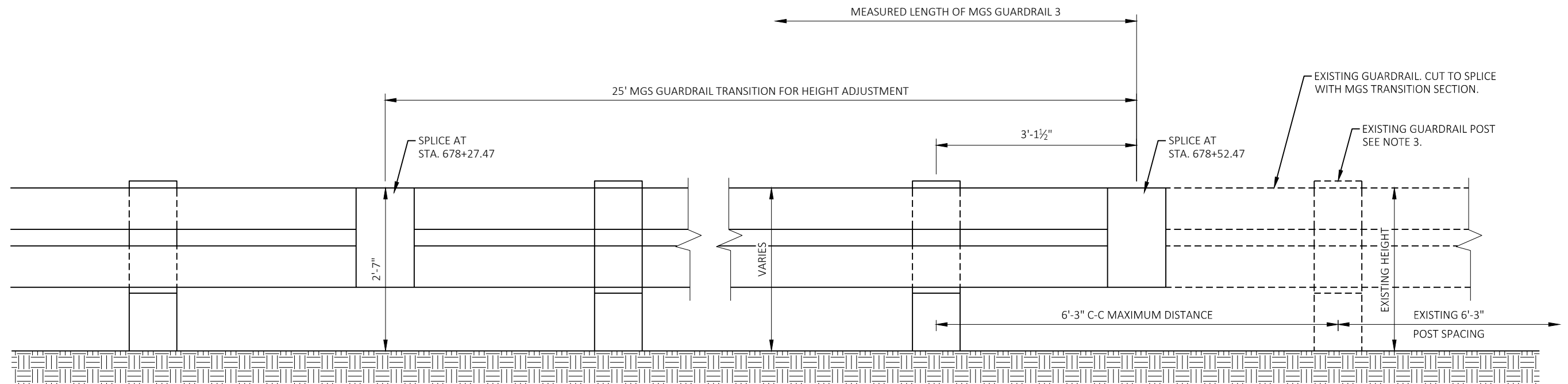
* 425+40 - 428+48 4.5% - 6% SUPER LT
467+16 - 469+75 3.8% SUPER LT
675+35 - 678+55 2% CROWN

**FINISHED TYPICAL SECTION**

SIDE ROADS WITH BEAM GUARD

NOTES:

- ** SALVAGED TOPSOIL AND EROSION MAT URBAN CLASS I TYPE B LIMITS
- *** SEEDING MIXTURE #20, SEEDING TEMPORARY, & FERTILIZER TYPE B LIMITS

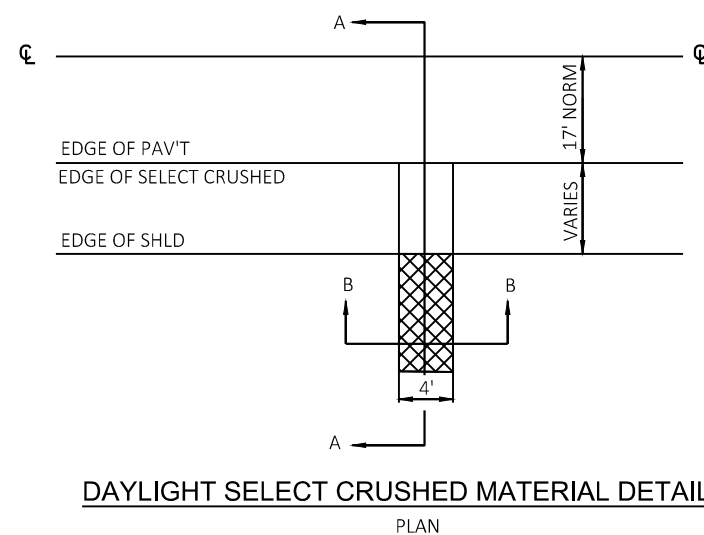


NOTES:

1. LOCATION OF SPLICE TO BE DETERMINED IN THE FIELD WITHIN 6'-3" OF PLAN LOCATION.
2. THE SPLICE SHALL BE LOCATED SO THAT THERE IS NO MORE THAN 6'-3" SPACE BETWEEN THE LAST EXISTING POST AND THE NEXT MGS POST.
3. INSTALL SUPPLEMENTAL POST ON EXISTING BEAM GUARD SIDE OF SPLICE IF NECESSARY TO MEET 6'-3" C-C MAXIMUM SPACING. PAYMENT INCLUDED WITH MEASURED LENGTH OF MGS GUARDRAIL 3.

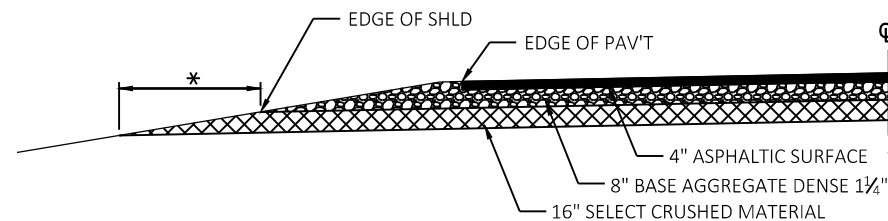
MGS GUARDRAIL CONNECTION TO EXISTING GUARDRAIL DETAIL

NOT TO SCALE

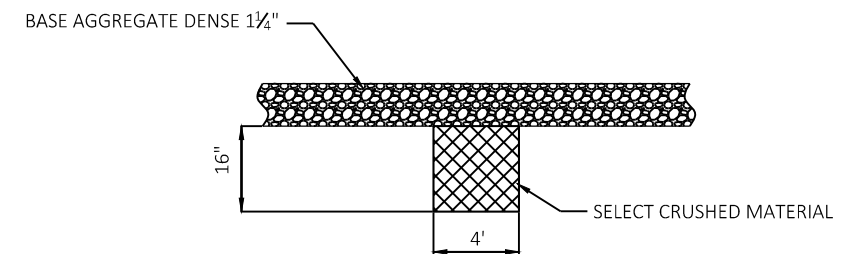
DAYLIGHT SELECT CRUSHED MATERIAL DETAIL

PLAN

NOTE: DAYLIGHTS SHALL BE SPACED AT 250' MAX. SPACING AND SAG POINTS OR AS DETERMINED BY ENGINEER IN FIELD. (SEE SECTION A-A FOR CROSS SECTION VIEW)

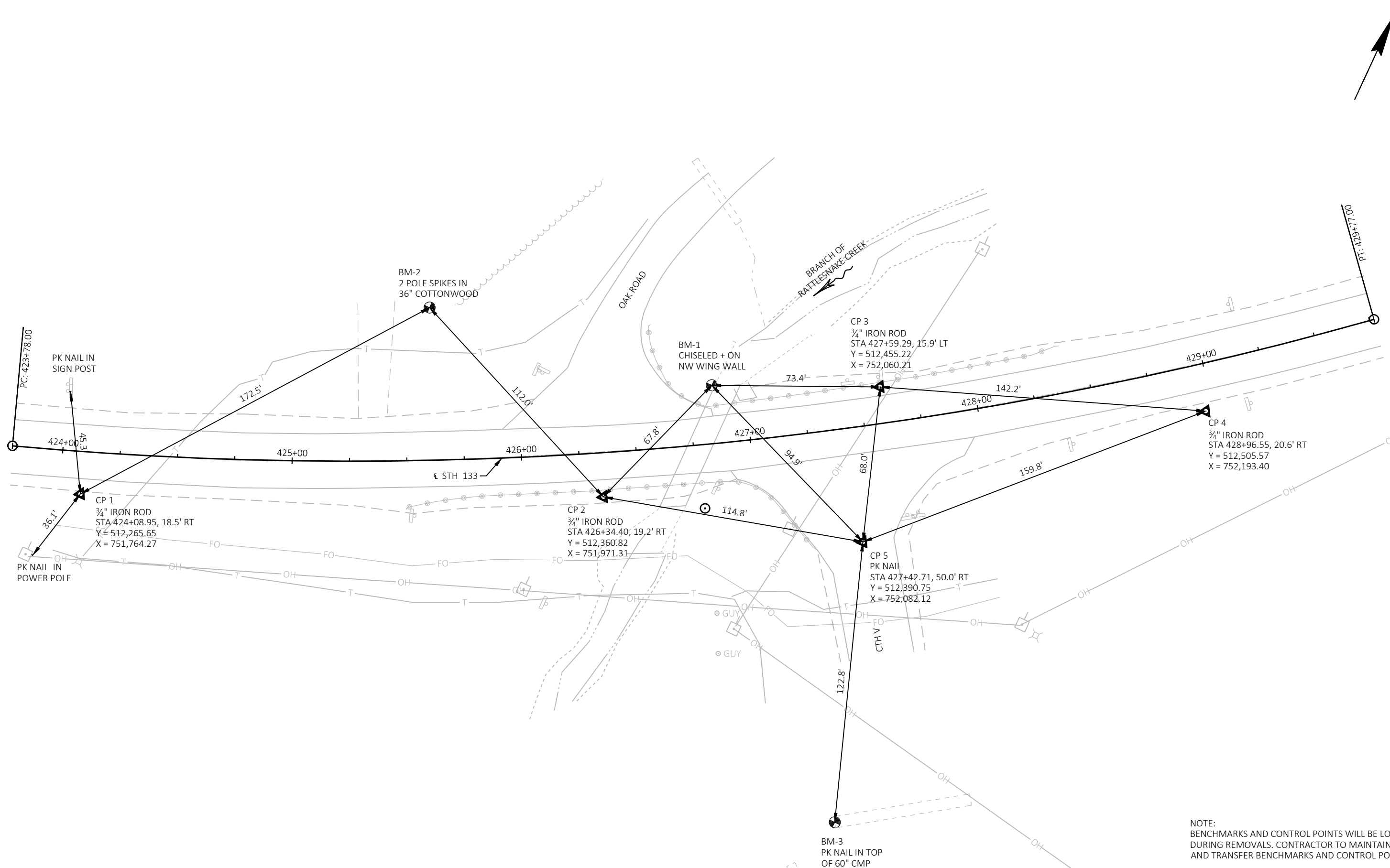
SECTION A-A

* AT SUPER ELEVATED SECTIONS, ADJUST SLOPE IN DAYLIGHT SECTIONS ONLY AS NECESSARY TO DRAIN.

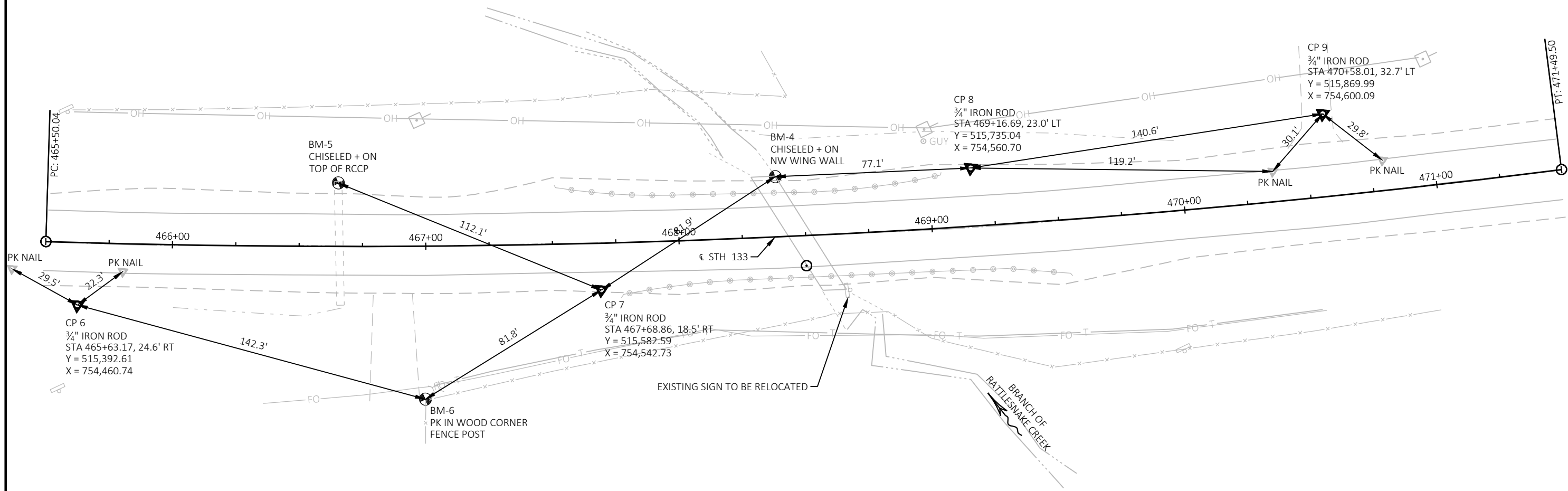
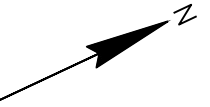
SECTION B-BDETAIL FOR RURAL SELECT CRUSHED MATERIAL FRENCH DRAINS

(LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ENGINEER, 250' NORMAL)

EXCAVATION REQUIRED TO CONSTRUCT FRENCH DRAINS SHALL BE CONSIDERED INCIDENTAL TO THE ITEM SELECT CRUSHED MATERIAL. DO NOT COVER SELECT CRUSHED WITH TOPSOIL.

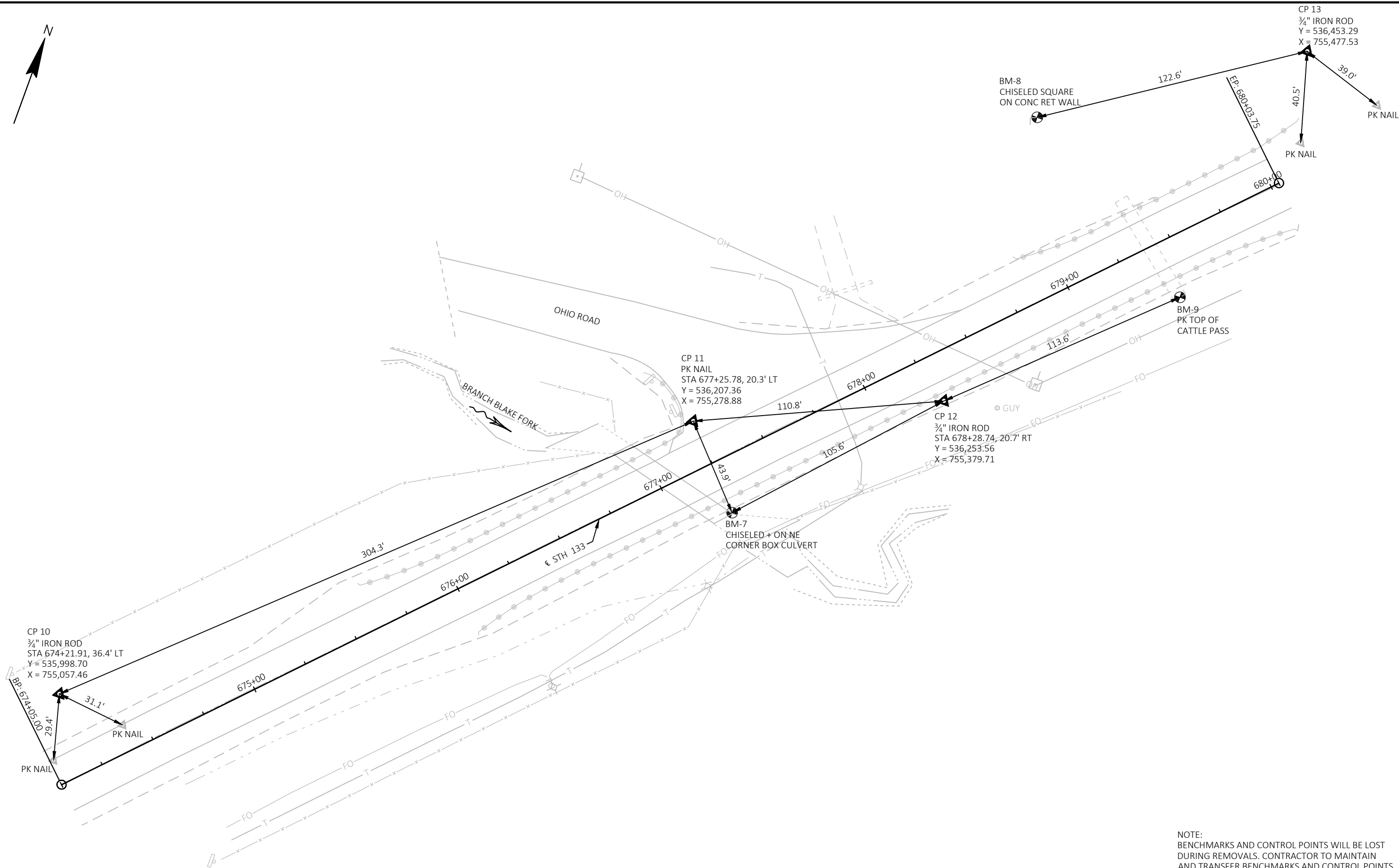


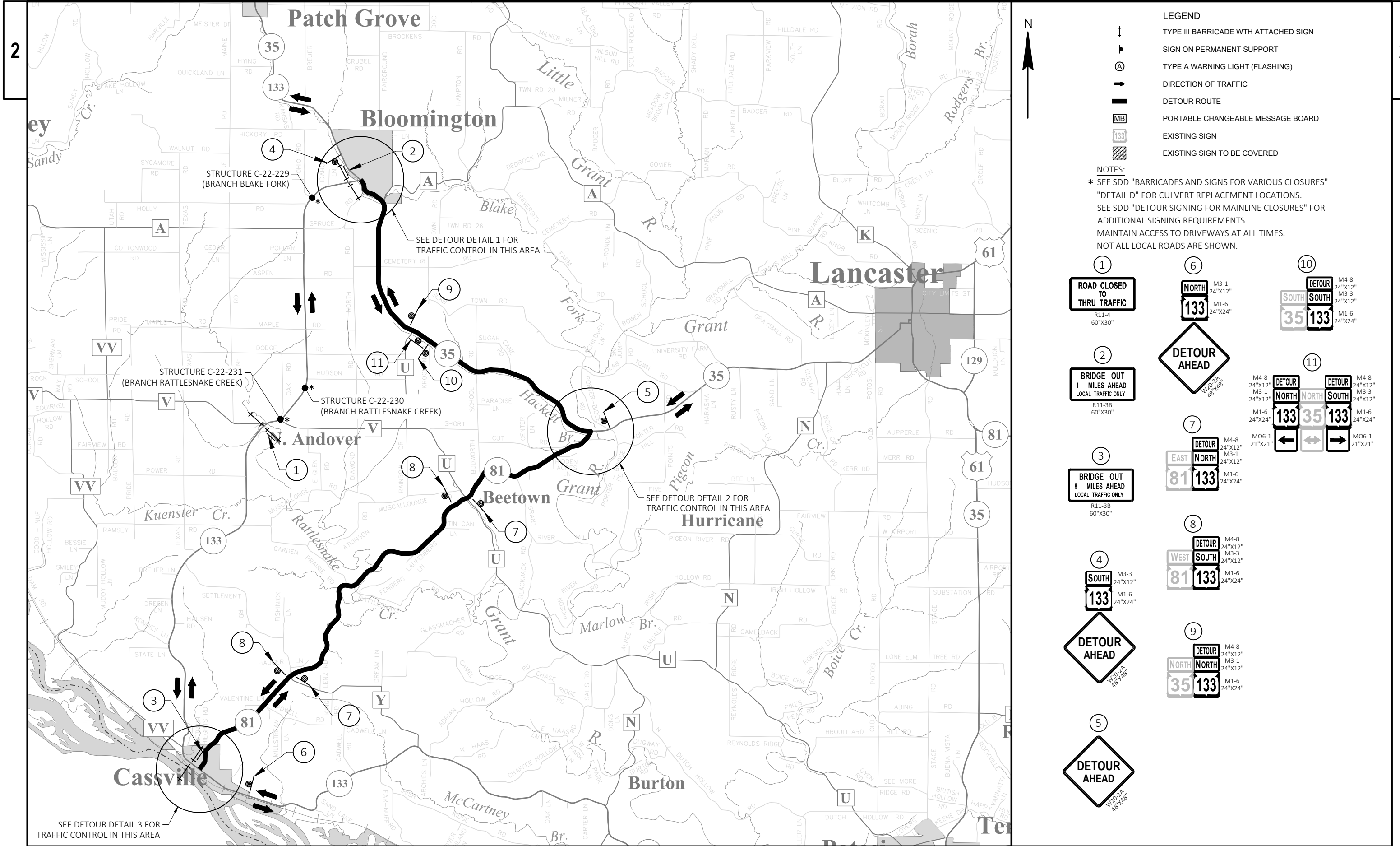
NOTE:
BENCHMARKS AND CONTROL POINTS WILL BE LOST
DURING REMOVALS. CONTRACTOR TO MAINTAIN
AND TRANSFER BENCHMARKS AND CONTROL POINTS.



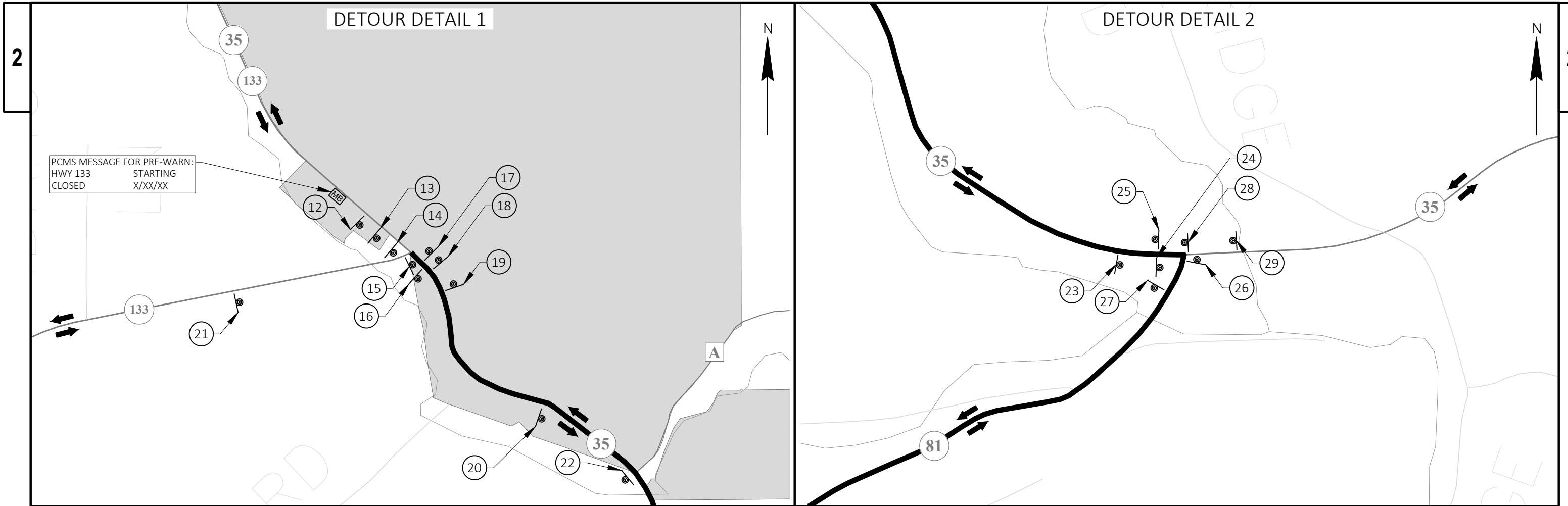
NOTE:
BENCHMARKS AND CONTROL POINTS WILL BE LOST
DURING REMOVALS. CONTRACTOR TO MAINTAIN
AND TRANSFER BENCHMARKS AND CONTROL POINTS.

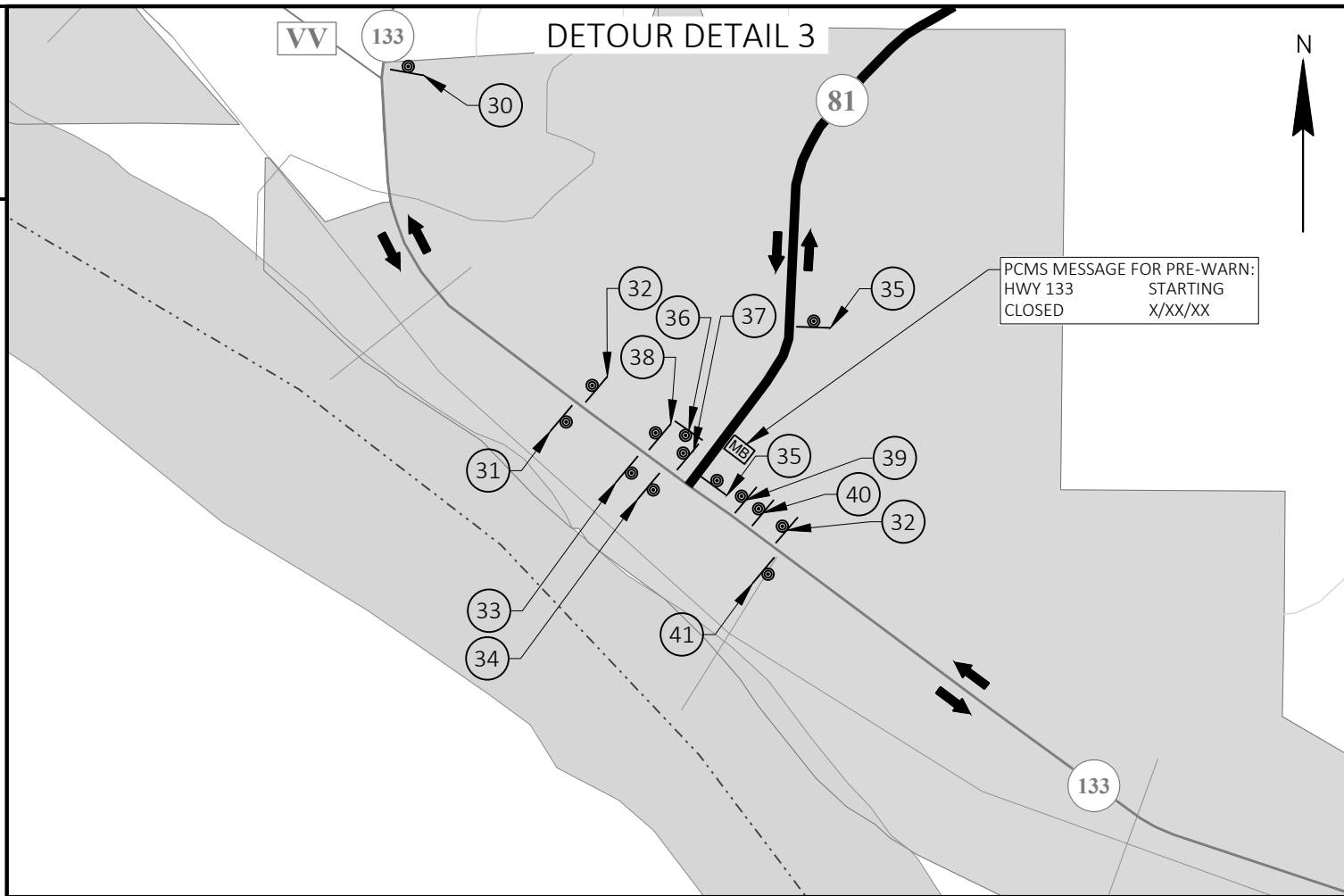
PROJECT NO: 5964-01-80	HWY: STH 133	COUNTY: GRANT	PROJECT CONTROL POINTS, TIES, AND COORDINATES (C-22-230)	SHEET	E
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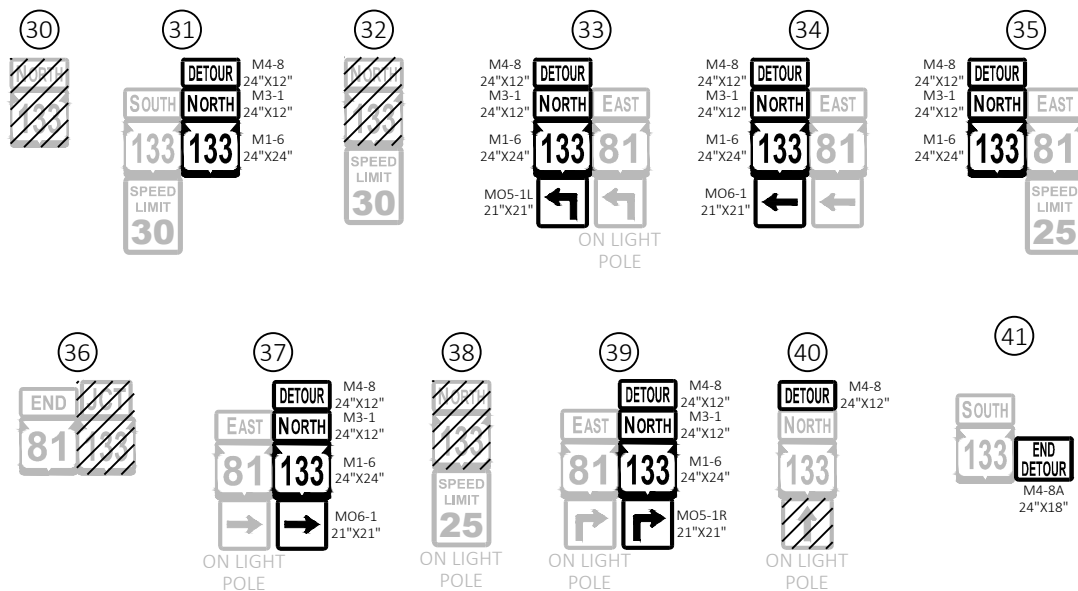
PROJECT NO: 5964-01-80	HWY: STH 133	COUNTY: GRANT	TRAFFIC CONTROL DETOUR ROUTE	SHEET E
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TRAFFIC CONTROL AND DETOUR GENERAL NOTES

1. DRAWINGS SHOW TRAFFIC CONTROL DETOUR FOR A TYPICAL SITUATION. ADDITIONAL TRAFFIC CONTROL DEVICES MAY BE REQUIRED AND/OR LAYOUT DETAILS MODIFIED DEPENDING ON SITE CONDITIONS AS DIRECTED BY THE ENGINEER. ALL CHANGES TO THE TRAFFIC CONTROL DETOUR PLAN SHALL BE REVIEWED WITH THE PROJECT ENGINEER.
2. CONSIDER GEOMETRICS WHEN LOCATING TRAFFIC CONTROL SIGNS PCMS SO TRAFFIC HAS A CLEAR VIEW OF THE BOARD FOR A MINIMUM OF 1000 FEET IN FRONT OF MESSAGE BOARD.
3. PLACE TRAFFIC CONTROL SIGNS PCMS AND DISPLAY THE "PRIOR TO CONSTRUCTION" MESSAGE 7 DAYS PRIOR TO THE EXPECTED START OF THE PROPOSED WORK THAT WILL REQUIRE BRIDGE CLOSURE, ADJUST THE MESSAGE DATE ACCORDINGLY.
4. ALL SIGNS SHALL BE PLACED IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
5. LOCATION AND SPACING OF SIGNS MAY BE ADJUSTED TO FIT FIELD CONDITIONS AS DIRECTED BY THE FIELD ENGINEER.
6. "MO" SIGNS ARE THE SAME AS "M" SIGNS EXCEPT THAT THE BACKGROUND IS ORANGE.
7. COVER, REMOVE, OR ALTER ANY EXISTING SIGNS THAT DISPLAY A CONFLICTING MESSAGE WITH THE PROPOSED DETOUR ROUTE.



LEGEND

- TYPE III BARRICADE WITH ATTACHED SIGN
- SIGN ON PERMANENT SUPPORT
- TYPE A WARNING LIGHT (FLASHING)
- DIRECTION OF TRAFFIC
- DETOUR ROUTE
- PORTABLE CHANGEABLE MESSAGE BOARD
- EXISTING SIGN
- EXISTING SIGN TO BE COVERED

NOTES:

SEE SDD "BARRICADES AND SIGNS FOR MAINLINE CLOSURES"
SEE SDD "DETOUR SIGNING FOR MAINLINE CLOSURES"
MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES.
NOT ALL LOCAL ROADS ARE SHOWN.

PROJECT NO: 5964-01-80

HWY: STH 133

COUNTY: GRANT

DETOUR DETAIL 3

SHEET

E

Estimate Of Quantities

5964-01-80

Line	Item	Item Description	Unit	Total	Qty
0002	203.0200	Removing Old Structure (station) 01. 426+78	LS	1.000	1.000
0004	203.0200	Removing Old Structure (station) 02. 468+50	LS	1.000	1.000
0006	203.0200	Removing Old Structure (station) 03. 677+05	LS	1.000	1.000
0008	204.0110	Removing Asphaltic Surface	SY	327.000	327.000
0010	204.0165	Removing Guardrail	LF	1,166.000	1,166.000
0012	205.0100	Excavation Common	CY	2,439.000	2,439.000
0014	206.2000	Excavation for Structures Culverts (structure) 01. C-22-231	LS	1.000	1.000
0016	206.2000	Excavation for Structures Culverts (structure) 02. C-22-230	LS	1.000	1.000
0018	206.2000	Excavation for Structures Culverts (structure) 03. C-22-229	LS	1.000	1.000
0020	210.2500	Backfill Structure Type B	TON	6,268.000	6,268.000
0022	211.0100	Prepare Foundation for Asphaltic Paving (project) 01. 5964-01-80	LS	1.000	1.000
0024	213.0100	Finishing Roadway (project) 01. 5964-01-80	EACH	1.000	1.000
0026	305.0110	Base Aggregate Dense 3/4-Inch	TON	324.000	324.000
0028	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	1,864.000	1,864.000
0030	311.0110	Breaker Run	TON	715.000	715.000
0032	312.0110	Select Crushed Material	TON	2,535.000	2,535.000
0034	455.0605	Tack Coat	GAL	158.000	158.000
0036	465.0105	Asphaltic Surface	TON	707.000	707.000
0038	504.0100	Concrete Masonry Culverts	CY	478.000	478.000
0040	505.0400	Bar Steel Reinforcement HS Structures	LB	61,100.000	61,100.000
0042	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	9,510.000	9,510.000
0044	516.0500	Rubberized Membrane Waterproofing	SY	88.000	88.000
0046	521.3136	Culvert Pipe Corrugated Steel 36-Inch	LF	8.000	8.000
0048	606.0300	Riprap Heavy	CY	595.000	595.000
0050	606.0700	Grouted Riprap Heavy	CY	11.000	11.000
0052	614.2300	MGS Guardrail 3	LF	575.000	575.000
0054	614.2340	MGS Guardrail 3 L	LF	225.000	225.000
0056	614.2350	MGS Guardrail Short Radius	LF	125.000	125.000
0058	614.2610	MGS Guardrail Terminal EAT	EACH	11.000	11.000
0060	618.0100	Maintenance And Repair of Haul Roads (project) 01. 5964-01-80	EACH	1.000	1.000
0062	619.1000	Mobilization	EACH	1.000	1.000
0064	624.0100	Water	MGAL	93.000	93.000
0066	625.0500	Salvaged Topsoil	SY	4,330.000	4,330.000
0068	628.1104	Erosion Bales	EACH	140.000	140.000
0070	628.1504	Silt Fence	LF	2,120.000	2,120.000
0072	628.1520	Silt Fence Maintenance	LF	2,120.000	2,120.000

Estimate Of Quantities

5964-01-80

Line	Item	Item Description	Unit	Total	Qty
0074	628.1905	Mobilizations Erosion Control	EACH	6.000	6.000
0076	628.1910	Mobilizations Emergency Erosion Control	EACH	6.000	6.000
0078	628.2008	Erosion Mat Urban Class I Type B	SY	4,250.000	4,250.000
0080	628.7504	Temporary Ditch Checks	LF	25.000	25.000
0082	628.7560	Tracking Pads	EACH	3.000	3.000
0084	628.7570	Rock Bags	EACH	140.000	140.000
0086	629.0210	Fertilizer Type B	CWT	3.000	3.000
0088	630.0120	Seeding Mixture No. 20	LB	130.000	130.000
0090	630.0200	Seeding Temporary	LB	70.000	70.000
0092	630.0500	Seed Water	MGAL	110.000	110.000
0094	638.2102	Moving Signs Type II	EACH	8.000	8.000
0096	638.4000	Moving Small Sign Supports	EACH	6.000	6.000
0098	642.5001	Field Office Type B	EACH	1.000	1.000
0100	643.0300	Traffic Control Drums	DAY	1,680.000	1,680.000
0102	643.0420	Traffic Control Barricades Type III	DAY	4,816.000	4,816.000
0104	643.0705	Traffic Control Warning Lights Type A	DAY	7,552.000	7,552.000
0106	643.0900	Traffic Control Signs	DAY	21,704.000	21,704.000
0108	643.0920	Traffic Control Covering Signs Type II	EACH	16.000	16.000
0110	643.1050	Traffic Control Signs PCMS	DAY	14.000	14.000
0112	643.5000	Traffic Control	EACH	1.000	1.000
0114	645.0105	Geotextile Type C	SY	732.000	732.000
0116	645.0120	Geotextile Type HR	SY	1,232.000	1,232.000
0118	646.1020	Marking Line Epoxy 4-Inch	LF	3,353.000	3,353.000
0120	650.4500	Construction Staking Subgrade	LF	887.000	887.000
0122	650.5000	Construction Staking Base	LF	887.000	887.000
0124	650.6500	Construction Staking Structure Layout (structure) 01. C-22-231	LS	1.000	1.000
0126	650.6500	Construction Staking Structure Layout (structure) 02. C-22-230	LS	1.000	1.000
0128	650.6500	Construction Staking Structure Layout (structure) 03. C-22-229	LS	1.000	1.000
0130	650.9910	Construction Staking Supplemental Control (project) 01. 5964-01-80	LS	1.000	1.000
0132	650.9920	Construction Staking Slope Stakes	LF	887.000	887.000
0134	690.0150	Sawing Asphalt	LF	371.000	371.000
0136	715.0502	Incentive Strength Concrete Structures	DOL	2,868.000	2,868.000
0138	ASP.1T0A	On-the-Job Training Apprentice at \$5.00/HR	HRS	3,600.000	3,600.000
0140	ASP.1T0G	On-the-Job Training Graduate at \$5.00/HR	HRS	600.000	600.000
0142	SPV.0105	Special 01. Temporary Water Diversion Culvert C-22-231	LS	1.000	1.000
0144	SPV.0105	Special 02. Temporary Water Diversion Culvert C-22-	LS	1.000	1.000

Estimate Of Quantities

5964-01-80

Line	Item	Item Description	Unit	Total	Qty
		230			
0146	SPV.0105	Special 03. Temporary Water Diversion Culvert C-22-229	LS	1.000	1.000

REMOVING ASPHALTIC SURFACE

204.0110 REMOVING ASPHALTIC SURFACE		
STATION - STATION	LOCATION	SY
425+91 - 426+83	LT	108
426+90 - 427+97	RT	95
677+19 - 678+55	LT	124
TOTAL:		327

REMOVING GUARDRAIL

204.0165 REMOVING GUARDRAIL		
STATION - STATION	LOCATION	LF
425+49 - 427+23	RT	191
426+58 - 428+40	LT	203
467+52 - 469+05	LT	153
467+78 - 469+53	RT	177
675+61 - 677+23	LT	189
675+99 - 678+52	RT	253
TOTAL:		1,166

ASPHALTIC SURFACE

211.0100 PREPARE FOUNDATION FOR ASPHALTIC PAVING			455.0605 TACK COAT		465.0105 ASPHALTIC SURFACE
STRUCTURE	STATION	- STATION	LS	GAL	TON
C-22-231	425+40	- 428+48	--	52	234
C-22-230	467+16	- 469+75	--	50	223
C-22-229	675+35	- 678+55	--	56	250
TOTALS:			1	158	707

CULVERT PIPE

521.3136 CULVERT PIPE CORRUGATED STEEL 36-INCH				STEEL THICKNESS
STATION	LOCATION	LF		
427+04	LT	8	0.079"	
TOTAL:		8		

EARTHWORK SUMMARY

STATION - STATION	205.0100 EXCAVATION COMMON	SALVAGED/ UNUSABLE PAVEMENT MATERIAL	AVAILABLE MATERIAL	UNEXPANDED	EXPANDED	MASS ORDINATE +/- (7)	COMMENTS
	CUT (2) CY	(3) CY	(5) CY	FILL CY	FILL (6) CY	+	
425+40 - 428+48	801	263	538	252	328	211	C-22-231
OAK ROAD INT	13	0	13	55	72	-59	BEAM GUARD GRADING
CTH V INT	14	0	14	36	47	-33	BEAM GUARD GRADING
467+16 - 469+75	720	226	494	208	270	224	C-22-230
675+35 - 678+55	872	344	528	512	666	-138	C-22-229
OHIO ROAD INT	19	0	38	128	166	-128	BEAM GUARD GRADING
TOTALS:	2,439	833	1,625	1,191	1,548	77	

- (1) EXCAVATION COMMON IS THE SUM OF THE CUT AND EBS EXCAVATION COLUMNS. ITEM 205.0100
(2) SALVAGED/UNUSEABLE PAVEMENT MATERIAL IS INCLUDED IN CUT.
(3) SALVAGED/UNUSEABLE PAVEMENT MATERIAL - EXISTING PAVEMENT
(5) AVAILABLE MATERIAL = CUT - SALVAGED/UNUSEABLE PAVEMENT MATERIAL
(6) EXPANDED FILL FACTOR = 1.30
(7) THE MASS ORDINATE + OR - QUANTITY CALCULATED FOR THE DIVISION. PLUS QUANTITY INDICATES AN EXCESS OF MATERIAL WITHIN THE DIVISION.
MINUS QUANTITY INDICATES A SHORTAGE OF MATERIAL WITHIN THE DIVISION.

BASE AGGREGATE DENSE

STRUCTURE	STATION	-	STATION	305.0110	305.0120	312.0110	624.0100	
				BASE	BASE			
				AGGREGATE	AGGREGATE			SELECT
				DENSE	DENSE			CRUSHED
				3/4-INCH	1 1/4-INCH			
				TON	TON	TON	MGAL	
C-22-231	425+40	-	428+48	74	550	835	29	
	OAK ROAD INTERSECTION			17	42	-	1	
	CTH V INTERSECTION			18	52	-	1	
C-22-230	467+16	-	469+75	109	570	795	29	
C-22-229	675+35	-	678+55	86	600	905	32	
	OHIO ROAD INTERSECTION			20	50	-	1	
TOTALS:				324	1,864	2,535	93	

GUARDRAIL

STATION - STATION	LOCATION	614.2300 MGS GUARDRAIL 3	614.2340 MGS GUARDRAIL 3 L	614.2350 MGS GUARDRAIL SHORT RADIUS	614.2610 MGS GUARDRAIL TERMINAL EAT	COMMENTS
		LF	LF	LF	EACH	
425+48 - 427+29	RT	112.5	---	25	2	* 26' RADIUS
426+58 - 428+41	LT	125	---	62.5	2	* 28' RADIUS
467+26 - 469+44	LT	---	112.5	---	2	
467+49 - 469+68	RT	---	112.5	---	2	
675+43 - 677+25	LT	137.5	---	37.5	2	* 16' RADIUS
675+99 - 678+53	RT	200	---	---	1	
TOTALS:		575	225	125	11	

ALL ITEMS ARE CAT 0010 UNLES NOTED OTHERWISE

TOPSOIL AND SEEDING

				625.0500 SALVAGED TOPSOIL	629.0210 FERTILIZER TYPE B	630.0120 SEEDING MIXTURE NO. 20	630.0200 SEEDING TEMPORARY	630.0500 SEED WATER
STATION	-	STATION	LOCATION	SY	CWT	LB	LB	MGAL
425+22	-	427+25	RT	665	0.50	22	-	18
426+58	-	428+80	LT	480	0.35	15	-	12
466+76	-	466+95	LT	450	0.35	14	-	12
467+00	-	470+18	RT	570	0.40	17	-	14
675+02	-	677+21	LT	540	0.40	16	-	14
675+54	-	678+55	RT	755	0.50	21	-	17
	-		UNDISTRIBUTED	870	0.50	25	70	23
TOTALS:				4,330	3.00	130	70	110

EROSION CONTROL

			628.1104 EROSION BALES EACH	628.1504 SILT FENCE LF	628.1520 SILT FENCE MAINTENANCE LF	628.2008 EROSION MAT URBAN CLASS I TYPE B SY	628.7504 TEMPORARY DITCH CHECKS LF	628.7560 TRACKING PADS EACH	628.7570 ROCK BAGS EACH
STATION	STATION	LOCATION							
425+22	-	427+25	RT	20	303	303	667	---	20
426+58	-	428+80	LT	20	277	277	478	---	20
466+70	-	470+00	LT	20	372	372	450	---	20
466+95	-	470+22	RT	20	349	349	568	---	20
675+00	-	677+21	LT	20	250	250	538	---	20
675+50	-	677+00	RT	---	---	---	393	20	---
677+45	-	678+62	RT	10	146	146	301	---	10
-	-	-	UNDISTRIBUTED	30	423	423	854	5	30
TOTALS:			140	2,120	2,120	4,250	25	3	140

SIGNING ITEMS

		638.2102 MOVING SIGNS TYPE II	638.4000 MOVING SMALL SIGN SUPPORTS	COMMENTS
STATION	LOCATION	EACH	EACH	
425+51	RT	1	1	ADOPT-A-HIGHWAY
426+82	RT	1	1	COUNTY V
426+82	RT	1	---	RIGHT DIRECTIONAL ARROW
427+59	LT	1	1	COUNTY V
427+59	LT	1	---	LEFT/STRAIGHT DIRECTIONAL ARROW
468+60	RT	1	1	SIDE ROAD SYMBOL, MOVE SIGN 300' NORTH
677+17	LT	1	1	STOP
677+20	LT	1	1	STREET INTERSECTION SIGN
TOTALS:		8	6	

ALL ITEMS ARE CAT 0010 UNLES NOTED OTHERWISE

TRAFFIC CONTROL																					
LOCATION	DAYS	643.0300		TRAFFIC CONTROL BARRICADES		643.0420		TRAFFIC CONTROL WARNING LIGHTS		643.0705		643.0900		643.0920		TRAFFIC CONTROL		643.105		643.5000	
		TRAFFIC CONTROL DRUMS EACH	TRAFFIC CONTROL DRUMS DAYS	TRAFFIC CONTROL BARRICADES TYPE III EACH	TRAFFIC CONTROL BARRICADES TYPE III DAYS	TRAFFIC CONTROL WARNING LIGHTS TYPE A EACH	TRAFFIC CONTROL WARNING LIGHTS TYPE A DAYS	TRAFFIC CONTROL SIGNS EACH	TRAFFIC CONTROL SIGNS DAYS	TRAFFIC COVERING SIGNS TYPE II EACH	TRAFFIC COVERING SIGNS TYPE II CYCLE(S)	TRAFFIC CONTROL SIGNS PCMS EACH	TRAFFIC CONTROL SIGNS PCMS DAY	TRAFFIC CONTROL SIGNS PCMS EACH	TRAFFIC CONTROL SIGNS PCMS DAY	TRAFFIC CONTROL SIGNS PCMS EACH	TRAFFIC CONTROL SIGNS PCMS DAY				
BEGINNING OF PROJECT	168	---	---	2	336	4	672	28	4,704	8	1	---	---	---	---	---	---	---	---	---	
BEGINNING OF PROJECT	7	---	---	---	---	---	---	---	---	---	---	1	7	---	---	---	---	---	---	---	
DETOUR	168	---	---	2	336	4	672	62	10,416	---	---	---	---	---	---	---	---	---	---	---	
STRUCTURE C-22-231	90	---	---	14	1,260	20	1,800	4	360	---	---	---	---	---	---	---	---	---	---	---	
STRUCTURE C-22-230	90	---	---	14	1,260	20	1,800	4	360	---	---	---	---	---	---	---	---	---	---	---	
STRUCTURE C-22-229	80	---	---	14	1,120	20	1,600	4	320	---	---	---	---	---	---	---	---	---	---	---	
END OF PROJECT	168	---	---	2	336	4	672	31	5,208	6	1	---	---	---	---	---	---	---	---	---	
END OF PROJECT	7	---	---	---	---	---	---	---	---	---	---	1	7	---	---	---	---	---	---	---	
PROJECT	168	10	1,680	1	168	2	336	2	336	2	1	---	---	---	---	---	---	---	---	1	
TOTALS:			1,680		4,816		7,552		21,704	16							14			1	

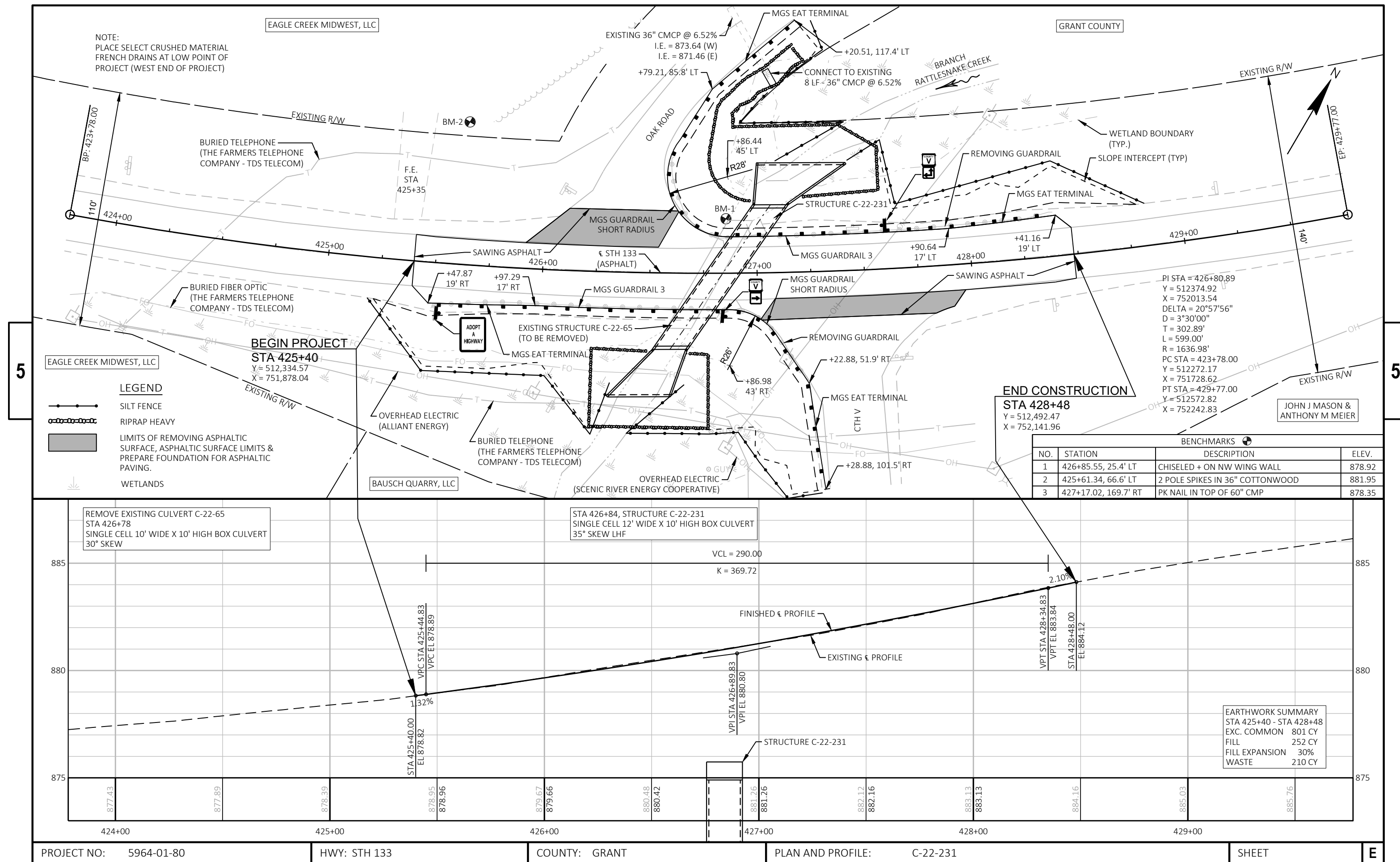
CONSTRUCTION STAKING					
CATEGORY	LOCATION	650.4500	650.5000	650.9910	650.9920
		CONSTRUCTION STAKING SUBGRADE	CONSTRUCTION STAKING BASE	CONSTRUCTION STAKING SUPPLEMENTAL CONTROL	CONSTRUCTION STAKING SLOPE STAKES
		LF	LF	LS	LF
0010	425+40 - 428+48	308	308	1	308
0010	467+16 - 469+75	259	259	---	259
0010	675+35 - 678+55	320	320	---	320
0020	C-22-231	---	---	---	---
0030	C-22-230	---	---	---	---
0040	C-22-229	---	---	---	---
TOTALS:		887	887	1	887

PAVEMENT MARKING			
STATION - STATION	LOCATION	646.1020	
		MARKING LINE	MARKING LINE
		EPOXY 4-INCH	EPOXY 4-INCH
		WHITE	YELLOW
		LF	LF
425+40 - 428+48	CL	---	616
425+40 - 428+48	LT & RT	616	---
467+16 - 469+75	CL	---	323
467+16 - 469+75	LT & RT	518	---
675+35 - 678+55	CL	---	640
675+35 - 678+55	LT & RT	640	---
TOTALS:		1,774	1,579
		3,353	

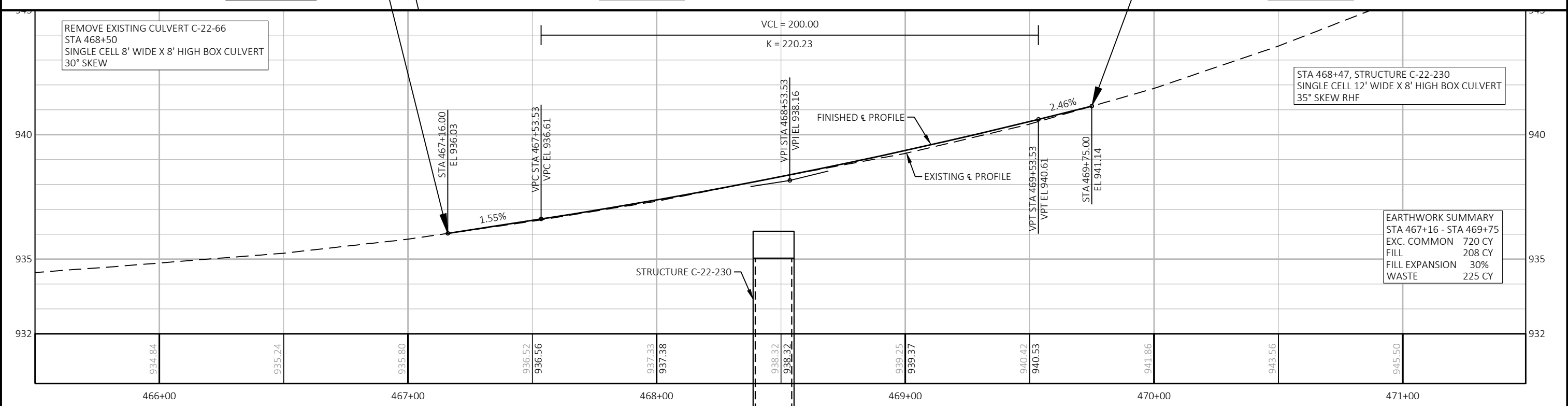
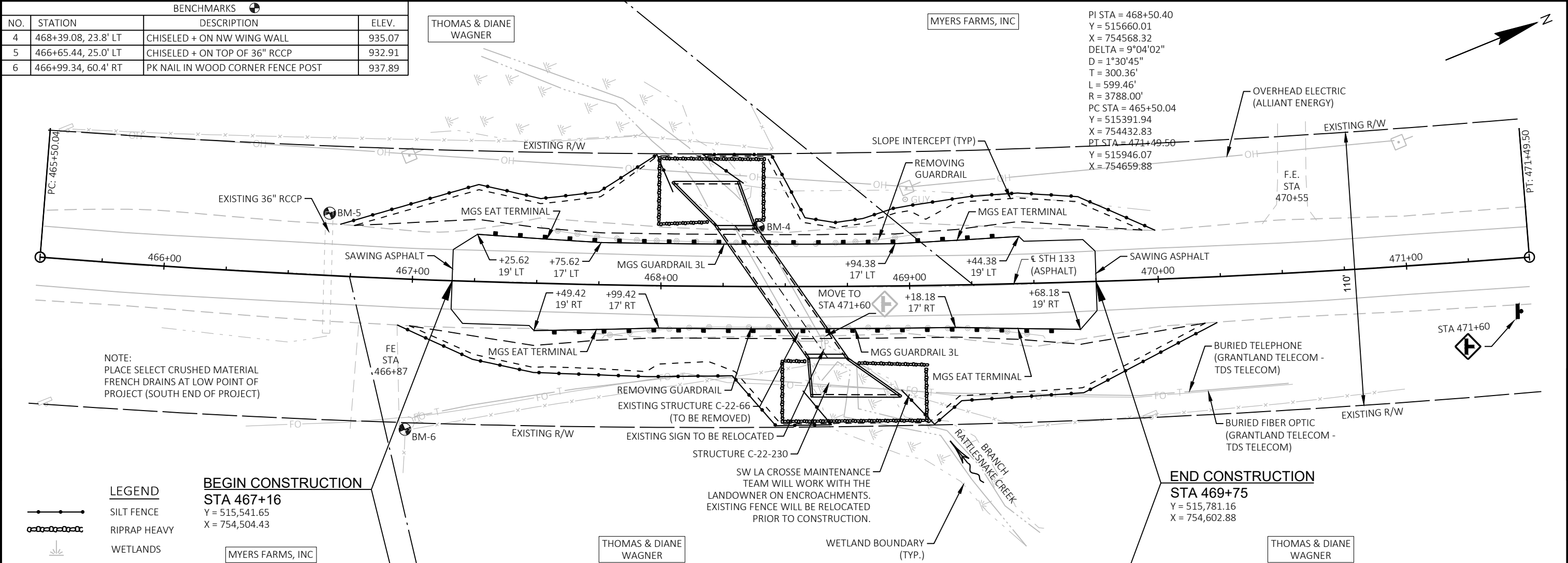
TEMPORARY WATER DIVERSION			
STATION	SPV.0105.01	SPV.0105.02	SPV.0105.03
	TEMPORARY WATER	TEMPORARY WATER	TEMPORARY WATER
	DIVERSION CULVERT C-22-231	DIVERSION CULVERT C-22-230	DIVERSION CULVERT C-22-229
	LS	LS	LS
426+78	1	---	---
468+50	---	1	---
677+05	---	---	1
TOTAL:	1	1	1

SAWING ASPHALT			
structure	690.0150		SAWING
	SAWING	SAWING	
	STATION - STATION	LOCATION	LF
C-22-231	425+40	RT & LT	24
C-22-231	426+11 - 426+63	LT	50
C-22-231	427+01 - 427+83	RT	82
C-22-231	428+48	RT & LT	24
C-22-230	467+16	RT & LT	24
C-22-230	469+75	RT & LT	24
C-22-229	675+35	RT & LT	24
C-22-229	677+19 - 678+14	LT	95
C-22-229	678+55	RT & LT	24
TOTAL:			371

ALL ITEMS ARE CAT 0010 UNLES NOTED OTHERWISE

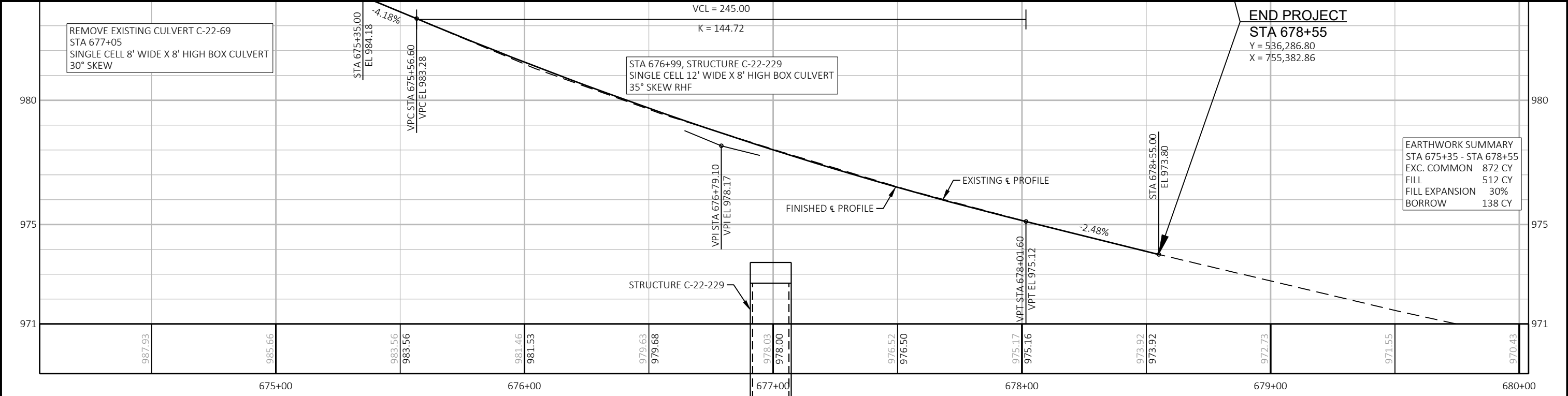
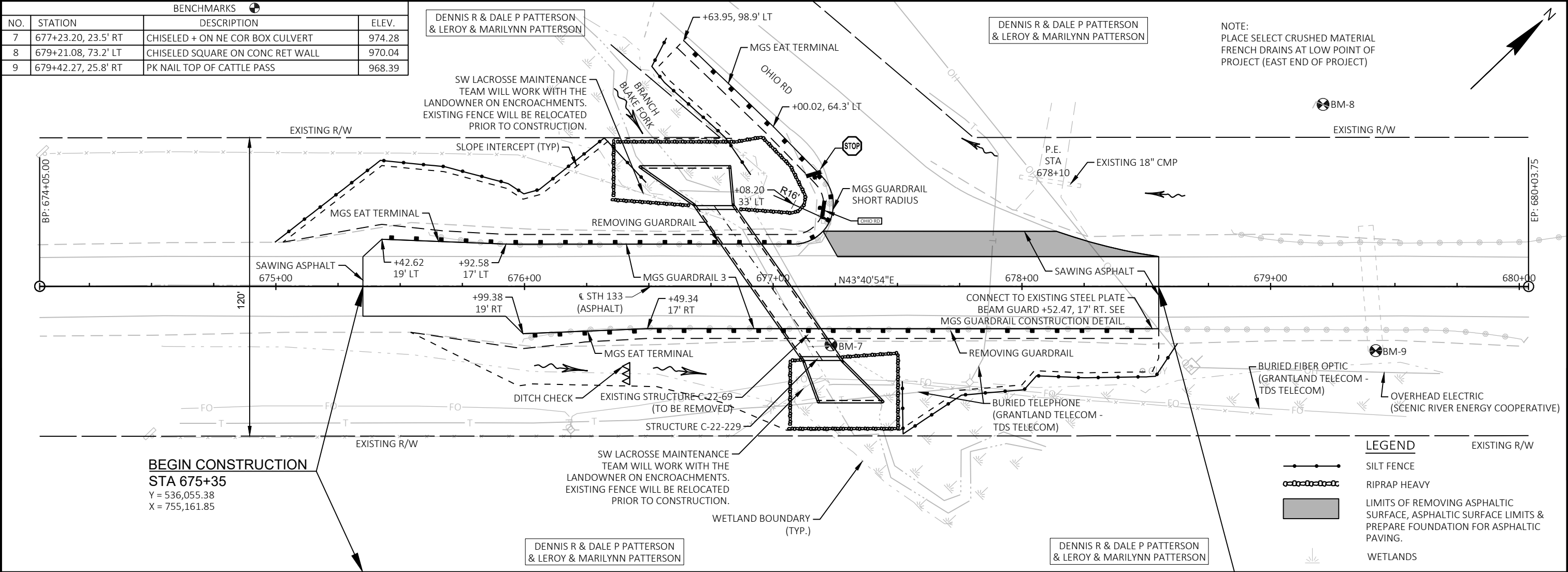


BENCHMARKS			
NO.	STATION	DESCRIPTION	ELEV.
4	468+39.08, 23.8' LT	CHISELED + ON NW WING WALL	935.07
5	466+65.44, 25.0' LT	CHISELED + ON TOP OF 36" RCCP	932.91
6	466+99.34, 60.4' RT	PK NAIL IN WOOD CORNER FENCE POST	937.89



PROJECT NO: 5964-01-80	HWY: STH 133	COUNTY: GRANT	PLAN AND PROFILE: C-22-230	SHEET E
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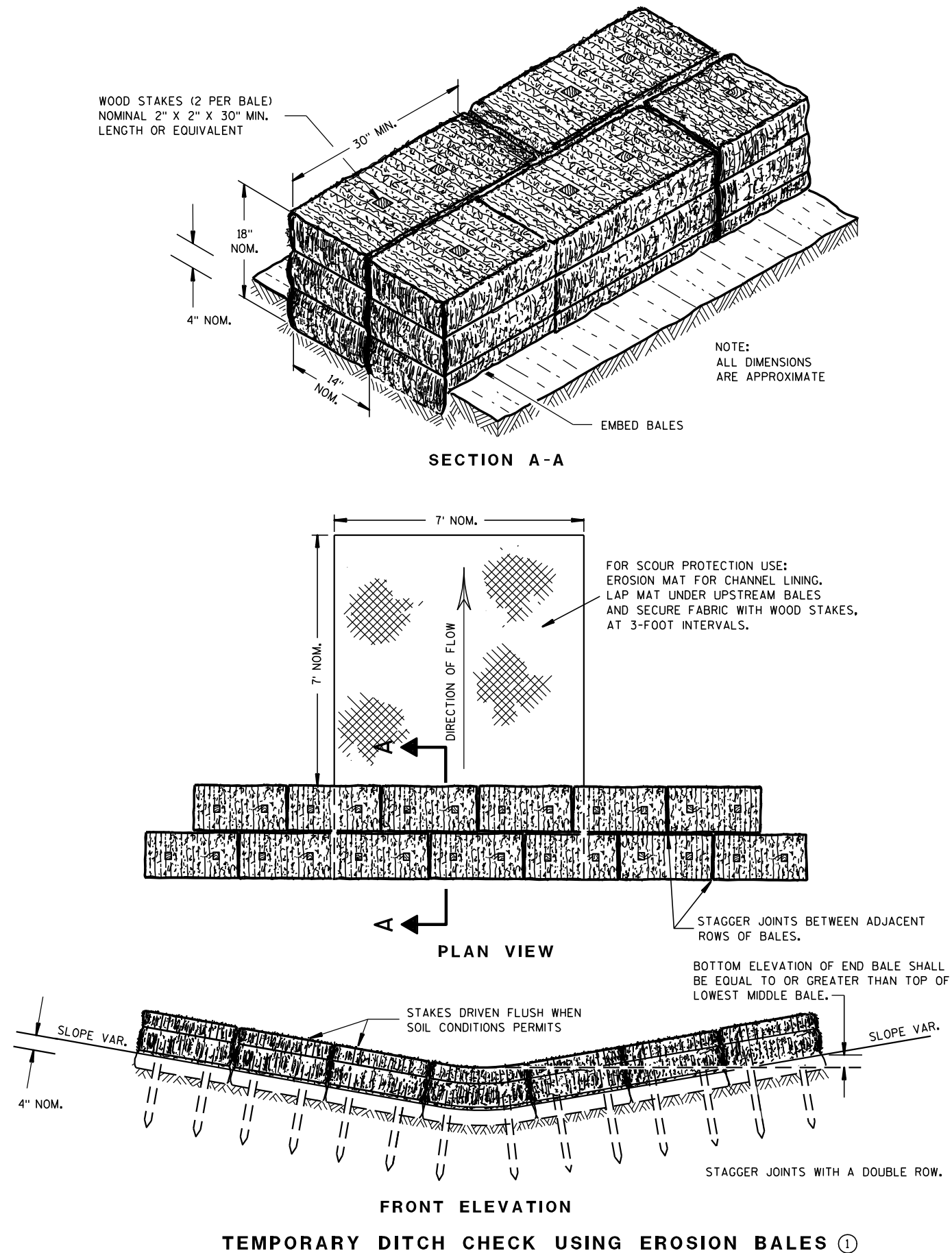
BENCHMARKS			
NO.	STATION	DESCRIPTION	ELEV.
7	677+23.20, 23.5' RT	CHISELED + ON NE COR BOX CULVERT	974.28
8	679+21.08, 73.2' LT	CHISELED SQUARE ON CONC RET WALL	970.04
9	679+42.27, 25.8' RT	PK NAIL TOP OF CATTLE PASS	968.39



PROJECT NO: 5964-01-80	HWY: STH 133	COUNTY: GRANT	PLAN AND PROFILE: C-22-229	SHEET E
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Standard Detail Drawing List

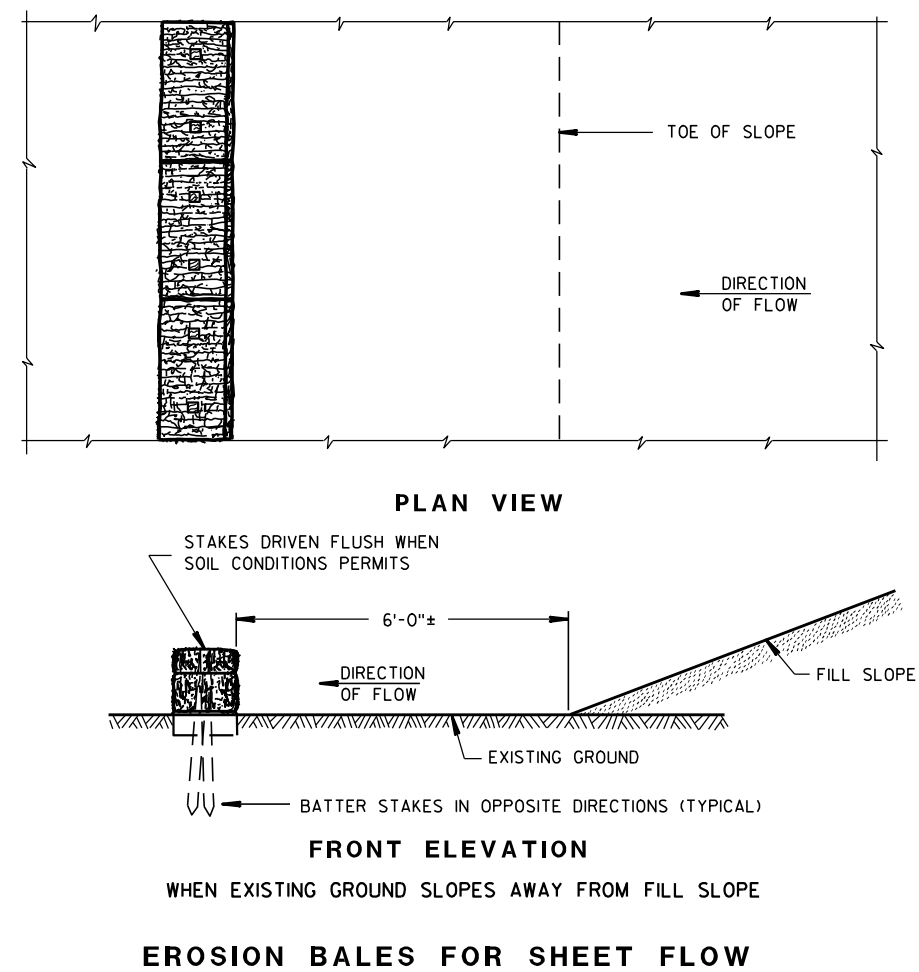
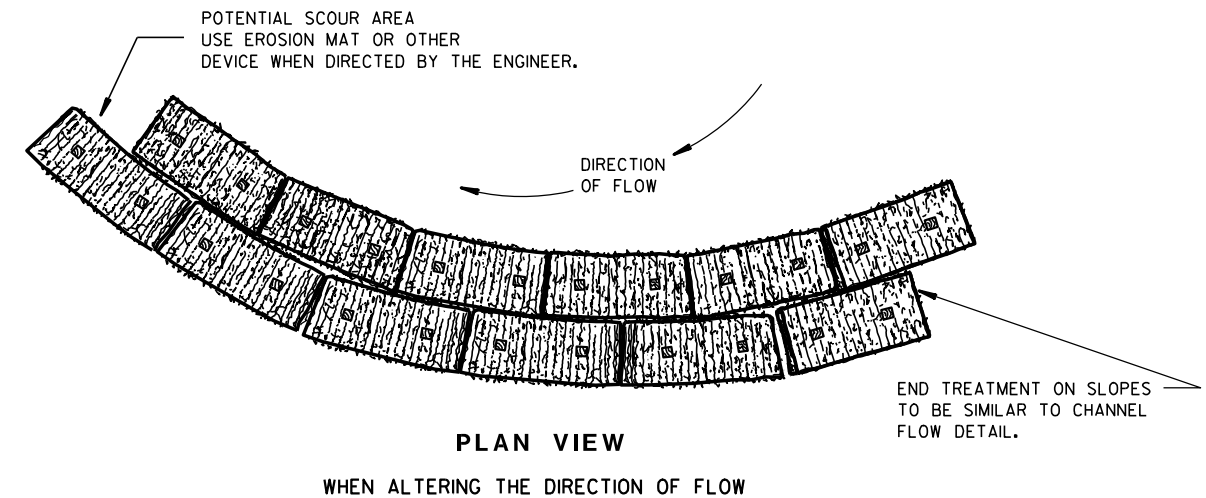
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E14-01	TRACKING PAD
12A03-10	NAME PLATE (STRUCTURES)
14B42-06A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06D	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B44-04A	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-04B	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-04C	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B53-01A	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01B	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01C	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01D	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01E	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01F	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01G	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01H	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01I	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
15C02-08A	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C02-08B	BARRICADES AND SIGNS FOR VARIOUS CLOSURES
15C02-08C	DETOUR SIGNING FOR MAINLINE CLOSURES
15C06-09	SIGNING & MARKING FOR TWO LANE BRIDGES
15C08-20A	LONGITUDINAL MARKING (MAINLINE)
15C11-07B	CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS
15D38-02A	TEMPORARY TRAFFIC CONTROL SIGN MOUNTING
15D38-02B	ATTACHMENT OF SIGNS TO POSTS



GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- ① TEMPORARY DITCH CHECKS EITHER EROSION BALES OR MANUFACTURED SHALL BE PAID FOR UNDER THE BID ITEM OF TEMPORARY DITCH CHECK. THE DEPARTMENT WILL NOT PAY FOR TEMPORARY DITCH CHECKS CONSTRUCTED OF A SINGLE ROW OF EROSION BALES.

TYPICAL INSTALLATIONS OF
EROSION BALES / TEMPORARY
DITCH CHECKS

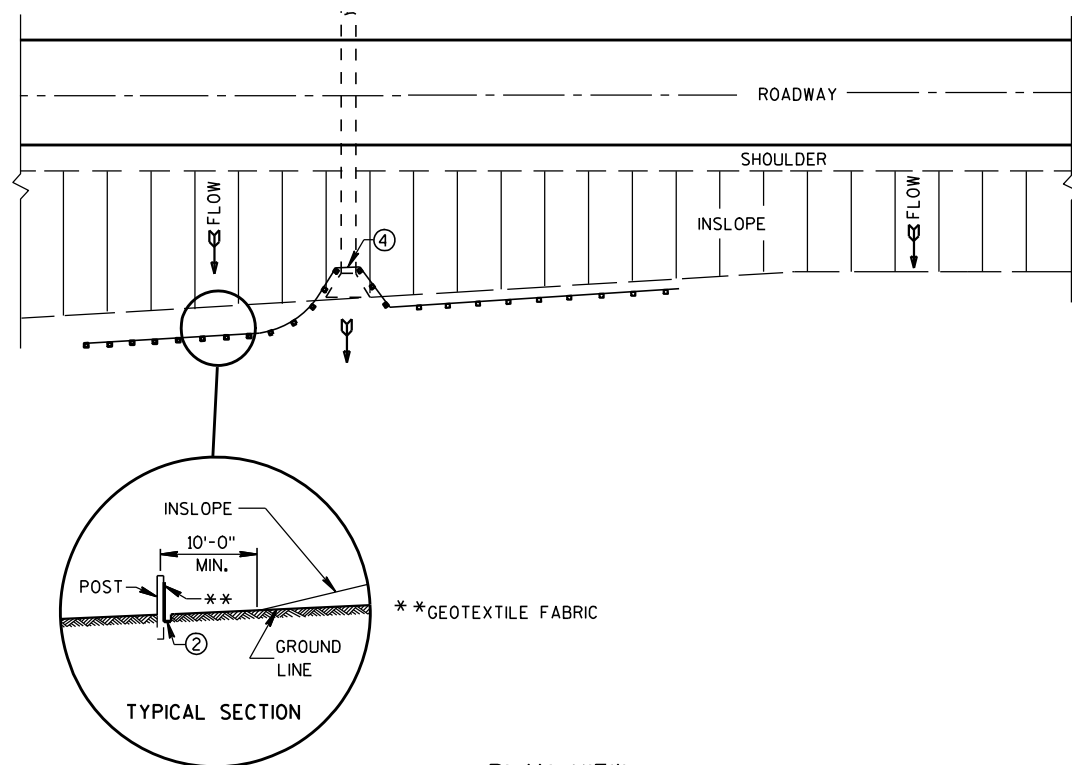
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

6/04/02
DATE

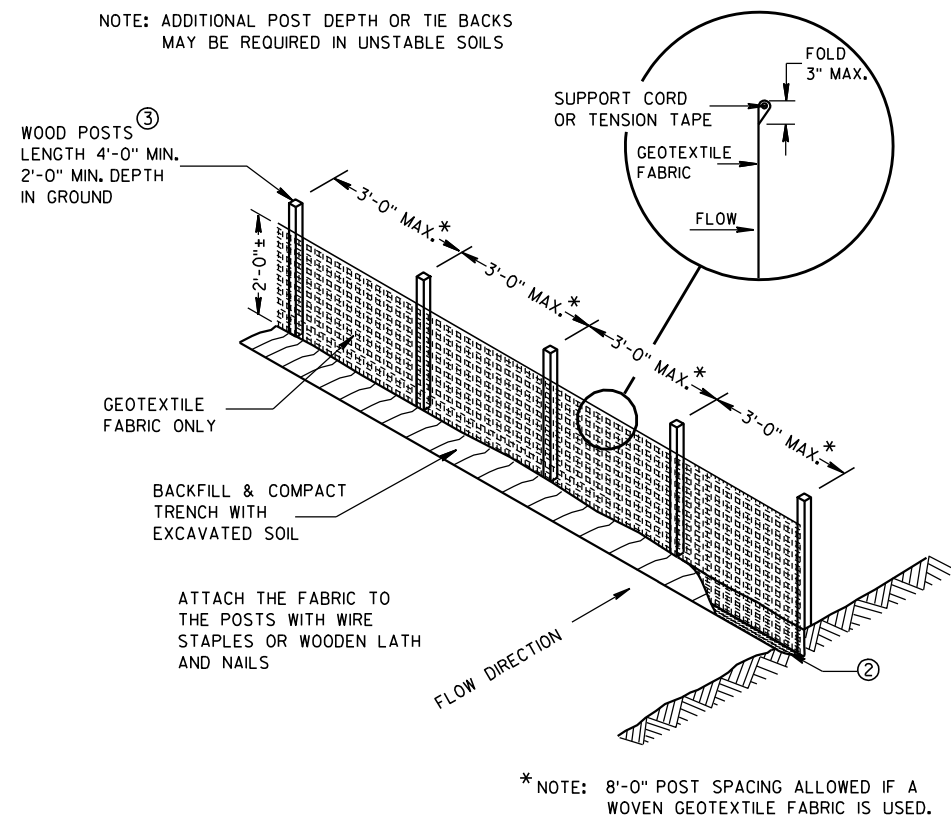
FHWA

/S/ Beth Canestra
CHIEF ROADWAY DEVELOPMENT ENGINEER

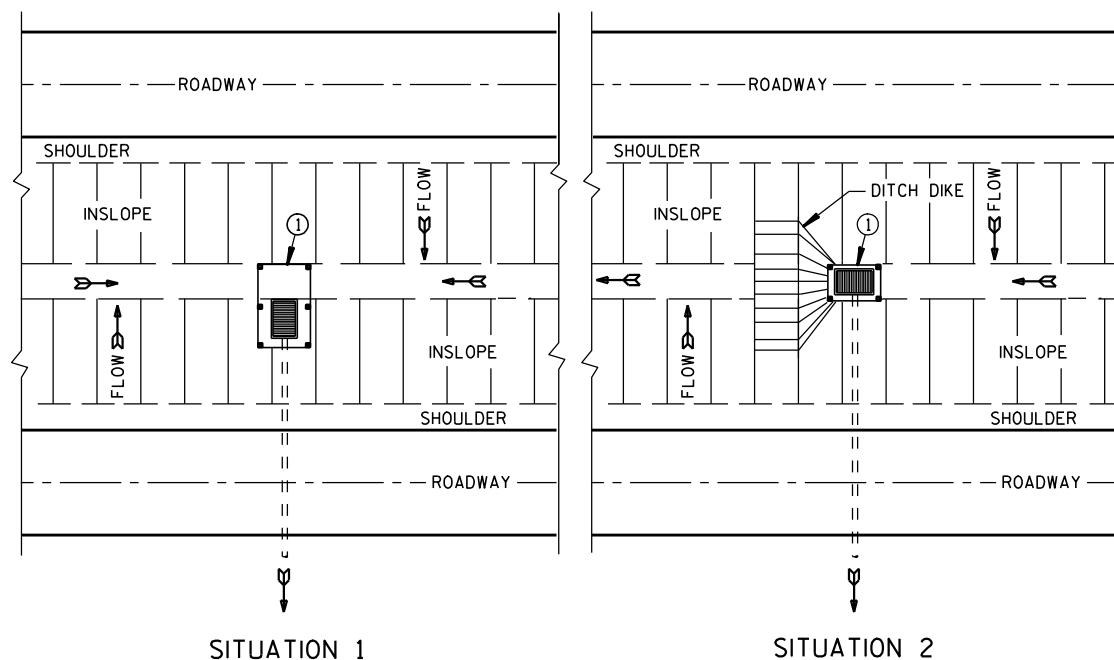


TYPICAL APPLICATION OF SILT FENCE

NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS

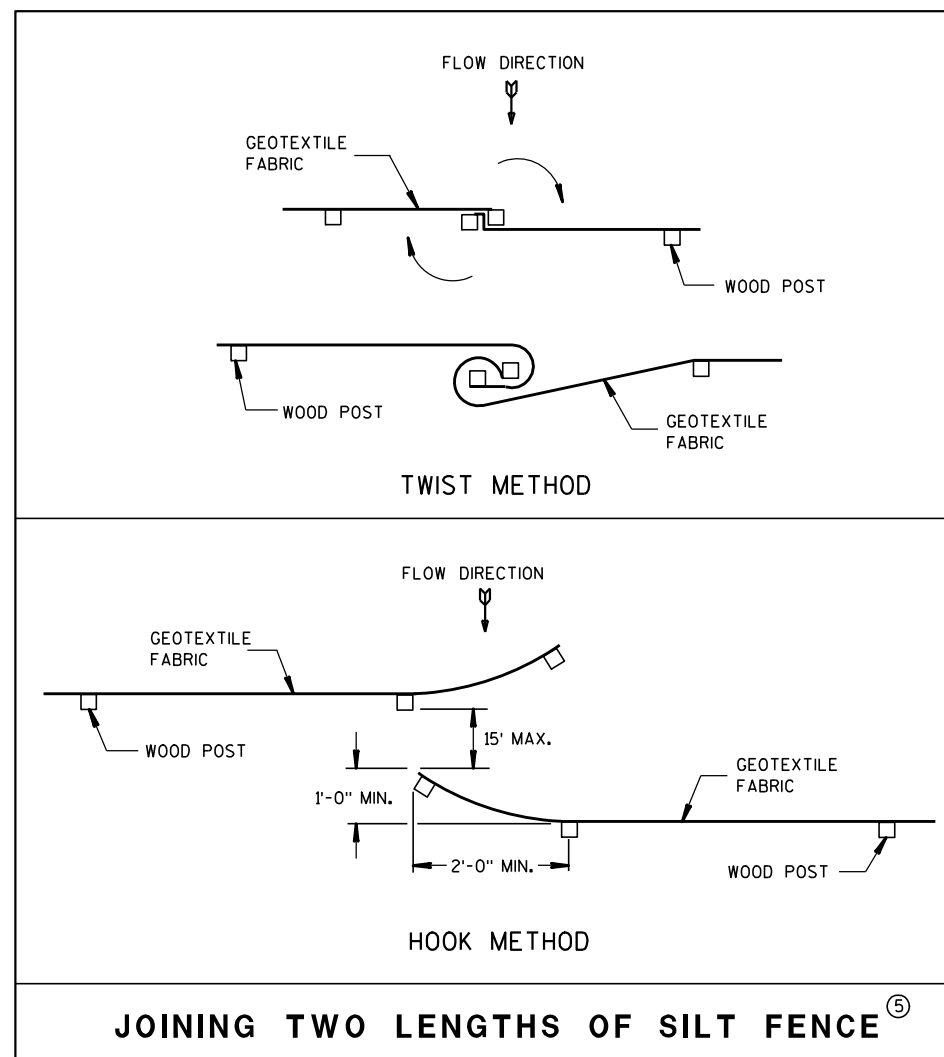


SILT FENCE



PLAN VIEW

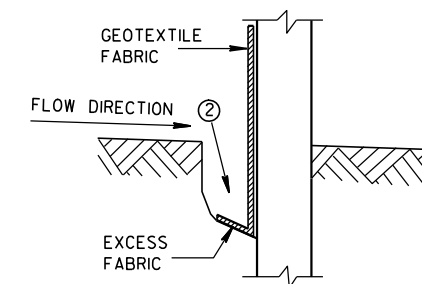
SILT FENCE AT MEDIAN SURFACE DRAINS



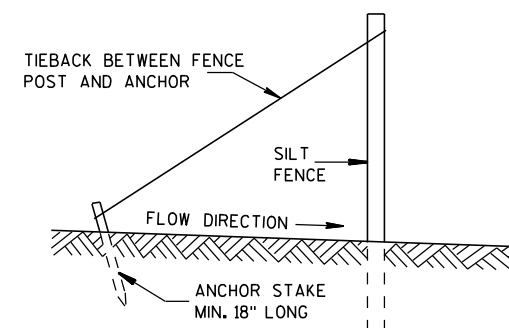
GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

- ① HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
- ② FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
- ③ WOOD POSTS SHALL BE A MINIMUM SIZE OF 1 1/8" X 1 1/8" OF OAK OR HICKORY.
- ④ SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.
- ⑤ CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.



TRENCH DETAIL



SILT FENCE TIE BACK (WHEN REQUIRED BY THE ENGINEER)

SILT FENCE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

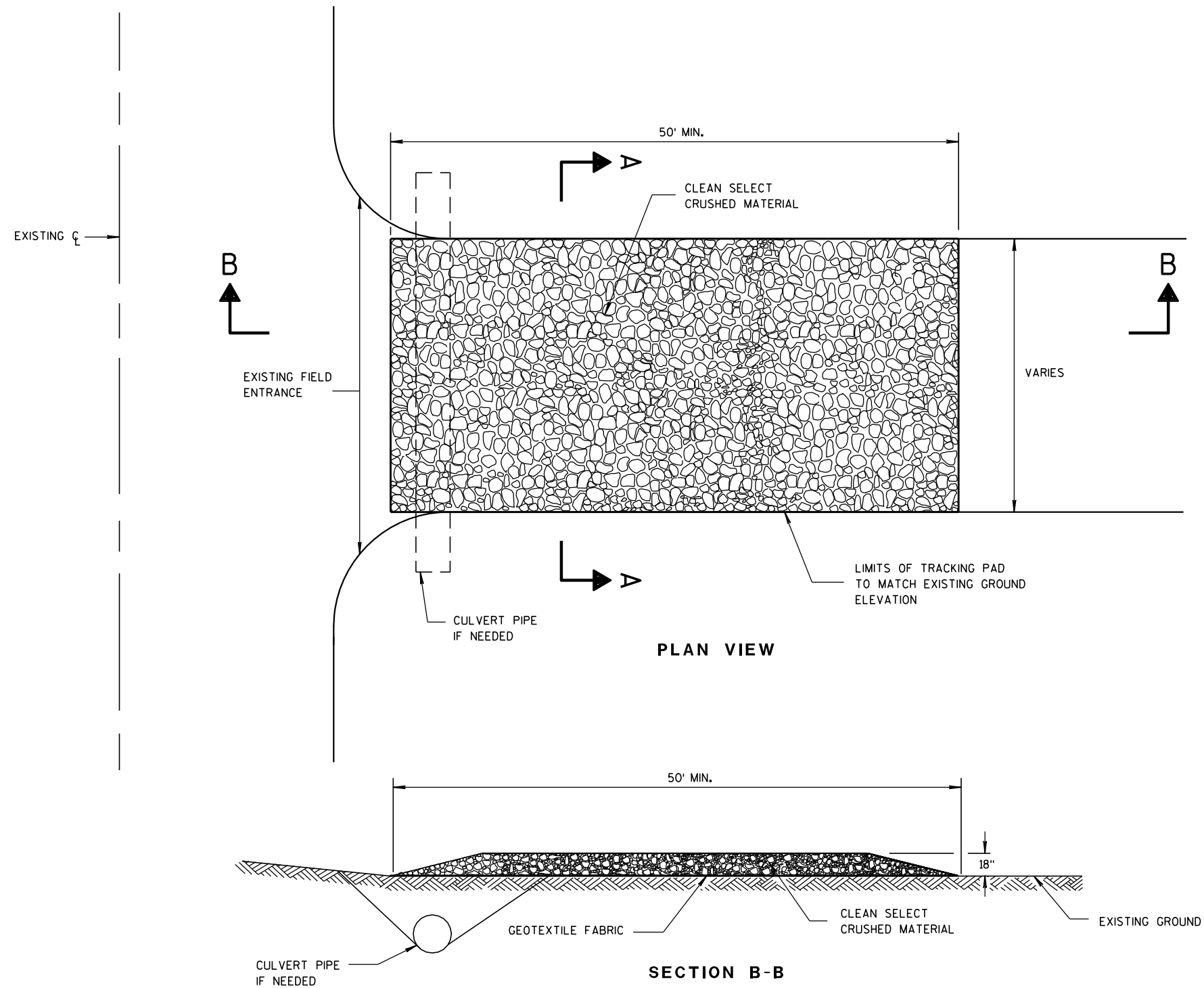
APPROVED

4-29-05

DATE

FHWA

/S/ Beth Canestra
CHIEF ROADWAY DEVELOPMENT ENGINEER



TRACKING PAD

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

TRACKING PAD SHALL BE INSPECTED DAILY. DEFICIENT AREAS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

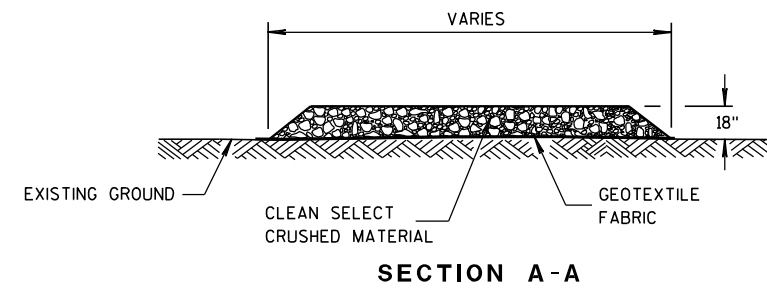
TRACKING PAD TO BE REMOVED AFTER CONSTRUCTION IS COMPLETED.

TRACKING PAD SHALL BE THE FULL WIDTH OF THE EGRESS POINT.

SURFACE WATER MUST BE PREVENTED FROM PASSING THROUGH THE TRACKING PAD. FLOWS SHALL BE DIVERTED AWAY, AROUND OR CONVEYED UNDER THE TRACKING PAD.

CULVERT PIPE OR OTHER BMP USED TO DIVERT WATER AWAY, AROUND OR UNDER THE TRACKING PAD SHALL BE DESIGNED TO CONVEY THE 2 YEAR - 24 HOUR EVENT.

THE COST OF ADDITIONAL BMP TO DIVERT WATER ARE INCIDENTAL TO THE TRACKING PAD BID ITEM.



TRACKING PAD

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

3/24/2011

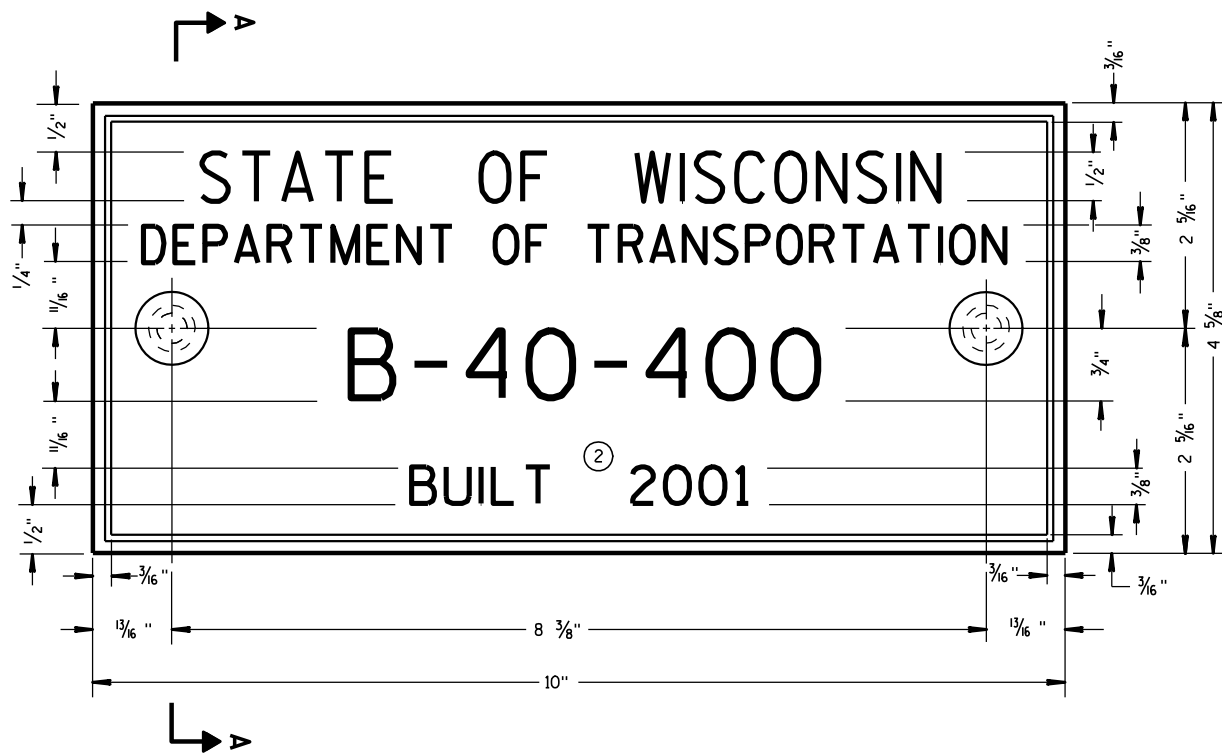
DATE

FHWA

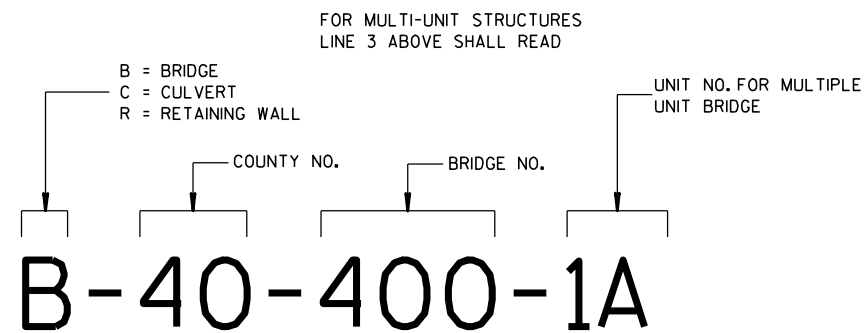
/S/ Jerry H. Zogg

ROADWAY STANDARDS DEVELOPMENT

ENGINEER



TYPICAL NAME PLATE
(BRIDGES, CULVERTS, AND RETAINING WALLS)



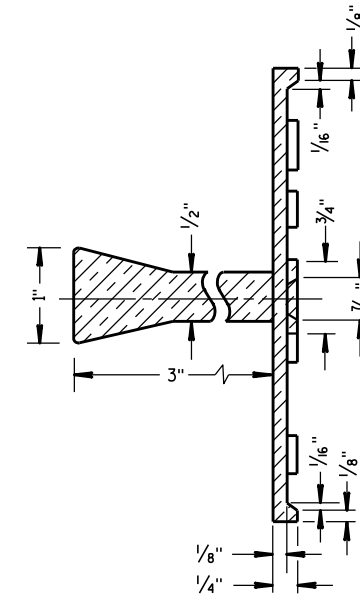
**NUMBERING DESIGNATION
MULTI-UNIT STRUCTURES**

GENERAL NOTES

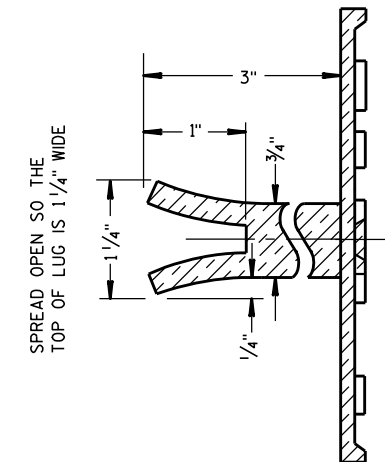
NAME PLATES TO BE INSTALLED ON BRIDGES, CULVERTS, AND RETAINING WALLS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS.

THE BRIDGE NUMBER AND YEAR BUILT SHOWN ON THIS DRAWING ARE EXAMPLES ONLY. SEE CONSTRUCTION PLANS FOR INDIVIDUAL NUMBERING AND YEAR BUILT.

- ① EPOXY RESIN SHALL BE FROM AN APPROVED MANUFACTURER AND USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ② REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.

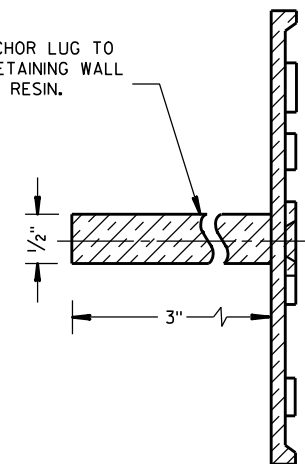


SECTION A-A



ALTERNATE LUG

- ① ADHERE ANCHOR LUG TO PRECAST RETAINING WALL WITH EPOXY RESIN.



ALTERNATE LUG
(FOR ATTACHMENT TO PRECAST STRUCTURES)

**NAME PLATE
(STRUCTURES)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

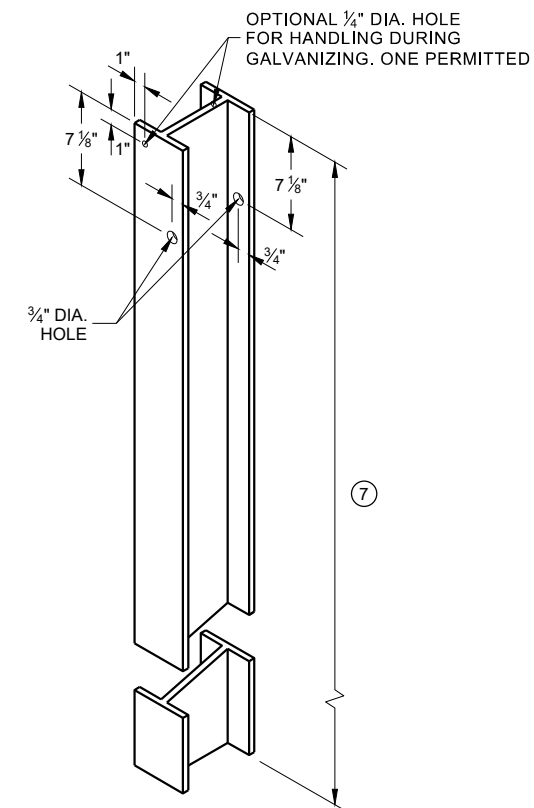
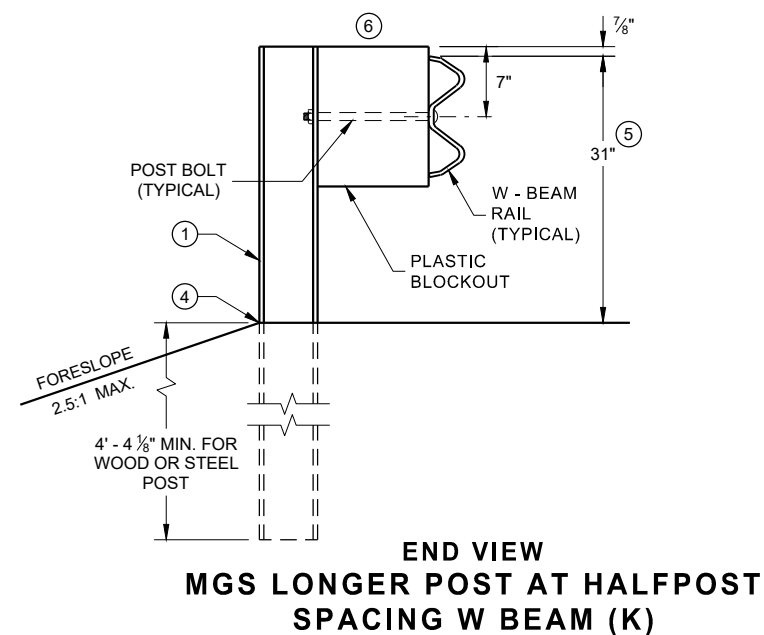
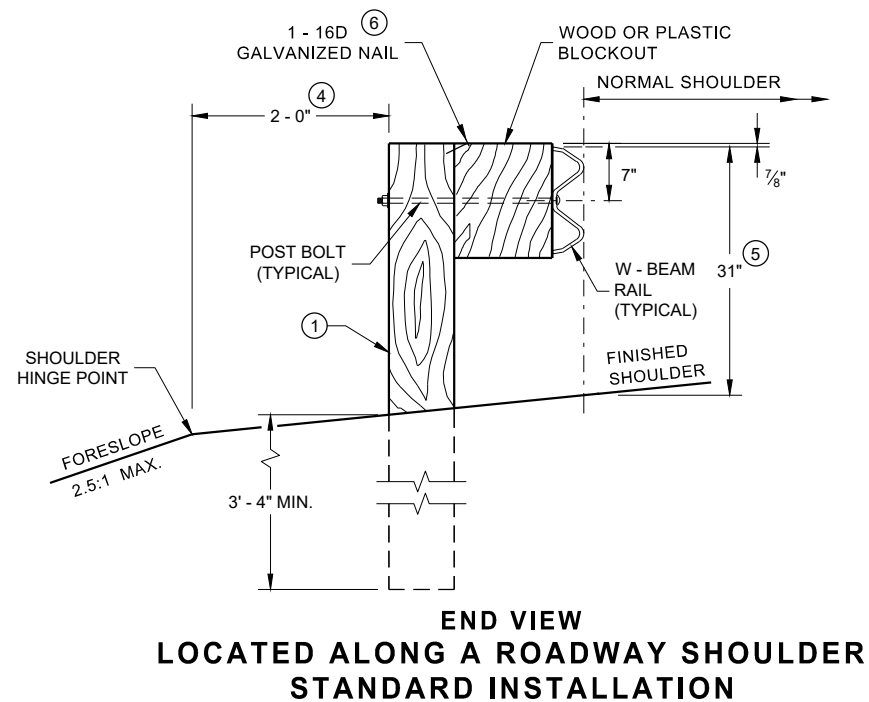
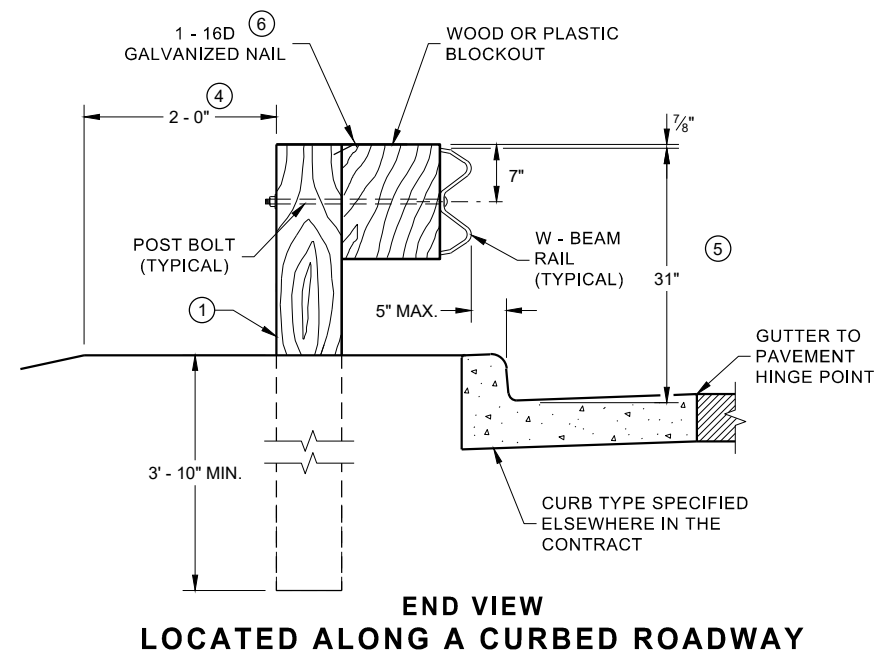
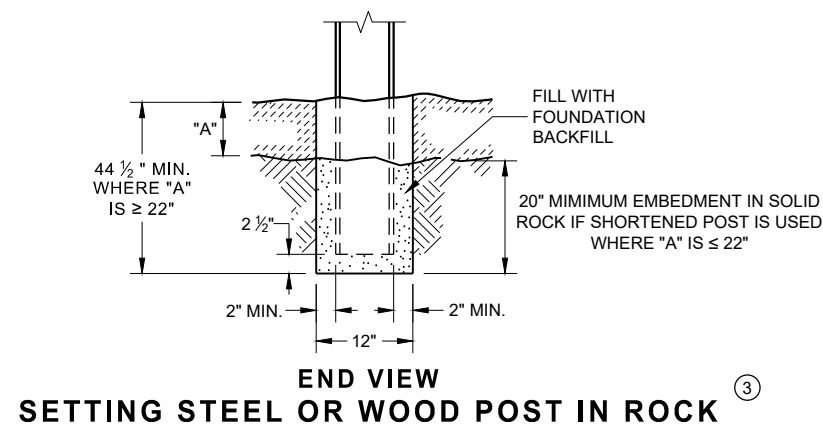
APPROVED

3/26/10
DATE

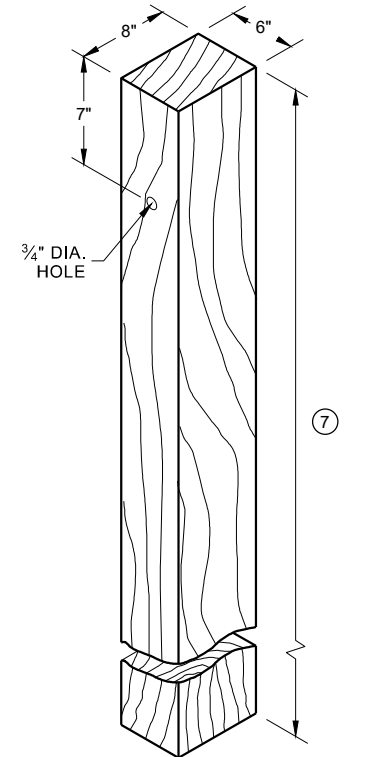
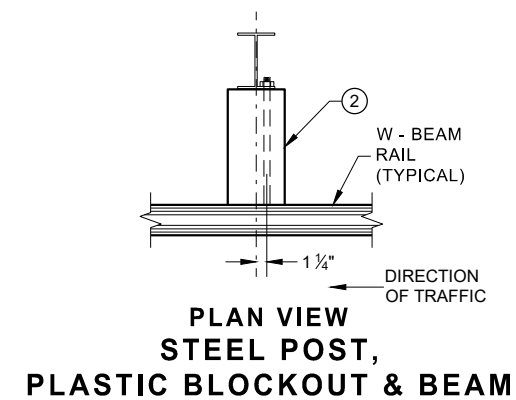
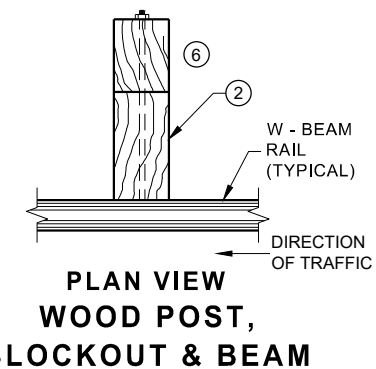
FHWA

/S/ Scot Becker
CHIEF STRUCTURAL DEVELOPMENT ENGINEER

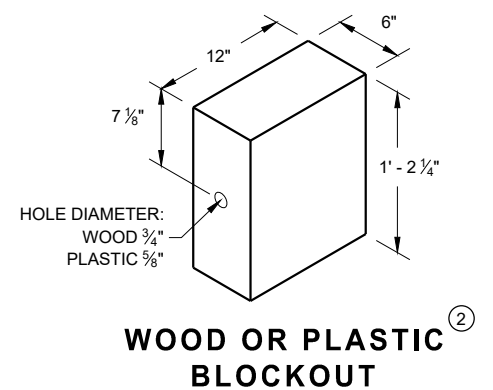
- ① WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- ② USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.
- ③ IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2 1/2" INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AND INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.
- ④ WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).
- ⑤ FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS +1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27 3/4" TO 32".
- ⑥ WHEN USING STEEL POST AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- ⑦ TOTAL POST LENGTH FOR TYPE K IS 7' - 0".
TOTAL POST LENGTH FOR OTHER MGS TYPES IS 6' - 0".

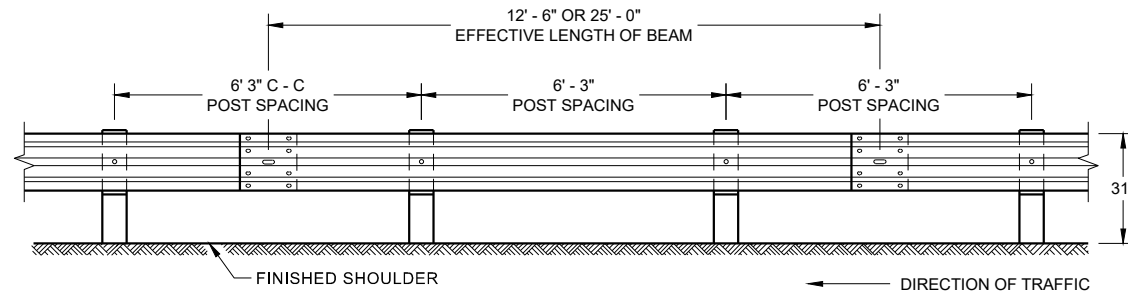


**STEEL POST & HOLE
PUNCHING DETAIL
(W 6 X 9) ①**

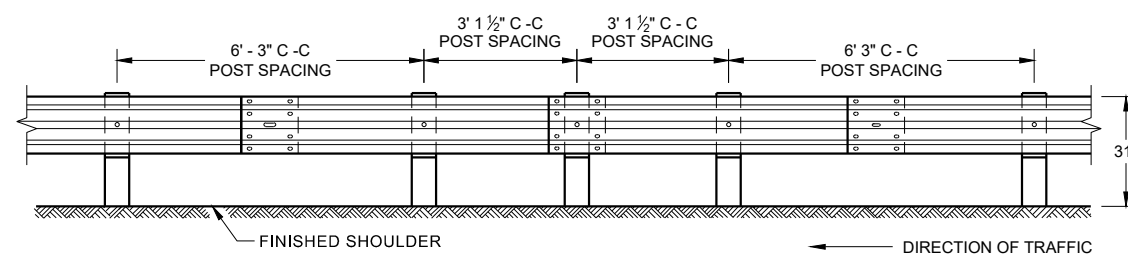


WOOD POST (6" X 8") NOMINAL ⁽¹⁾

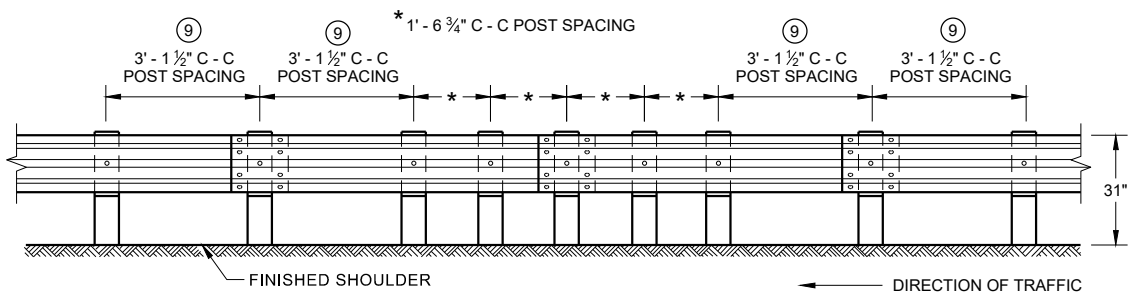




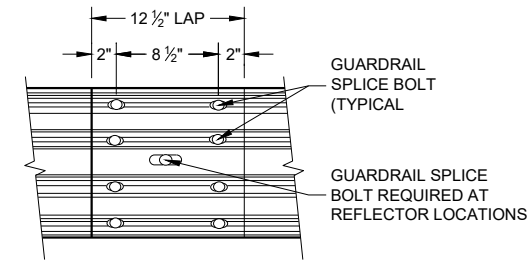
**FRONT VIEW
POST SPACING STANDARD INSTALLATION**



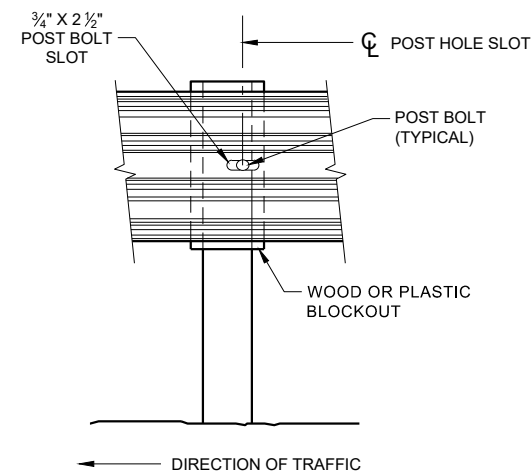
**FRONT VIEW
HALF POST SPACING (HS) AND
HALF POST SPACING WITH LONGER POSTS (K)**



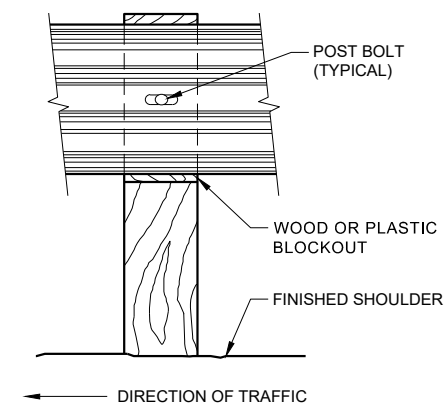
**FRONT VIEW
QUARTER POST SPACING (QS)**



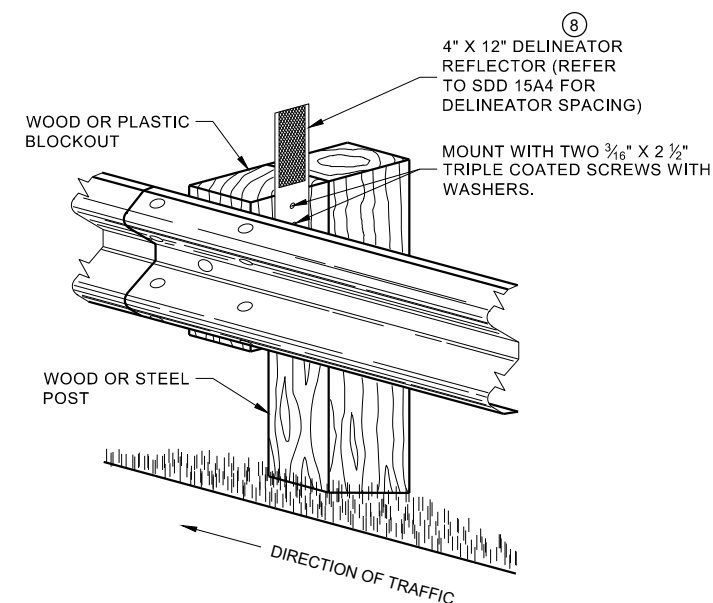
**FRONT VIEW
MID-SPAN BEAM SPLICE**



FRONT VIEW AT STEEL POST



FRONT VIEW AT WOOD POST



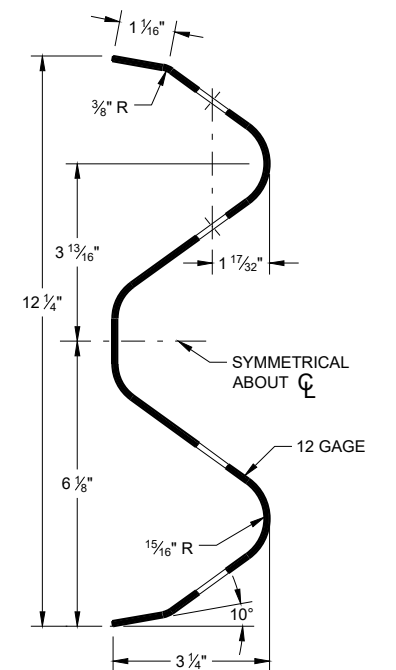
**ONE SIDED REFLECTOR DETAIL
AND TYPICAL INSTALLATION**

GENERAL NOTES

- 8 DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
- 9 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.

POST BOLTS ARE A 3/4" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 3/4" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.

GUARD RAIL SPLICE BOLTS ARE A 3/4" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.



SECTION THRU W-BEAM RAIL

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.

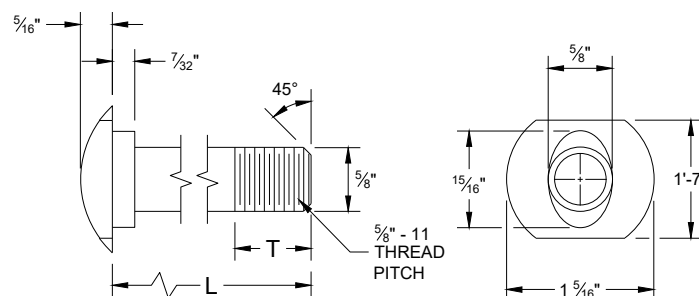


NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.

DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.

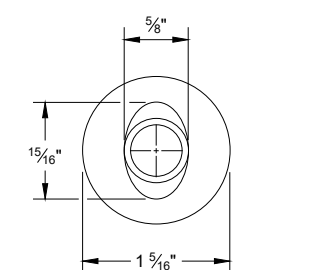
NOTE:

1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF $\frac{3}{16}$ ".
2. IF THE BOLT EXTENDS MORE THAN $\frac{1}{4}$ " FROM THE NUT THE BOLT SHOULD BE TRIMMED BACK.

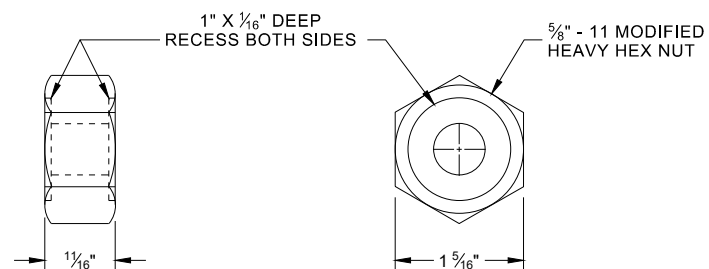


POST BOLT TABLE

L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"

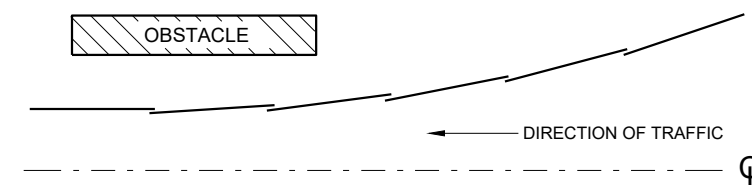


ALTERNATE BOLT HEAD

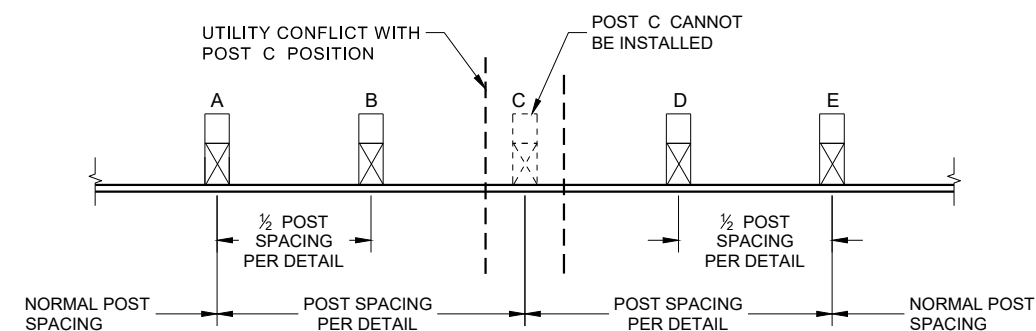


POST BOLT, SPLICE BOLT AND RECESS NUT

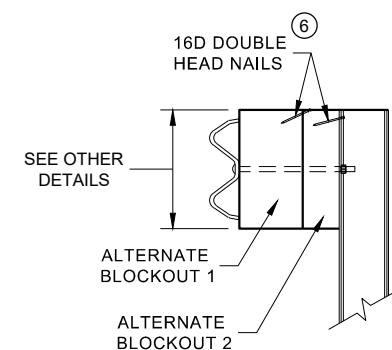
⑥ WHEN USING STEEL POST AD WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.



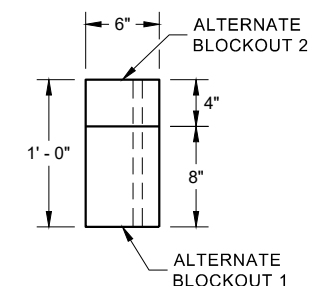
**PLAN VIEW
BEAM LAPPING DETAIL**



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION



SIDE VIEW

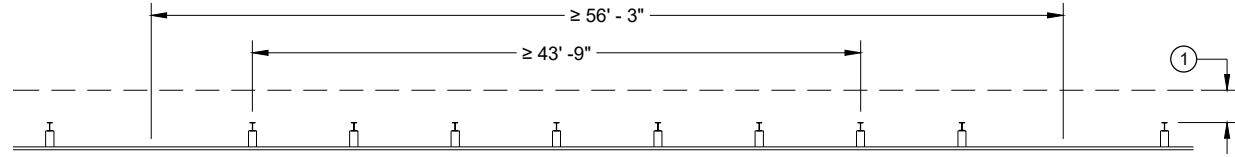


PLAN VIEW

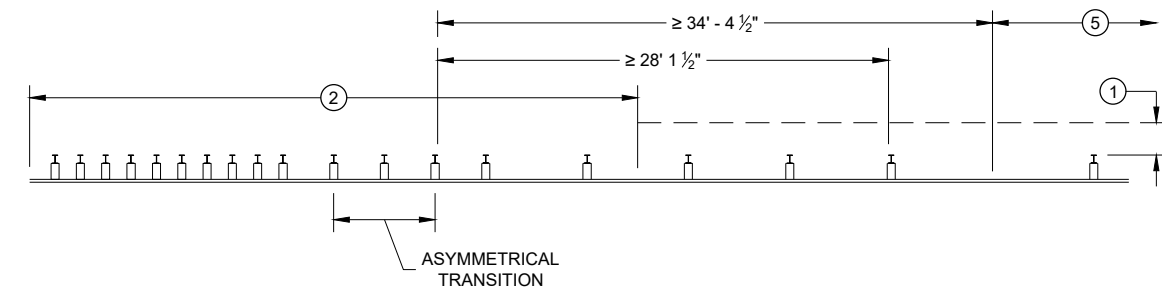
ALTERNATE WOOD BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

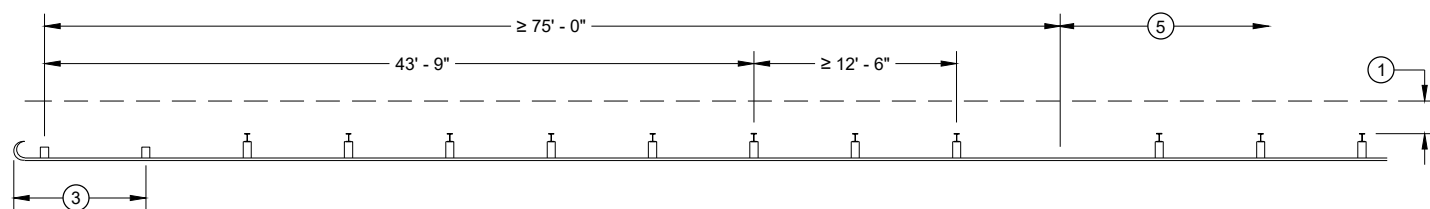
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



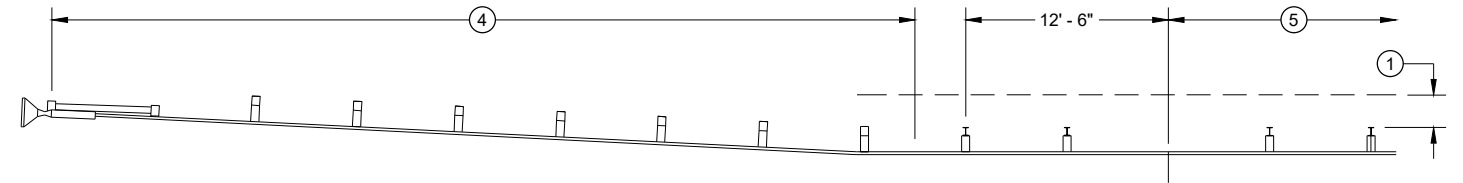
MISSING POST IN NORMAL BEAM GUARD RUN



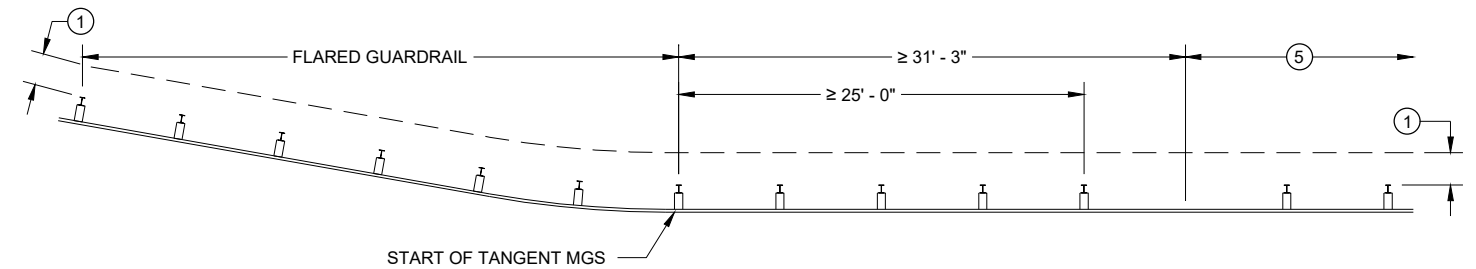
MISSING POST NEAR APPROACH THRIE BEAM TRANSITION



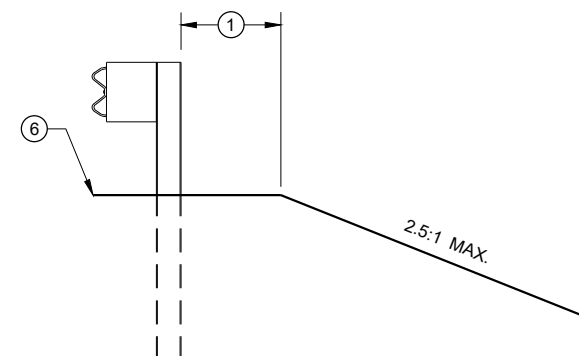
MISSING POST IN NORMAL BEAM GUARD RUN
NEAR TYPE 2 TERMINAL



MISSING POST IN NORMAL BEAM GUARD RUN NEAR EAT



MISSING POST IN NORMAL BEAM GUARD RUN
NEAR FLARED BEAM GUARD



CROSS SECTION VIEW

- (1) MINIMUM OF 2 FEET OF GRADING BEHIND POST.
- (2) SEE SDD 14B45 FOR MORE DETAILS.
- (3) SEE SDD 14B47 FOR MORE DETAILS.
- (4) SEE SDD 14B44 FOR MORE DETAILS.
- (5) SEE MISSING POST IN NORMAL BEAM GUARD RUN FOR DISTANCE TO NEXT MISSING POST AND AREA FOR WELL DRAINED, COMPACTED SOILS.
- (6) SEE PLAN FOR SHOULDER DESIGN.

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
7/2018
DATE
/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR
FHWA

GENERAL NOTES

- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL) AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
 - (B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED
 - (C) DIFFERENT MANUFACTURERS REQUIRE DIFFERENT PERFORATED W - BEAM RAIL END PANELS. SEE MANUFACTURER'S INFORMATION.
 - (D) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF - TAPPING SCREWS. ONE SCREW PER CORNER.
 - (E) HARDWARE MAY VARY BETWEEN MANUFACTURER. SEE MANUFACTURER'S DRAWING FOR INFORMATION.
- DIMENSIONS MAY VARY, MANUFACTURER'S INFORMATION.

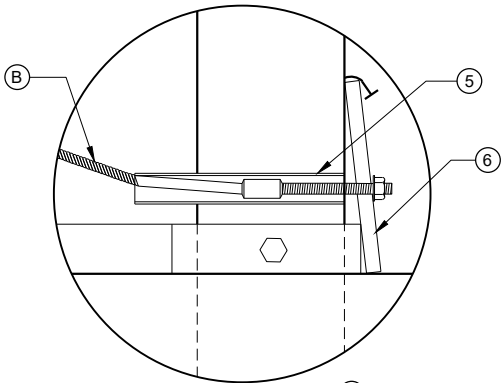
SEE SDD 14B42 FOR MORE INFORMATION.

* DO NOT ATTACH BLOCKOUTS TO POST 1 AND 2.

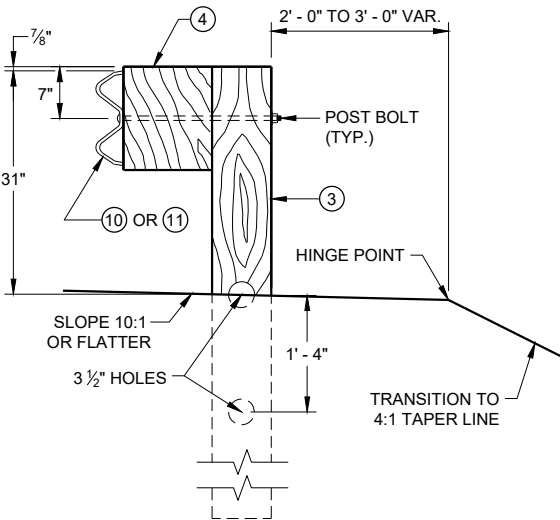
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

SEE MANUFACTURER'S DRAWING FOR SPLICE LOCATION, HARDWARE DIMENSIONS AND INSTALLATION INSTRUCTIONS.

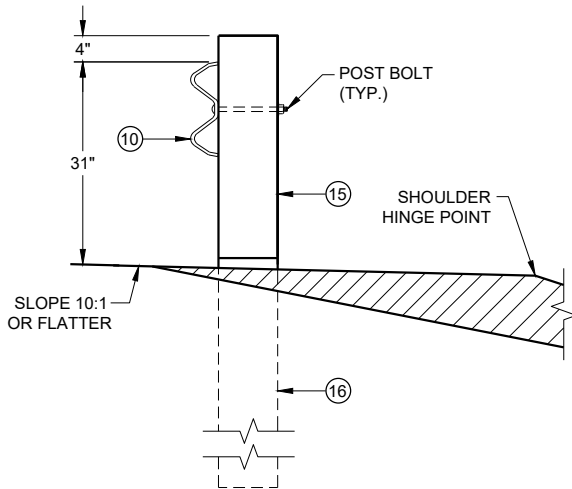
THE CENTER OF THE UPPER 3 1/2" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE. WOOD BLOCKS ON POSTS NUMBERED 3 THROUGH 9 MAY BE ADJUSTED UP TO 3" ABOVE THE TOP OF POST.



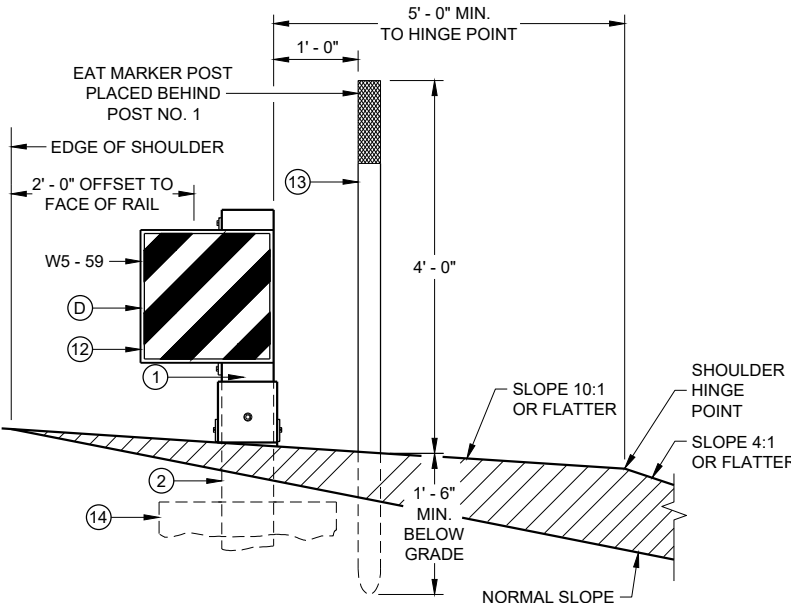
DETAIL "A"



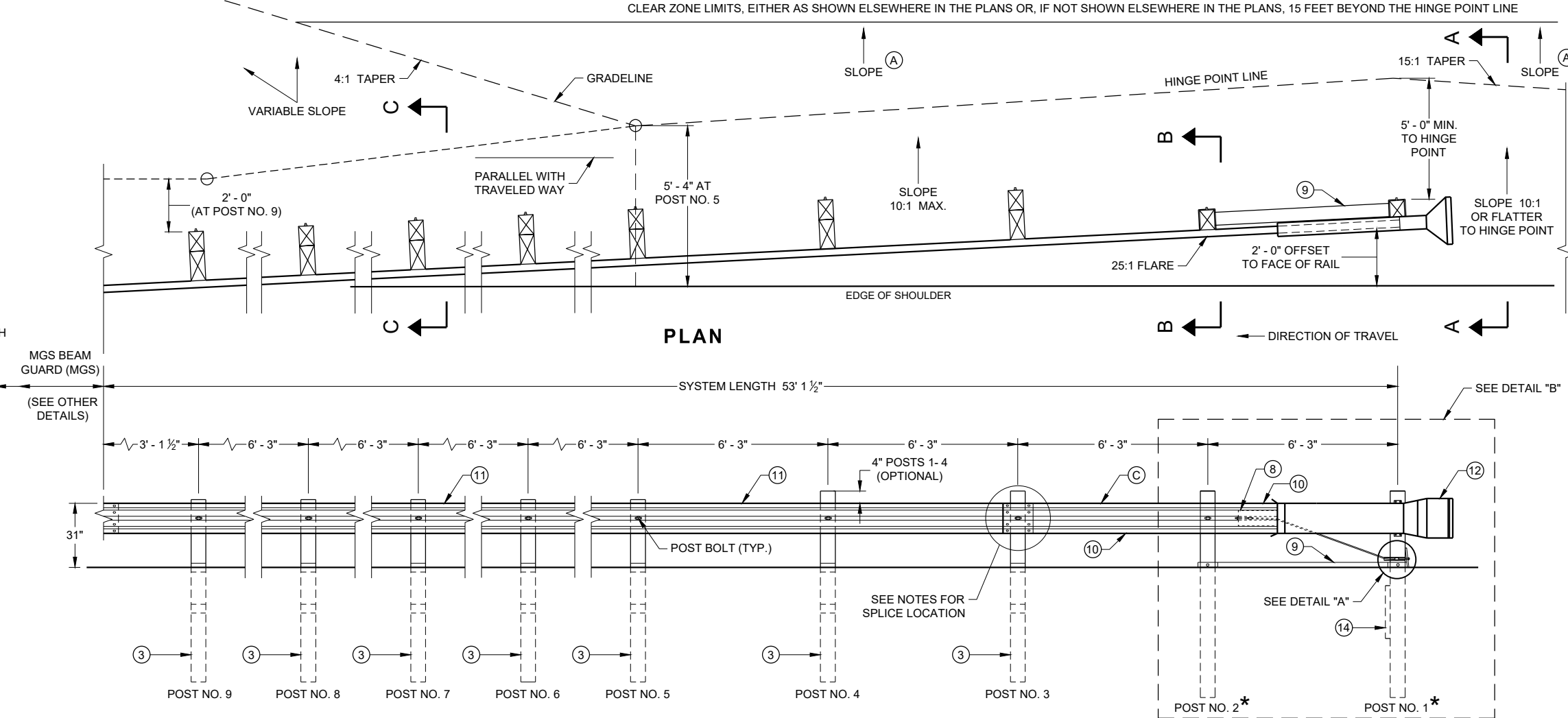
SECTION C - C
TYPICAL AT POST NOS. 3 - 9



SECTION B - B
TYPICAL AT POST NO. 2*

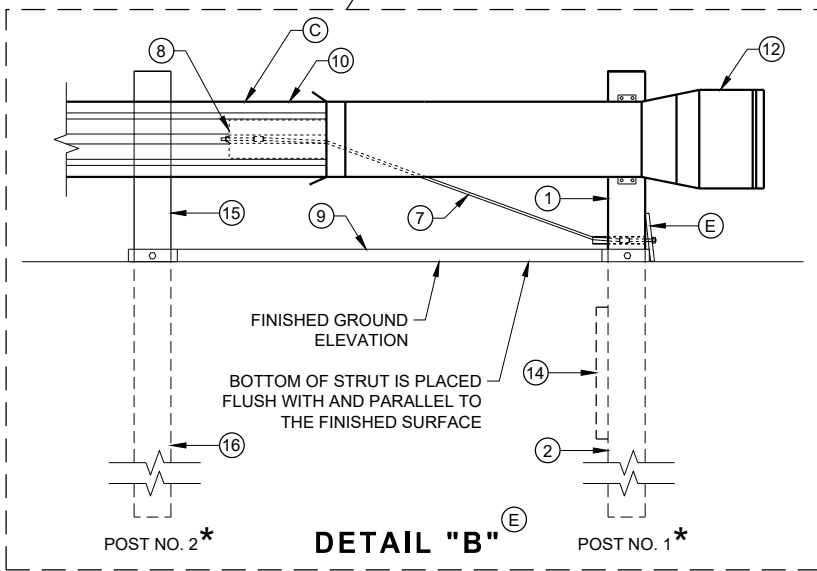


SECTION A - A
TYPICAL AT POST NO. 1*



PLAN

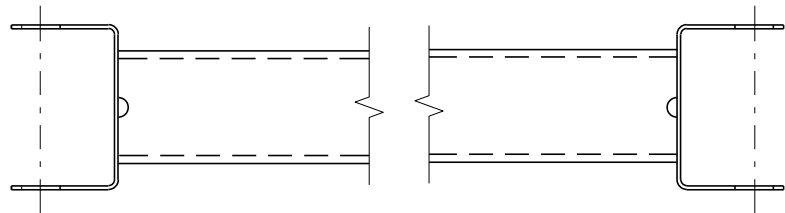
ELEVATION



DETAIL "B"

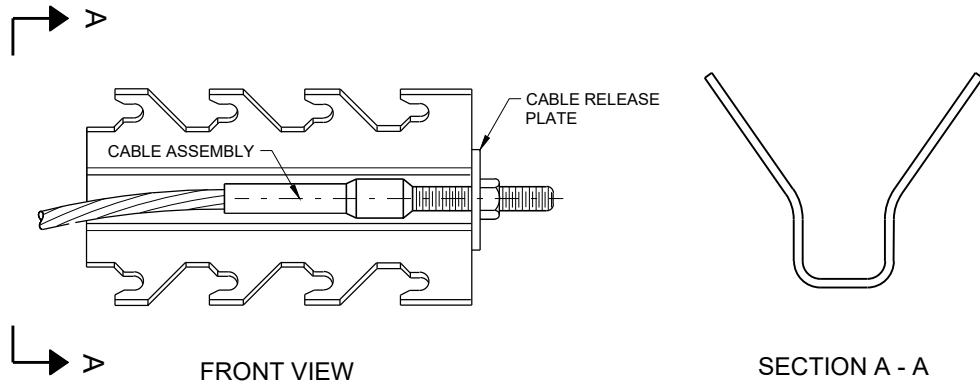
**MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

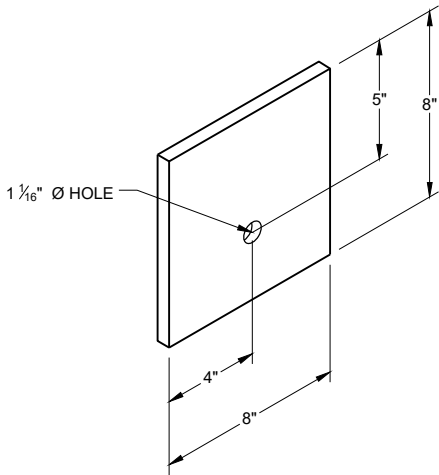


GENERIC GROUND STRUT⁹ ^E

BILL OF MATERIALS	
PART NO.	DESCRIPTION MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
①	UPPER POST NO. 1 6" X 6" TUBE
②	LOWER POST NO. 1
③	WOOD CRT
④	WOOD BLOCKOUT
⑤	PIPE SLEEVE
⑥	BEARING PLATE
⑦	BCT CABLE ASSEMBLY
⑧	ANCHOR CABLE BOX
⑨	GROUND STRUT
⑩	PERFORATED W-BEAM RAIL END PANEL, 12'-6" LONG.
⑪	STANDARD W-BEAM RAIL. MULTIPLE SECTIONS REQUIRED. SECTIONS VARY IN LENGTH.
⑫	IMPACT HEAD
⑬	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)
⑭	SOIL PLATE
⑮	UPPER POST NO. 2
⑯	LOWER POST NO. 2



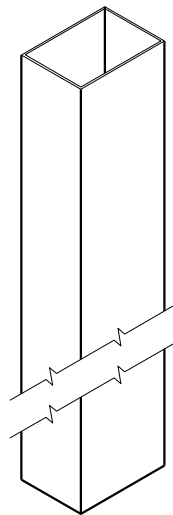
GENERIC ANCHOR CABLE BOX⁹ ^E



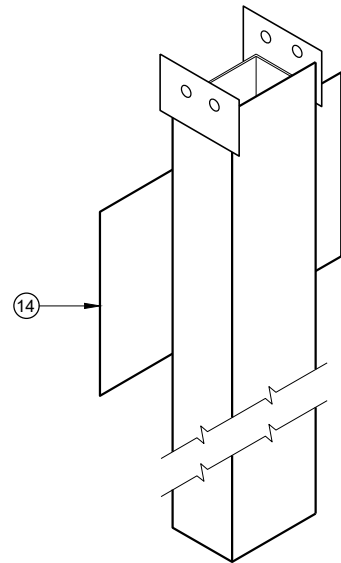
BEARING PLATE⁶ ^E

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

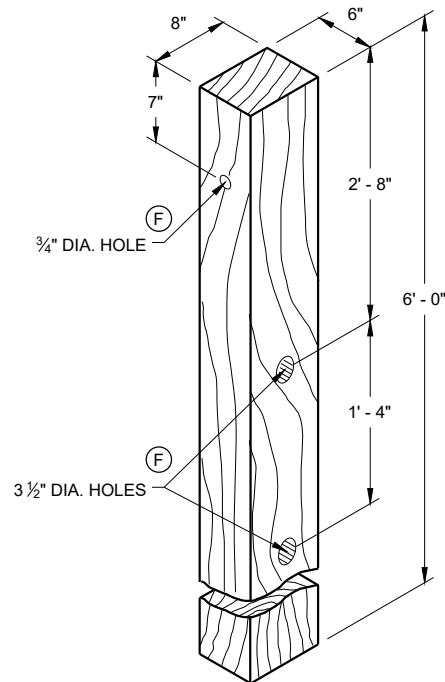
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



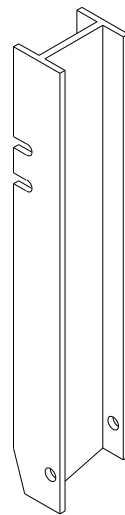
UPPER POST NO. 1 ⁽¹⁾ (E)



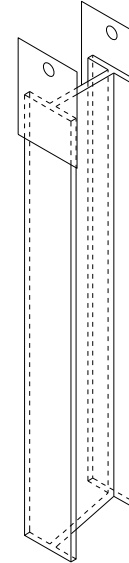
LOWER POST NO. 1 ⁽²⁾ (E)



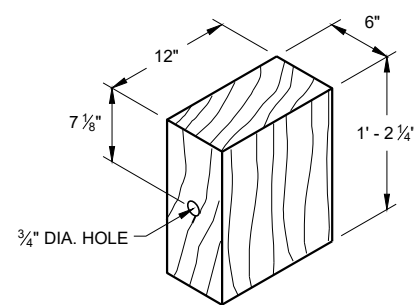
WOOD CRT POST ⁽³⁾ (E)
POSTS NUMBER 3-9



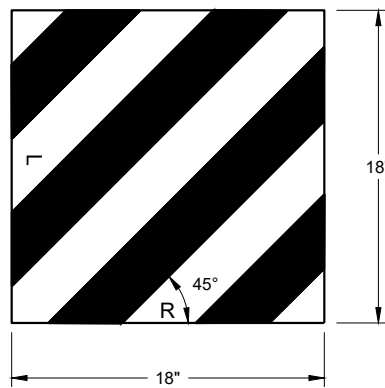
UPPER POST NO. 2 ⁽¹⁵⁾ (E)



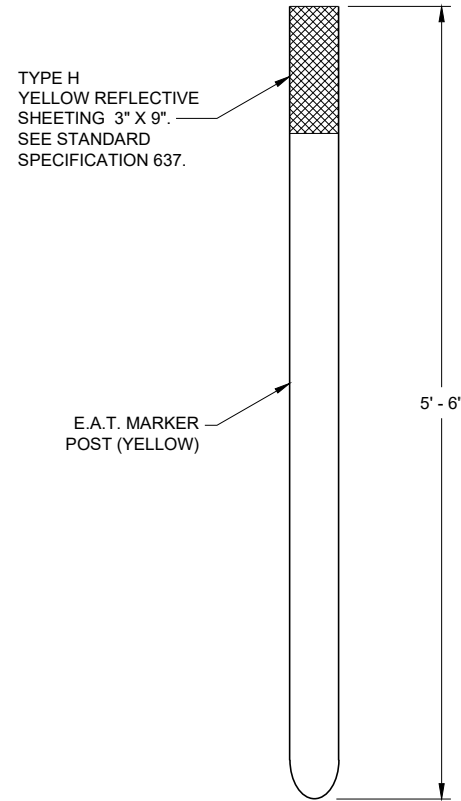
LOWER POST NO. 2 ⁽¹⁶⁾ (E)



WOOD BLOCKOUT ⁽⁴⁾
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2



REFLECTIVE SHEETING DETAIL ^(E)

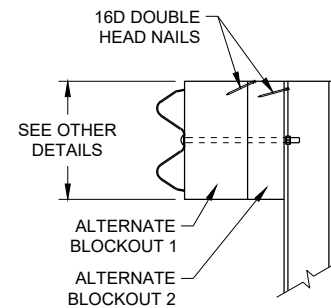


FRONT VIEW

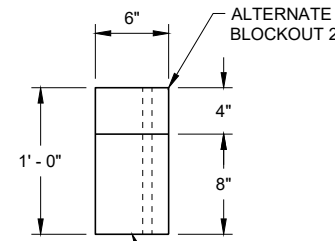


SIDE VIEW

E.A.T. MARKER POST ⁽¹³⁾



SIDE VIEW



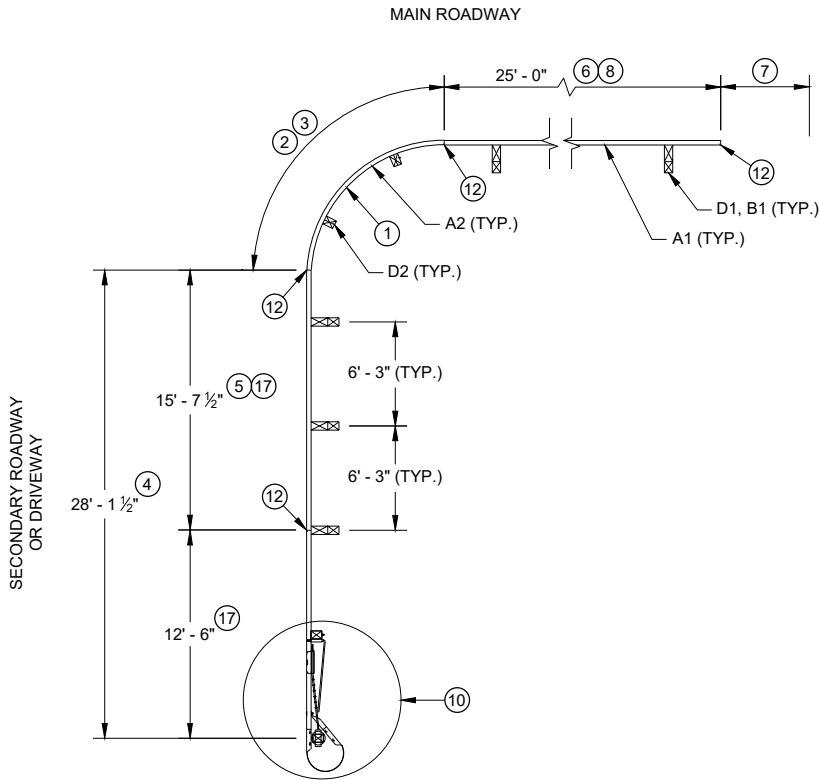
TOP VIEW

ALTERNATE WOOD
BLOCKOUT DETAIL

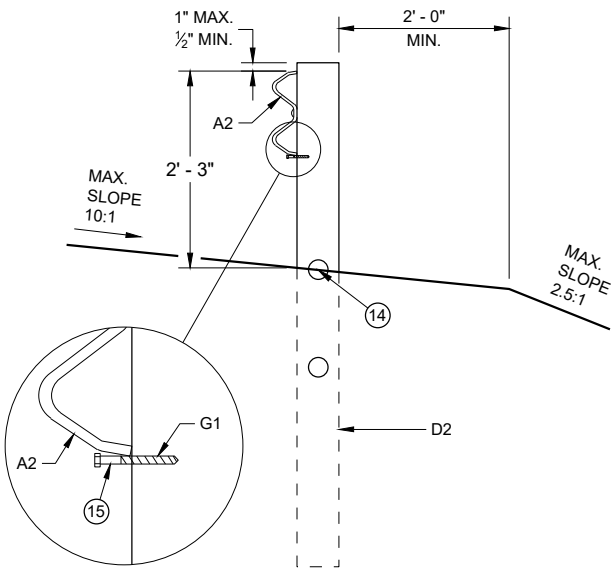
**MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

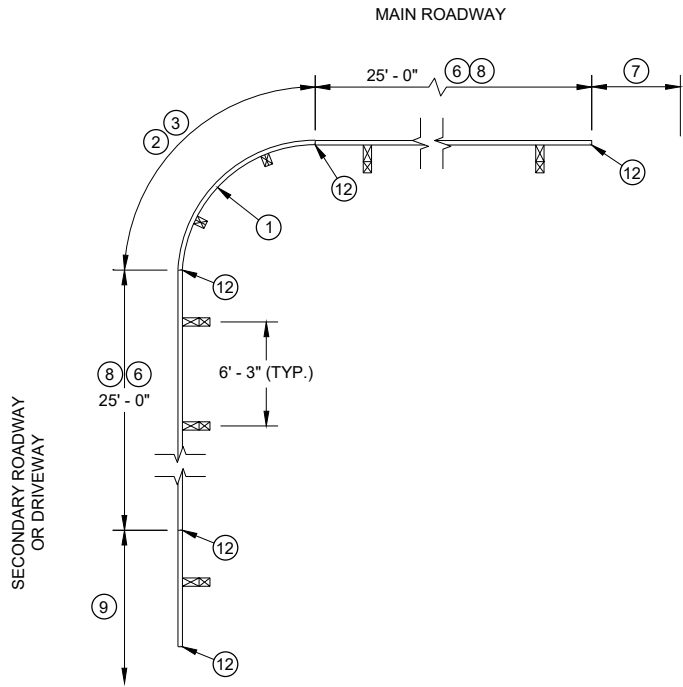
APPROVED
7/2018 DATE /S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR
FHWA



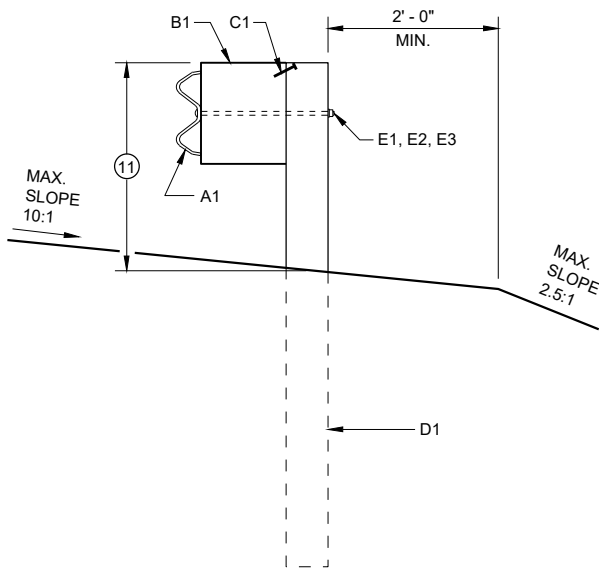
PLAN VIEW
SHORT RADIUS BEAM GUARD WITH
SHORT RADIUS TERMINAL ON
SECONDARY ROAD OR DRIVEWAY



CONTROLLED RELEASE
TERMINAL POST (CRT) IN RADIUS



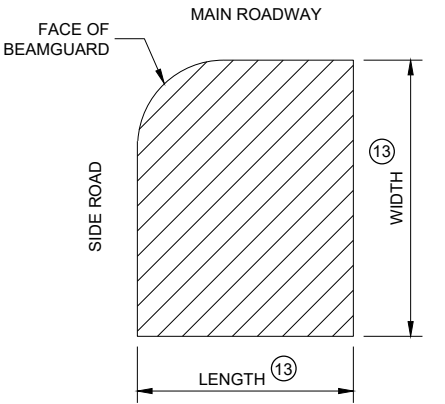
PLAN VIEW
SHORT RADIUS BEAM GUARD WITH
EAT, ADDITIONAL BEAM GUARD
OR
TRANSITION TO RIGID BARRIER ON
SECONDARY ROAD OR DRIVEWAY



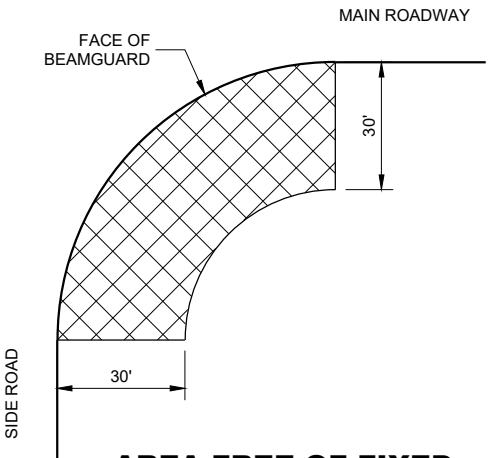
BEAM GUARD POSTS
IN HEIGHT TRANSITION

TABLE FOR RADIUS OF 32' AND LESS

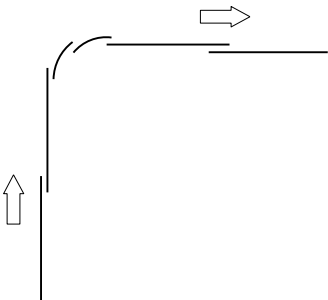
RADIUS (FT)	LENGTH (FT)	WIDTH (FT)
8	25	15
16	30	15
24	40	20
32	50	30



AREA FREE OF FIXED
OBJECTS FOR RADIUS
32' AND LESS



AREA FREE OF FIXED
OBJECTS FOR RADIUS
GREATER THAN 32'



LAP SPLICE DETAIL

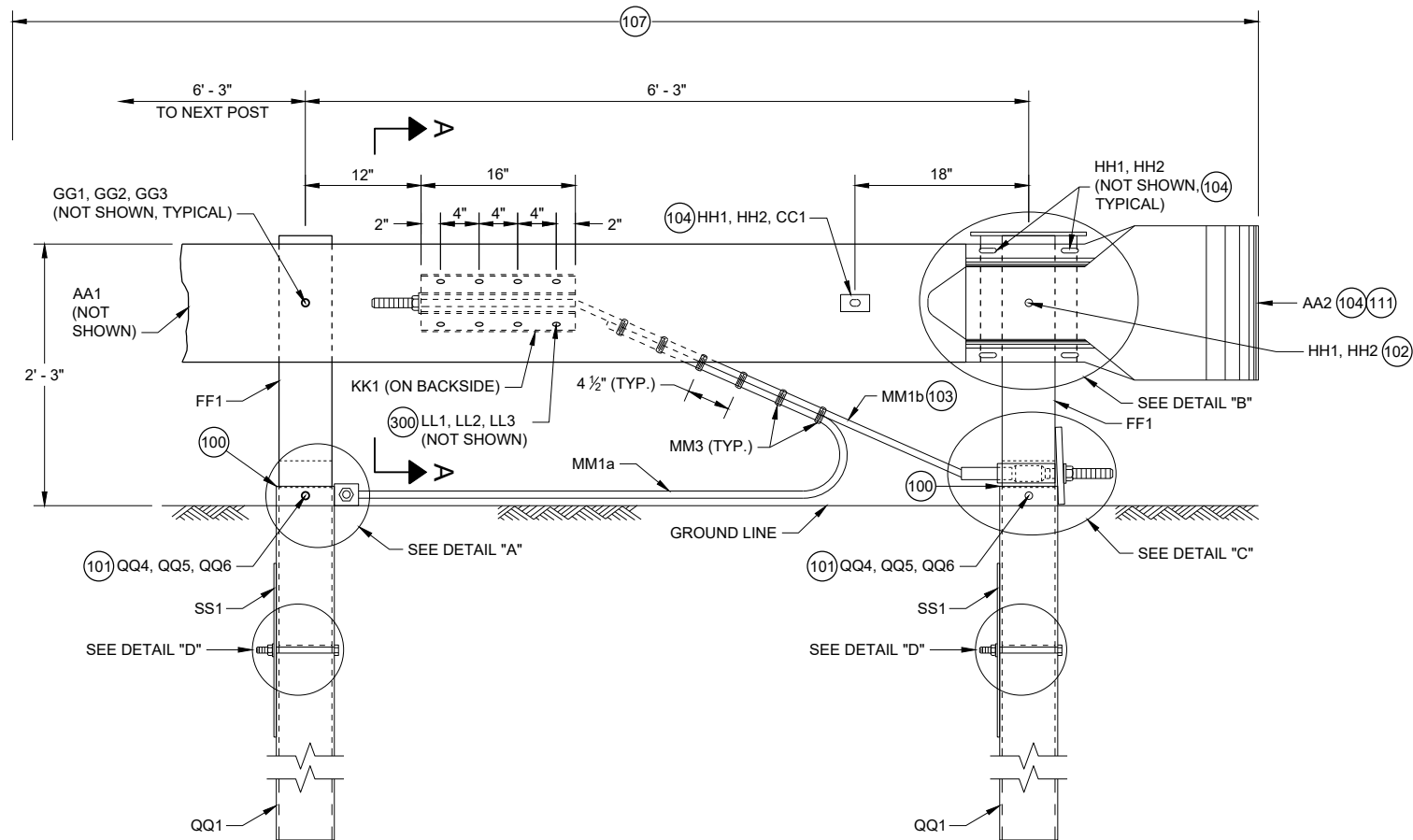
GENERAL NOTES

- SEE PLANS FOR OTHER BARRIER SYSTEM AND LOCATION SPECIFICS.
- SEE SDD 14B42 FOR MORE INFORMATION ON BEAM GUARD INSTALLATION, PARTS, MATERIALS, AND INSTALLATION INFORMATION.
- GALVANIZE PARTS AFTER FABRICATION.
- WELDING TO FOLLOW CURRENT REQUIREMENTS OF THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE ANSI / AWS D1.1.
- UNLESS NOTED OTHERWISE, ALL PLATES ARE FLAT AND FREE OF WARP.
- UNLESS NOTED OTHERWISE, ALL EDGES ARE SMOOTH, STRAIGHT AND VERTICAL.
- ALL CUTS AND HOLES, EXCEPT IN BEAM GUARD RAIL ARE TO BE MACHINED OR MACHINE FLAME CUT.
- UNLESS NOTED OTHERWISE, CUT OR PROVIDE BOLTS THAT ARE 1/4" TO 1/2" BEYOND THE NUT.
- DRAWINGS ARE NOT TO SCALE.

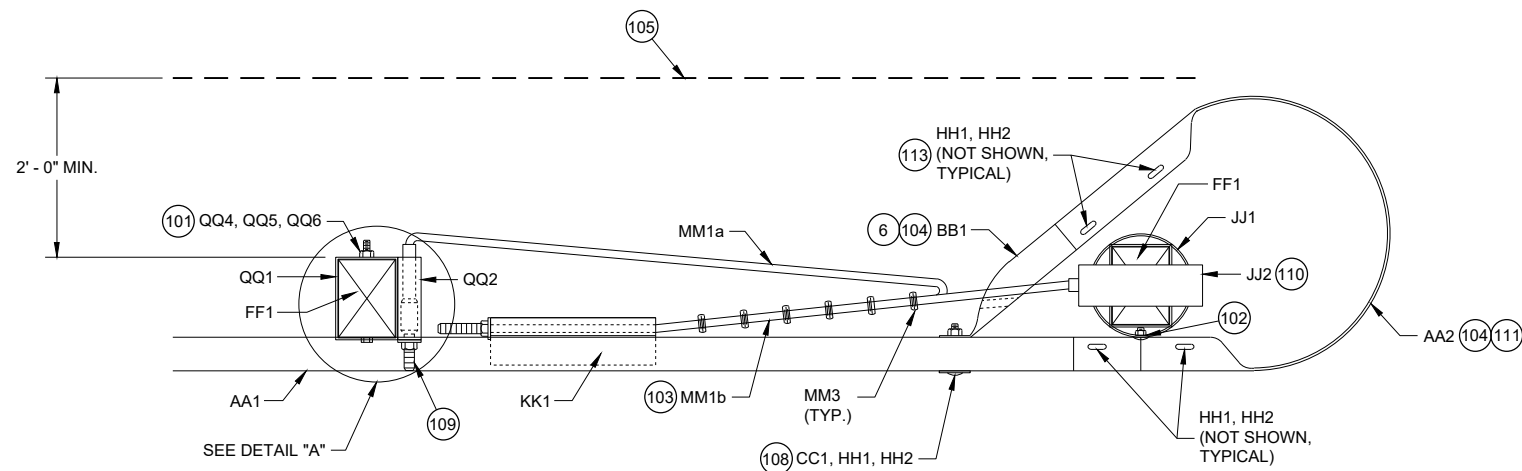
- ① RADIUS MEASURE FROM INSIDE OF RAIL. LENGTH OF BEAM GUARD SHORT RADIUS GUARD MEASURED ALONG TRAFFIC SIDE OF RAIL. RADIUS BETWEEN 8 FEET TO 150 FEET. SEE PLAN FOR REQUIRED RADIUS. BEAM GUARD RAIL IN RADIUS IS SHOP BENT. ODD RAIL LENGTH OR FIELD CUTS MAY BE REQUIRED.
- ② CONTROLLED RELEASE TERMINAL (CRT) POSTS ARE USED IN THE RADIUS. CONTROLLED RELEASE TERMINAL (CRT) POSTS ARE SPACED 6' - 3". SEE PLAN FOR NUMBER OF CONTROLLED RELEASE (CRT) POSTS.
- ③ WITHIN RADIUS BEAM GUARD RAILS ARE NOT BOLTED TO POSTS. BEAM GUARD RAIL IS RESTED ON TOP OF LAG SCREW.
- ④ MINIMUM LENGTH OF BEAM GUARD ALONG SIDE ROAD OR DRIVEWAY TO INSTALL SHORT RADIUS TERMINAL. BEAM GUARD IS PAID WITH BEAM GUARD ITEM.
- ⑤ ODD LENGTH OF BEAM GUARD REQUIRED TO INSTALL SHORT RADIUS TERMINAL.
- ⑥ MINIMUM AMOUNT OF BEAM GUARD TO BE INSTALLED PRIOR TO TRANSITION TO RIGID BARRIER. ADDITIONAL BEAM GUARD, OR EAT. BEAM GUARD PAID FOR WITH BEAM GUARD ITEM. SEE PLANS FOR MORE DETAIL.
- ⑦ BEAM GUARD, EAT, OR TRANSITION TO RIGID BARRIER. SEE PLAN.
- ⑧ TOP OF BEAM GUARD BY THE RADIUS IS 27". HEIGHT OF BEAM GUARD IS 31" BY TRANSITION TO RIGID BARRIER, ADDITIONAL BEAM GUARD OR EAT.
- ⑨ ADDITIONAL BEAM GUARD, EAT OR TRANSITION TO RIGID BARRIER. BEAM GUARD SHOWN. SEE PLAN FOR DETAILS.
- ⑩ SHORT RADIUS TERMINAL (SEE OTHER DETAILS).
- ⑪ HEIGHT VARIES. SEE NOTE ⑧ AND ⑧.
- ⑫ BEAM GUARD RAIL SPLICE LOCATION. SPLICE LOCATION REQUIRES PART F1 AND F2. SEE SDD 14B42 FOR DETAILS.
- ⑬ SEE TABLE FOR VALUES.
- ⑭ MAXIMUM HEIGHT FOR CENTER OF HOLE IS 3/4" ABOVE FINISHED GROUND ±1".
- ⑮ DRILL POST 15/64" DIA. PILOT HOLE. DO NOT HAMMER LAG SCREW INTO POST.
- ⑯ SMALL SIGNS ON BREAKAWAY HARDWARE ARE ACCEPTABLE.
- ⑰ TOP OF RAIL HEIGHT IS 27" WHEN USING A SHORT RADIUS TERMINAL (CRT).

SHORT RADIUS BEAM
GUARD (MGS) SHORT
RADIUS TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



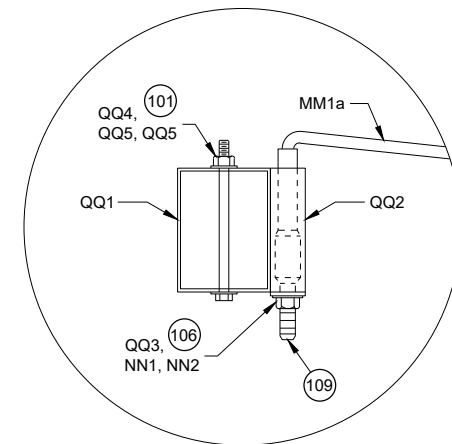
**PROFILE VIEW
SHORT RADIUS TERMINAL**



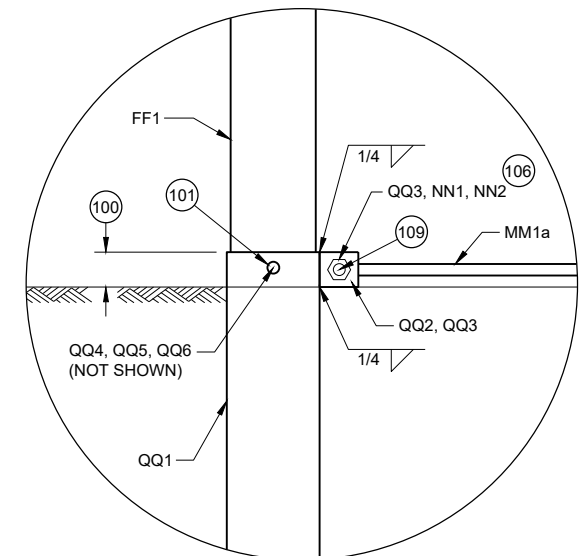
**TOP VIEW
SHORT RADIUS TERMINAL**

GENERAL NOTES

- (100) TOP OF FOUNDATION TUBE 2 INCHES MAXIMUM ABOVE FINISHED GROUND.
- (101) WASHERS REQUIRED BETWEEN BOLT HEAD AND FOUNDATION TUBE AND BETWEEN NUT AND FOUNDATION TUBE.
- (102) SPLICE BOLT AND NUT CONNECTS BEAM GUARD RAIL, W-BEAM SECTION BUFFER, AND STEEL PIPE ASSEMBLY. NO WASHER REQUIRED. SEE DETAIL "B".
- (103) CABLE IS TAUT.
- (104) ADJUST AA2 AND BB1 TO FIT.
- (105) BREAK POINT OF SHOULDER.
- (106) TACK WELD CABLE CONNECTOR TUBE PLATE TO CABLE CONNECTION TUBE. SEE DETAIL "A" PROFILE VIEW.
- (107) PAY LIMIT FOR BEAM GUARD.
- (108) SQUARE WASHER BETWEEN HEAD OF BOLT AND TRAFFIC FACE OF BEAM GUARD. ROUND WASHER REQUIRED BETWEEN NUT AND BB1.
- (109) CUT OR PROVIDE THREADED STUD THAT IS FLUSH WITH FACE OF BEAM GUARD RAIL KK1 (PLUS OR MINUS 1/2" TOLERANCE). DEBURR AFTER CUTTING.
- (110) SEE STEEL PIPE ASSEMBLY DETAILS.
- (111) ATTACH UU2 WITH UU3. SHOP APPLY UU1 TO UU2.
- (112) FOUR (4) HH1 AND HH2 REQUIRED TO ATTACH AA1 TO AA2.
- (113) FOUR (4) HH1 AND HH2 REQUIRED TO ATTACH AA2 TO BB1.



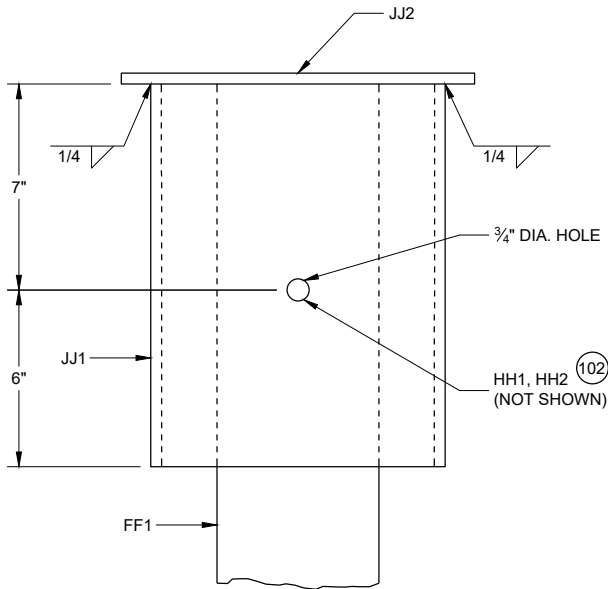
**TOP VIEW
DETAIL "A"
(WOOD BREAKAWAY AND BEAM
GUARD RAIL POSTS NOT SHOWN)**



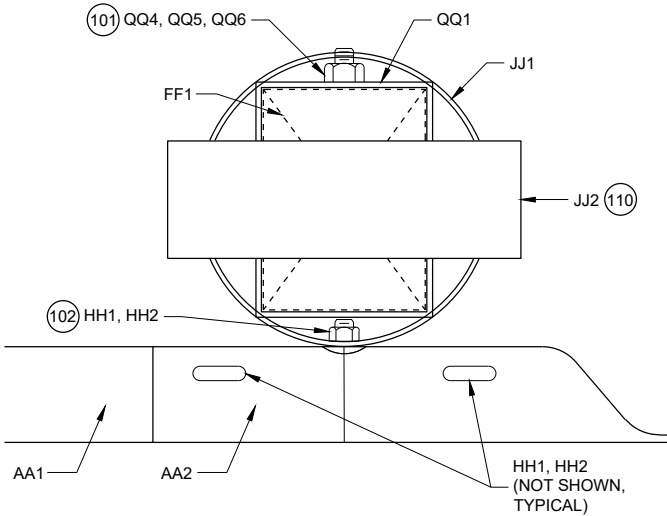
**PROFILE VIEW
DETAIL "A"**

**SHORT RADIUS BEAM
GUARD (MGS) SHORT
RADIUS TERMINAL (MGS)**

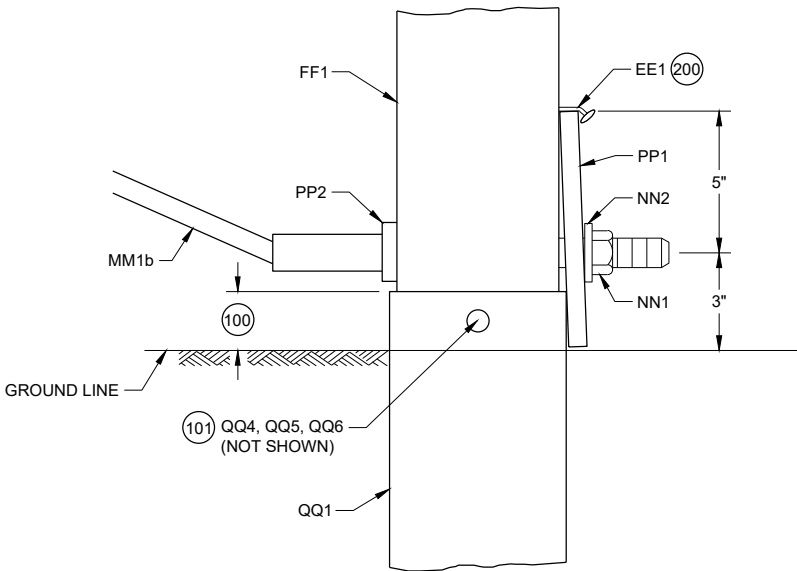
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



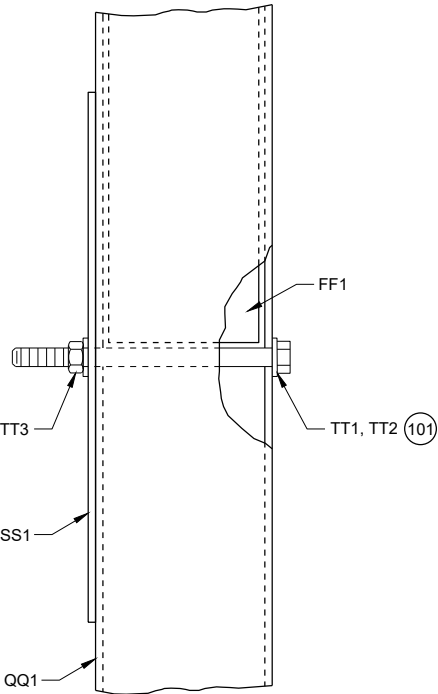
**PROFILE VIEW
DETAIL "B"
STEEL PIPE ASSEMBLY
(BEAM GUARD AND W BEAM
END SECTION NOT SHOWN)**



**PLAN VIEW
DETAIL "B"
STEEL PIPE ASSEMBLY**



**PROFILE VIEW
DETAIL "C"**



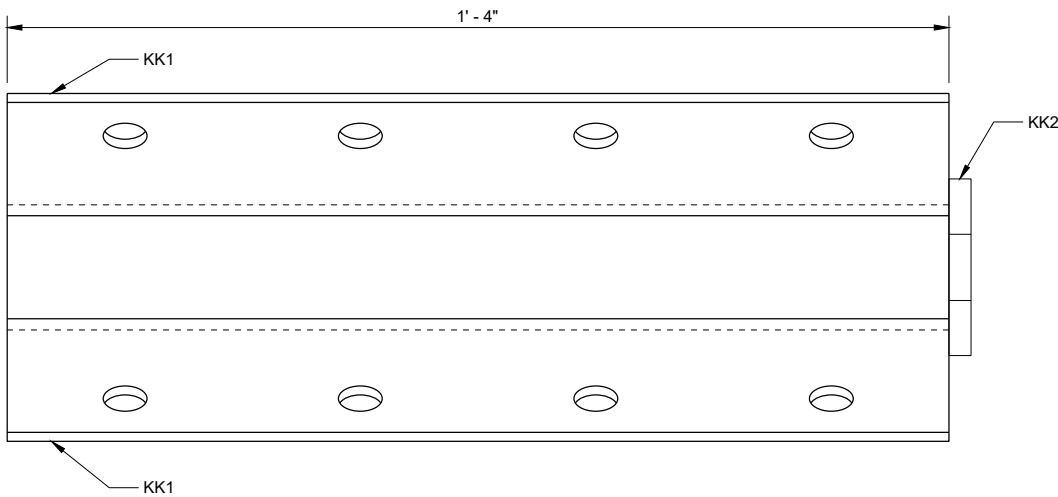
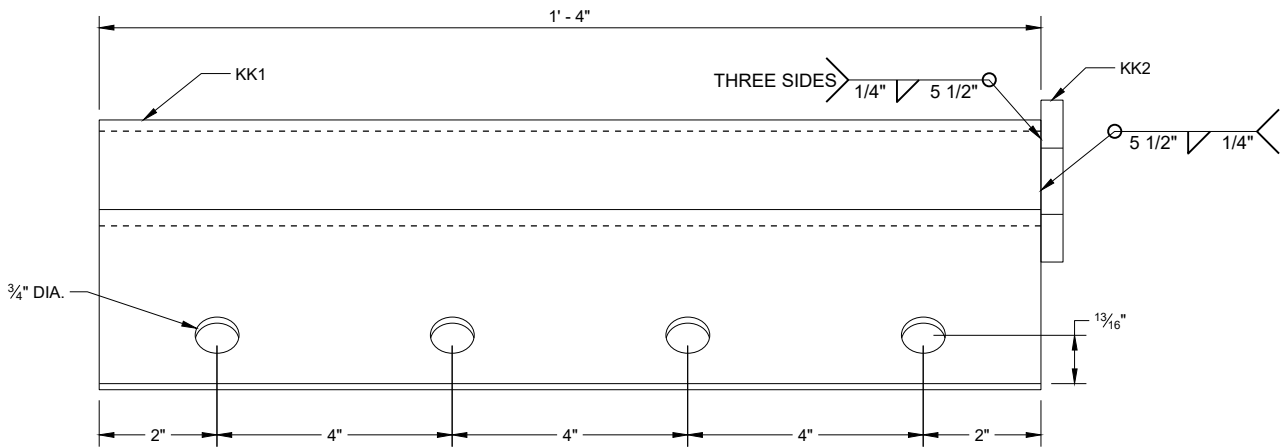
**PROFILE VIEW
DETAIL "D"**

GENERAL NOTES

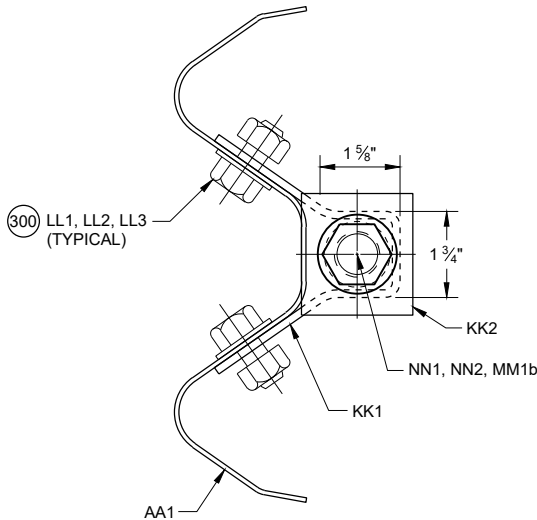
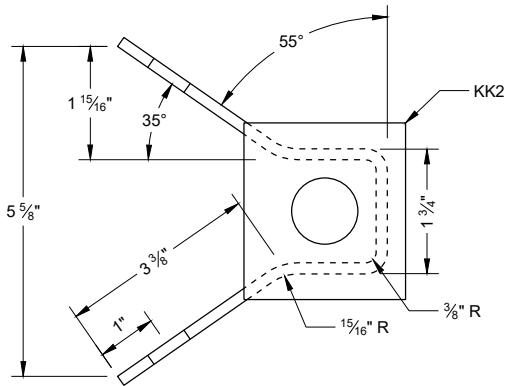
(200) TWO (2) NAILS SPACED 4 INCHES CENTER TO CENTER.

**SHORT RADIUS BEAM
GUARD (MGS) SHORT
RADIUS TERMINAL (MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



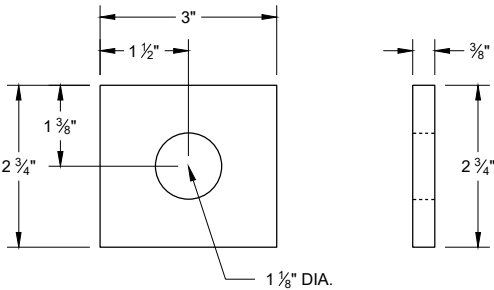
ANCHOR BRACKET (KK1, KK2)



SECTION A - A

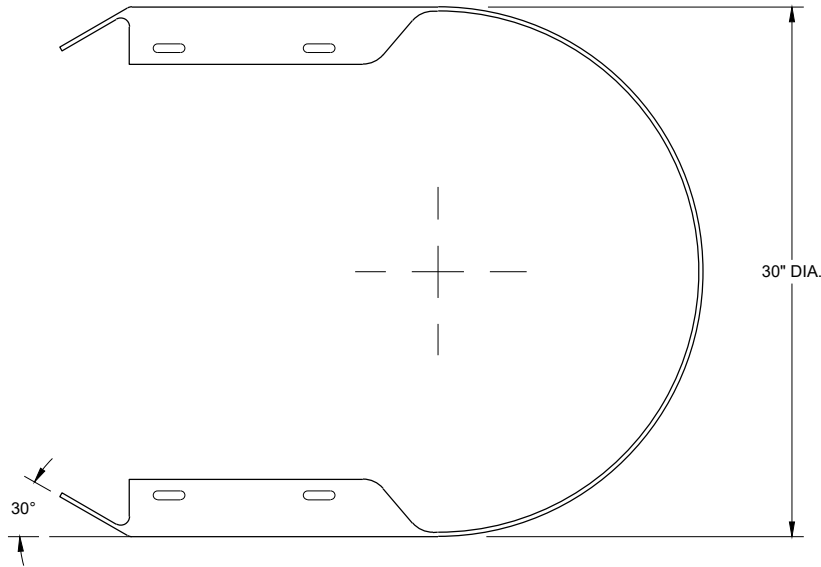
300 WASHERS REQUIRED BETWEEN BOLT HEAD AND BEAM GUARD RAIL AND BETWEEN NUT AND ANCHOR BRACKET. EIGHT (8) LL1 AND LL3 REQUIRED. SIXTEEN (16) LL2 REQUIRED.

ANCHOR BRACKET BEARING PLATE (KK2)

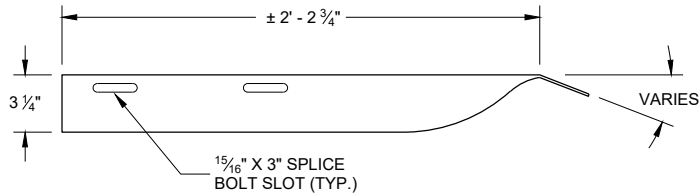


SHORT RADIUS BEAM
GUARD (MGS) SHORT
RADIUS TERMINAL (MGS)

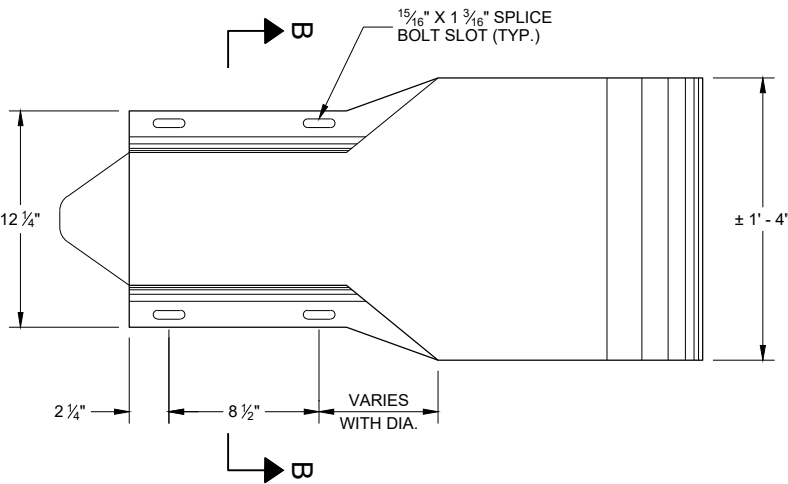
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



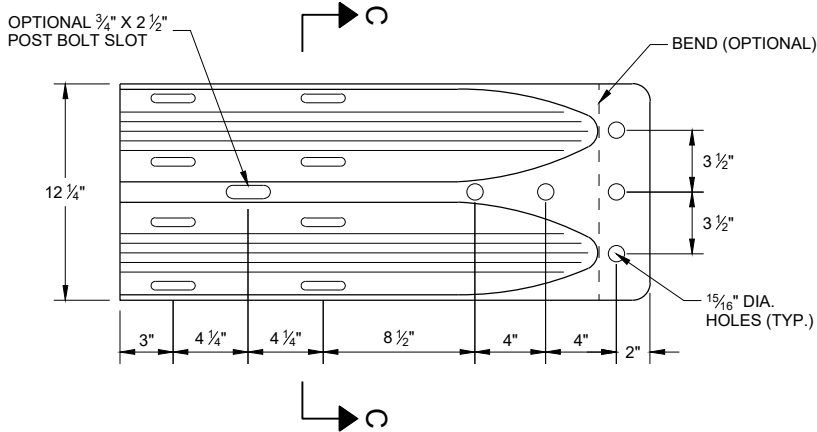
TOP VIEW



TOP VIEW



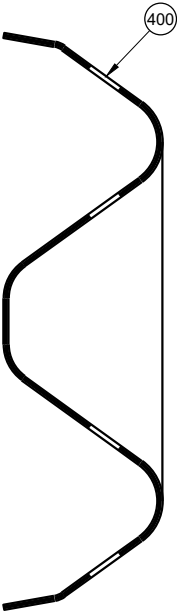
PROFILE VIEW
W BEAM
END SECTION BUFFER (AA2)



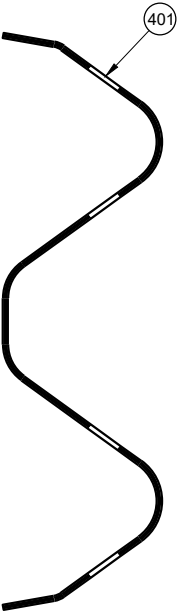
PROFILE VIEW
W BEAM
TERMINAL CONNECTOR (BB1)

GENERAL NOTES

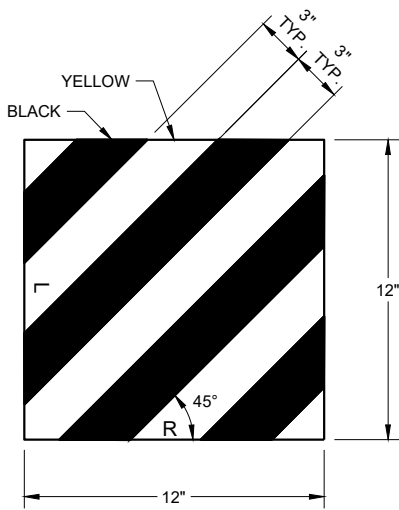
- (400) CROSS SECTION OF PART IS TO FIT OVER AA1 .
- (401) CROSS SECTION OF PART IS TO FIT OVER OR UNDER AA1 .



SECTION B -B



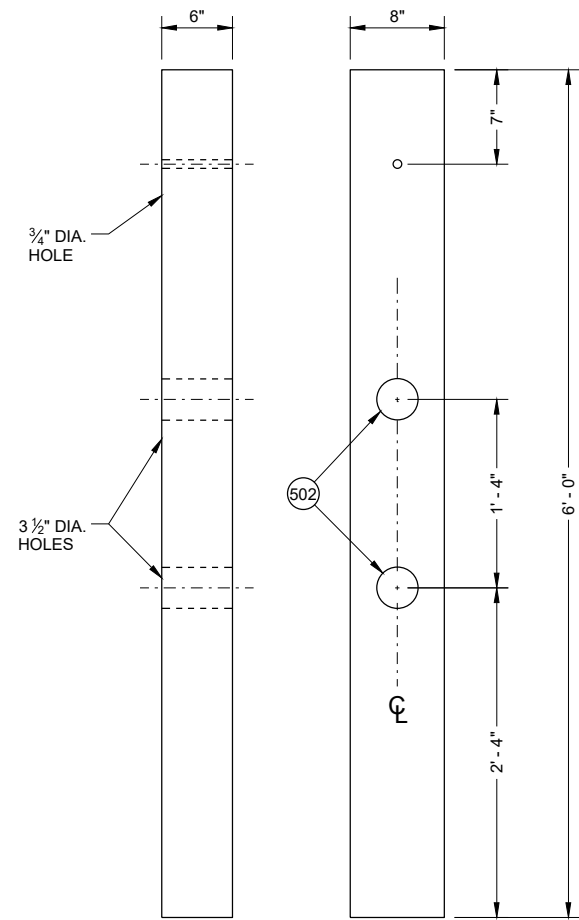
SECTION C -C



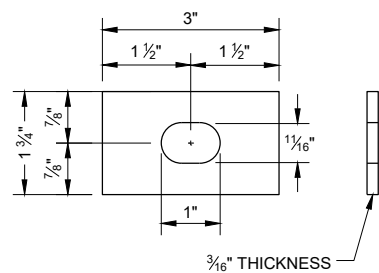
REFLECTIVE SHEETING (UU1, UU2)

SHORT RADIUS BEAM
GUARD (MGS) SHORT
RADIUS TERMINAL (MGS)

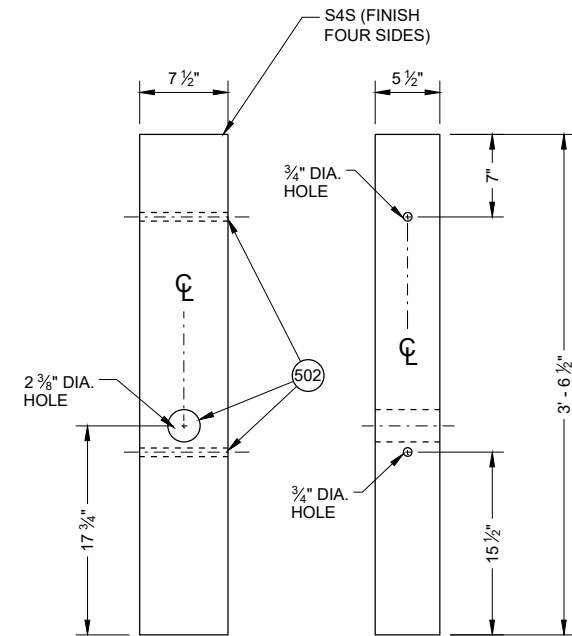
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



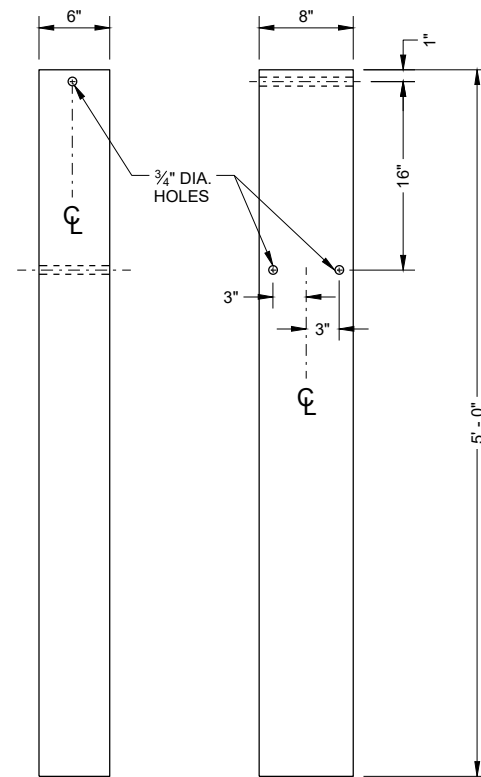
FRONT VIEW SIDE VIEW
CONTROLLED RELEASE POST (CRT) (DD2)



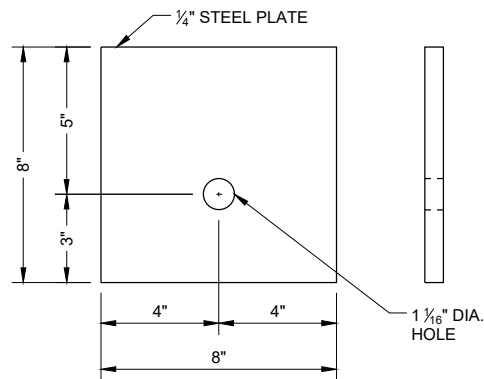
RECTANGULAR PLATE WASHER (CC1)



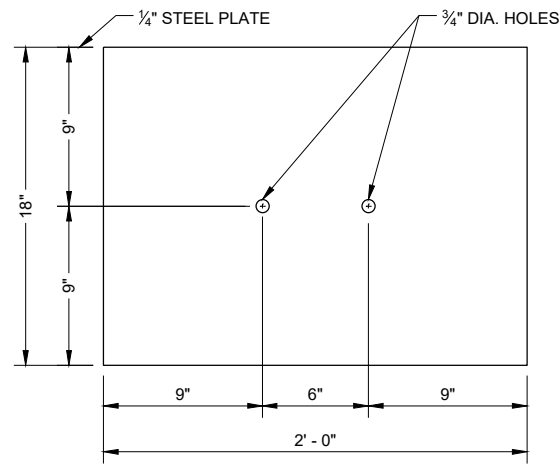
FRONT VIEW SIDE VIEW
WOOD BREAKAWAY POST (FF1)



FRONT VIEW SIDE VIEW
FOUNDATION TUBE (QQ1)



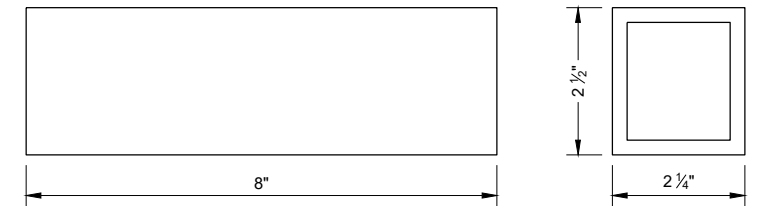
BEARING PLATE (PP1)



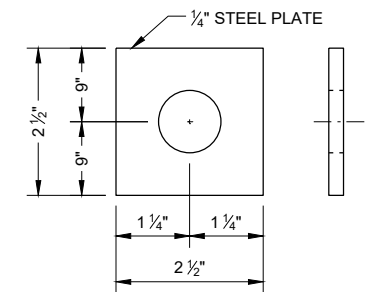
SOIL PLATE (SS1)

GENERAL NOTES

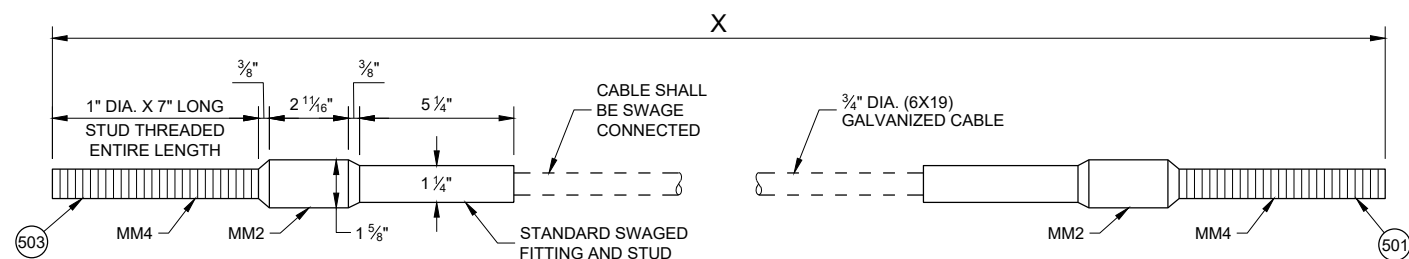
- (500) SEE DETAIL "D" FOR LOCATION AND ATTACHMENT OF SS1.
- (501) FOR MM1a THREADED STUD ONLY REQUIRED ON ONE END. SWAGED FITTING REQUIRED.
- (502) LOCATE HOLES ON THE CENTERLINE OF THE SIDE OF THE POST.
- (503) MM1a MAY HAVE ONE THREADED STUD 4 INCHES LONG. SEE NOTE (109).



FOUNDATION TUBE - ANCHOR CABLE TUBE (QQ2)



ANCHOR CABLE TUBE END PLATE (QQ3)



CABLE ASSEMBLY (MM1a, MM1b)

"X" LENGTH

MM1b	9' - 0"
MM1b	6' - 8"

SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
A1	BEAM GUARD RAIL	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
A2	BEAM GUARD RAIL - SHOP BENT	INDICATE ON BACK OF RAIL THE RADIUS THAT RAIL WAS BENT TO. SHOP BEND RADIUS IS TO THE NEAREST FOOT. FOLLOW AASHTO M180 ON HOW TO MARK RADIUS INFORMATION.	
		AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
B1	BLOCK - WOOD	WISDOT SPEC. 614	SEE SDD 14B42
C1	NAIL	ASTM A153 HOT DIP CLASS D	
		ASTM F1667 TYPE 1 STYLE 12 (16 DOUBLE HEAD)	
D1	POST-STRONG POST-WOOD	WISDOT SPEC. 614	SEE SDD 14B42
D2	POST-CRT-WOOD	WISDOT SPEC. 614	
E1	POST BOLT	ASTM A307 GRADE A OR SAE J429 GRADE 2	5/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
E2	POST BOLT - WASHER	ASTM F436 TYPE 1 (HARDEN TYPICALLY USED WITH STEEL) OR ASTM F844 (UNHARDENED TYPICALLY WITH WOOD)	5/8" DIA.
		GALV. AASHTO M111 / ASTM A 123 OR GALV. HOT DIP. TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
E3	POST BOLT - NUT	AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	5/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		ASTM A563 GRADE A HEAVY HEX HEAD	
F1	SPlice BOLT	GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	5/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		ASTM A307 GRADE A OR SAE J429 GRADE 2	
		UNC	
		AASHTO M180	

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
F2	SPlice BOLT - NUT	ASTM A563 GRADE A	5/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C/ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
G1	LAG SCREW	ASTM A308 GRADE A ASTM A153 CLASS D	1/2" DIA. 6" LONG
H1	DELINEATOR - BEAM GUARD		SEE SDD 14B42 FOR MORE INFORMATION
H2	DELINEATION - SHEETING	YELLOW OR WHITE	
		WISDOT SPEC 637 TYPE SH	
		APPROVED PRODUCT LIST	
J1	FOUNDATION BACKFILL	STANDARD SPEC. 614	
AA1	BEAM GUARD RAIL - PUNCHED	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
AA2	BEAM GUARD RAIL - END SECTION BUFFER	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
BB1	BEAM GUARD RAIL - TERMINAL CONNECTOR MODIFIED	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
CC1	SHORT RADIUS - SQUARE WASHER	AASHTO M180	
		GALV. AASHTO M111 / ASTM A123	
EE1	NAIL	ASTM A153 HOT DIP CLASS D	
		ASTM F1667 TYPE 1 STYLE 12 (16 DOUBLE HEADED)	
FF1	POST - BCT - WOOD	S4S FINISH ON 4 SIDES	
		WISDOT SPEC. 614	
GG1	POST BOLT	ASTM A307 GRADE A OR SAE J429 GRADE 2	3/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C/ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		UNC	
GG2	POST BOLT - WASHER	ASTM F436 TYPE 1 (HARDEN TYPICALLY USED WITH STEEL) OR ASTM F844 (UNHARDENED TYPICALLY WITH WOOD)	3/8" DIA.
		GALV. AASHTO M111 / ASTM A 123 OR GALV. HOT DIP. TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329	

SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
GG3	POST BOLT - NUT	ASTM A563 GRADE A	3/8" DIA. SEE 14B42 FOR GEOMETRY
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		ASTM A563 GRADE A HEAVY HEX HEAD	
HH1	SPLICE BOLT	GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	3/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		ASTM A307 GRADE A OR SAE J429 GRADE 2	
		UNC	
		AASHTO M180 HEAD GEOMETRY	
HH2	SPLICE BOLT - NUT	ASTM A563 GRADE A	3/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
JJ1	PIPE - STEEL	ASTM A53 GALVANIZED GRADE B SCHEDULE 40	10" O.D.
JJ2	TOP PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	DIMENSIONS 3/8" X 4" X 1' - 0"
		GALV. AASHTO M111 / ASTM A123	
KK1	ANCHOR BRACKET	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
KK2	ANCHOR BRACKET - BEARING PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
LL1	ANCHOR BRACKET - BOLT	ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	3/8" DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
LL2	ANCHOR BRACKET - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	3/8" DIA.
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
LL3	ANCHOR BRACKET - NUT	ASTM A563 GRADE A	3/8" DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
MM1a	ANCHOR CABLE	AASHTO M30 / ASTM A741 INDEPENDENT WIRE CORE (IWRC) OR WIRE STRAND CORE (WCS), IMPROVED PLOW STEEL (IPS), 6X19, TYPE II OR IIc CLASS C ZINC COATED	
MM1b	ANCHOR CABLE	AASHTO M30 / ASTM A741 INDEPENDENT WIRE CORE (IWRC) OR WIRE STRAND CORE (WCS), IMPROVED PLOW STEEL (IPS), 6X19, TYPE II OR IIc CLASS C ZINC COATED	
MM2	ANCHOR CABLE - SWAGE FITTING	ASTM A576 GRADE 1035	
		SWAGE FITTINGS ARE TO BE FACTORY SWEDGED. WITH A BREAKING STRENGTH 40,000 LBS.	
		GALV. AASHTO M111 / ASTM A123	
		ASME B30.26 FORGED, CAST, OR DIE STAMPED WITH THE FOLLOWING INTO CONNECTION: NAME OF MANUFACTURER OR TRADEMARK OF CONNECTION'S MANUFACTURER, SIZE OR RATED LOAD, GRADE.	
MM3	WIRE ROPE CABLE CLAMPS	FF-C-450D TYPE 1 CLASS 1	3/4"
		ASTM A153 HOT DIP CLASS D	
MM4	ANCHOR CABLE - SWAGE FITTING - STUD	ASTM F3125 GRADE A325 TYPE 1 OR SAE GRADE 5 OR ASTM A449 TYPE 1 HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
NN1	ANCHOR CABLE - NUT	ASTM A563 GRADE A	1" DIA.
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
NN2	ANCHOR CABLE - NUT - WASHER	UNC	1" DIA.
		ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	
		ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	1" DIA.
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	

SHORT RADIUS BEAM
GUARD (MGS) SHORT
RADIUS TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)

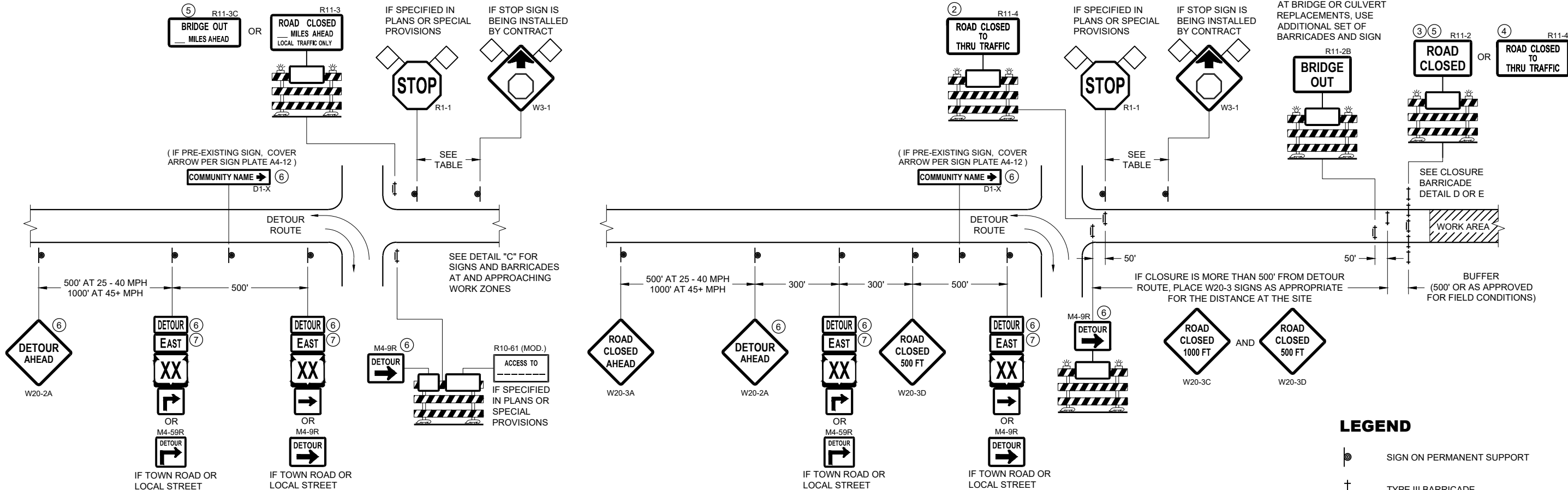
PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
PP1	BEARING PLATE AT POST	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
PP2	PIPE - STEEL	ASTM A53 GALVANIZED GRADE B SCHEDULE 40	2" DIA. x 6" LONG
QQ1	FOUNDATION TUBE	ASTM A500 GRADE B	8" X 6" X $\frac{3}{16}$ "
		GALV. AASHTO M111 / ASTM A123	
QQ2	SHORT RADIUS - FOUNDATION TUBE - ANCHOR CABLE - TUBE	ASTM A500 GRADE B	DIMENSIONS 2 $\frac{1}{2}$ " X 2 $\frac{1}{4}$ " X $\frac{1}{4}$ " X 8"
		GALV. AASHTO M111 / ASTM A123	
QQ3	SHORT RADIUS - SOIL TUBE - ANCHOR CABLE - TUBE - END PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	DIMENSIONS 2 $\frac{1}{2}$ " X 2 $\frac{1}{2}$ " X $\frac{1}{4}$ "
		GALV. AASHTO M111 / ASTM A123	
QQ4	GROUND STRUT AND YOKE - BOLT	GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	$\frac{5}{8}$ DIA.
		ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	
		UNC	
QQ5	GROUND PLATE AND YOKE - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	$\frac{5}{8}$ DIA.
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
QQ6	GROUND STRUT AND YOKE - NUT	HEAVY HEX	$\frac{5}{8}$ DIA.
		UNC	
		ASTM A563 GRADE A	
		OVER TAPPED NUTS AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
SS1	SOIL PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / A123	
TT1	SOIL PLATE - BOLT	ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	$\frac{5}{8}$ DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
TT2	SOIL PLATE - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	$\frac{5}{8}$ DIA.
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
TT3	SOIL PLATE - NUT	GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	$\frac{5}{8}$ DIA.
UU1	OBJECT MARKER - SHEETING	MUTCD / WISDOT OBJECT MARKER TYPE 3	PATTERN AND COLOR FOR SHEETING. SHEETING TYPE FOR MARKER.
		WISDOT SPEC 637 TYPE F	
		APPROVED PRODUCT LIST	
UU2	OBJECT MARKER - ALUMINUM PLATE	WISDOT SPEC 637 ALUMINUM PLATE	MATERIAL AND THICKNESS OF MATERIALS
UU3	OBJECT MARKER - SCREWS	STAINLESS SELF-TAPPING SCREWS	
VV1	FOUNDATION BACKFILL	WISDOT SPEC 614	

SHORT RADIUS BEAM
GUARD (MGS) SHORT
RADIUS TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT
ENGINEER
FHWA



LEGEND

- SIGN ON PERMANENT SUPPORT
- TYPE III BARRICADE
- TYPE III BARRICADE WITH ATTACHED SIGN
- TYPE "A" WARNING LIGHT (FLASHING)
- WORK AREA
- FLAGS, 16" X 16" MIN. (ORANGE)

SPEED LIMIT (MPH)	"STOP AHEAD" ADVANCE WARNING DISTANCE (FT)
25	200
30	200
35	350
40	350
45	500
50	550
55	750

SEE SDD 15C2-SHEET "b" FOR GENERAL NOTES AND FOOTNOTES ① THROUGH ⑦

BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
February 2020 /S/ Andrew Heidtke
DATE WORK ZONE ENGINEER

FHWA



SEE SDD 15C2 - SHEET "a" FOR LEGEND

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND BARRICADES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE", SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

BARRICADES THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY RE-ESTABLISHED UPON COMPLETION OF THE OPERATION, OR FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

ALL TYPE III BARRICADES SHALL HAVE RAILS REFLECTORIZED ON BOTH FACES. STRIPES SHALL BE PROPERLY SLOPED DOWN TOWARD THE TRAFFIC SIDE OR AS SHOWN IN THE ROAD CLOSURE BARRICADE DETAIL "D" FOR FULL ROAD CLOSURES.

TYPE "A" LOW - INTENSITY FLASHING WARNING LIGHTS SHALL BE VISIBLE ON BOTH SIDES OF THE BARRICADE.

THE R11 - 2, R11 - 3, M4 - 9, R11 - 4, AND R10 - 61 SIGNS PLACED ON THE BARRICADES SHALL COVER NO MORE THAN THE TOP RAIL. THE SIGNS SHALL NOT COVER ANY PORTION OF THE MIDDLE RAIL OR BOTTOM RAILS.

"WO" AND "MO" SIGNS ARE THE SAME AS "W" AND "M" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:

LESS OTHERWISE NOTED BELOW:

R11 - 2 SHALL BE 48" X 30"

R11 - 3 SHALL, R11 - 4 AND R10 - 61 SHALL BE 60" X 30"

M4 - 9 SHALL BE 30" X 24"

M3 - X SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)

M4 - 8 SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)

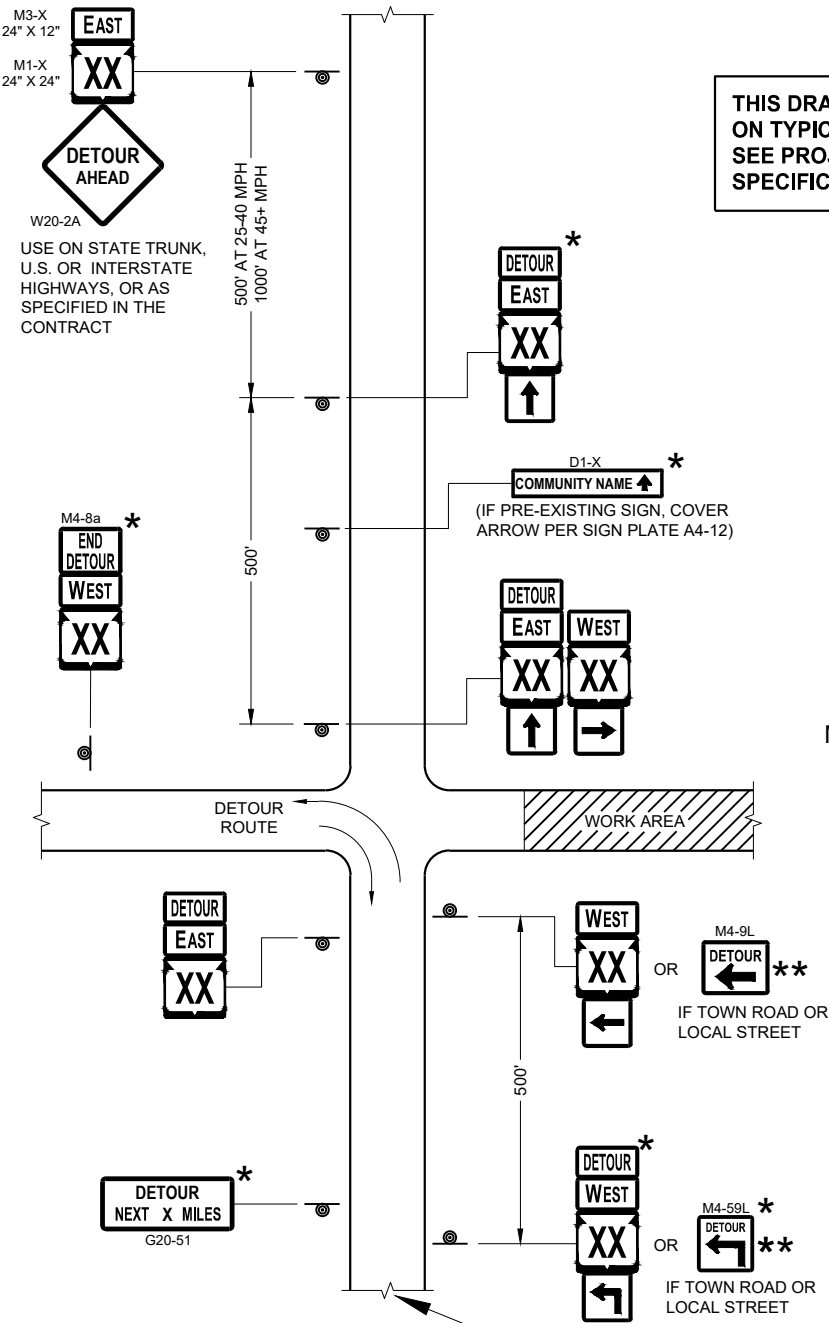
M1 - 4, M1 - 5A AND M1 - 6 SHALL BE 24" X 24" (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS)

MO5 - 1 AND MO6 - 1 SHALL BE 21" X 21" (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS)

D1 - X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.

R1 - 1 SHALL BE 36" X 36"

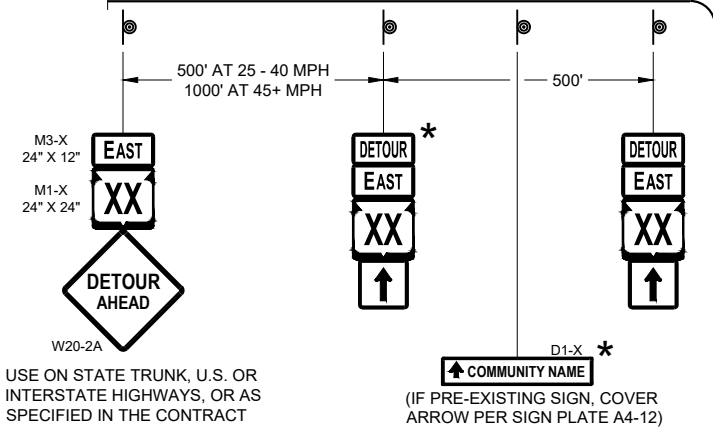
- ① TWO WARNING LIGHTS SHALL BE PROVIDED ON THE CENTER BARRICADE AND A MINIMUM OF ONE WARNING LIGHT SHALL BE PROVIDED ON EACH OF THE OTHER BARRICADES WITHIN THE ROADWAY LIMITS. SPACING OF THE WARNING LIGHTS SHALL BE UNIFORM TO THE EDGE OF ROADWAY AS SHOWN (APPROX. 8 FOOT LIGHT SPACING).
- ② THESE SIGNS AND BARRICADES ARE NOT REQUIRED IF ROAD CLOSURE BEGINS AT AN INTERSECTION.
- ③ FOR ROAD CLOSURE WITHOUT LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL "D".
- ④ FOR ROAD CLOSURE WITH LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL "E".
- ⑤ FOR BRIDGE OR CULVERT REPLACEMENTS, SUBSTITUTE "BRIDGE OUT" INSTEAD OF "ROAD CLOSED" ON R11 - 2 AND R11 - 3 SIGNS.
- ⑥ INSTALL DETOUR AND COMMUNITY GUIDE SIGNS AND ARROWS ONLY IF SPECIFIED IN THE CONTRACT. IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. MODIFY EXISTING SIGNS WHERE POSSIBLE. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. IF DETOUR SIGNS ARE BEING INSTALLED BY OTHERS, PLACE THE CONTRACTED TRAFFIC CONTROL SIGNS TO ALLOW FOR PLACEMENT OF ALL WARNING, DETOUR AND GUIDE SIGNS AS SHOWN.
- ⑦ "EAST" CARDINAL DIRECTION MARKERS AND RIGHT TURN ARROWS ARE SHOWN. USE OTHER CARDINAL DIRECTIONS AND ARROWS AS APPROPRIATE.



SEE SPECIFIC PROJECT DETOUR
SIGNING DETAIL SHEETS AND
DETAIL A OR B ON SDD SHEET 15C02 - SHEET "a"

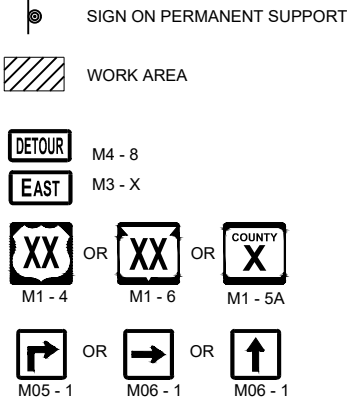
THIS DRAWING PROVIDES GENERAL GUIDANCE
ON TYPICAL DETOUR SIGN LAYOUT AND SPACING.
SEE PROJECT DETOUR SIGNING SHEETS FOR
SPECIFIC DETAILS FOR EACH PROJECT.

MATCH POINT



DETAIL F
DETOUR SIGNING

LEGEND



GENERAL NOTES

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. MODIFY EXISTING SIGNS WHERE POSSIBLE.

THE SPACING BETWEEN TRAFFIC CONTROL AND DETOUR SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

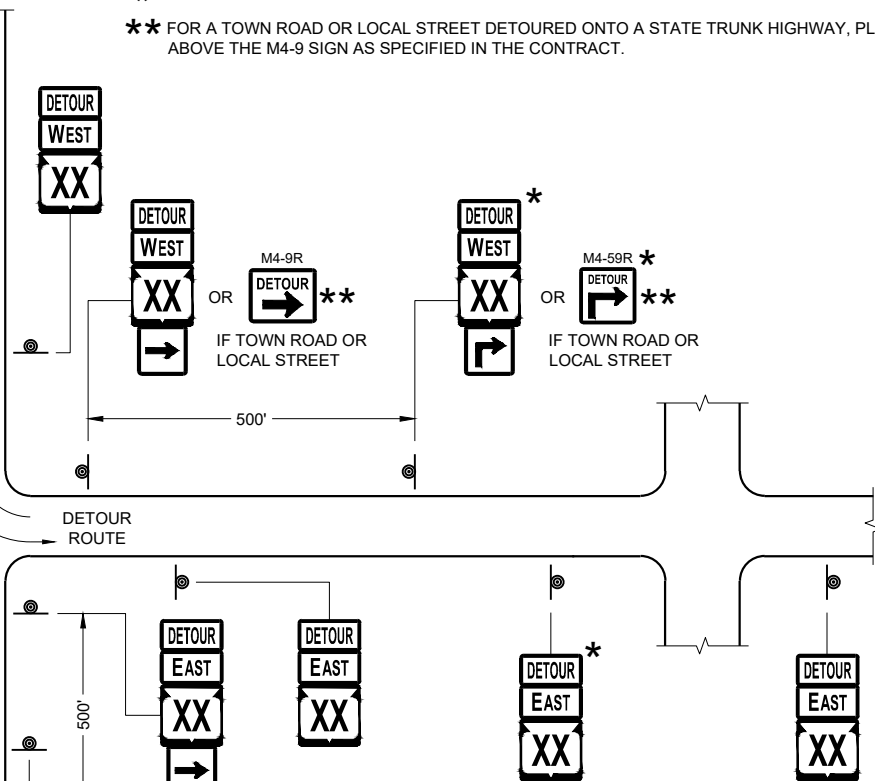
SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

"MO" SIGNS ARE THE SAME AS "M" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

SIGN SIZES SHALL BE AS FOLLOWS:

- M3-X SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)
- M4-8 SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)
- M1-4, M1-5A AND M1-6 SHALL BE 24" X 24" (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS)
- M05-1 AND M06-1 SHALL BE 21" X 21" (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS)
- M4-9 AND M4-9R SHALL BE 30" X 24"
- M4-8a SHALL BE 24" X 18"
- G20-51 SHALL BE 60" X 24"
- W20-2A SHALL BE 48" X 48"
- D1-X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.

- * OPTIONAL SIGNS. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS.
- ** FOR A TOWN ROAD OR LOCAL STREET DETOURED ONTO A STATE TRUNK HIGHWAY, PLACE A ROAD NAME PLAQUE ABOVE THE M4-9 SIGN AS SPECIFIED IN THE CONTRACT.

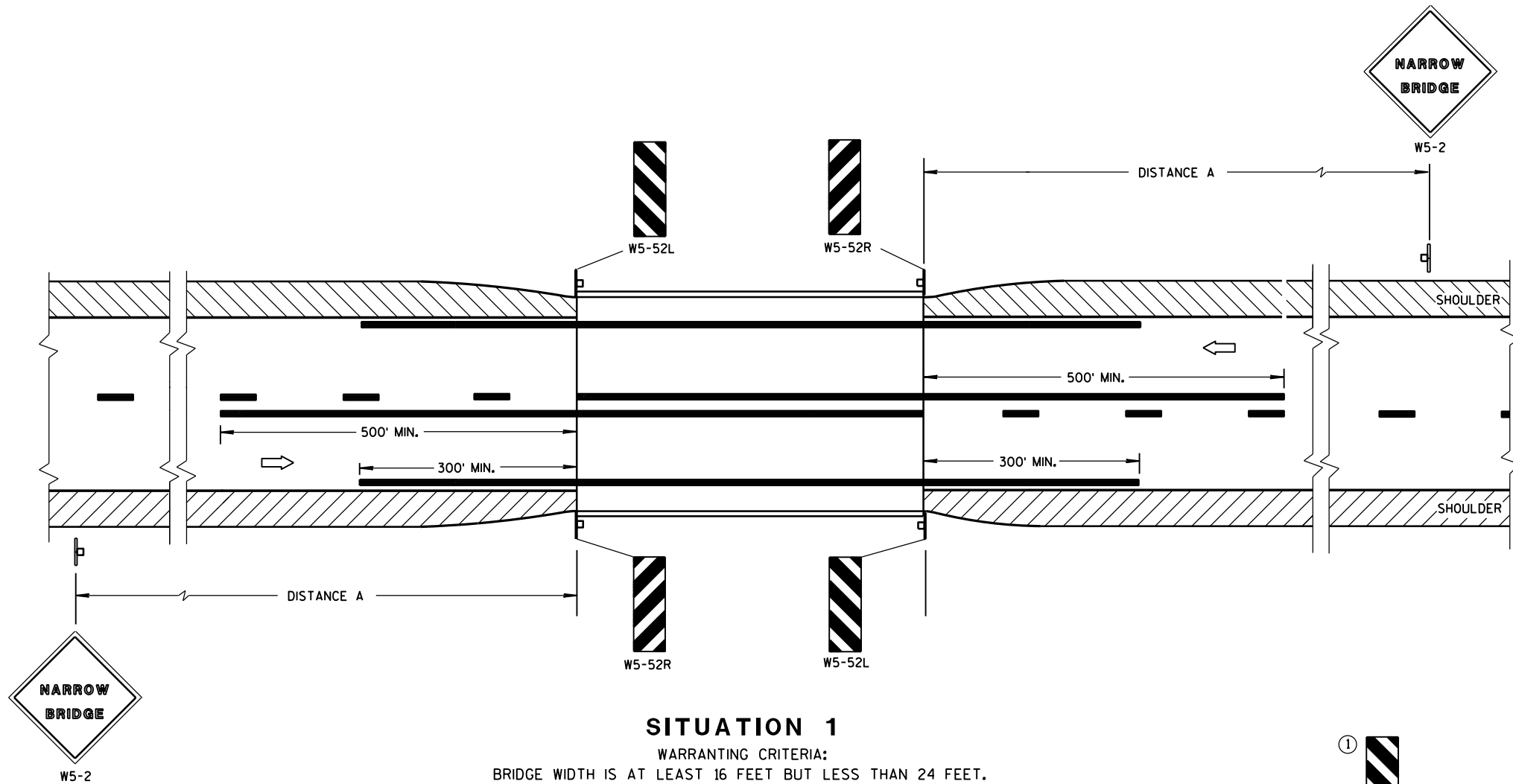


PLACE SIGNS BEYOND INTERSECTIONS
WITH STATE OR COUNTY TRUNK
HIGHWAYS OR AT 4 MILE MAXIMUM
SPACING (4 BLOCKS IF URBAN AREA)

DETOUR SIGNING
FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
February 2020 /S/ Andrew Heidtke
DATE WORK ZONE ENGINEER
FHWA



SITUATION 1

WARRANTING CRITERIA:
BRIDGE WIDTH IS AT LEAST 16 FEET BUT LESS THAN 24 FEET.

DISTANCE TABLE

POSTED OR 85th PERCENTILE SPEED	DISTANCE "A "
25	150'
30	200'
35	250'
40	300'
45	400'
50	550'
55	750'

GENERAL NOTES

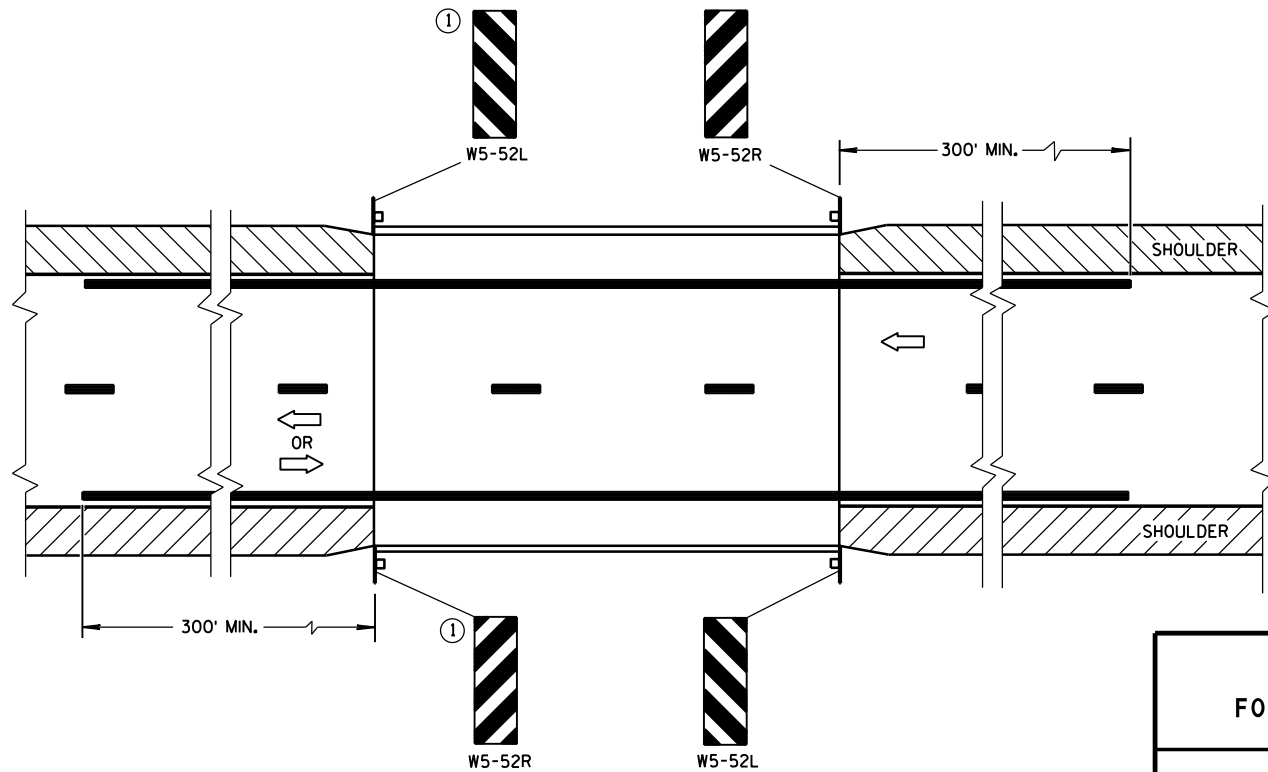
DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

LOCATE W5-52 SIGN POST(S) BEHIND GUARDRAIL WHEN PRESENT.

PLACE THE EDGE OF THE W5-52 SIGN IN LINE WITH FACE OF CURB OR PARAPET.

① OMIT ON ONE-WAY TRAVELLED WAYS.

➡ DIRECTION OF TRAFFIC



SITUATION 2

WARRANTING CRITERIA:
1. BRIDGE WIDTH IS AT LEAST 24 FEET AND
2. BRIDGE SHOULDER WIDTH IS LESS THAN 6 FEET.

SIGNING & MARKING FOR TWO LANE BRIDGES

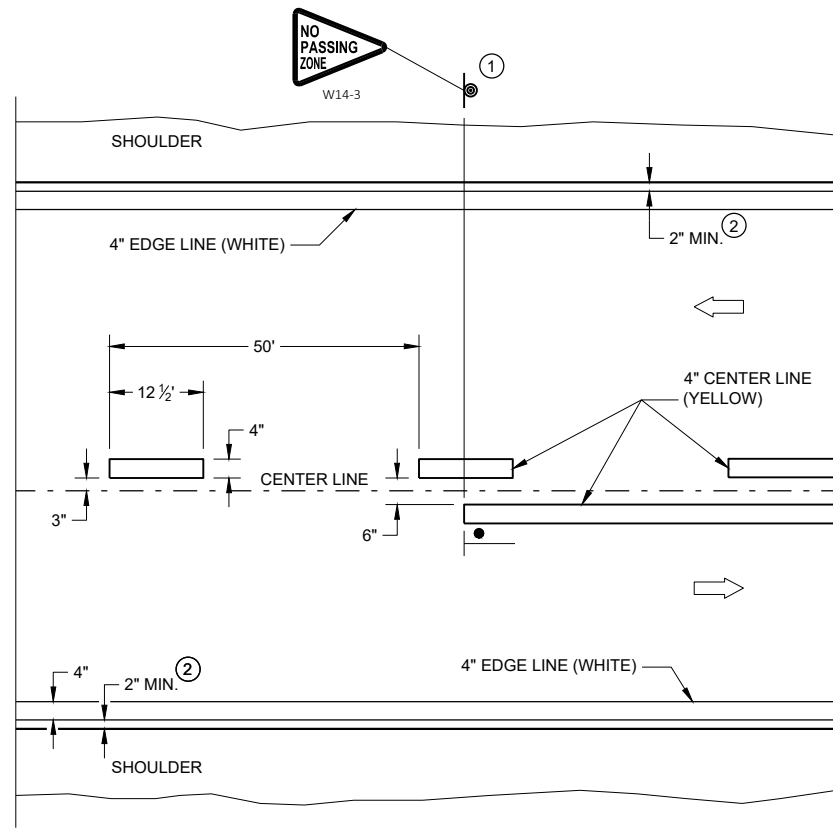
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

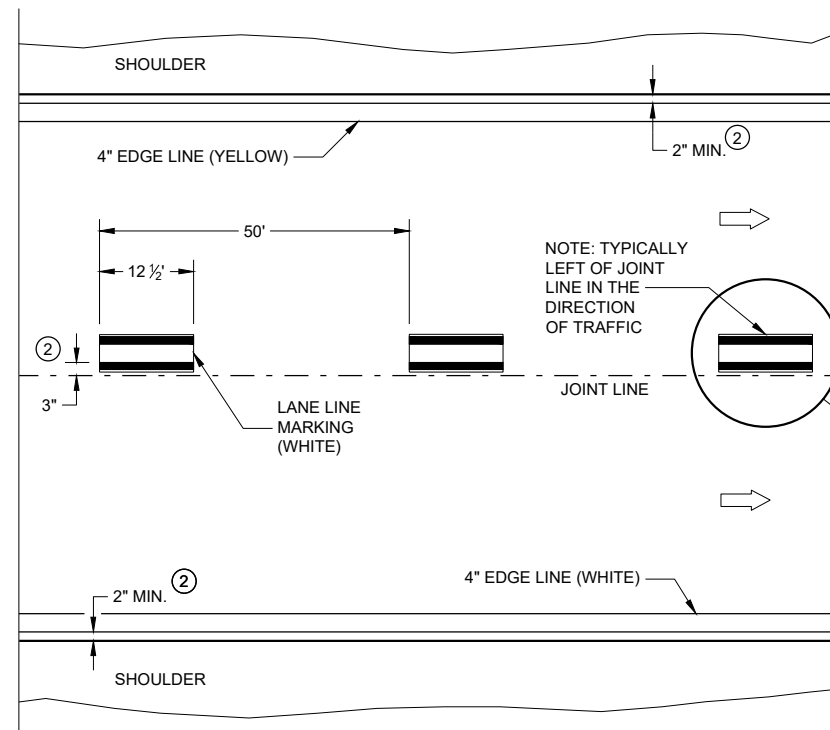
June 2017
DATE

/S/ Matthew R. Rauch
STATE SIGNING AND MARKING ENGINEER

FHWA

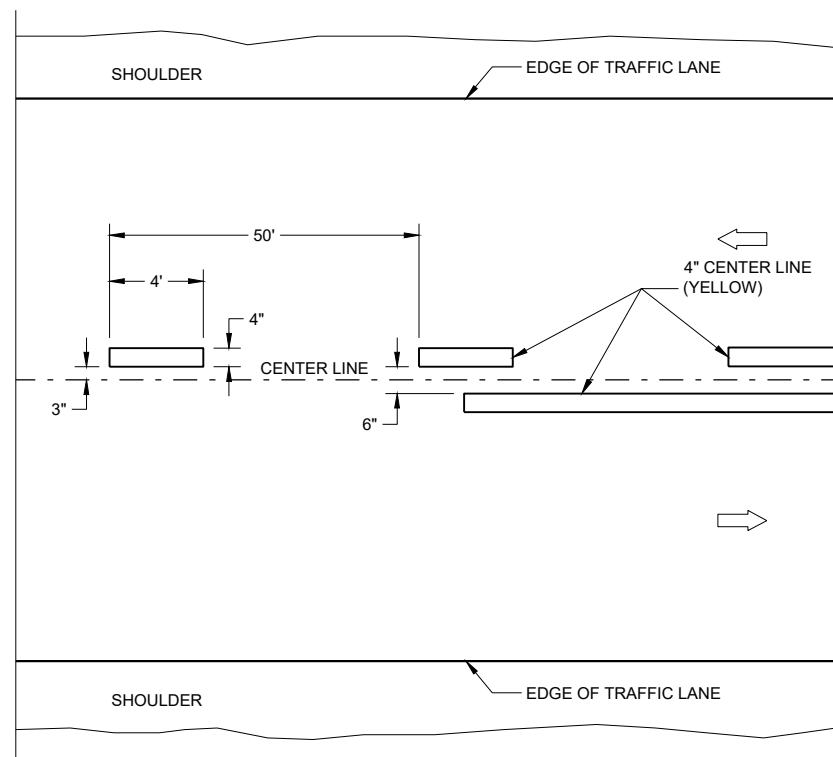


TWO WAY TRAFFIC

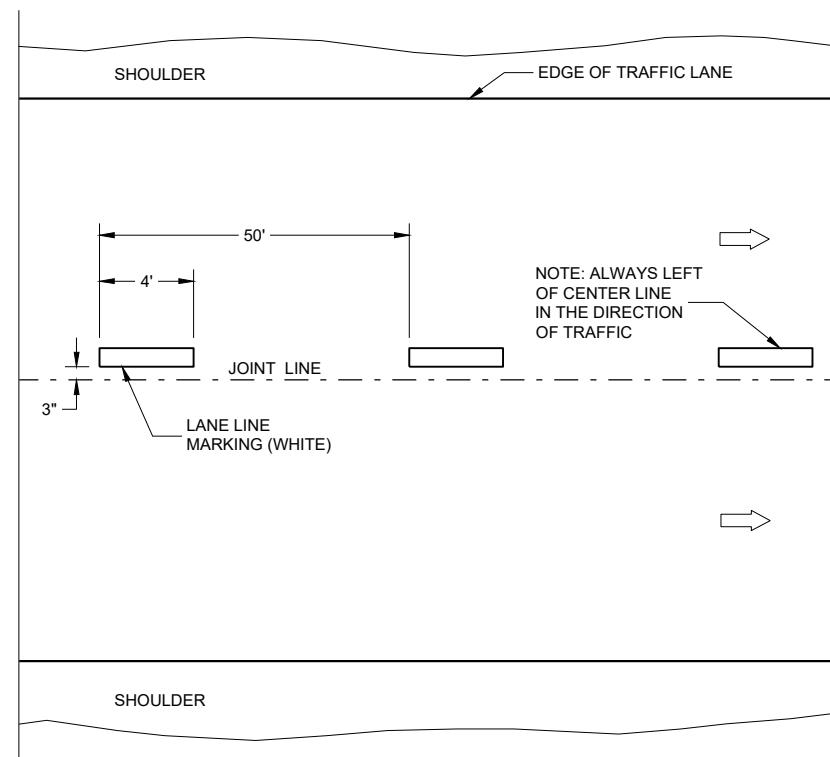


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY PAVEMENT MARKING

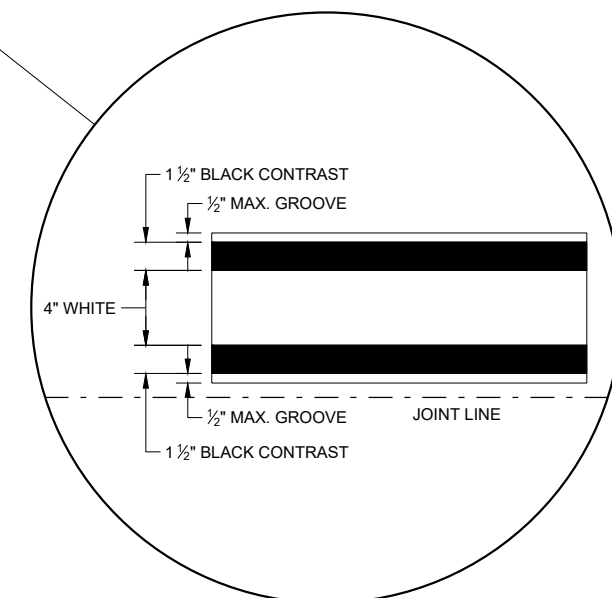
GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM
TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

- ① LOCATE THE NO PASSING ZONE W14-3 SIGN WITH 50 FEET OF THE "T" MARKING
- ② MEASURE FROM EDGE OF MARKING TO JOINT LINE. THIS DOES NOT INCLUDE SPACE NEEDED FOR GROOVING OPERATIONS.

LEGEND

-  "T" MARKING
 SIGN ON PERMANENT SUPPORT
 DIRECTION OF TRAFFIC

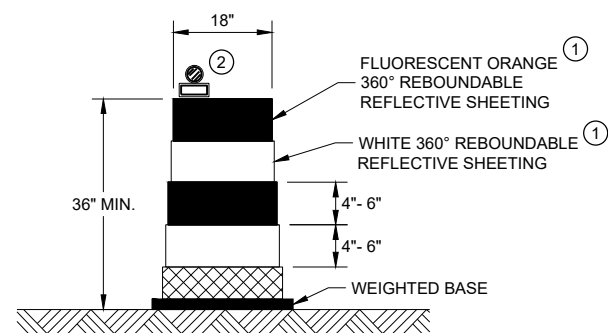
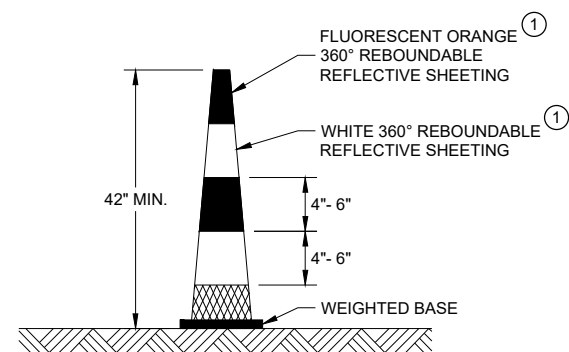


LONGITUDINAL MARKING (MAINLINE)

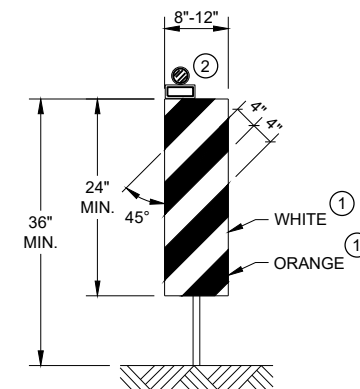
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
February 2020
DATE

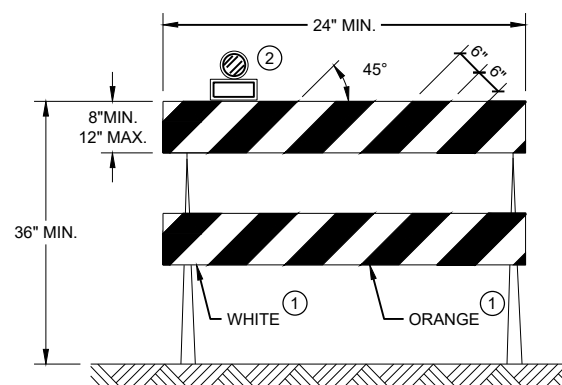
/S/ Matthew Rauch
STATEWIDE SIGNING AND MARKING
ENGINEER

**DRUM****42" CONE**

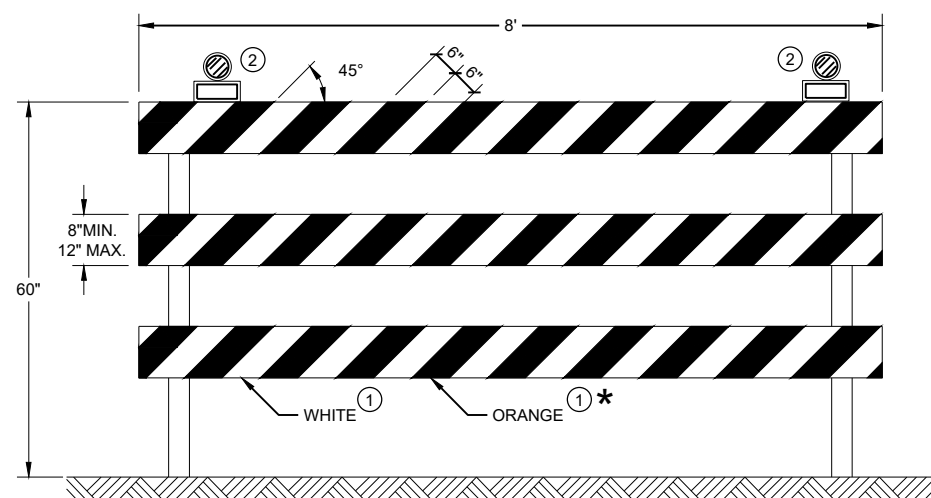
DO NOT USE IN TAPERS
 $\frac{1}{2}$ SPACING OF DRUMS

**VERTICAL PANEL**

THE STRIPES SHALL SLOPE DOWNWARD TO
 THE TRAFFIC SIDE FOR CHANNELIZATION.

**TYPE II BARRICADE**

FOR RAILS LESS THAN 36" LONG, 4" WIDE STRIPES
 MAY BE USED. ALL STRIPES SHALL SLOPE DOWNWARD
 TO THE TRAFFIC SIDE FOR CHANNELIZATION.

**TYPE III BARRICADE**

IF SIGN MOUNTED, DO NOT COVER MORE THAN 50% OF THE TOP
 TWO RAILS OR 33% OF THE TOTAL AREA OF THE THREE RAILS.

* IF USED FOR A PERMANENT APPLICATION USE RED SHEETING.

GENERAL NOTES

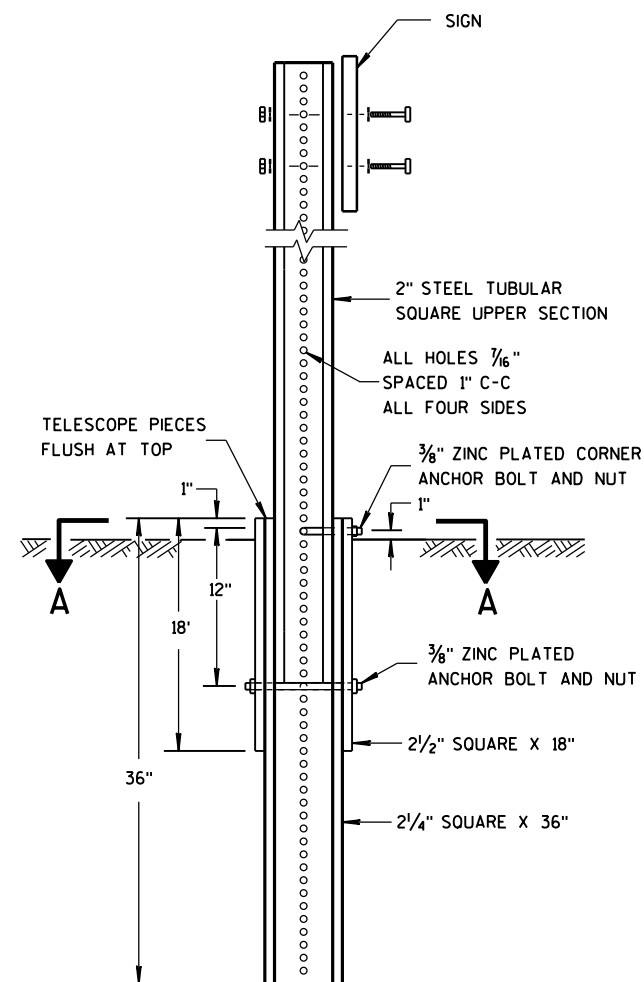
- ① REFLECTIVE SHEETING SHALL FOLLOW THE REQUIREMENTS IN THE APPROVED PRODUCTS LISTING FOR SIGN SHEETING.
- ② LOCATION OF WARNING LIGHTS WHEN SHOWN ON THE PLAN.

**CHANNELIZING DEVICES
 DRUMS, CONES, BARRICADES
 AND VERTICAL PANELS**

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

APPROVED
 June 2017 /S/ Andrew Heidtke
 DATE WORK ZONE ENGINEER

FHWA

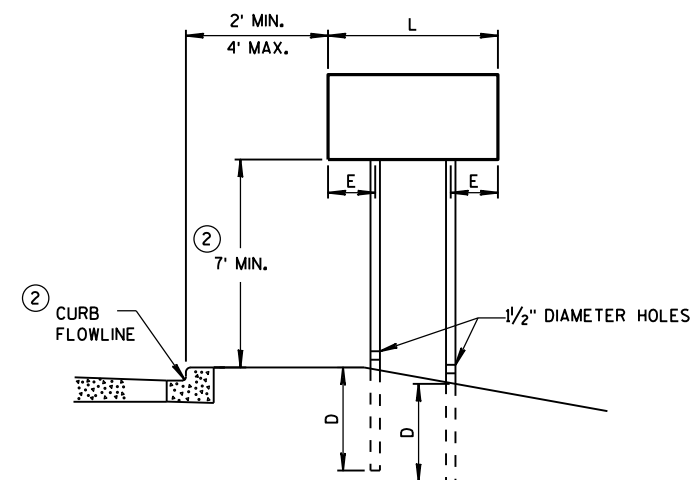
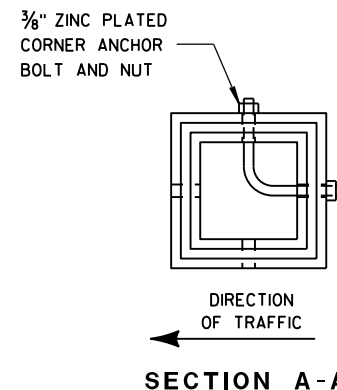


DETAIL OF TUBULAR
STEEL SIGN POST

TUBULAR STEEL POSTS

AREA OF SIGN INSTALLATION (SQ. FT.)	NUMBER OF REQUIRED TUBULAR STEEL POSTS
9 OR LESS	1
GREATER THAN 9 LESS THAN OR EQUAL TO 18	2
GREATER THAN 18 LESS THAN OR EQUAL TO 27	3

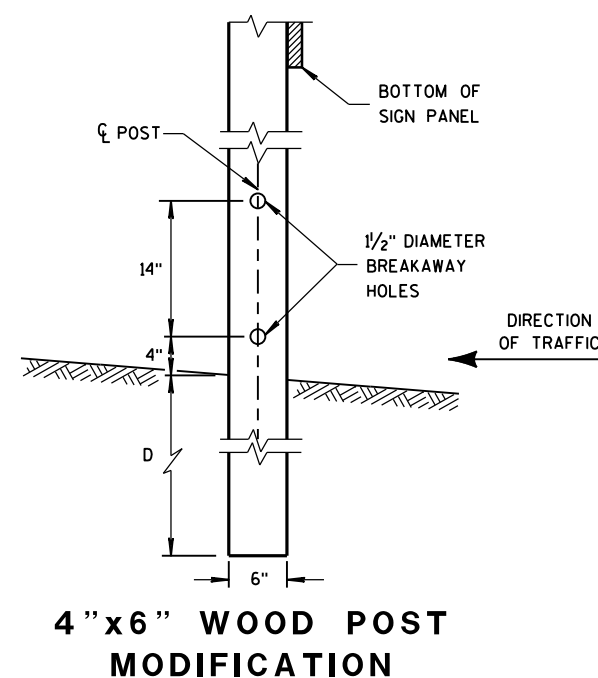
SIGNS WIDER THAN 3 FEET OR LARGER THAN 9 SQ. FT. SHALL
BE MOUNTED ON MULTIPLE POSTS (SEE ABOVE TABLE).
SIGNS LARGER THAN 27 SQ. FT. SHALL NOT BE MOUNTED
ON TUBULAR STEEL POSTS.



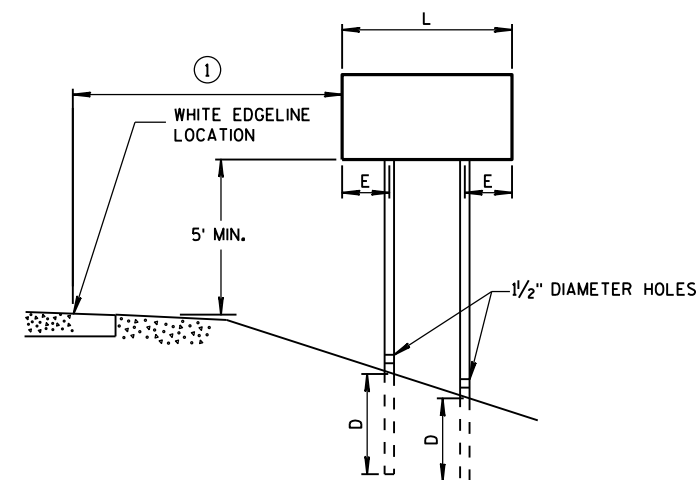
URBAN AREA

POST MOUNTING DETAIL FOR TEMPORARY TRAFFIC CONTROL FIXED MESSAGE SIGNS

WOOD POST EMBEDMENT DEPTH	
AREA OF SIGN INSTALLATION (SQ. FT.)	D (MIN)
20 OR LESS	4'
GREATER THAN 20	5'



4 "x6 " WOOD POST
MODIFICATION



RURAL AREA

POST SPACING REQUIREMENTS		NUMBER OF WOOD POSTS REQUIRED
L	E	
48" OR LESS AND LESS THAN 20 SQ. FT.	-	1
LESS THAN 60"	12"	2
60" TO 120"	L/5	2
GREATER THAN 120" LESS THAN 168"	12"	3
168" AND GREATER	12"	4

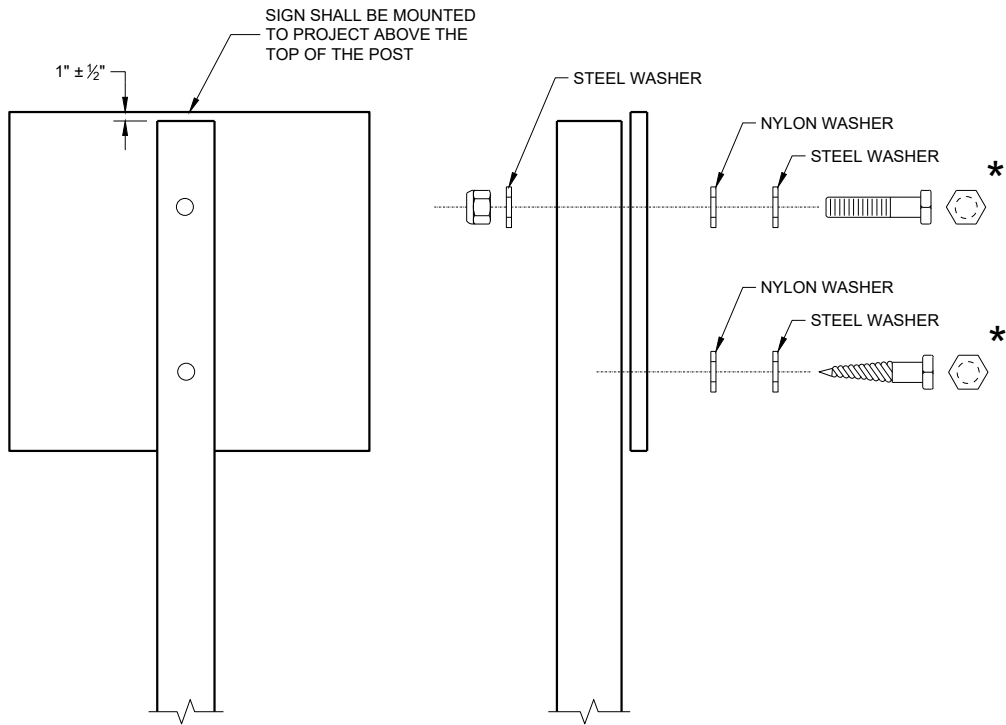
SEE NOTE ③

GENERAL NOTES

- ① 6 FEET FROM THE EDGE OF PAVEMENT (EDGE LINE LOCATION) UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER. LATERAL OFFSET SHOULD BE ADJUSTED TO AVOID THE DITCH FLOWLINE.
- ② THE EXISTENCE OF CURB AND GUTTER DOES NOT IN ITSELF MANDATE THE VERTICAL CLEARANCE ILLUSTRATED. THAT HEIGHT IS TYPICALLY MEASURED WHERE THERE IS SIDEWALK ADJACENT TO THE ROADWAY OR PARKING IS PERMITTED. IN THE ABSENCE OF SIDEWALK, VERTICAL CLEARANCE IS MEASURED FROM THE TOP OF THE CURB. IF NO SIDEWALK AND NO PARKING, VERTICAL CLEARANCE MAY BE REDUCED TO 5 FOOT MINIMUM. OFFSET OF SIGNS IS MEASURED FROM THE CURB FLOWLINE.
- ③ FOR SIGNS REQUIRING 4 POSTS, SPACE INTERMEDIATE POSTS EVENLY.

TEMPORARY TRAFFIC CONTROL
SIGN MOUNTING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



NUTS, BOLTS AND LAGS USED FOR MOUNTING SIGNS
SHALL HAVE HEXAGONAL HEADS AND SHALL BE EITHER:

- A. HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM
DESIGNATION: A 153, CLASS D, OR SC 3
- B. ELECTRO-GALVANIZED IN ACCORDANCE WITH ASTM
DESIGNATION: B 633, TYPE III, SC 3

THREADS ON BOLTS AND NUTS SHALL BE MANUFACTURED WITH
SUFFICIENT ALLOWANCE FOR THE CADMIUM PLATE OR GALVANIZED
COATING TO PERMIT THE NUTS TO RUN FREELY ON THE BOLTS.

WOOD POST (4" x 6")
LAG SCREWS - 3/8" x 3"
MACHINE BOLTS - 5/16" x 6 1/2" OR 7" LENGTH W/NUTS

SQUARE STEEL POST (2" x 2")
MACHINE BOLTS - 3/8" x 3 1/4" LENGTH W/NUTS
RIVETS - 3/32" (6605-9-6) BULB-TITE, TRI-FOLD, ALUMINUM
BODY/MANDREL O.D. FLANGE 0.720 - 0.765 INCH,
GRIP RANGE 0.042 - 0.375 INCH

WASHERS (ALL POSTS) -
1 1/4" O.D. x 3/8" I.D. x 1/16" STEEL
1 1/4" O.D. x 3/8" I.D. x 0.080 NYLON

* TWO DIFFERENT FASTENING SYSTEMS ARE SHOWN FOR ILLUSTRATION
PURPOSES. ON ANY INDIVIDUAL SIGN, EITHER ONE OR THE OTHER SYSTEM
SHALL BE USED. ACTUAL NUMBER OF FASTENERS PER SIGN VARIES WITH
THE SIGN AREA. FOR A SINGLE POST INSTALLATION, ALL SIGNS GREATER
THAN 9 SQ. FT. REQUIRE THE USE OF 3 FASTENERS.

ATTACHMENT OF SIGNS
TO POSTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017 /S/ Andrew Heidtke
DATE WORK ZONE ENGINEER

FHWA

5964-01-80

BENCHMARKS

NO.	STATION	DESCRIPTION	ELEV.
7	677+23.20, 23.5' RT	CHISELED + ON NE COR BOX CULVERT	974.28
8	679+21.08, 73.2' LT	CHISELED SQUARE ON CONC RET WALL	970.04
9	679+42.27, 25.8' RT	PK NAIL TOP OF CATTLE PASS	968.39

DESIGN DATA

LIVE LOAD:

DESIGN LOADING: HL-93
 INVENTORY RATING FACTOR: 1.05
 OPERATIONAL RATING FACTOR: 1.35
 WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = 255 KIPS

TRAFFIC DATA:

A.A.D.T. (2021) = 1,300
 A.A.D.T. (2041) = 1,500
 R.D.S. = 60 MPH

EARTH LOAD: DESIGNED FOR 4 TO 4.5 FEET OF FILL

MATERIAL PROPERTIES:

CONCRETE MASONRY f'_c = 3,500 P.S.I.
 BAR STEEL REINFORCEMENT HS STRUCTURES f_y = 60,000 P.S.I.

FOUNDATION DATA:

ALLOWABLE SOIL BEARING CAPACITY = 5,000 P.S.F.

HYDRAULIC DATA:

100 YEAR FREQUENCY
 DRAINAGE AREA = 0.71 SQ. MI.
 Q_{100} = 780 C.F.S.
 VELOCITY = 12.79 F.P.S.
 WATERWAY AREA = 61 SQ. FT.
 HIGH WATER 100 ELEVATION = 973.44
 ROADWAY OVERFLOW DESIGN FREQUENCY = >100 YEARS
 SCOUR CRITICAL CODE = 8
 O_2 ELEVATION (150 C.F.S.) = 969.26
 VELOCITY₂ = 6.46 F.P.S.

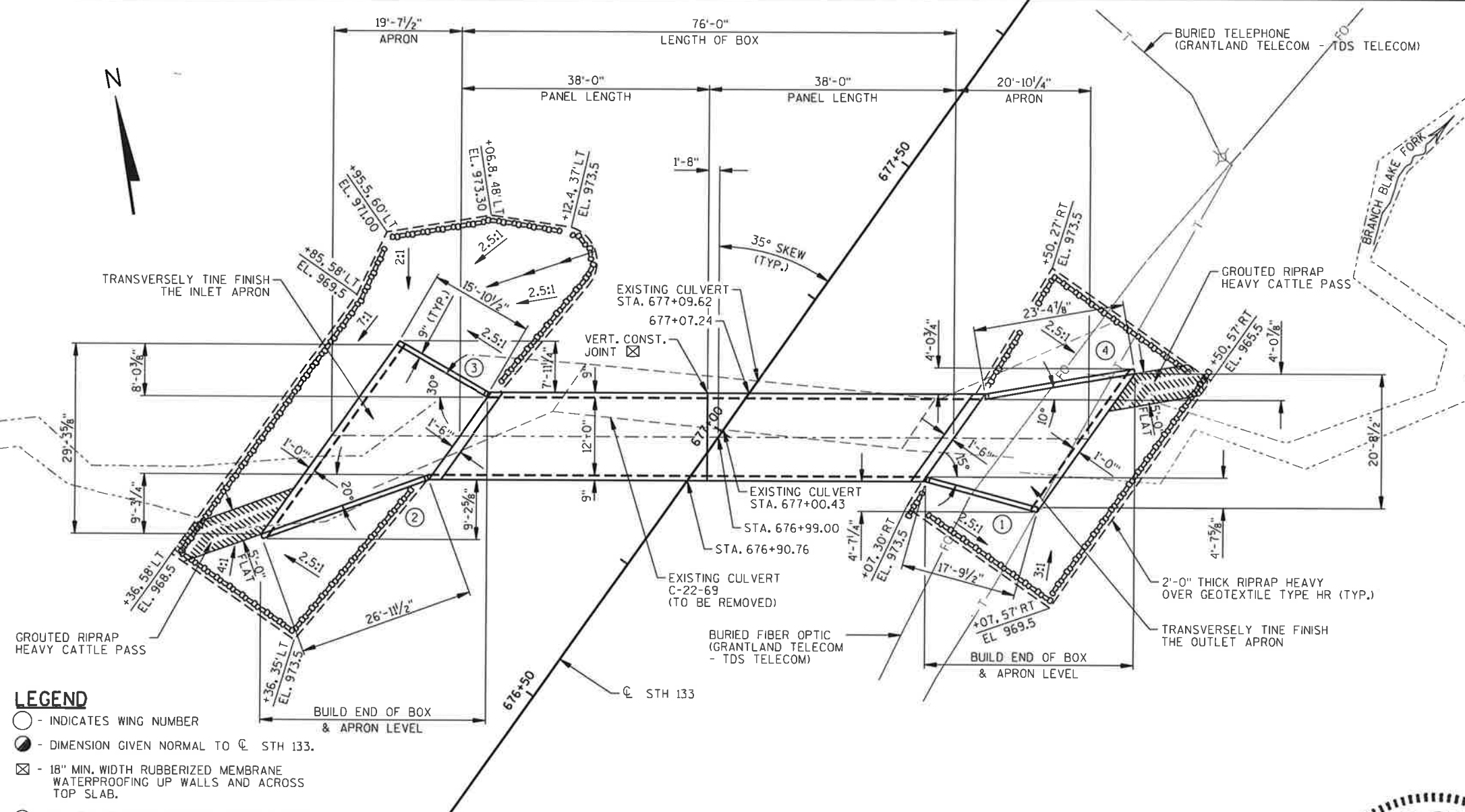
LIST OF DRAWINGS

1. GENERAL PLAN
2. CROSS SECTION, QUANTITIES, NOTES & DETAILS
3. BOX CULVERT
4. BOX CULVERT DETAILS
5. INLET APRON & WING DETAILS
6. OUTLET APRON & WING DETAILS
7. SUBSURFACE EXPLORATION



CONSULTANT DESIGN CONTACT:
 JOSH SWENO
 (608) 355-8852

BRIDGE OFFICE CONTACT:
 AARON BONK
 (608) 261-0261

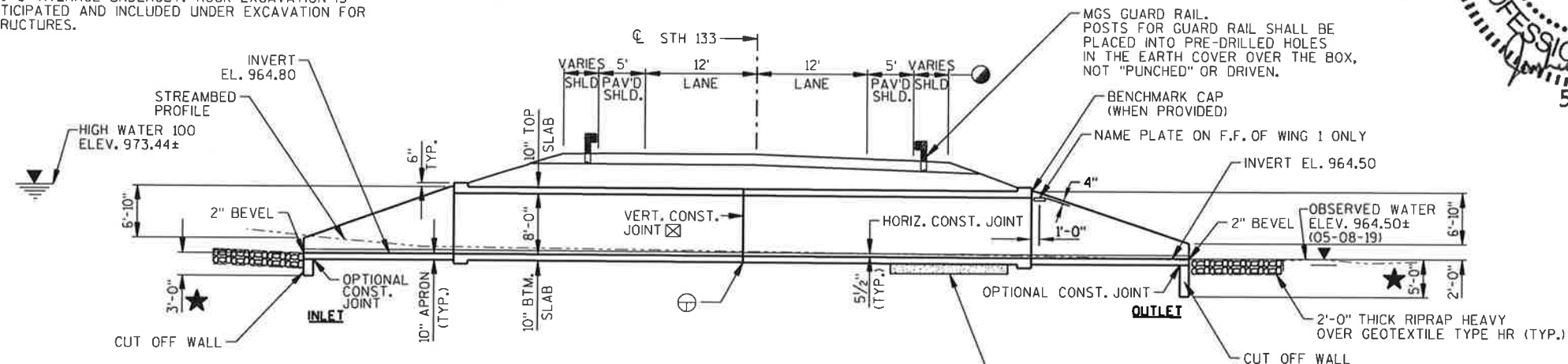


PLAN

SINGLE CELL REINFORCED CONCRETE BOX CULVERT

LEGEND

- - INDICATES WING NUMBER
- - DIMENSION GIVEN NORMAL TO ϕ STH 133.
- ⊗ - 18" MIN. WIDTH RUBBERIZED MEMBRANE WATERPROOFING UP WALLS AND ACROSS TOP SLAB.
- ⊕ - IN LIEU OF CONSTRUCTION JOINTS IN THE BOTTOM SLAB, THE CONTRACTOR MAY PROVIDE 2" DEEP SAUCUTS WITHIN 12 HOURS AFTER POURING.
- ★ - THE CONCRETE CUT OFF WALL SHALL BE NOTCHED 1'-0" MIN. IF BEDROCK IS ENCOUNTERED. ROCK EXCAVATION IS ANTICIPATED AND INCLUDED UNDER EXCAVATION FOR STRUCTURES.
- ⊕ - UNDERCUT 6" MIN. IN AREAS WHERE BEDROCK IS ENCOUNTERED. BREAKER RUN QUANTITY BASED ON A 1'-0" AVERAGE UNDERCUT. ROCK EXCAVATION IS ANTICIPATED AND INCLUDED UNDER EXCAVATION FOR STRUCTURES.

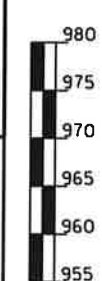


ELEVATION

(LOOKING NORTH - NORMAL TO BOX)

NO.	DATE	REVISION	BY

MSA		ENGINEERING ARCHITECTURE SURVEYING FUNDING PLANNING ENVIRONMENTAL 1702 PANKRATZ ST., MADISON WI 53704 (608) 242-7779 www.msa-ps.com © MSA Professional Services, Inc.
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION		
ACCEPTED	<i>[Signature]</i> SDR	08/25/20
CHIEF STRUCTURES DESIGN ENGINEER DATE		
STRUCTURE C-22-229		
STH 133 OVER BRANCH BLAKE FORK		
COUNTY	GRANT	TOWN/CITY/VILLAGE BLOOMINGTON
DESIGN SPEC. AASHTO LRFD BRIDGE DESIGN SPEC.		
DESIGNED BY	JZ	DESIGN CK'D. JRS
DRAWN BY	RLR	PLANS CK'D. JRS
GENERAL PLAN		SHEET 1 OF 7



TOTAL ESTIMATED QUANTITIES

ITEM NUMBER	BID ITEM	UNIT	TOTAL
203.0200.03	REMOVING OLD STRUCTURE STATION 677+05	LS	1
206.2000.03	EXCAVATION FOR STRUCTURES CULVERTS C-22-229	LS	1
210.2500	BACKFILL STRUCTURE TYPE B	TON	1840
311.0110	BREAKER RUN	TON	254
504.0100	CONCRETE MASONRY CULVERTS	CY	143
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	19,630
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	2,560
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	26
606.0300	RIPRAP HEAVY	CY	170
606.0700	GROUTED RIPRAP HEAVY	CY	11
645.0105	GEOTEXTILE TYPE C	SY	334
645.0120	GEOTEXTILE TYPE HR	SY	370
	NON-BID ITEMS		
	PREFORMED FILLER	SIZE	¾"

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS SHOWN OR NOTED OTHERWISE.

THE FIRST DIGIT OF A THREE DIGIT BAR MARK SIGNIFIES THE BAR SIZE.

THE CONCRETE IN THE CUT OFF WALL MAY BE PLACED UNDERWATER IF THE EXCAVATION CANNOT BE DEWATERED.

AN ALTERNATE CUT OFF WALL MAY NOT BE USED IN LIEU OF THE CAST IN PLACE CUT OFF WALLS DUE TO THE PRESENCE OF BEDROCK. THE CONCRETE CUT OFF WALL SHALL BE NOTCHED 1'-0" MIN. IF BEDROCK IS ENCOUNTERED. ROCK EXCAVATION IS ANTICIPATED AND INCLUDED UNDER EXCAVATION FOR STRUCTURES.

THIS STRUCTURE WILL REPLACE THE EXISTING STRUCTURE, A 8' WIDE X 8' HIGH SINGLE CELL REINFORCED CONCRETE BOX CULVERT.

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES CULVERTS C-22-229" SHALL BE THE EXISTING GROUND LINE.

THE BACKFILL QUANTITIES ARE BASED ON THE PAY LIMITS SHOWN ON THE PLANS AND MAY NOT REFLECT ACTUAL PLACED QUANTITIES. "BACKFILL STRUCTURE TYPE B" REQUIRED ON THE BOX CULVERT SIDES AND TOP AND BEHIND APRON WINGS FOR 3 FEET.

THE CONTRACTOR MAY FURNISH A PRECAST CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE BOX CULVERT WITH THE ACCEPTANCE OF THE SHOP DRAWINGS BY THE STRUCTURES DESIGN SECTION. THE PRECAST CONCRETE BOX CULVERT SHALL CONFORM TO PRECAST DETAILS IN CHAPTER 36 STANDARDS OF THE CURRENT WISCONSIN DOT BRIDGE MANUAL. PAYMENT FOR THE PRECAST CULVERT SHALL BE BASED ON THE QUANTITIES AND PRICES BID FOR THE ITEMS LISTED IN THE "TOTAL ESTIMATED QUANTITIES". ALL PRECAST BOX SECTIONS SHALL BE PLACED ON A BEDDING OF "BACKFILL STRUCTURE TYPE B" OF 6" MIN. DEPTH.

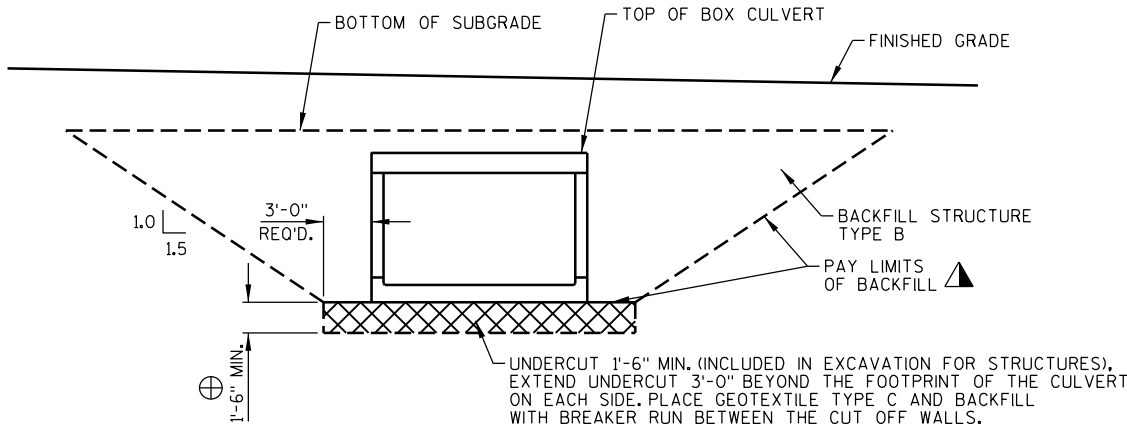
BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

APRONS AND BOTTOM SLAB MAY BE POURED CONTINUOUSLY.

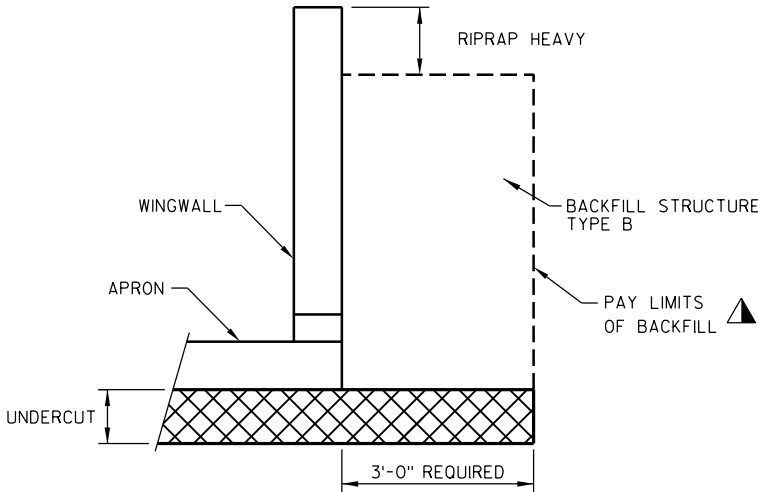
ELEVATIONS SHOWN ON THIS PLAN ARE REFERENCED TO USGS NAVD 88 (2012 ADJUSTED). BENCHMARKS WERE LOCATED IN THE FIELD USING GPS TECHNOLOGY.

UNDERCUT 6" MIN. IN AREAS WHERE BEDROCK IS ENCOUNTERED. BREAKER RUN QUANTITY BASED ON A 1'-0" AVERAGE UNDERCUT. ROCK EXCAVATION IS ANTICIPATED AND INCLUDED UNDER EXCAVATION FOR STRUCTURES.

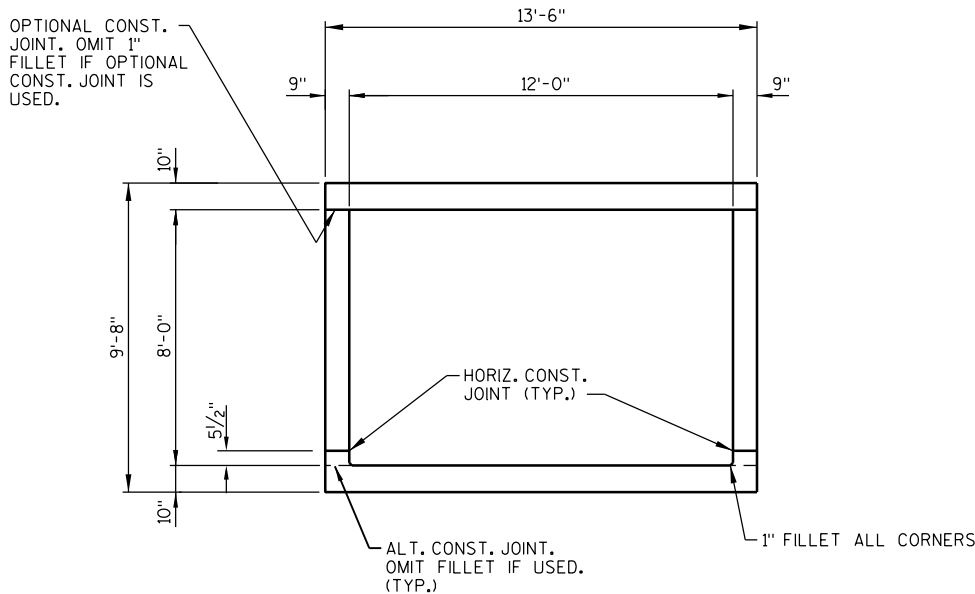
A TEMPORARY WATER DIVERSION SHALL BE PROVIDED DURING CONSTRUCTION OF THE NEW CULVERT. THE TEMPORARY WATER DIVERSION BID ITEM IS DETAILED IN THE SPECIAL PROVISIONS AND PROVIDED IN THE ROADWAY QUANTITIES.



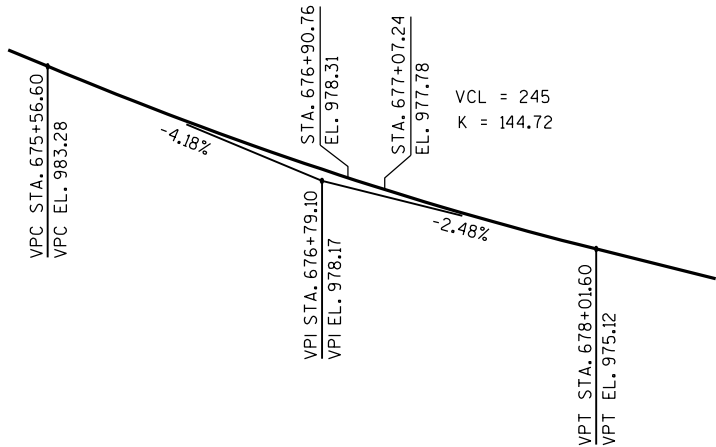
CULVERT BACKFILL STRUCTURE DETAIL



WINGWALL BACKFILL DETAIL

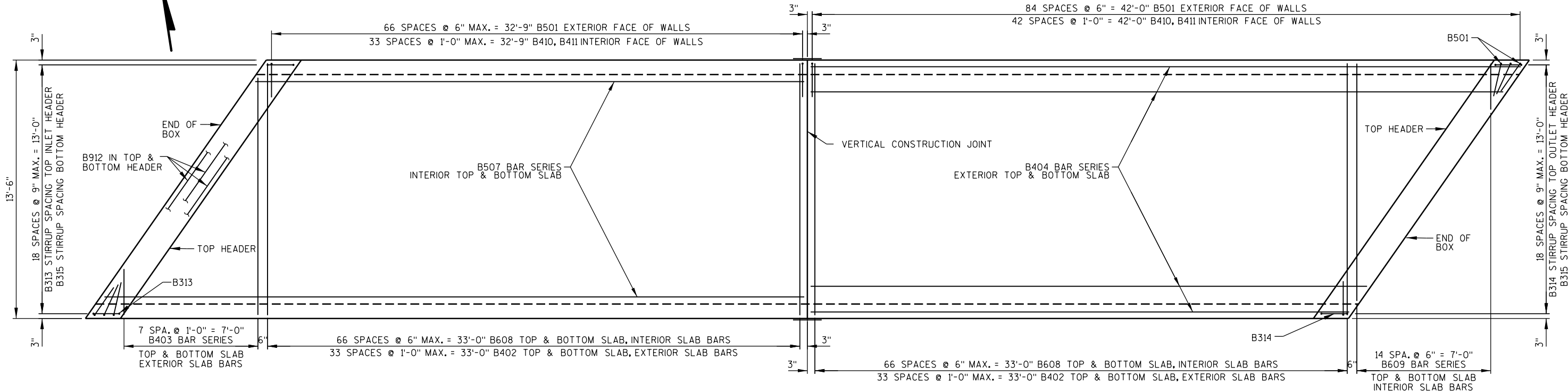


TYPICAL SECTION THRU BOX

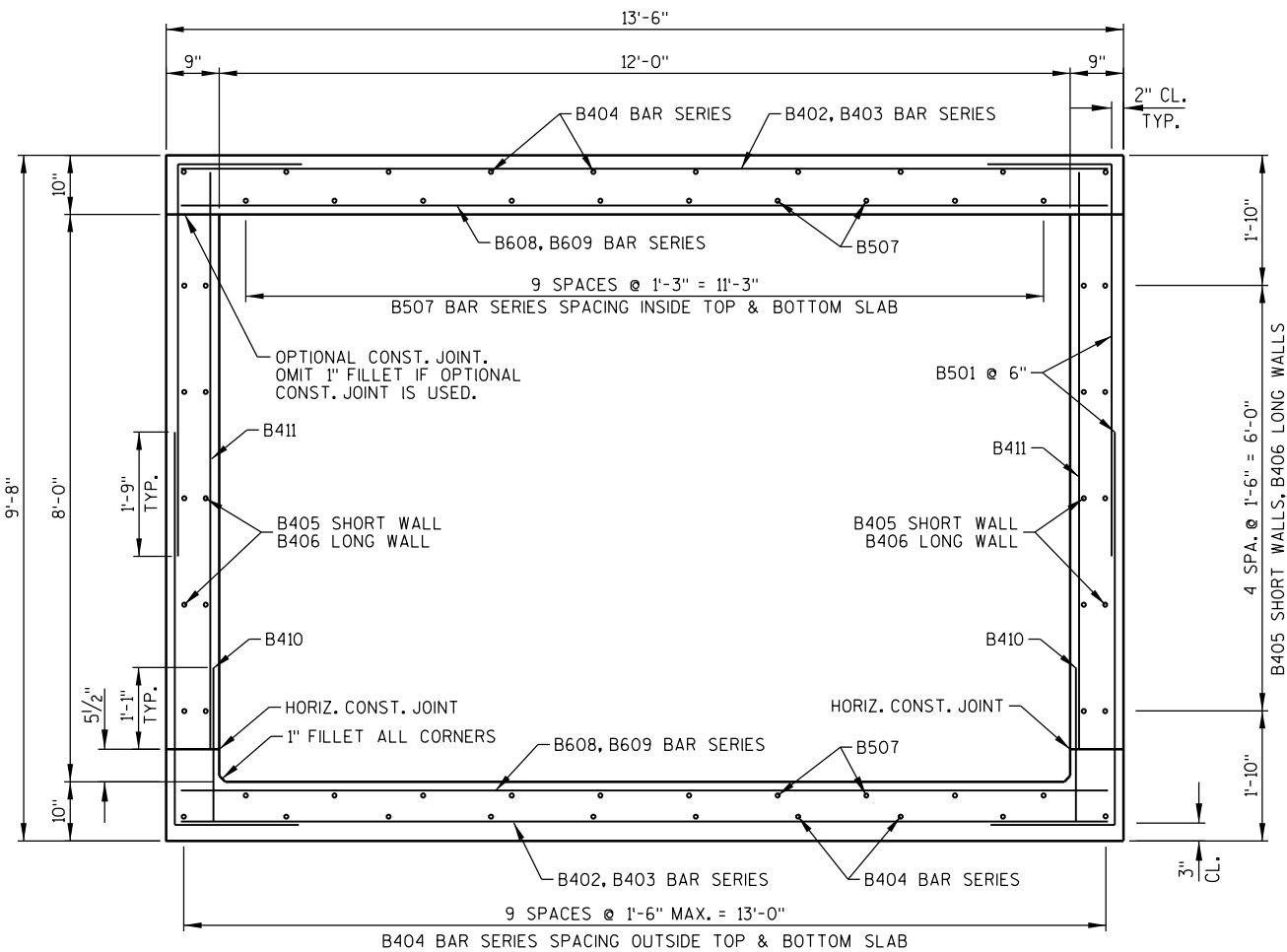


PROFILE GRADE LINE - STH 133

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-229			
DRAWN BY RLR		PLANS CK'D. JRS	
CROSS SECTION, QUANTITIES, NOTES & DETAILS			SHEET 2 OF 7



PLAN VIEW OF PANEL



TYPICAL SECTION THRU BOX

BAR SERIES TABLE

MARK	NO. REQUIRED	LENGTH
B403	4 SERIES OF 8	2'-4" TO 12'-4"
B404	4 SERIES OF 10	33'-0" TO 42'-2"
B507	4 SERIES OF 10	33'-8" TO 41'-6"
B609	4 SERIES OF 15	2'-4" TO 12'-4"

BUNDLE AND TAG EACH SERIES SEPARATELY

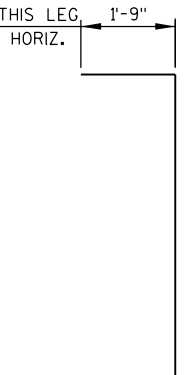
BILL OF BARS

UNCOATED 18,130 LBS.

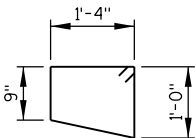
MARK	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
B501	608	7'-2"	X		BOX CORNERS - TOP & BOTTOM - TRANS.
B402	136	13'-2"			BOX EXTERIOR SLABS - TRANS.
B403	32	7'-4"	*		BOX EXTERIOR SLABS - END - TRANS.
B404	40	37'-7"	*		BOX EXTERIOR SLABS - LONGIT.
B405	20	33'-0"			BOX EXTERIOR SHORT WALLS - LONGIT.
B406	20	41'-11"			BOX EXTERIOR LONG WALLS - LONGIT.
B507	40	37'-7"	*		BOX INTERIOR SLABS - LONGIT.
B608	268	13'-2"			BOX INTERIOR SLABS - TRANS.
B609	60	7'-4"	*		BOX INTERIOR SLABS - END - TRANS.
B410	154	2'-2"			BOX INTERIOR WALL DOWELS - VERT.
B411	154	8'-2"			BOX INTERIOR WALLS - VERT.
B912	24	16'-0"			TOP & BOTTOM HEADER - TRANS
B313	19	4'-10"	X		TOP INLET HEADER STIRRUPS - VERT.
B314	19	5'-1"	X		TOP OUTLET HEADER STIRRUPS - VERT.
B315	38	4'-7"	X		BOTTOM HEADERS STIRRUPS - VERT.
B516	46	4'-0"			BOX VERT. CONST. JOINT DOWELS - VERT.

DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.

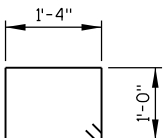
* - LENGTH SHOWN FOR BAR IS AN AVERAGE LENGTH AND SHOULD ONLY BE USED FOR BAR WEIGHT CALCULATIONS. SEE BAR SERIES TABLE FOR ACTUAL LENGTHS. BENT BARS IF USED IN BAR SERIES TABLE SHALL BE BENT AFTER CUTTING.



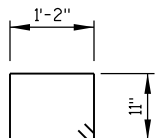
B501



B313

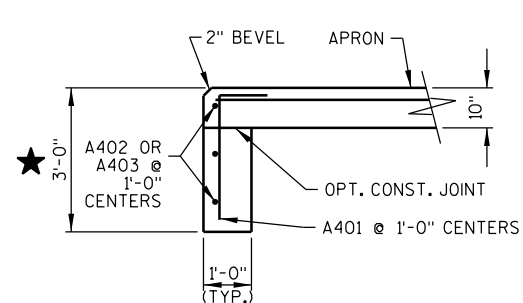


B314

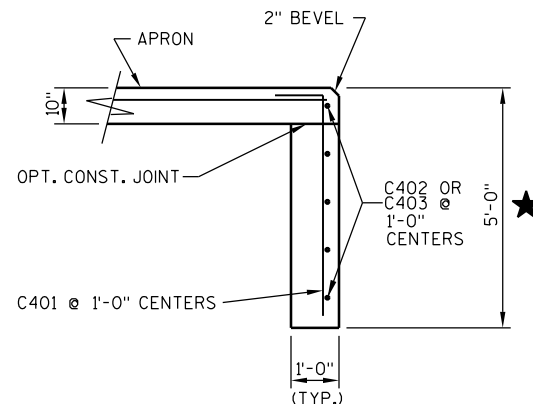


B315

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-229			
DRAWN BY CAR		PLANS CK'D. JRS	
BOX CULVERT			SHEET 3 OF 7

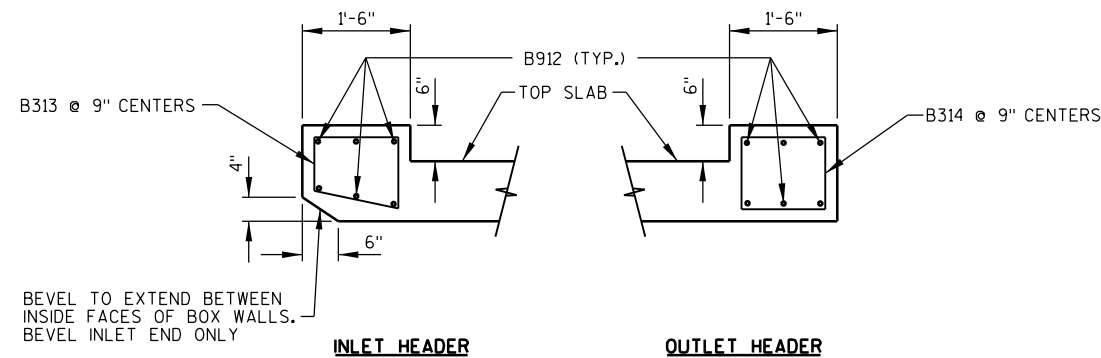


SECTION THRU INLET CUT OFF WALL

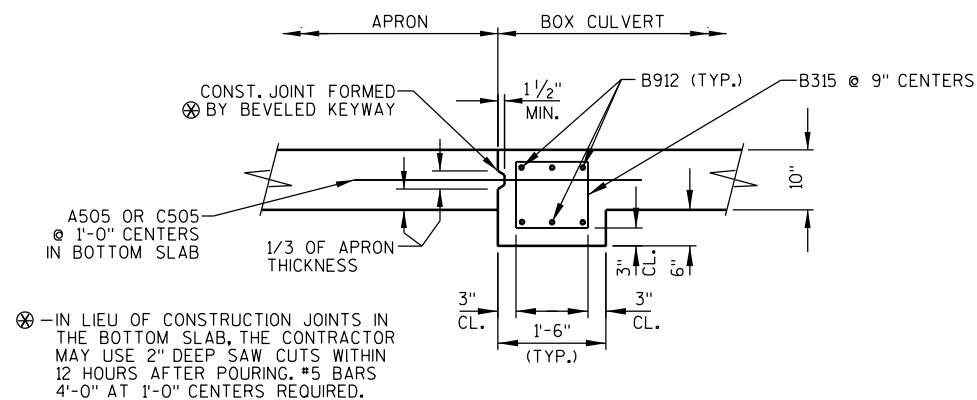


SECTION THRU OUTLET CUT OFF WALL

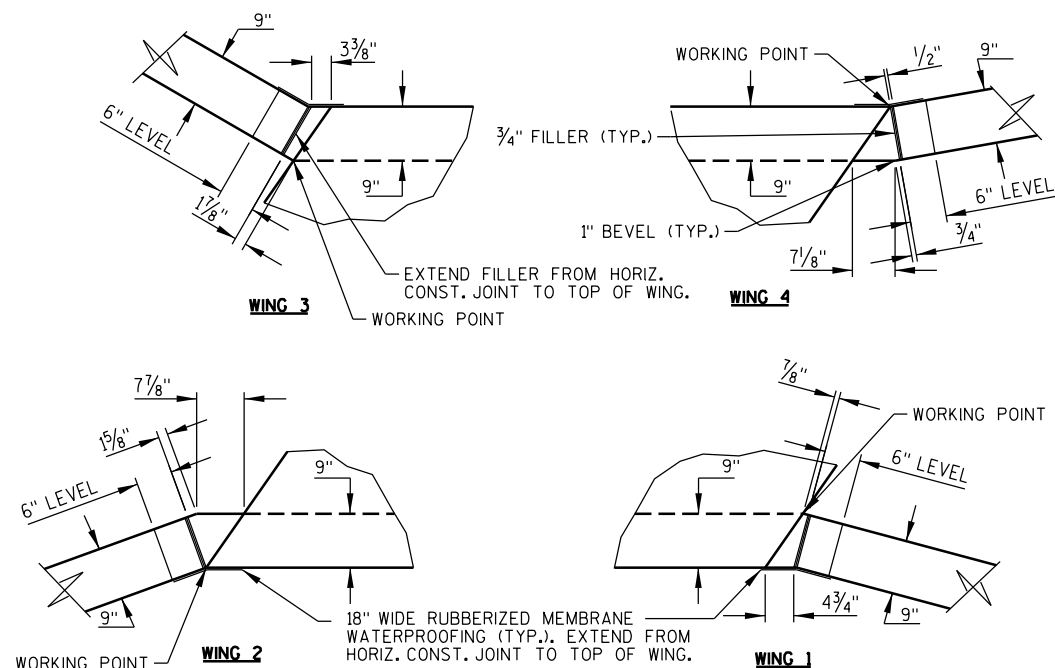
★ -THE CONCRETE CUT OFF WALL SHALL BE NOTCHED 1'-0" MIN. IF BEDROCK IS ENCOUNTERED. ROCK EXCAVATION IS ANTICIPATED AND INCLUDED UNDER EXCAVATION FOR STRUCTURES.



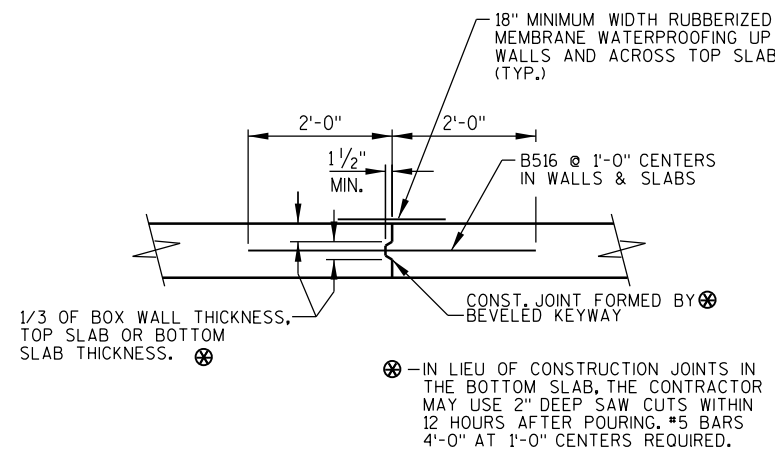
SECTION THRU TOP HEADER



APRON CONNECTION & HEADER DETAIL



CORNER DETAILS



VERTICAL CONSTRUCTION JOINT

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-229			
DRAWN BY CAR		PLANS CK'D. JRS	
BOX CULVERT DETAILS		SHEET 4 OF 7	

BAR SERIES TABLE

MARK	NO. REQUIRED	LENGTH
A406	1 SERIES OF 8	4'-0" TO 18'-8"
A407	1 SERIES OF 7	4'-1" TO 18'-9"
A408	1 SERIES OF 16	8'-0" TO 17'-3"
A409	1 SERIES OF 16	9'-8" TO 20'-8"
A413	1 SERIES OF 5	2'-6" TO 4'-8"
A414	1 SERIES OF 6	6'-2" TO 8'-4"
A415	1 SERIES OF 9	6'-1" TO 7'-9"
A416	1 SERIES OF 7	4'-3" TO 8'-2"
A418	2 SERIES OF 4	4'-0" TO 14'-2"
A420	1 SERIES OF 7	2'-5" TO 4'-9"
A421	1 SERIES OF 10	6'-0" TO 8'-4"
A422	1 SERIES OF 15	6'-1" TO 7'-9"
A423	1 SERIES OF 12	4'-0" TO 8'-2"
A425	2 SERIES OF 4	6'-8" TO 24'-2"
A427	1 SERIES OF 8	3'-6" TO 5'-10"
A428	1 SERIES OF 13	3'-6" TO 5'-10"

BUNDLE AND TAG EACH SERIES SEPARATELY

COATED 1310 LBS.
UNCOATED 780 LBS.

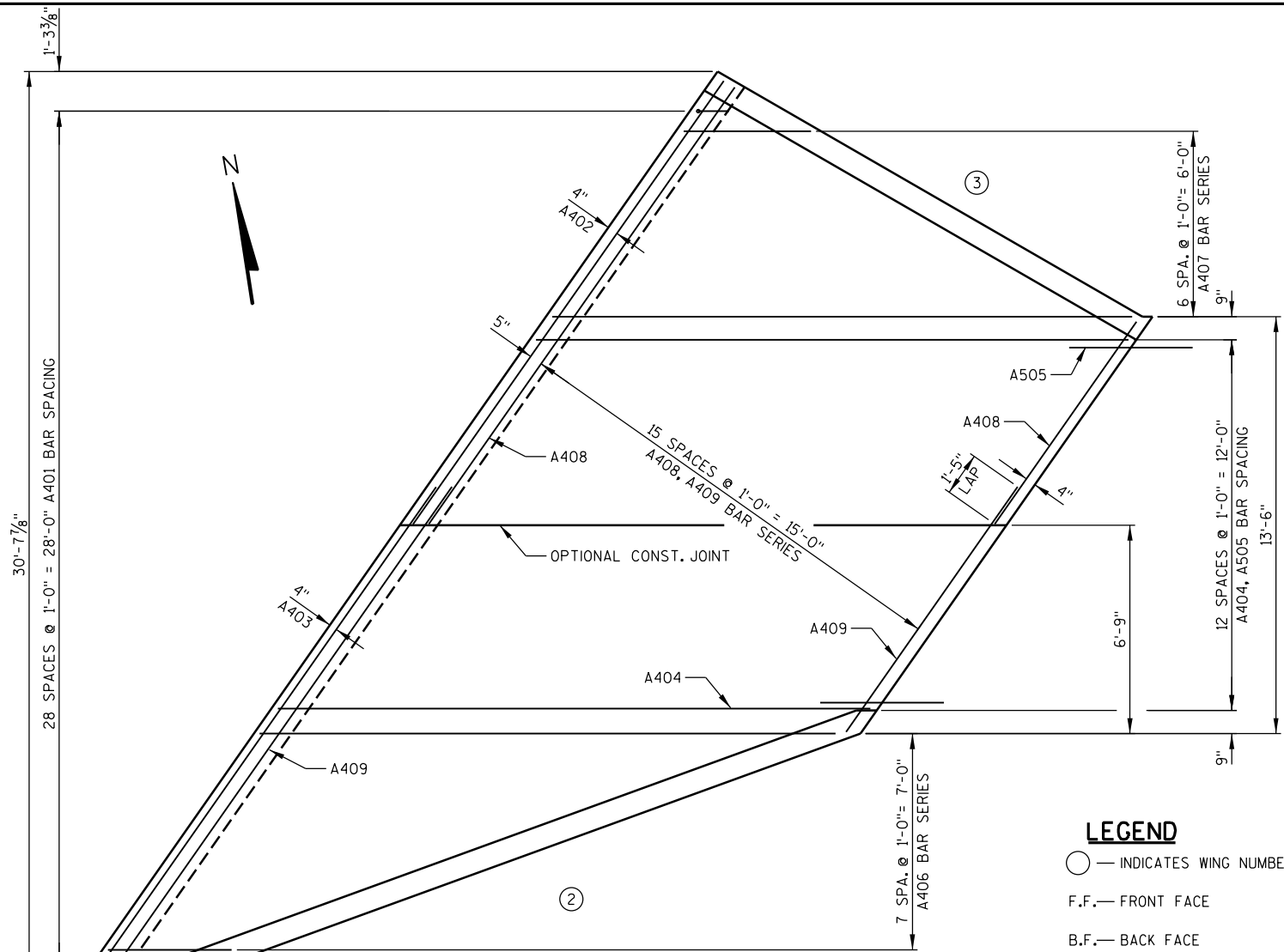
BILL OF BARS

MARK	NUMBER REQUIRED COATED UNCOATED	LENGTH	BENT	BAR SERIES	LOCATION
A401	- 29	3'-6"	X		INLET APRON CUT OFF WALL - VERT.
A402	- 3	17'-6"			INLET APRON CUT OFF WALL - TRANS.
A403	- 3	20'-3"			INLET APRON CUT OFF WALL - TRANS.
A404	- 13	19'-2"			INLET APRON - LONGIT.
A505	- 13	4'-0"			INLET APRON CONNECTION DOWELS
A406	- 8	11'-4"		*	INLET APRON @ WING 2 - LONGIT.
A407	- 7	11'-5"		*	INLET APRON @ WING 3 - LONGIT.
A408	- 16	12'-8"		*	INLET APRON - TRANS.
A409	- 16	15'-2"		*	INLET APRON - TRANS.
A610	24 -	10'-5"	X		WINGS 2 & 3 - B.F. DOWELS - VERT.
A511	21 -	9'-2"	X		WINGS 2 & 3 - B.F. DOWELS - VERT.
A412	19 -	2'-9"			WINGS 2 & 3 - F.F. DOWELS - VERT.
A413	5 -	3'-7"		*	WING 3 - F.F. - END - VERT.
A414	6 -	7'-3"	X	*	WING 3 - B.F. - END - VERT.
A415	9 -	6'-11"		*	WING 3 - B.F. - VERT.
A416	7 -	6'-3"		*	WING 3 - F.F. - VERT.
A417	4 -	15'-6"			WING 3 & INLET APRON - LONGIT.
A418	8 -	9'-1"		*	WING 3 - F.F. & B.F. - LONGIT.
A519	2 -	16'-11"			WING 3 - F.F. & B.F. - TOP - LONGIT.
A420	7 -	3'-7"		*	WING 2 - F.F. - END - VERT.
A421	10 -	7'-2"	X	*	WING 2 - B.F. - END - VERT.
A422	15 -	6'-11"		*	WING 2 - B.F. - VERT.
A423	12 -	6'-1"		*	WING 2 - F.F. - VERT.
A424	4 -	26'-6"			WING 2 & INLET APRON - LONGIT.
A425	8 -	15'-4"		*	WING 2 - F.F. & B.F. - LONGIT.
A526	2 -	27'-6"			WING 2 - F.F. & B.F. - TOP - LONGIT.
A427	8 -	4'-8"		*	WING 3 - B.F. - VERT.
A428	13 -	4'-8"		*	WING 2 - B.F. - VERT.

DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.

* - LENGTH SHOWN FOR BAR IS AN AVERAGE LENGTH AND SHOULD ONLY BE USED FOR BAR WEIGHT CALCULATIONS. SEE BAR SERIES TABLE FOR ACTUAL LENGTHS. BENT BARS IF USED IN BAR SERIES TABLE SHALL BE BENT AFTER CUTTING.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-229			
DRAWN BY CAR		PLANS CK'D. JRS	
INLET APRON & WING DETAILS			SHEET 5 OF 7



INLET APRON PLAN

LEGEND

○ — INDICATES WING NUMBER

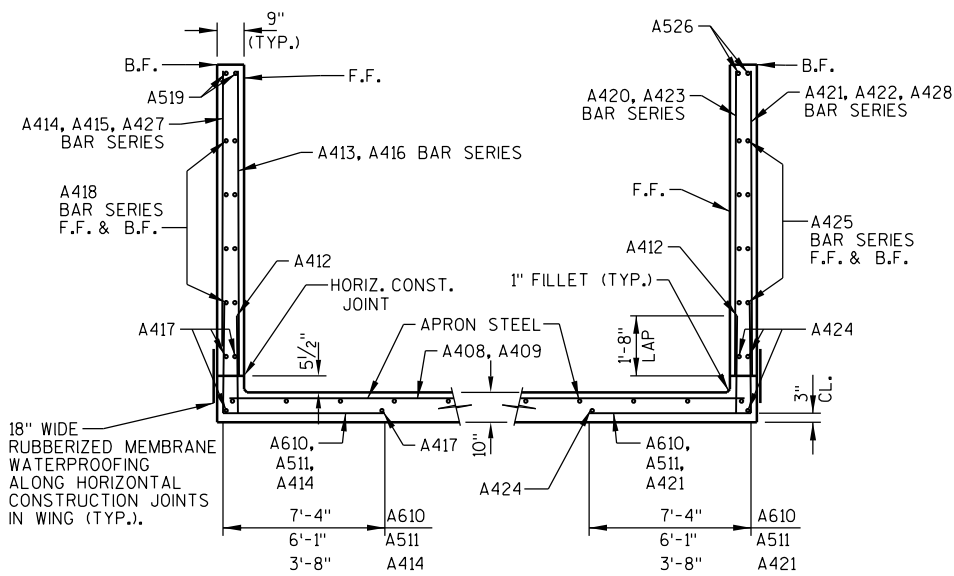
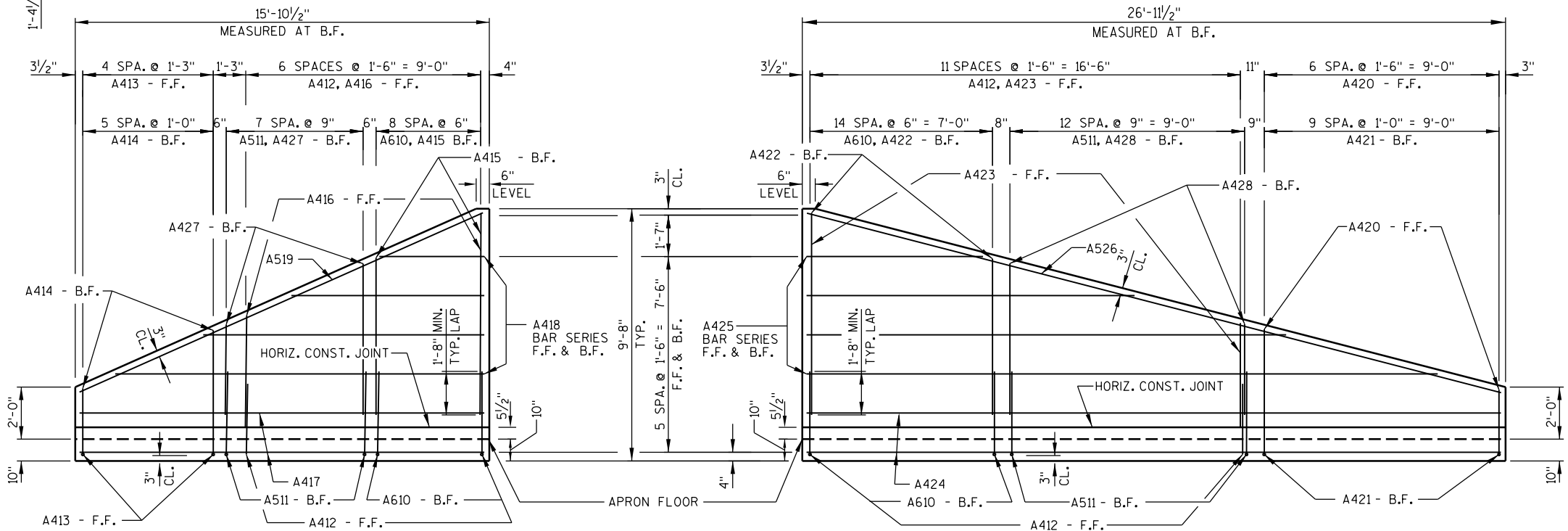
F.F.— FRONT FACE

B.F.— BACK FACE

CL. — CLEAR

THIS LEG
HORIZ.

MARK	A
A401	1'-0"
A610	7'-4"
A511	6'-1"
A414	3'-8"
A421	3'-8"

SECTION THRU WINGS
(NORMAL TO WINGWALLS)

INLET WING ELEVATIONS

WING 2

WING 3

BAR SERIES TABLE

MARK	NO. REQUIRED	LENGTH
C406	1 SERIES OF 4	6'-2" TO 19'-6"
C407	1 SERIES OF 4	4'-8" TO 19'-8"
C408	1 SERIES OF 17	8'-0" TO 12'-10"
C409	1 SERIES OF 17	9'-6" TO 14'-10"
C413	1 SERIES OF 5	2'-6" TO 4'-10"
C414	1 SERIES OF 7	6'-1" TO 8'-5"
C415	1 SERIES OF 10	6'-0" TO 7'-8"
C416	1 SERIES OF 8	4'-1" TO 8'-2"
C418	2 SERIES OF 4	4'-6" TO 15'-8"
C420	1 SERIES OF 6	2'-6" TO 4'-8"
C421	1 SERIES OF 9	6'-1" TO 8'-5"
C422	1 SERIES OF 13	6'-0" TO 7'-9"
C423	1 SERIES OF 11	3'-10" TO 8'-2"
C425	2 SERIES OF 4	5'-10" TO 21'-0"
C427	1 SERIES OF 8	3'-8" TO 5'-9"
C428	1 SERIES OF 11	3'-7" TO 5'-10"

BUNDLE AND TAG EACH SERIES SEPARATELY

COATED 1250 LBS.
UNCOATED 720 LBS.

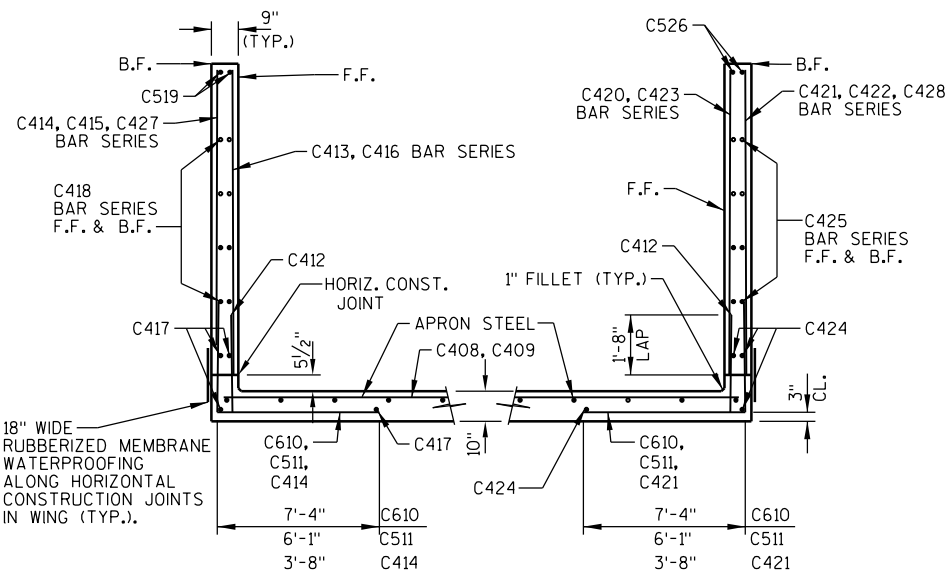
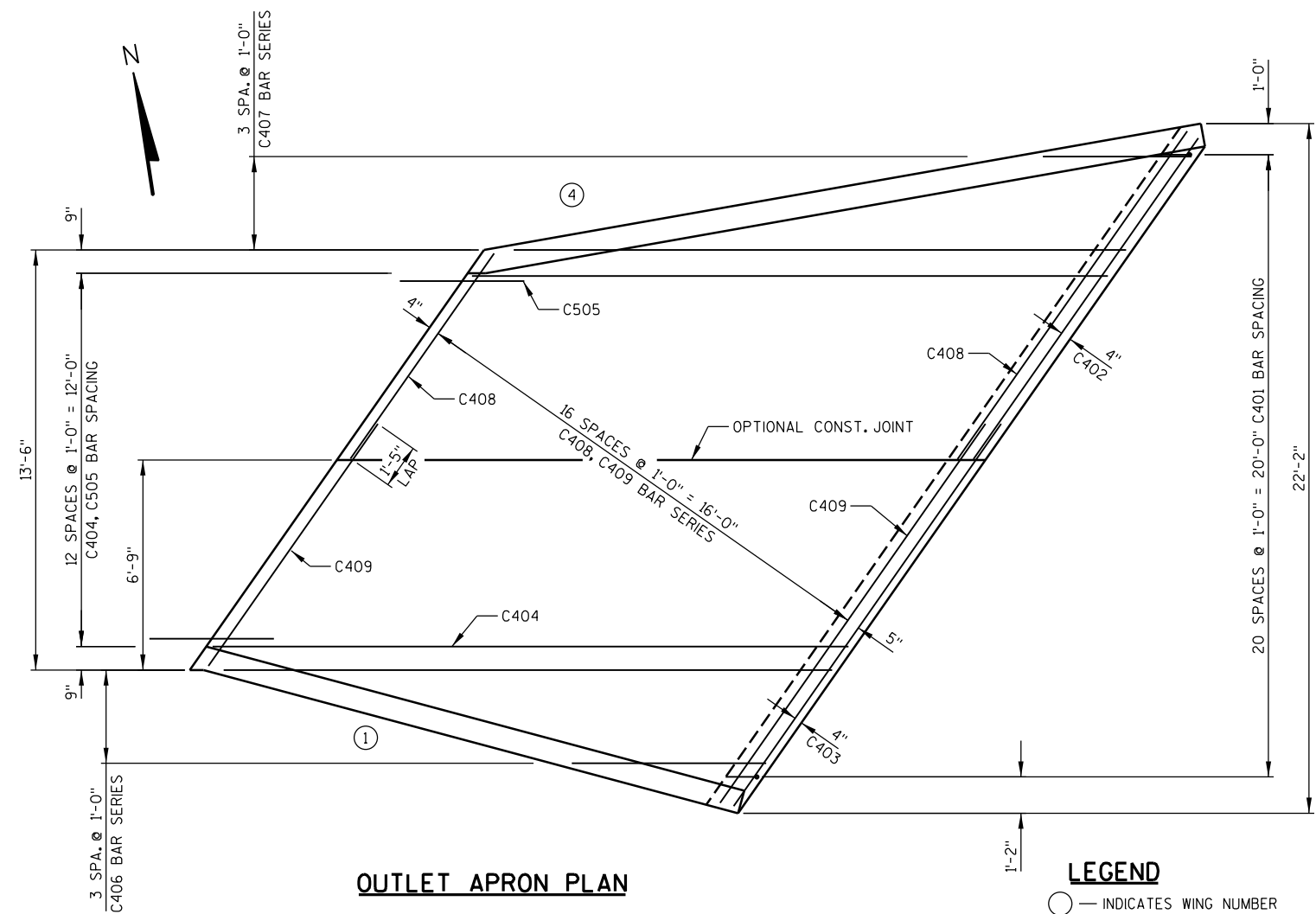
BILL OF BARS

MARK	NUMBER REQUIRED COATED UNCOATED	LENGTH	BENT	BAR SERIES	LOCATION
C401	- 21	5'-6"	X		OUTLET APRON CUT OFF WALL - VERT.
C402	- 5	12'-7"			OUTLET APRON CUT OFF WALL - TRANS.
C403	- 5	15'-0"			OUTLET APRON CUT OFF WALL - TRANS.
C404	- 13	20'-5"			OUTLET APRON - LONGIT.
C505	- 13	4'-0"			OUTLET APRON CONNECTION DOWELS
C406	- 4	12'-10"		*	OUTLET APRON @ WING 1 - LONGIT.
C407	- 4	12'-2"		*	OUTLET APRON @ WING 4 - LONGIT.
C408	- 17	10'-5"		*	OUTLET APRON - TRANS.
C409	- 17	12'-2"		*	OUTLET APRON - TRANS.
C610	23 -	10'-5"	X		WINGS 1 & 4 - B.F. DOWELS - VERT.
C511	19 -	9'-2"	X		WINGS 1 & 4 - B.F. DOWELS - VERT.
C412	19 -	2'-9"			WINGS 1 & 4 - F.F. DOWELS - VERT.
C413	5 -	3'-8"		*	WING 1 - F.F. - END - VERT.
C414	7 -	7'-3"	X	*	WING 1 - B.F. - END - VERT.
C415	10 -	6'-10"		*	WING 1 - B.F. - VERT.
C416	8 -	6'-2"		*	WING 1 - F.F. - VERT.
C417	4 -	17'-5"			WING 1 & OUTLET APRON - LONGIT.
C418	8 -	10'-1"		*	WING 1 - F.F. & B.F. - LONGIT.
C519	2 -	18'-8"			WING 1 - F.F. & B.F. - TOP - LONGIT.
C420	6 -	3'-7"		*	WING 4 - F.F. - END - VERT.
C421	9 -	7'-3"	X	*	WING 4 - B.F. - END - VERT.
C422	13 -	6'-11"		*	WING 4 - B.F. - VERT.
C423	11 -	6'-0"		*	WING 4 - F.F. - VERT.
C424	4 -	23'-0"			WING 4 & OUTLET APRON - LONGIT.
C425	8 -	13'-5"		*	WING 4 - F.F. & B.F. - LONGIT.
C526	2 -	24'-0"			WING 4 - F.F. & B.F. - TOP - LONGIT.
C427	8 -	4'-9"		*	WING 1 - B.F. - VERT.
C428	11 -	4'-9"		*	WING 4 - B.F. - VERT.

DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.

* - LENGTH SHOWN FOR BAR IS AN AVERAGE LENGTH AND SHOULD ONLY BE USED FOR BAR WEIGHT CALCULATIONS. SEE BAR SERIES TABLE FOR ACTUAL LENGTHS. BENT BARS IF USED IN BAR SERIES TABLE SHALL BE BENT AFTER CUTTING.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-229			
DRAWN BY CAR		PLANS CK'D. JRS	
OUTLET APRON & WING DETAILS			SHEET 6 OF 7

SECTION THRU WINGS
(NORMAL TO WINGWALLS)

LEGEND

○ — INDICATES WING NUMBER

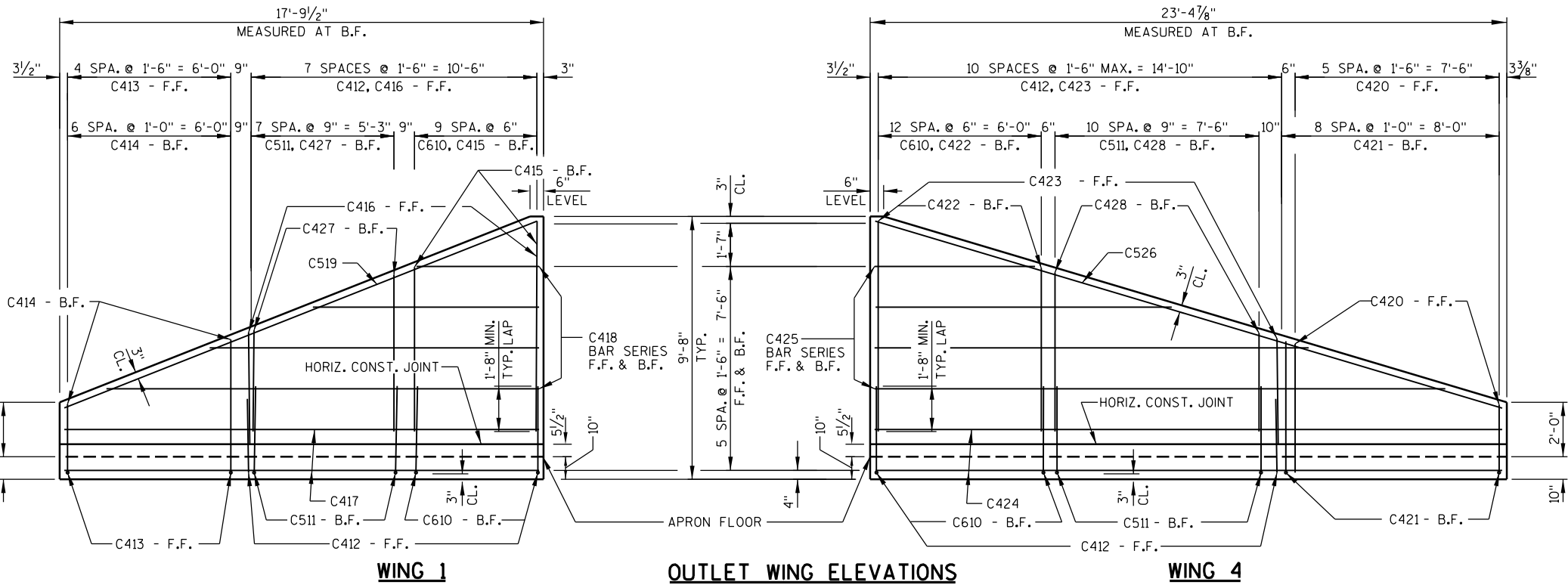
F.F. — FRONT FACE

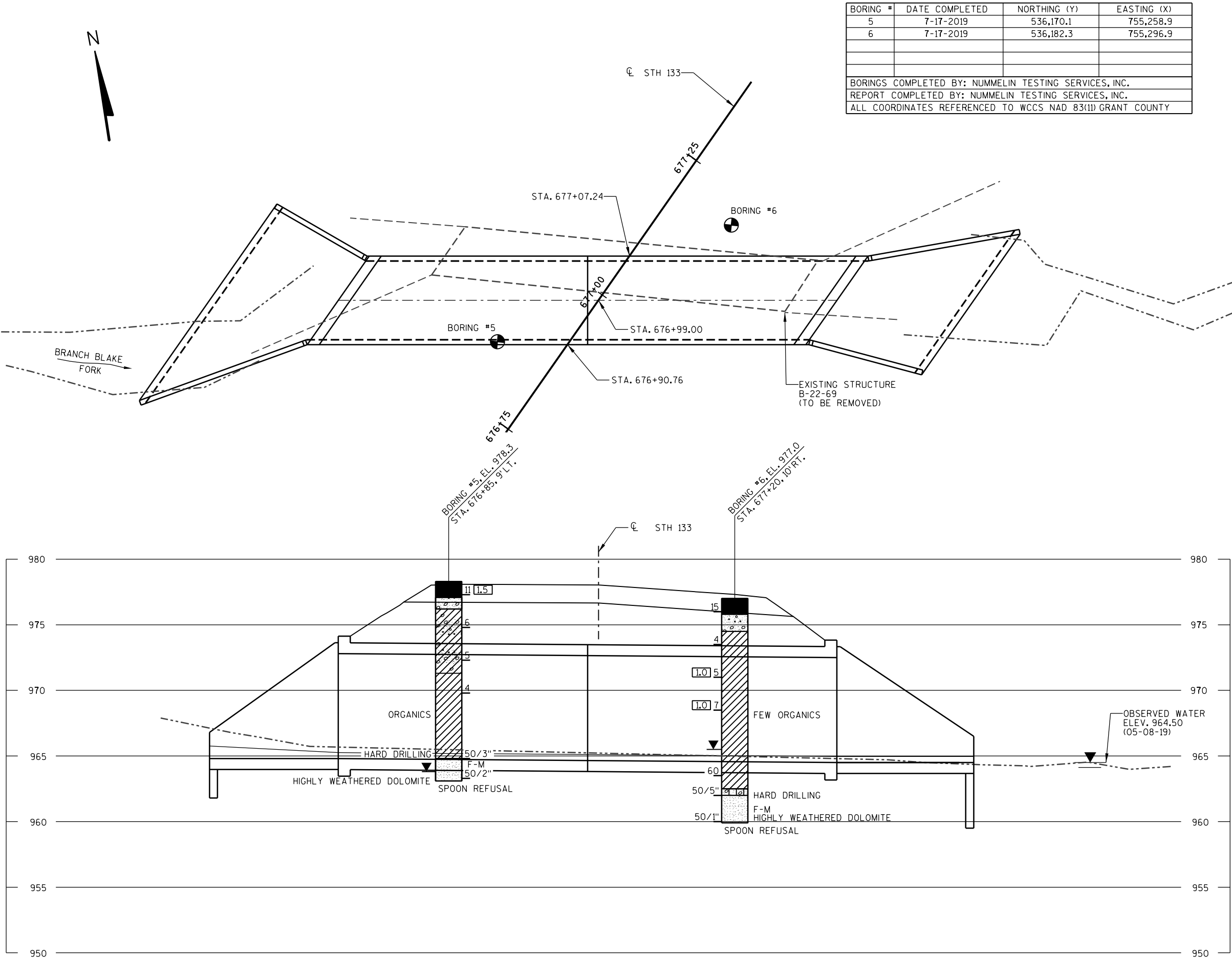
B.F. — BACK FACE

CL. — CLEAR

THIS LEG
HORIZ.

MARK	A
C401	1'-0"
C610	7'-4"
C511	6'-1"
C414	3'-8"
C421	3'-8"





5964-01-80

BENCHMARKS

NO.	STATION	DESCRIPTION	ELEV.
4	468+39.08, 23.8' LT	CHISELED + ON NW WING WALL	935.07
5	466+65.44, 25.0' LT	CHISELED + ON TOP OF 36" RCCP	932.91
6	466+99.34, 60.4' RT	PK NAIL IN WOOD CORNER FENCE POST	937.89

DESIGN DATA

LIVE LOAD:

DESIGN LOADING: HL-93
INVENTORY RATING FACTOR: 1.05
OPERATIONAL RATING FACTOR: 1.35
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = 255 KIPS

TRAFFIC DATA:

A.A.D.T. (2021) = 910
A.A.D.T. (2041) = 1,100
R.D.S. = 60 MPH

EARTH LOAD: DESIGNED FOR 1.5 TO 3 FEET OF FILL

MATERIAL PROPERTIES:

CONCRETE MASONRY f'_c = 3,500 P.S.I.
BAR STEEL REINFORCEMENT HS STRUCTURES f_y = 60,000 P.S.I.

FOUNDATION DATA:

ALLOWABLE SOIL BEARING CAPACITY = 5,000 P.S.F.

HYDRAULIC DATA:

100 YEAR FREQUENCY

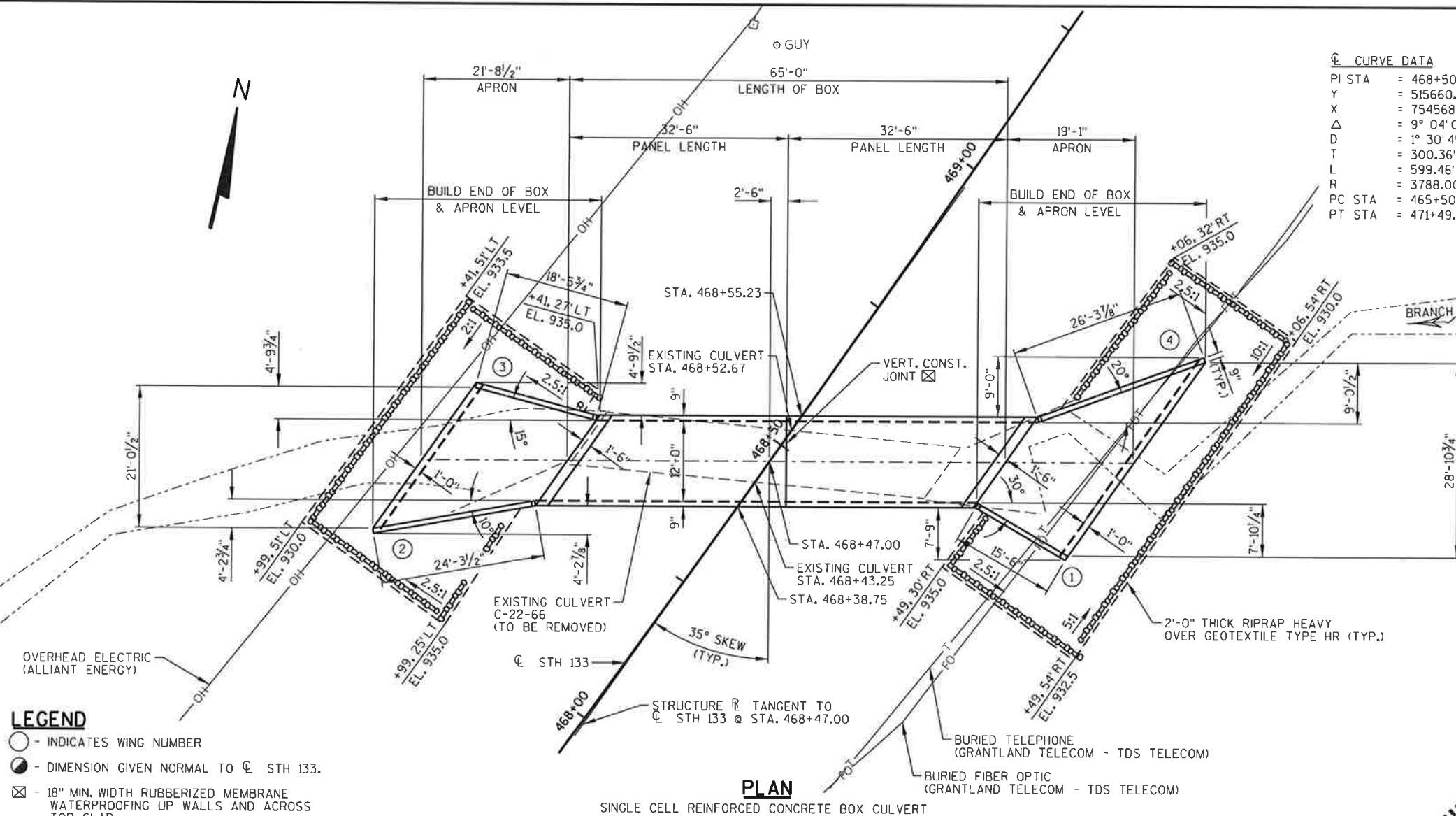
DRAINAGE AREA = 0.59 SQ. MI.
 Q_{100} = 620 C.F.S.
VELOCITY = 9.89 F.P.S.
WATERWAY AREA = 63 SQ. FT.
HIGH WATER 100 ELEVATION = 934.44
ROADWAY OVERFLOW DESIGN FREQUENCY = >100 YEARS
SCOUR CRITICAL CODE = 8
 O_2 ELEVATION (120 C.F.S.) = 930.88
VELOCITY₂ = 2.80 F.P.S.

LIST OF DRAWINGS

1. GENERAL PLAN
2. CROSS SECTION, QUANTITIES, NOTES & DETAILS
3. BOX CULVERT
4. BOX CULVERT DETAILS
5. INLET APRON & WING DETAILS
6. OUTLET APRON & WING DETAILS
7. SUBSURFACE EXPLORATION

CONSULTANT DESIGN CONTACT:
JOSH SWENO
(608) 355-8852

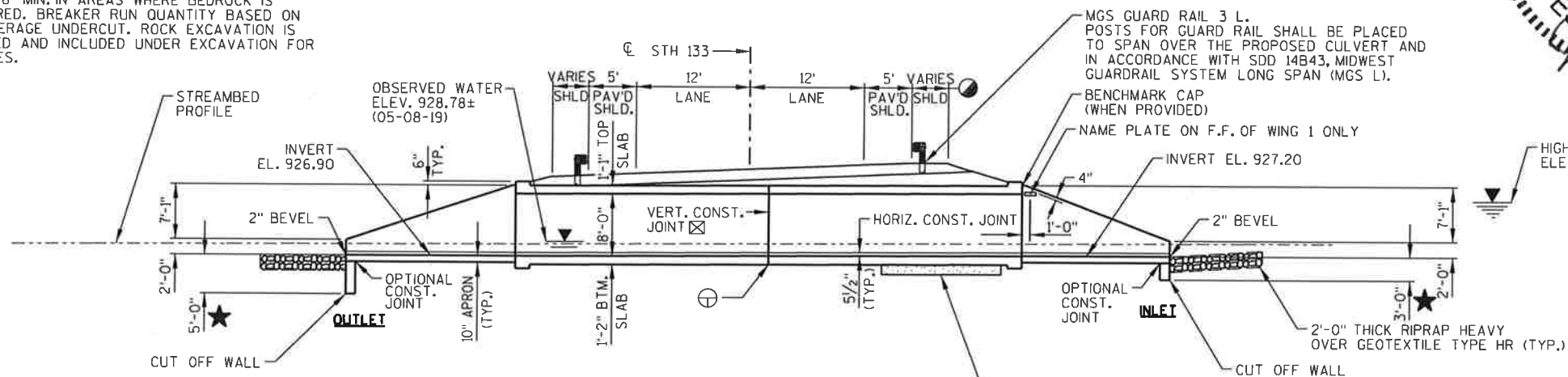
BRIDGE OFFICE CONTACT:
AARON BONK
(608) 261-0261



PLAN
SINGLE CELL REINFORCED CONCRETE BOX CULVERT

LEGEND

- - INDICATES WING NUMBER
- - DIMENSION GIVEN NORMAL TO $\angle$ STH 133.
- ⊠ - 18" MIN. WIDTH RUBBERIZED MEMBRANE WATERPROOFING UP WALLS AND ACROSS TOP SLAB.
- ⊕ - IN LIEU OF CONSTRUCTION JOINTS IN THE BOTTOM SLAB, THE CONTRACTOR MAY PROVIDE 2" DEEP SAWCUTS WITHIN 12 HOURS AFTER POURING.
- ★ - THE CONCRETE CUT OFF WALL SHALL BE NOTCHED 1'-0" MIN. IF BEDROCK IS ENCOUNTERED. ROCK EXCAVATION IS ANTICIPATED AND INCLUDED UNDER EXCAVATION FOR STRUCTURES.
- ⊕ - UNDERCUT 6" MIN. IN AREAS WHERE BEDROCK IS ENCOUNTERED. BREAKER RUN QUANTITY BASED ON A 1'-0" AVERAGE UNDERCUT. ROCK EXCAVATION IS ANTICIPATED AND INCLUDED UNDER EXCAVATION FOR STRUCTURES.



ELEVATION
(LOOKING NORTH - NORMAL TO BOX)

NO.	DATE	REVISION	BY
ENGINEERING ARCHITECTURE SURVEYING FUNDING PLANNING ENVIRONMENTAL 1702 PANKRATZ ST., MADISON WI 53704 (608) 242-7779 www.msa-ps.com © MSA Professional Services, Inc.			
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION ACCEPTED SDR 08/25/20 CHIEF STRUCTURES DESIGN ENGINEER DATE			
STRUCTURE C-22-230			
STH 133 OVER BRANCH RATTLESNAKE CREEK			
COUNTY	GRANT	TOWN/CITY/VILLAGE	GLEN HAVEN
DESIGN SPEC.	AASHTO LRFD BRIDGE DESIGN SPEC.		
DESIGNED BY	JZ	DESIGN CK'D.	JRS
DRAWN BY	RLR	PLANS CK'D.	JZ
GENERAL PLAN			SHEET 1 OF 7

TOTAL ESTIMATED QUANTITIES

ITEM NUMBER	BID ITEM	UNIT	TOTAL
203.0200.02	REMOVING OLD STRUCTURE STATION 468+50	LS	1
206.2000.02	EXCAVATION FOR STRUCTURES CULVERTS C-22-230	LS	1
210.2500	BACKFILL STRUCTURE TYPE B	TON	1303
311.0110	BREAKER RUN	TON	156
504.0100	CONCRETE MASONRY CULVERTS	CY	148
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	17,540
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	2,600
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	25
606.0300	RIPRAP HEAVY	CY	130
645.0120	GEOTEXTILE TYPE HR	SY	283
	NON-BID ITEMS		
	PREFORMED FILLER	SIZE	¾"

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS SHOWN OR NOTED OTHERWISE.

THE FIRST DIGIT OF A THREE DIGIT BAR MARK SIGNIFIES THE BAR SIZE.

THE CONCRETE IN THE CUT OFF WALL MAY BE PLACED UNDERWATER IF THE EXCAVATION CANNOT BE DEWATERED.

AN ALTERNATE CUT OFF WALL MAY NOT BE USED IN LIEU OF THE CAST IN PLACE CUT OFF WALLS DUE TO THE PRESENCE OF BEDROCK. THE CONCRETE CUT OFF WALL SHALL BE NOTCHED 1'-0" MIN. IF BEDROCK IS ENCOUNTERED. ROCK EXCAVATION IS ANTICIPATED AND INCLUDED UNDER EXCAVATION FOR STRUCTURES.

THIS STRUCTURE WILL REPLACE THE EXISTING STRUCTURE, A 8' WIDE X 8' HIGH SINGLE CELL REINFORCED CONCRETE BOX CULVERT.

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES CULVERTS C-22-230" SHALL BE THE EXISTING GROUND LINE.

THE BACKFILL QUANTITIES ARE BASED ON THE PAY LIMITS SHOWN ON THE PLANS AND MAY NOT REFLECT ACTUAL PLACED QUANTITIES. "BACKFILL STRUCTURE TYPE B" REQUIRED ON THE BOX CULVERT SIDES AND TOP AND BEHIND APRON WINGS FOR 3 FEET.

THE CONTRACTOR MAY FURNISH A PRECAST CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE BOX CULVERT WITH THE ACCEPTANCE OF THE SHOP DRAWINGS BY THE STRUCTURES DESIGN SECTION. THE PRECAST CONCRETE BOX CULVERT SHALL CONFORM TO PRECAST DETAILS IN CHAPTER 36 STANDARDS OF THE CURRENT WISCONSIN DOT BRIDGE MANUAL. PAYMENT FOR THE PRECAST CULVERT SHALL BE BASED ON THE QUANTITIES AND PRICES BID FOR THE ITEMS LISTED IN THE "TOTAL ESTIMATED QUANTITIES". ALL PRECAST BOX SECTIONS SHALL BE PLACED ON A BEDDING OF "BACKFILL STRUCTURE TYPE B" OF 6" MIN. DEPTH.

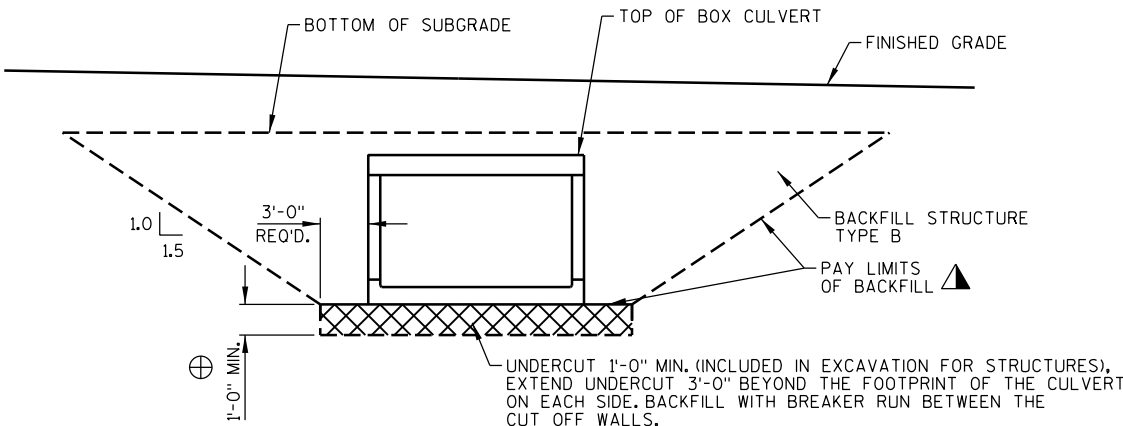
BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

APRONS AND BOTTOM SLAB MAY BE POURED CONTINUOUSLY.

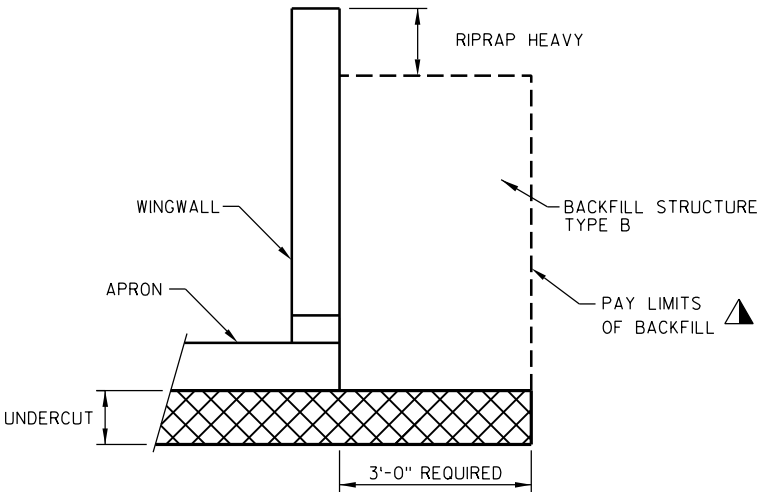
ELEVATIONS SHOWN ON THIS PLAN ARE REFERENCED TO USGS NAVD 88 (2012 ADJUSTED). BENCHMARKS WERE LOCATED IN THE FIELD USING GPS TECHNOLOGY.

UNDERCUT 6" MIN. IN AREAS WHERE BEDROCK IS ENCOUNTERED. BREAKER RUN QUANTITY BASED ON A 1'-0" AVERAGE UNDERCUT. ROCK EXCAVATION IS ANTICIPATED AND INCLUDED UNDER EXCAVATION FOR STRUCTURES.

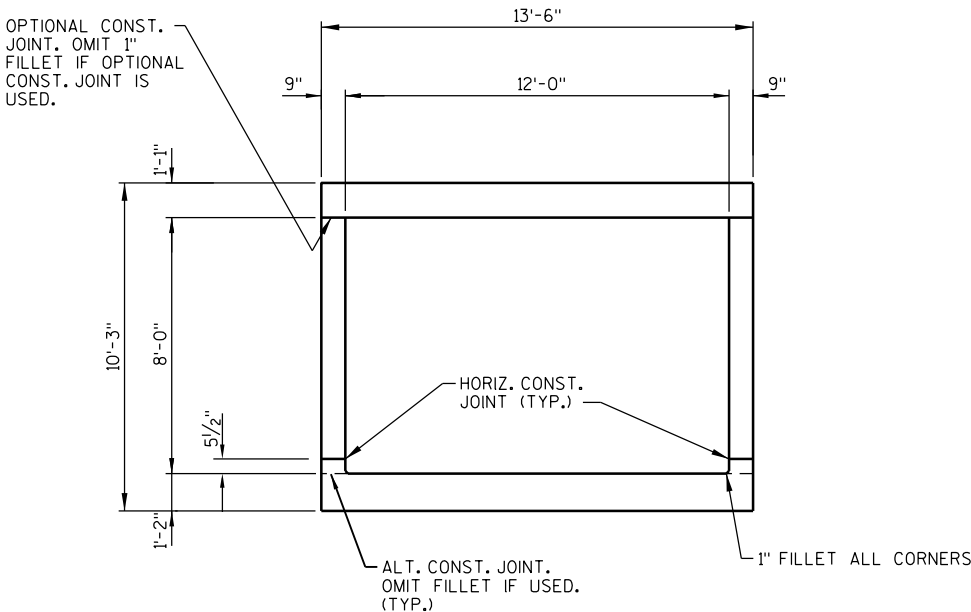
A TEMPORARY WATER DIVERSION SHALL BE PROVIDED DURING CONSTRUCTION OF THE NEW CULVERT. THE TEMPORARY WATER DIVERSION BID ITEM IS DETAILED IN THE SPECIAL PROVISIONS AND PROVIDED IN THE ROADWAY QUANTITIES.



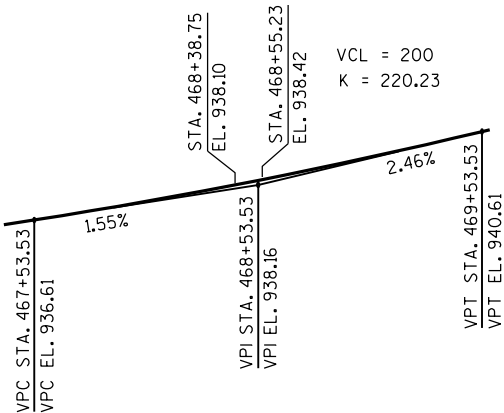
CULVERT BACKFILL STRUCTURE DETAIL



WINGWALL BACKFILL DETAIL



TYPICAL SECTION THRU BOX



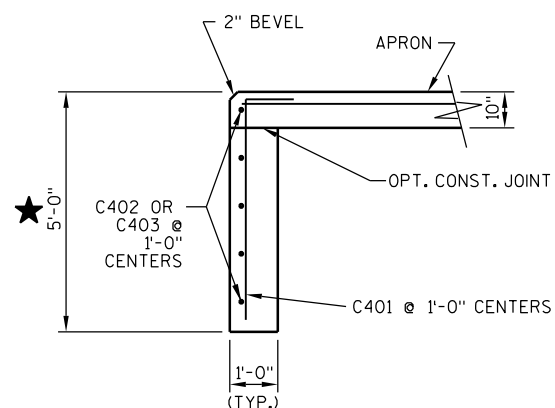
PROFILE GRADE LINE - STH 133

STATE PROJECT NUMBER
5964-01-80

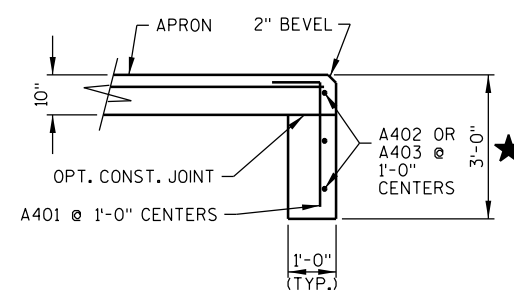
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-230			
DRAWN BY RLR		PLANS CK'D. JZ	
CROSS SECTION, QUANTITIES, NOTES & DETAILS		SHEET 2 OF 7	



NO.	DATE	REVISION	B
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-230			
		DRAWN BY CAR	PLANS CK'D. JR
BOX CULVERT		SHEET 3 OF	

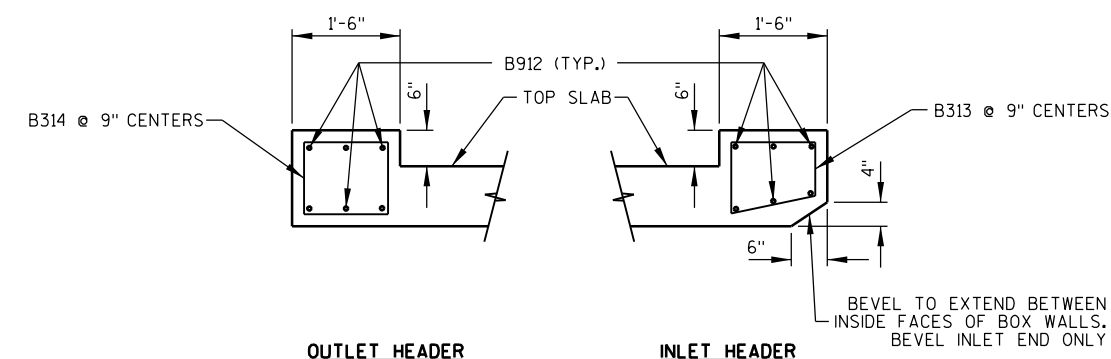


SECTION THRU OUTLET CUT OFF WALL

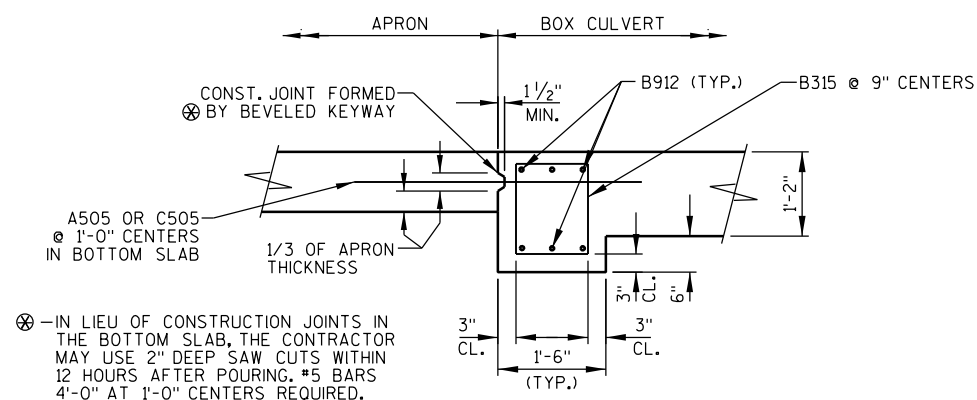


SECTION THRU INLET CUT OFF WALL

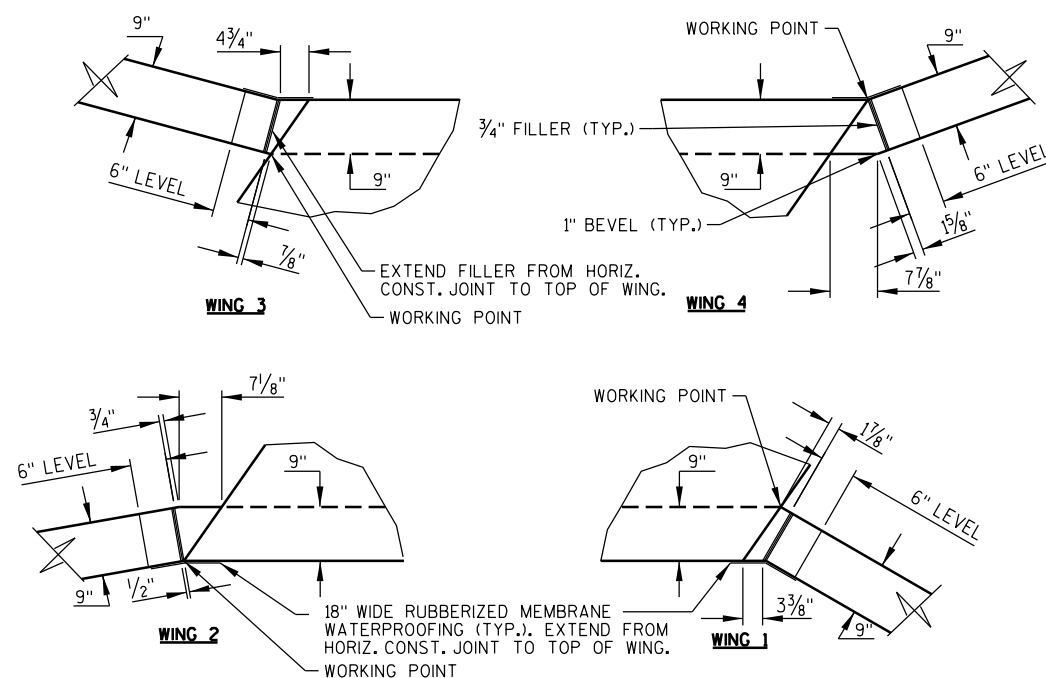
★ -THE CONCRETE CUT OFF WALL SHALL BE NOTCHED 1'-0" MIN. IF BEDROCK IS ENCOUNTERED. ROCK EXCAVATION IS ANTICIPATED AND INCLUDED UNDER EXCAVATION FOR STRUCTURES.



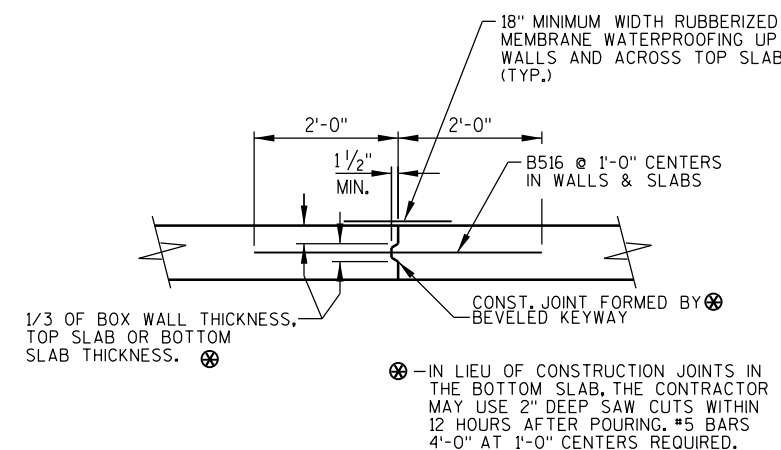
SECTION THRU TOP HEADER



APRON CONNECTION & HEADER DETAIL



CORNER DETAILS



VERTICAL CONSTRUCTION JOINT

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-230			
DRAWN BY CAR		PLANS CK'D. JRS	
BOX CULVERT DETAILS		SHEET 4 OF 7	

BAR SERIES TABLE

MARK	NO. REQUIRED	LENGTH
A406	1 SERIES OF 8	4'-1" TO 18'-5"
A407	1 SERIES OF 7	3'-7" TO 18'-3"
A408	1 SERIES OF 16	8'-2" TO 18'-10"
A409	1 SERIES OF 16	9'-7" TO 18'-7"
A413	1 SERIES OF 4	2'-6" TO 4'-6"
A414	1 SERIES OF 6	6'-2" TO 8'-6"
A415	1 SERIES OF 9	6'-3" TO 8'-0"
A416	1 SERIES OF 7	4'-2" TO 8'-5"
A418	2 SERIES OF 4	4'-4" TO 13'-10"
A420	1 SERIES OF 7	2'-6" TO 4'-8"
A421	1 SERIES OF 9	6'-2" TO 8'-4"
A422	1 SERIES OF 15	6'-2" TO 8'-0"
A423	1 SERIES OF 12	3'-11" TO 8'-5"
A425	2 SERIES OF 4	7'-3" TO 23'-9"
A427	1 SERIES OF 7	3'-11" TO 6'-0"
A428	1 SERIES OF 14	3'-4" TO 6'-0"

BUNDLE AND TAG EACH SERIES SEPARATELY

COATED 1,300 LBS.
UNCOATED 770 LBS.

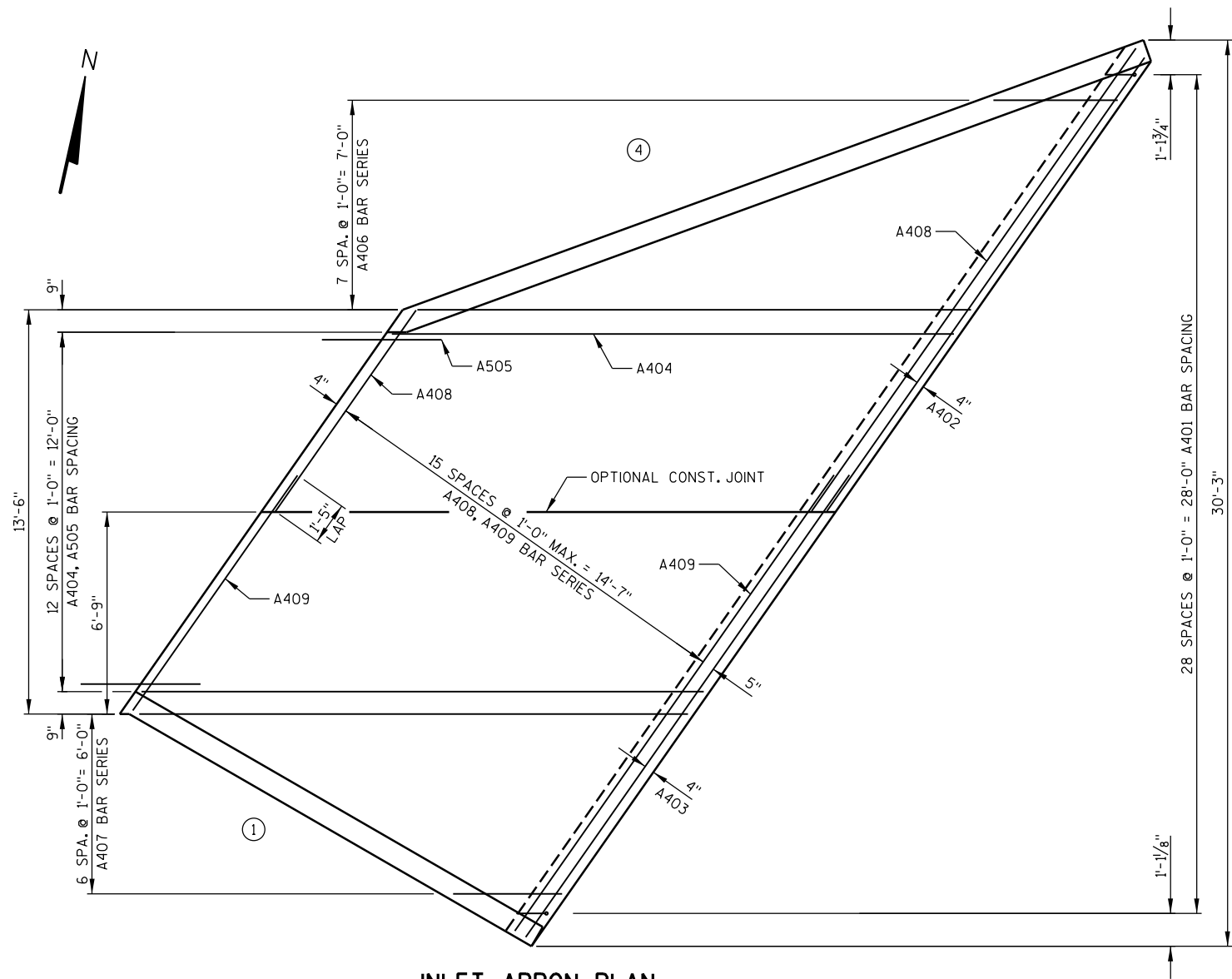
BILL OF BARS

MARK	NUMBER COATED	REQUIRED UNCOATED	LENGTH	BENT	BAR SERIES	LOCATION
A401	-	29	3'-6"	X		INLET APRON CUT OFF WALL - VERT.
A402	-	3	18'-6"			INLET APRON CUT OFF WALL - TRANS.
A403	-	3	18'-10"			INLET APRON CUT OFF WALL - TRANS.
A404	-	13	18'-9"			INLET APRON - LONGIT.
A405	-	13	4'-0"			INLET APRON CONNECTION DOWELS
A406	-	8	11'-3"		*	INLET APRON @ WING 4 - LONGIT.
A407	-	7	10'-11"		*	INLET APRON @ WING 1 - LONGIT.
A408	-	16	13'-6"		*	INLET APRON - TRANS.
A409	-	16	14'-1"		*	INLET APRON - TRANS.
A610	24	-	10'-5"	X		WINGS 1 & 4 - B.F. DOWELS - VERT.
A511	21	-	9'-2"	X		WINGS 1 & 4 - B.F. DOWELS - VERT.
A412	19	-	2'-9"			WINGS 1 & 4 - F.F. DOWELS - VERT.
A413	4	-	3'-6"		*	WING 1 - F.F. - END - VERT.
A414	6	-	7'-4"	X	*	WING 1 - B.F. - END - VERT.
A415	9	-	7'-2"		*	WING 1 - B.F. - VERT.
A416	7	-	6'-4"		*	WING 1 - F.F. - VERT.
A417	4	-	15'-2"			WING 1 - INLET APRON - LONGIT.
A418	8	-	9'-1"		*	WING 1 - F.F. & B.F. - LONGIT.
A519	2	-	16'-8"			WING 1 - F.F. & B.F. - TOP - LONGIT.
A420	7	-	3'-7"		*	WING 4 - F.F. - END - VERT.
A421	9	-	7'-3"	X	*	WING 4 - B.F. - END - VERT.
A422	15	-	7'-1"		*	WING 4 - B.F. - VERT.
A423	12	-	6'-2"		*	WING 4 - F.F. - VERT.
A424	4	-	26'-0"			WING 4 - INLET APRON - LONGIT.
A425	8	-	15'-6"		*	WING 4 - F.F. & B.F. - LONGIT.
A526	2	-	26'-9"			WING 4 - F.F. & B.F. - TOP - LONGIT.
A427	7	-	5'-0"		*	WING 1 - B.F. - VERT.
A428	14	-	4'-8"		*	WING 4 - B.F. - VERT.

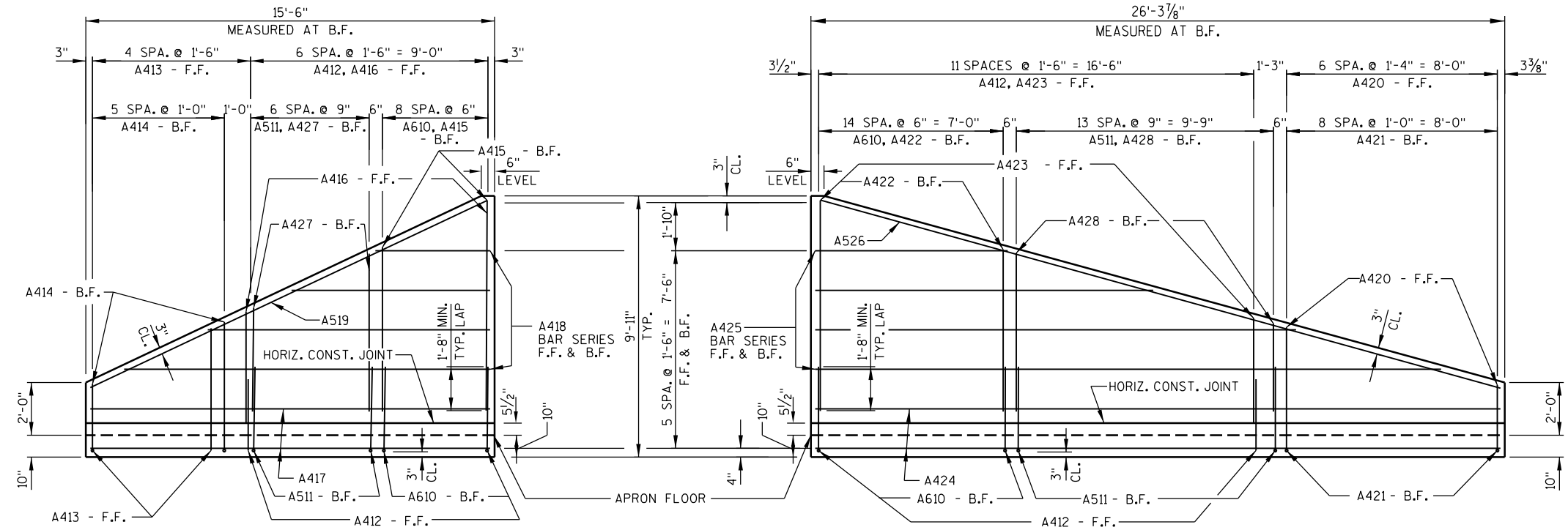
DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.

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NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-230			
DRAWN BY CAR		PLANS CK'D. JRS	
INLET APRON & WING DETAILS			SHEET 5 OF 7



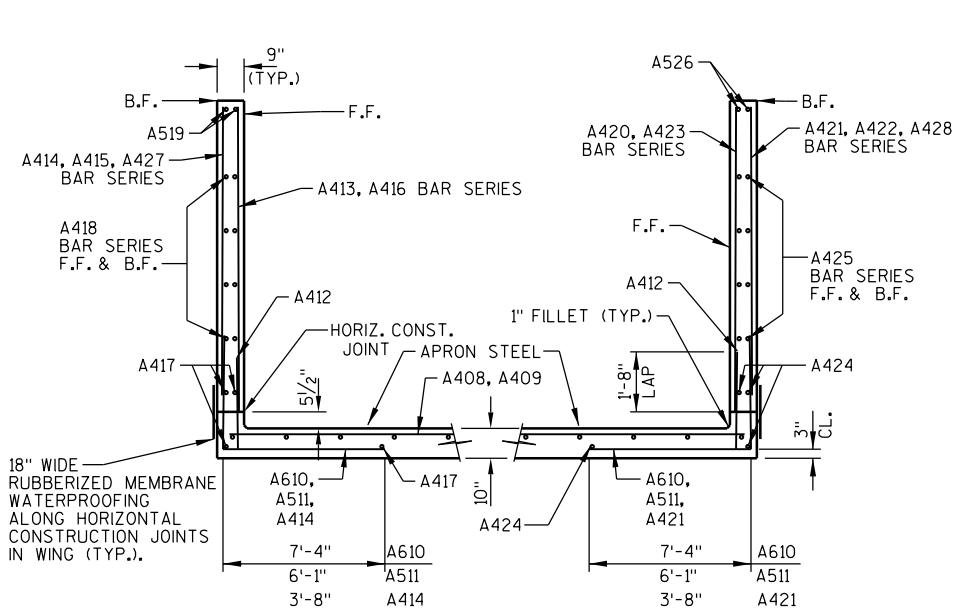
INLET APRON PLAN



WING 1

INLET WING ELEVATIONS

WING 4

SECTION THRU WINGS
(NORMAL TO WINGWALLS)

LEGEND

○ — INDICATES WING NUMBER

F.F. — FRONT FACE

B.F. — BACK FACE

CL. — CLEAR

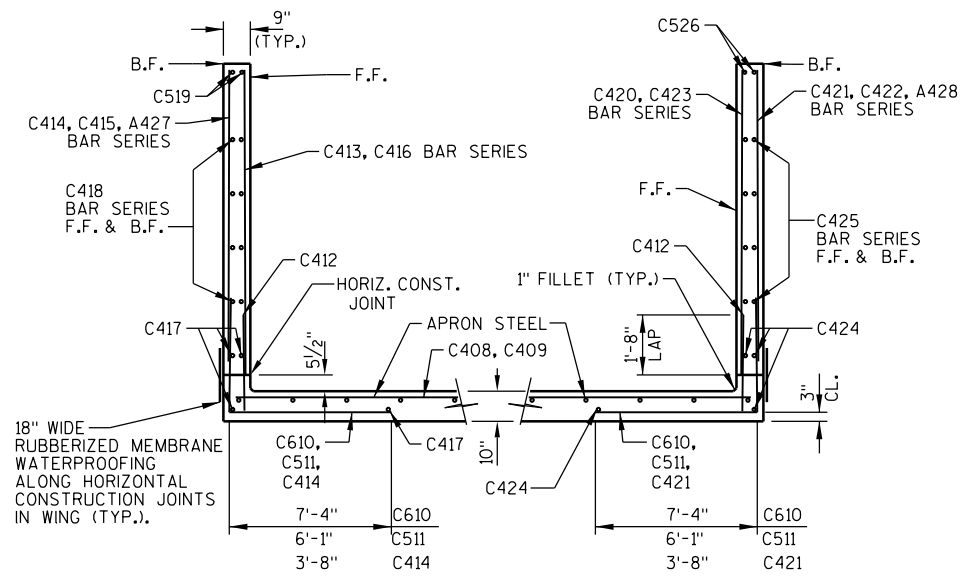
MARK	A
A401	1'-0"
A610	7'-4"
A511	6'-1"
A414	3'-8"
A421	3'-8"

THIS LEG
HORIZ.

BAR SERIES TABLE

MARK	NO. REQUIRED	LENGTH
C406	1 SERIES OF 4	7'-0" TO 20'-4"
C407	1 SERIES OF 4	5'-6" TO 20'-6"
C408	1 SERIES OF 18	8'-0" TO 13'-7"
C409	1 SERIES OF 18	9'-6" TO 14'-6"
C413	1 SERIES OF 5	2'-6" TO 4'-10"
C414	1 SERIES OF 7	6'-2" TO 8'-6"
C415	1 SERIES OF 10	6'-4" TO 8'-0"
C416	1 SERIES OF 8	4'-5" TO 8'-5"
C418	2 SERIES OF 4	5'-2" TO 16'-7"
C420	1 SERIES OF 6	2'-6" TO 4'-8"
C421	1 SERIES OF 9	6'-2" TO 8'-4"
C422	1 SERIES OF 13	6'-4" TO 8'-0"
C423	1 SERIES OF 11	4'-0" TO 8'-5"
C425	2 SERIES OF 4	6'-9" TO 21'-10"
C427	1 SERIES OF 9	3'-8" TO 6'-0"
C428	1 SERIES OF 12	3'-8" TO 6'-1"

BUNDLE AND TAG EACH SERIES SEPARATELY



WING 3

WING 2

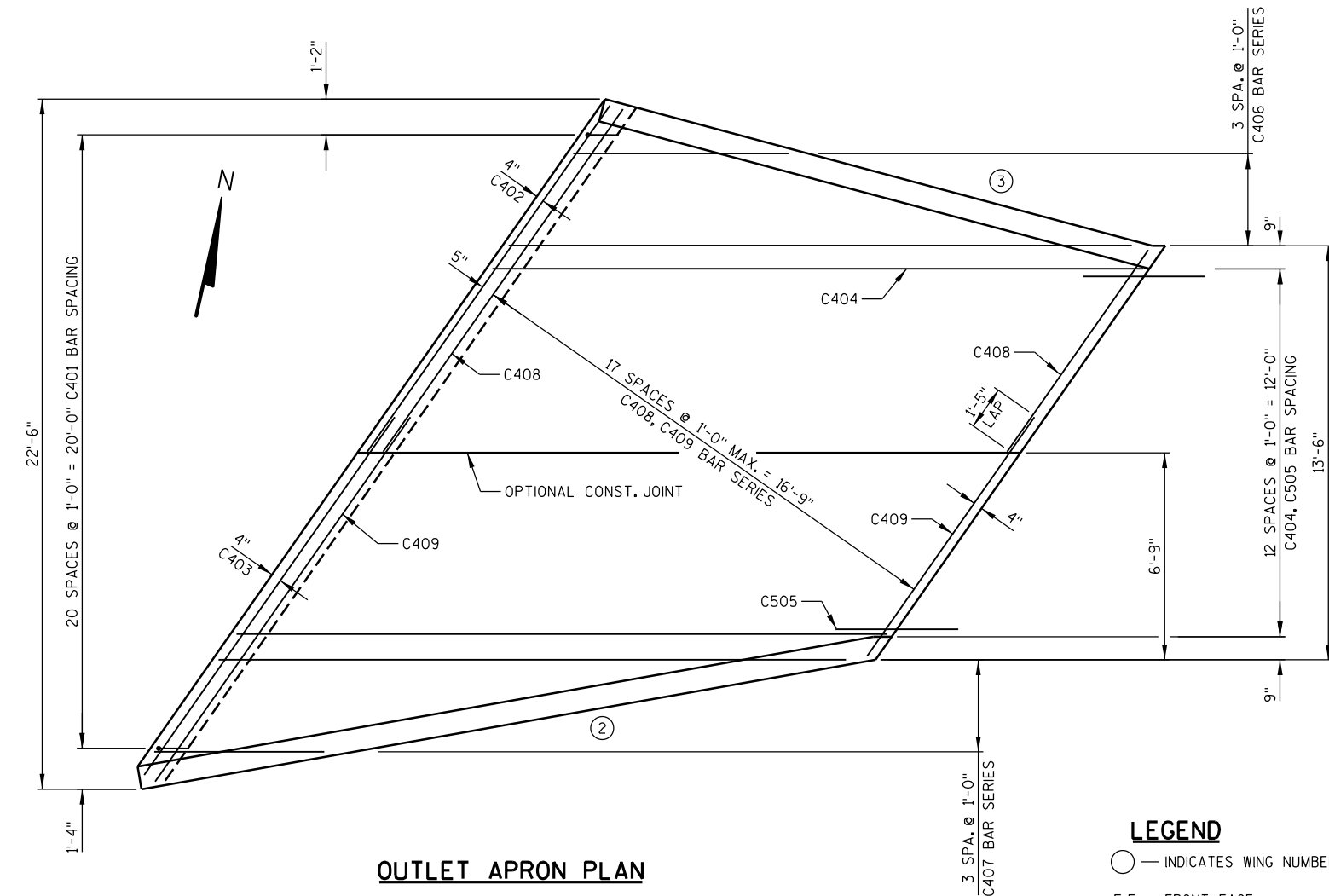
SECTION THRU WINGS
(NORMAL TO WINGWALLS)COATED 1,300 LBS.
UNCOATED 750 LBS.

BILL OF BARS

MARK	NUMBER REQUIRED COATED UNCOATED	LENGTH	BENT	BAR SERIES	LOCATION
C401	- 21	5'-6"	X		OUTLET APRON CUT OFF WALL - VERT.
C402	- 5	13'-9"			OUTLET APRON CUT OFF WALL - TRANS.
C403	- 5	14'-3"			OUTLET APRON CUT OFF WALL - TRANS.
C404	- 13	21'-2"			OUTLET APRON - LONGIT.
C505	- 13	4'-0"			OUTLET APRON CONNECTION DOWELS
C406	- 4	13'-8"		*	OUTLET APRON @ WING 3 - LONGIT.
C407	- 4	13'-0"		*	OUTLET APRON @ WING 2 - LONGIT.
C408	- 18	10'-10"		*	OUTLET APRON - TRANS.
C409	- 18	12'-0"		*	OUTLET APRON - TRANS.
C610	23 -	10'-5"	X		WINGS 2 & 3 - B.F. DOWELS - VERT.
C511	21 -	9'-2"	X		WINGS 2 & 3 - B.F. DOWELS - VERT.
C412	19 -	2'-9"			WINGS 2 & 3 - F.F. DOWELS - VERT.
C413	5 -	3'-8"		*	WING 3 - F.F. - END - VERT.
C414	7 -	7'-4"	X	*	WING 3 - B.F. - END - VERT.
C415	10 -	7'-2"		*	WING 3 - B.F. - VERT.
C416	8 -	6'-5"		*	WING 3 - F.F. - VERT.
C417	4 -	18'-1"			WING 3 - OUTLET APRON - LONGIT.
C418	8 -	10'-11"		*	WING 3 - F.F. & B.F. - LONGIT.
C519	2 -	19'-5"			WING 3 - F.F. & B.F. - TOP - LONGIT.
C420	6 -	3'-7"		*	WING 2 - F.F. - END - VERT.
C421	9 -	7'-3"	X	*	WING 2 - B.F. - END - VERT.
C422	13 -	7'-2"		*	WING 2 - B.F. - VERT.
C423	11 -	6'-3"		*	WING 2 - F.F. - VERT.
C424	4 -	23'-11"			WING 2 - OUTLET APRON - LONGIT.
C425	8 -	14'-4"		*	WING 2 - F.F. & B.F. - LONGIT.
C526	2 -	25'-0"			WING 2 - F.F. & B.F. - TOP - LONGIT.
C427	9 -	4'-10"		*	WING 3 - B.F. - VERT.
C428	12 -	4'-11"		*	WING 2 - B.F. - VERT.

DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.

* - LENGTH SHOWN FOR BAR IS AN AVERAGE LENGTH AND SHOULD ONLY BE USED FOR BAR WEIGHT CALCULATIONS. SEE BAR SERIES TABLE FOR ACTUAL LENGTHS. BENT BARS IF USED IN BAR SERIES TABLE SHALL BE BENT AFTER CUTTING.



OUTLET APRON PLAN

LEGEND

○ — INDICATES WING NUMBER

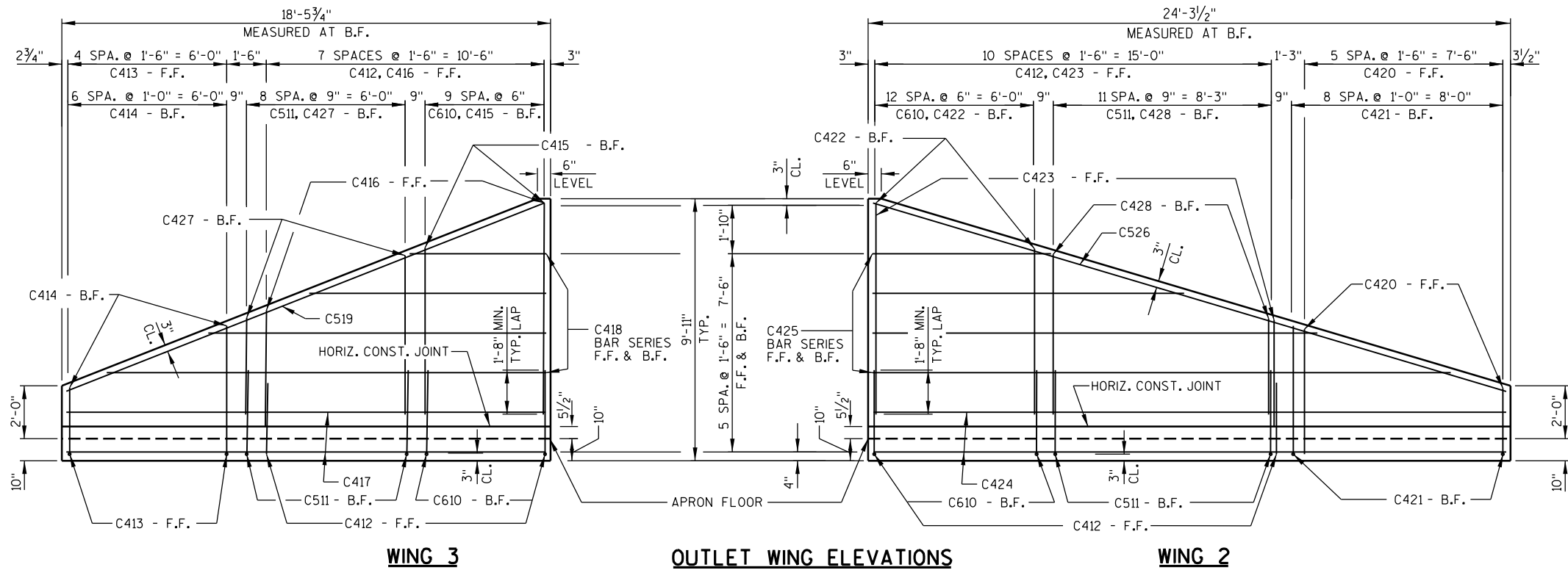
F.F. — FRONT FACE

B.F. — BACK FACE

CL. — CLEAR

THIS LEG
HORIZ. A

MARK	A
C401	1'-0"
C610	7'-4"
C511	6'-1"
C414	3'-8"
C421	3'-8"

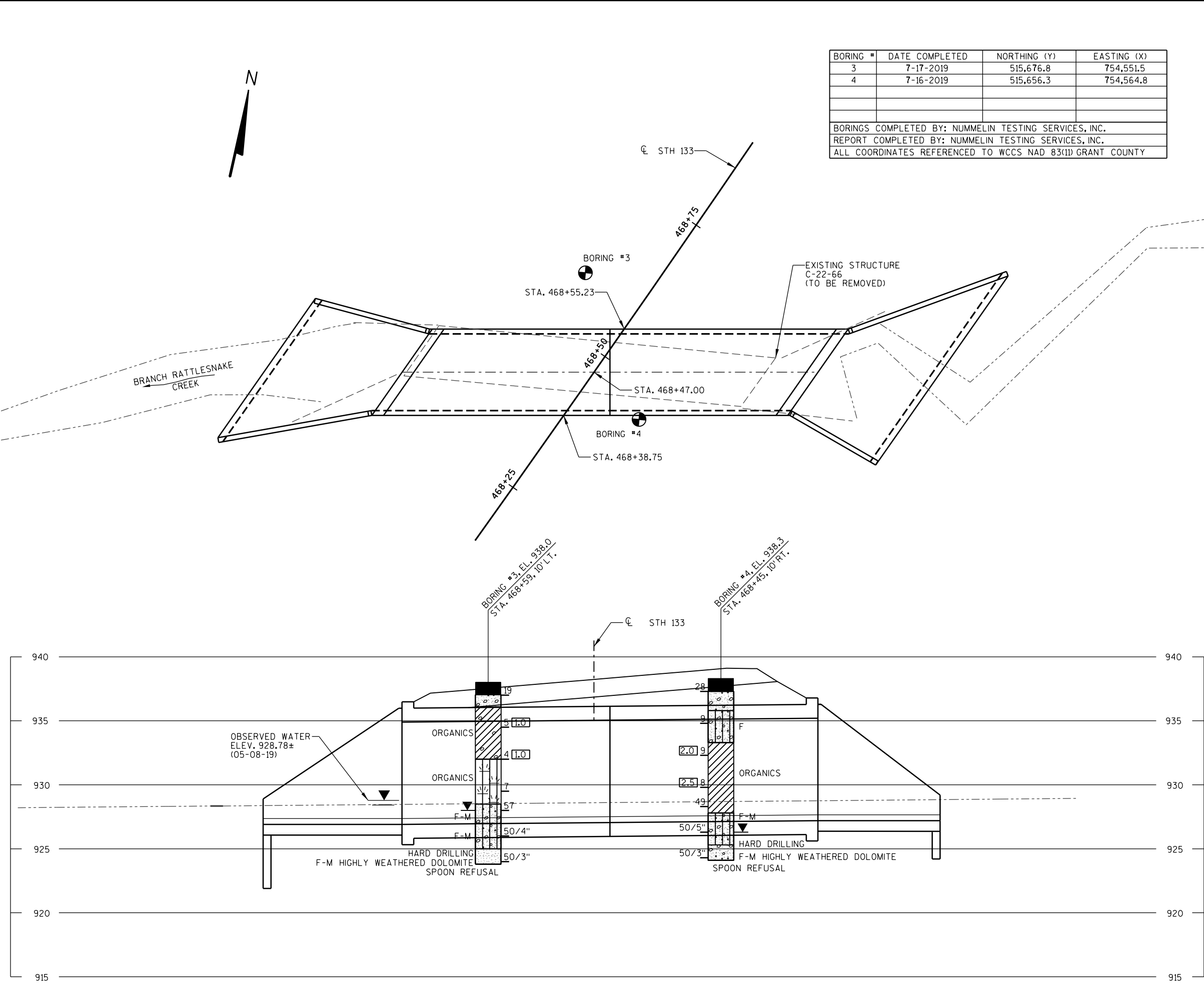


WING 3

OUTLET WING ELEVATIONS

WING 2

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-230			
DRAWN BY CAR		PLANS CK'D. JRS	
OUTLET APRON & WING DETAILS			SHEET 6 OF 7



BORING #	DATE COMPLETED	NORTHING (Y)	EASTING (X)
3	7-17-2019	515,676.8	754,551.5
4	7-16-2019	515,656.3	754,564.8
BORINGS COMPLETED BY: NUMMELIN TESTING SERVICES, INC.			
REPORT COMPLETED BY: NUMMELIN TESTING SERVICES, INC.			
ALL COORDINATES REFERENCED TO WCCS NAD 83(11) GRANT COUNTY			

STATE PROJECT NUMBER

5964-01-80

MATERIAL SYMBOLS

ASPHALT

CONCRETE

SAND

BOULDERS OR COBBLES

SHALE

TOPSOIL

FILL

CLAY

LIMESTONE

SANDSTONE

PEAT

GRAVEL

SILT

BEDROCK (UNKNOWN)

IGNEOUS/META

LEGEND OF BORING

BORING #/EL. STA./OFFSET

ST

0.25

17

F-C

COBBLE OR BOULDER

WEATHERED LIMESTONE

CORE RUN #1 - 24'-29'

REC=80%, ROD=72%

GROUND WATER ELEVATION

AT TIME OF DRILLING

END OF DRILLING

AFTER DRILLING

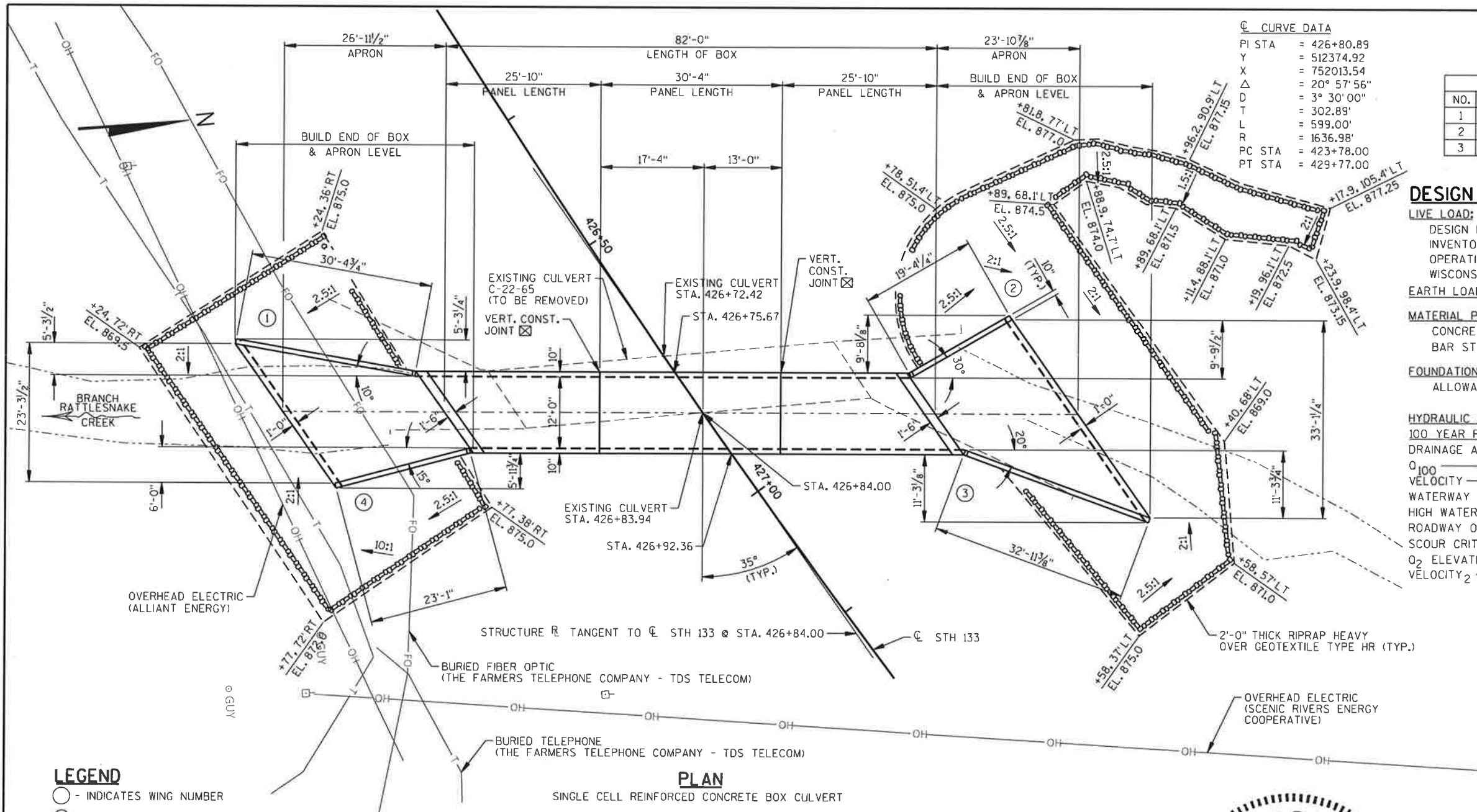
ABBREVIATIONS

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.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-230			
DRAWN BY		RLR	PLANS CK'D. JRS
SUBSURFACE EXPLORATION		SHEET 7 OF 7	

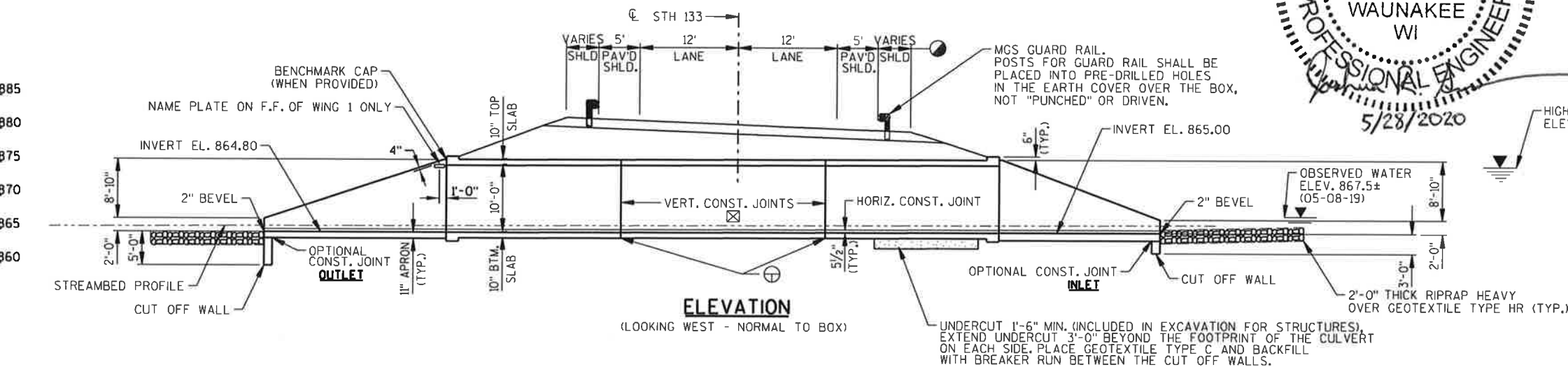


LEGEND

- - INDICATES WING NUMBER
- - DIMENSION GIVEN NORMAL TO ϕ STH 133.
- ⊠ - 18" MIN. WIDTH RUBBERIZED MEMBRANE WATERPROOFING UP WALLS AND ACROSS TOP SLAB.
- ⊕ - IN LIEU OF CONSTRUCTION JOINTS IN THE BOTTOM SLAB, THE CONTRACTOR MAY PROVIDE 2" DEEP SAWCUTS WITHIN 12 HOURS AFTER POURING.

PLAN

SINGLE CELL REINFORCED CONCRETE BOX CULVERT



ELEVATION

(LOOKING WEST - NORMAL TO BOX)

CL CURVE DATA

PI STA = 426+80.89
Y = 512374.92
X = 752013.54
 Δ = 20° 57' 56"
D T = 3° 30' 00"
L = 599.00'
R = 1636.98'
PC STA = 423+78.00
PT STA = 429+77.00

STATE PROJECT NUMBER

5964-01-80

BENCHMARKS

NO.	STATION	DESCRIPTION	ELEV.
1	426+85.55, 25.4' LT	CHISELED + ON NW WING WALL	878.92
2	425+61.34, 66.6' LT	2 POLE SPIKES IN 36" COTTONWOOD	881.95
3	427+17.02, 169.7' RT	PK NAIL TOP OF 60" CMP	878.35

DESIGN DATA

LIVE LOAD:

DESIGN LOADING: HL-93
INVENTORY RATING FACTOR: 1.05
OPERATIONAL RATING FACTOR: 1.35
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = 255 KIPS

TRAFFIC DATA:

A.A.D.T. (2021) = 910
A.A.D.T. (2041) = 1,100
R.D.S. = 60 MPH

EARTH LOAD: DESIGNED FOR 4 TO 6 FEET OF FILL

MATERIAL PROPERTIES:

CONCRETE MASONRY f'_c = 3,500 P.S.I.
BAR STEEL REINFORCEMENT HS STRUCTURES f_y = 60,000 P.S.I.

FOUNDATION DATA:

ALLOWABLE SOIL BEARING CAPACITY = 3,000 P.S.F.

HYDRAULIC DATA:

100 YEAR FREQUENCY
DRAINAGE AREA = 1.2 SQ. MI.
 Q_{100} = 1000 C.F.S.
VELOCITY = 11.41 F.P.S.
WATERWAY AREA = 88 SQ. FT.
HIGH WATER 100 ELEVATION = 874.99
ROADWAY OVERFLOW DESIGN FREQUENCY = >100 YEARS
SCOUR CRITICAL CODE = 8
 Q_2 ELEVATION (190 C.F.S.) = 870.11
VELOCITY₂ = 3.50 F.P.S.

LIST OF DRAWINGS

1. GENERAL PLAN
2. CROSS SECTION, QUANTITIES, NOTES & DETAILS
3. BOX CULVERT
4. BOX CULVERT DETAILS
5. INLET APRON & WING DETAILS
6. OUTLET APRON & WING DETAILS
7. SUBSURFACE EXPLORATION

CONSULTANT DESIGN CONTACT:
JOSH SWENO
(608) 355-8852

BRIDGE OFFICE CONTACT:
AARON BONK
(608) 261-0261



NO.	DATE	REVISION	BY
1	08/25/20		
MSA ENGINEERING ARCHITECTURE SURVEYING FUNDING PLANNING ENVIRONMENTAL 1702 PANKRATZ ST., MADISON WI 53704 (608) 242-7779 www.msa-ps.com			
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION ACCEPTED <i>[Signature]</i> SDR 08/25/20 CHIEF STRUCTURES DESIGN ENGINEER DATE			
STRUCTURE C-22-231			
STH 133 OVER BRANCH RATTLESNAKE CREEK			
COUNTY	GRANT	TOWN/CITY/VILLAGE	CLEN HAVEN
DESIGN SPEC. AASHTO LRFD BRIDGE DESIGN SPEC.			
DESIGNED BY	JZ	DESIGN CR'D.	JRS
DRAWN BY	RLR	PLANS CR'D.	JZ
GENERAL PLAN			SHEET 1 OF 7

TOTAL ESTIMATED QUANTITIES

ITEM NUMBER	BID ITEM	UNIT	TOTAL
203.0200.01	REMOVING OLD STRUCTURE STATION 426+78	LS	1
206.2000.01	EXCAVATION FOR STRUCTURES CULVERTS C-22-231	LS	1
210.2500	BACKFILL STRUCTURE TYPE B	TON	3125
311.0110	BREAKER RUN	TON	305
504.0100	CONCRETE MASONRY CULVERTS	CY	187
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	23,930
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	4,350
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	37
606.0300	RIPRAP HEAVY	CY	295
645.0105	GEOTEXTILE TYPE C	SY	398
645.0120	GEOTEXTILE TYPE HR	SY	579
	NON-BID ITEMS		
	PREFORMED FILLER	SIZE	¾"

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS SHOWN OR NOTED OTHERWISE.

THE FIRST DIGIT OF A THREE DIGIT BAR MARK SIGNIFIES THE BAR SIZE.

THE CONCRETE IN THE CUT OFF WALL MAY BE PLACED UNDERWATER IF THE EXCAVATION CANNOT BE DEWATERED.

THE ALTERNATE CUT OFF WALL MAY BE USED IN LIEU OF THE CAST IN PLACE CUT OFF WALLS. PAYMENT SHALL BE BASED ON CONCRETE CUT OFF WALLS.

THIS STRUCTURE WILL REPLACE THE EXISTING STRUCTURE, A 10'WIDE X 10'HIGH SINGLE CELL REINFORCED CONCRETE BOX CULVERT.

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES CULVERTS C-22-231" SHALL BE THE EXISTING GROUND LINE.

THE BACKFILL QUANTITIES ARE BASED ON THE PAY LIMITS SHOWN ON THE PLANS AND MAY NOT REFLECT ACTUAL PLACED QUANTITIES. "BACKFILL STRUCTURE TYPE B" REQUIRED ON THE BOX CULVERT SIDES AND TOP AND BEHIND APRON WINGS FOR 3 FEET.

THE CONTRACTOR MAY FURNISH A PRECAST CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE BOX CULVERT WITH THE ACCEPTANCE OF THE SHOP DRAWINGS BY THE STRUCTURES DESIGN SECTION. THE PRECAST CONCRETE BOX CULVERT SHALL CONFORM TO PRECAST DETAILS IN CHAPTER 36 STANDARDS OF THE CURRENT WISCONSIN DOT BRIDGE MANUAL. PAYMENT FOR THE PRECAST CULVERT SHALL BE BASED ON THE QUANTITIES AND PRICES BID FOR THE ITEMS LISTED IN THE "TOTAL ESTIMATED QUANTITIES". ALL PRECAST BOX SECTIONS SHALL BE PLACED ON A BEDDING OF "BACKFILL STRUCTURE TYPE B" OF 6" MIN. DEPTH.

BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

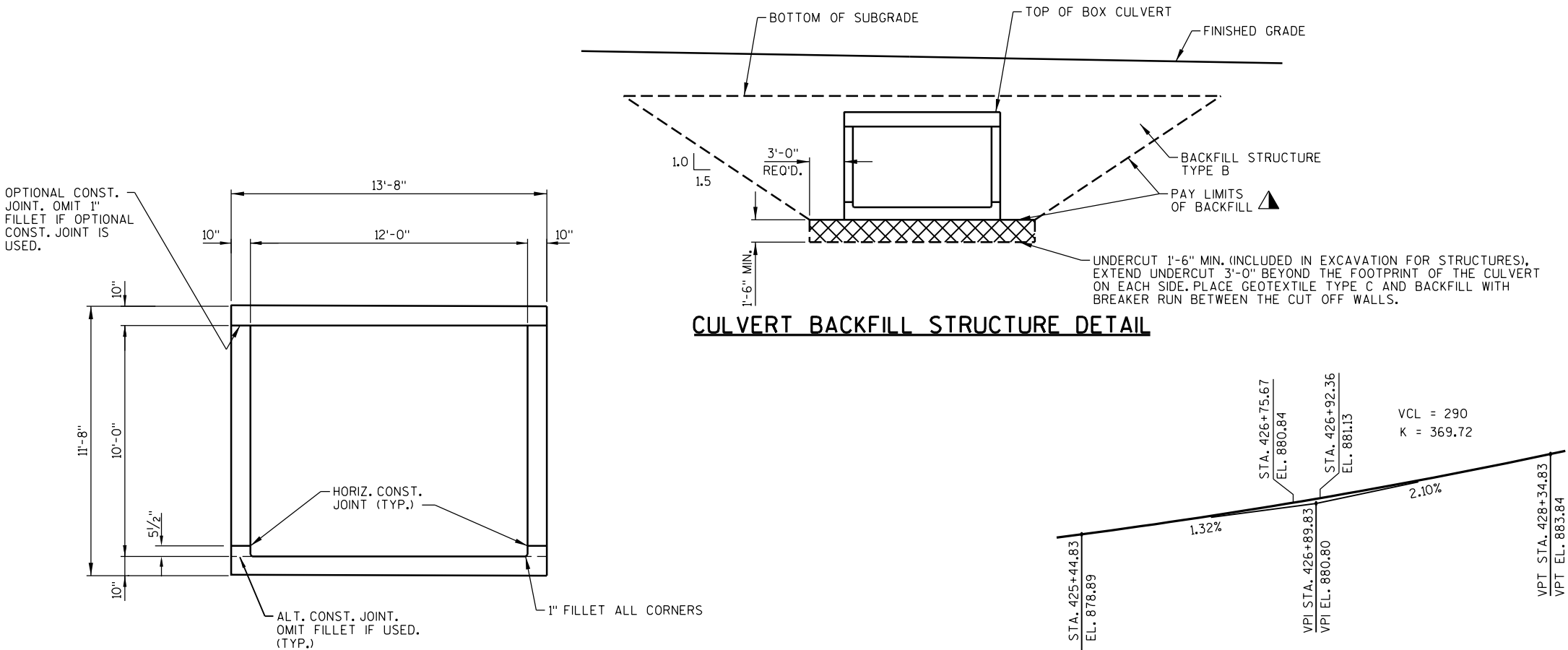
APRONS AND BOTTOM SLAB MAY BE POURED CONTINUOUSLY.

ELEVATIONS SHOWN ON THIS PLAN ARE REFERENCED TO USGS NAVD 88 (2012 ADJUSTED). BENCHMARKS WERE LOCATED IN THE FIELD USING GPS TECHNOLOGY.

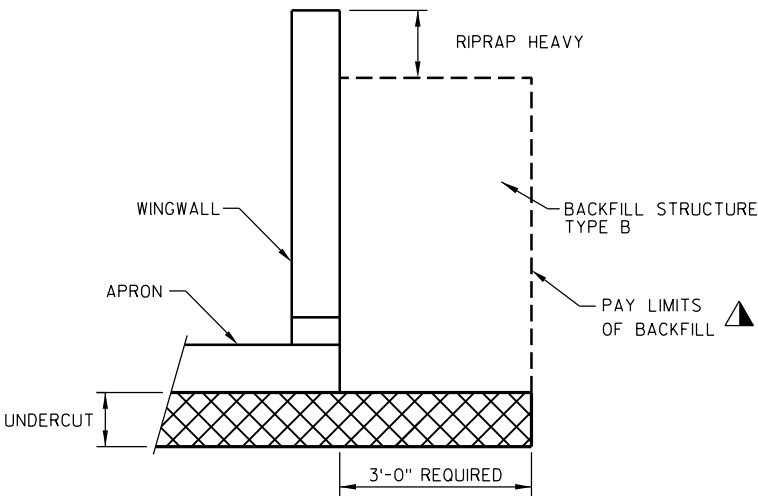
A TEMPORARY WATER DIVERSION SHALL BE PROVIDED DURING CONSTRUCTION OF THE NEW CULVERT. THE TEMPORARY WATER DIVERSION BID ITEM IS DETAILED IN THE SPECIAL PROVISIONS AND PROVIDED IN THE ROADWAY QUANTITIES.

STATE PROJECT NUMBER

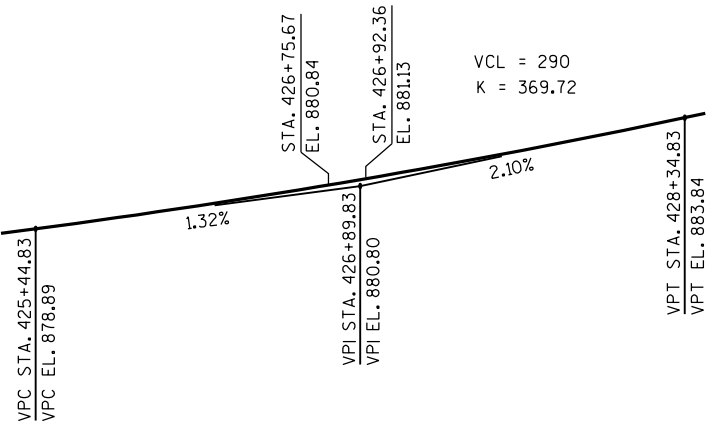
5964-01-80



CULVERT BACKFILL STRUCTURE DETAIL

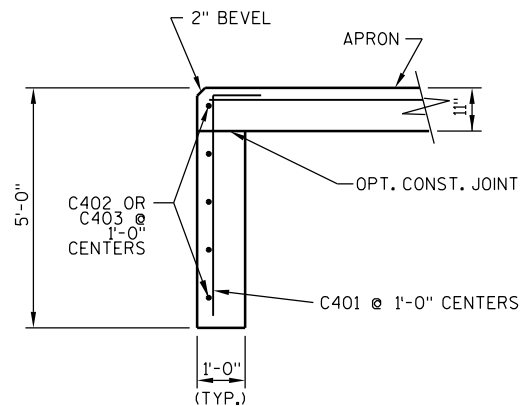


WINGWALL BACKFILL DETAIL

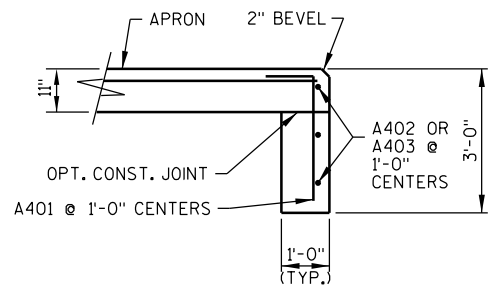


PROFILE GRADE LINE - STH 133

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-231			
DRAWN BY RLR		PLANS CK'D. JRS	
CROSS SECTION, QUANTITIES, NOTES & DETAILS			SHEET 2 OF 7

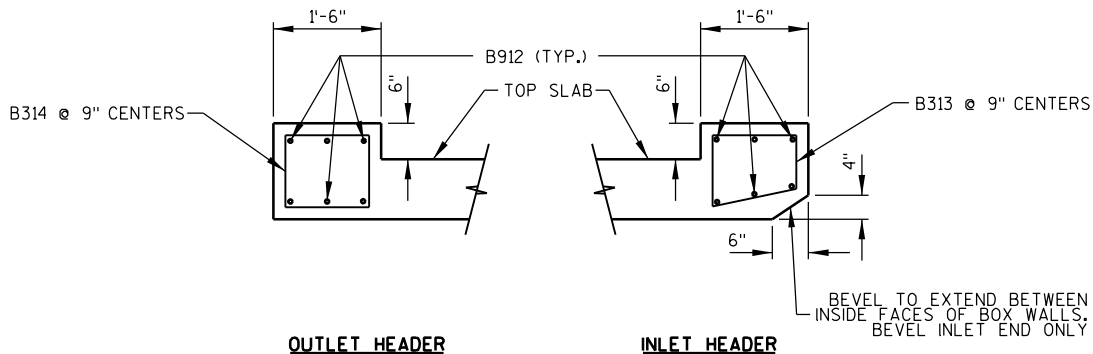


SECTION THRU OUTLET CUT OFF WALL

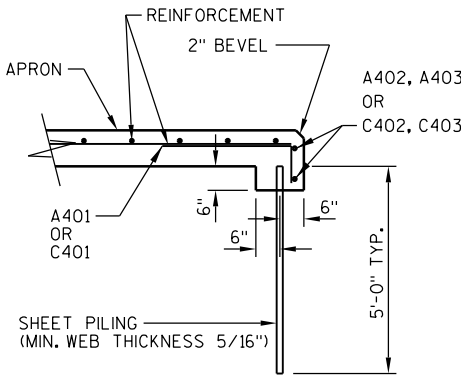


SECTION THRU INLET CUT OFF WALL

FOR ALTERNATE CUT OFF WALL DETAIL, SEE DETAIL ON THIS SHEET

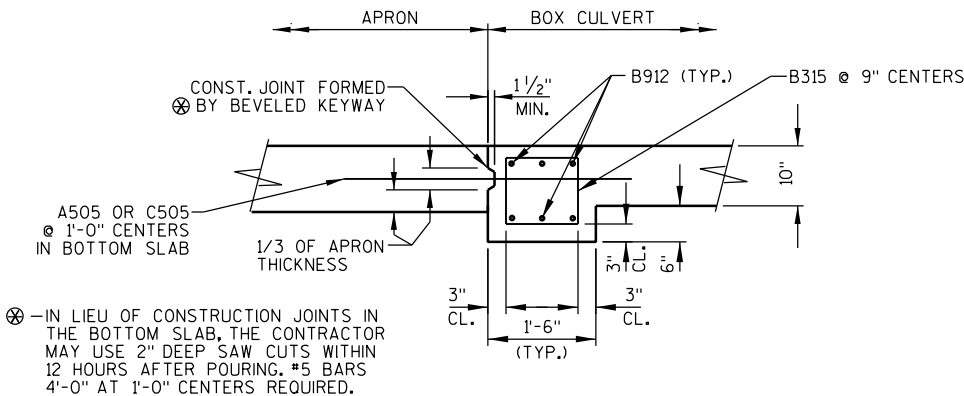


SECTION THRU TOP HEADER

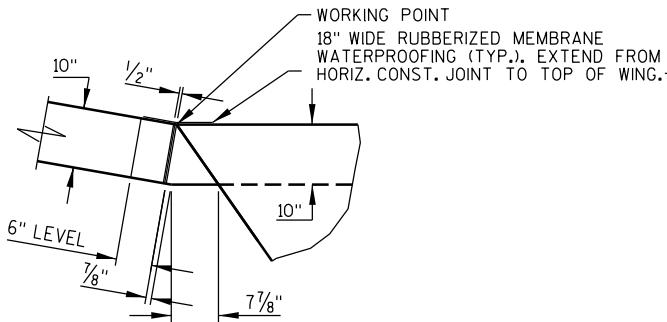


ALTERNATE CUT OFF WALL

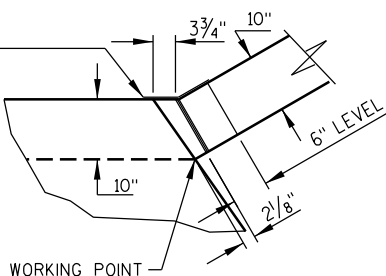
PAYMENT BASED ON CONCRETE CUT OFF WALL.



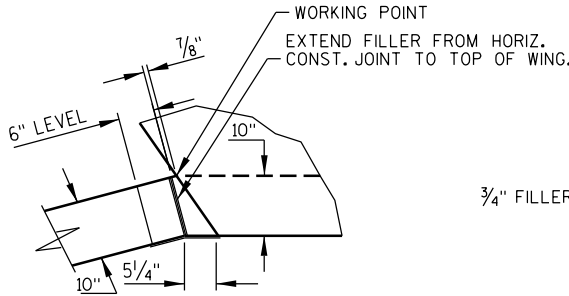
APRON CONNECTION & HEADER DETAIL



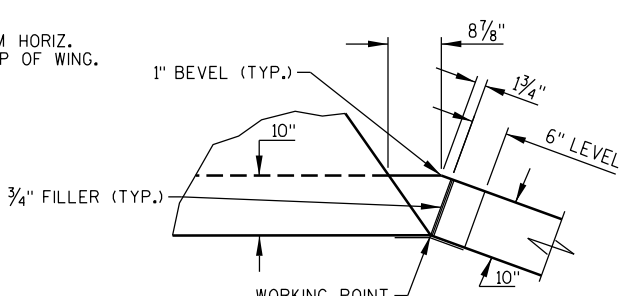
WING 1



WING 2

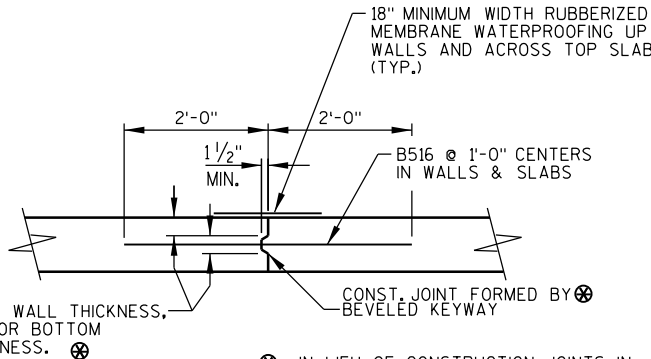


WING 4



WING 3

CORNER DETAILS



VERTICAL CONSTRUCTION JOINT

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-231			
DRAWN BY CAR		PLANS CK'D. JRS	
BOX CULVERT DETAILS		SHEET 4 OF 7	

BAR SERIES TABLE

MARK	NO. REQUIRED	LENGTH
A406	1 SERIES OF 10	4'-10" TO 23'-4"
A407	1 SERIES OF 9	3'-6" TO 23'-0"
A408	1 SERIES OF 20	8'-2" TO 19'-6"
A409	1 SERIES OF 20	9'-10" TO 23'-4"
A413	1 SERIES OF 9	2'-6" TO 4'-11"
A414	1 SERIES OF 10	6'-2" TO 8'-6"
A415	1 SERIES OF 25	6'-7" TO 9'-9"
A416	1 SERIES OF 15	4'-6" TO 10'-2"
A418	2 SERIES OF 6	3'-0" TO 30'-7"
A420	1 SERIES OF 4	2'-6" TO 4'-8"
A421	1 SERIES OF 5	6'-2" TO 8'-4"
A422	1 SERIES OF 15	6'-7" TO 9'-9"
A423	1 SERIES OF 10	3'-10" TO 10'-2"
A425	2 SERIES OF 6	1'-10" TO 17'-10"
A427	1 SERIES OF 14	3'-9" TO 6'-5"
A428	1 SERIES OF 10	3'-3" TO 6'-5"

BUNDLE AND TAG EACH SERIES SEPARATELY

COATED 2,160 LBS.
UNCOATED 1,000 LBS.

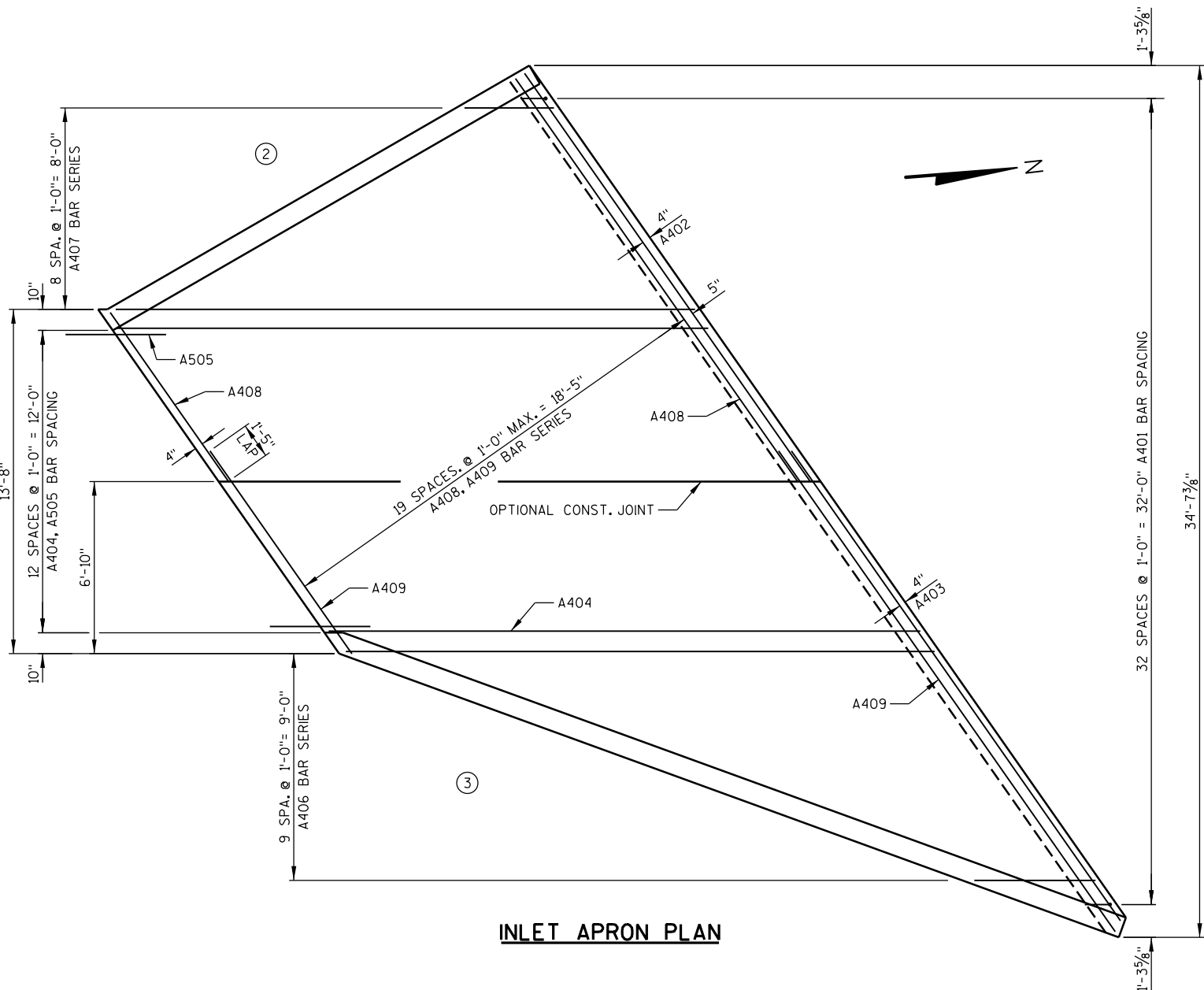
BILL OF BARS

MARK	NUMBER REQUIRED COATED UNCOATED	LENGTH	BENT	BAR SERIES	LOCATION
A401	- 33	3'-6"	X		INLET APRON CUT OFF WALL - VERT.
A402	- 3	19'-9"			INLET APRON CUT OFF WALL - TRANS.
A403	- 3	22'-9"			INLET APRON CUT OFF WALL - TRANS.
A404	- 13	23'-6"			INLET APRON - LONGIT.
A405	- 13	4'-0"			INLET APRON CONNECTION DOWELS
A406	- 10	14'-1"		*	INLET APRON @ WING 3 - LONGIT.
A407	- 9	13'-3"		*	INLET APRON @ WING 2 - LONGIT.
A408	- 20	13'-10"		*	INLET APRON - TRANS.
A409	- 20	16'-7"		*	INLET APRON - TRANS.
A710	40 -	11'-0"	X		WINGS 2 & 3 - B.F. DOWELS - VERT.
A511	24 -	9'-2"	X		WINGS 2 & 3 - B.F. DOWELS - VERT.
A412	25 -	2'-9"			WINGS 2 & 3 - F.F. DOWELS - VERT.
A413	9 -	3'-9"		*	WING 3 - F.F. - END - VERT.
A414	10 -	7'-4"	X	*	WING 3 - B.F. - END - VERT.
A415	25 -	8'-2"		*	WING 3 - B.F. - VERT.
A416	15 -	7'-4"		*	WING 3 - F.F. - VERT.
A417	4 -	32'-7"			WING 3 & INLET APRON - LONGIT.
A418	12 -	16'-10"		*	WING 3 - F.F. & B.F. - LONGIT.
A519	2 -	33'-9"			WING 3 - F.F. & B.F. - TOP - LONGIT.
A420	4 -	3'-7"		*	WING 2 - F.F. - END - VERT.
A421	5 -	7'-3"	X	*	WING 2 - B.F. - END - VERT.
A422	15 -	8'-2"		*	WING 2 - B.F. - VERT.
A423	10 -	7'-0"		*	WING 2 - F.F. - VERT.
A424	4 -	19'-0"			WING 2 & INLET APRON - LONGIT.
A425	12 -	9'-10"		*	WING 2 - F.F. & B.F. - LONGIT.
A526	2 -	20'-10"			WING 2 - F.F. & B.F. - TOP - LONGIT.
A427	14 -	5'-1"		*	WING 3 - B.F. - VERT.
A428	10 -	4'-10"		*	WING 2 - B.F. - VERT.

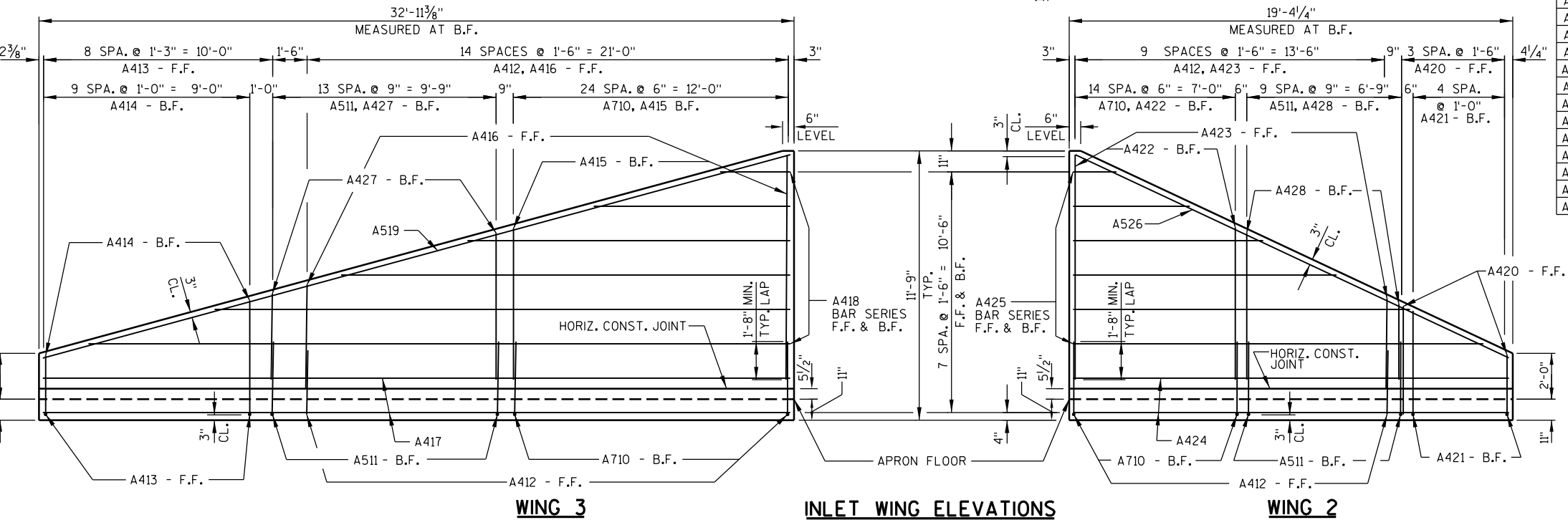
DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.

* - LENGTH SHOWN FOR BAR IS AN AVERAGE LENGTH AND SHOULD ONLY BE USED FOR BAR WEIGHT CALCULATIONS. SEE BAR SERIES TABLE FOR ACTUAL LENGTHS. BENT BARS IF USED IN BAR SERIES TABLE SHALL BE BENT AFTER CUTTING.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-231			
DRAWN BY CAR		PLANS CK'D. JRS	
INLET APRON & WING DETAILS			SHEET 5 OF 7



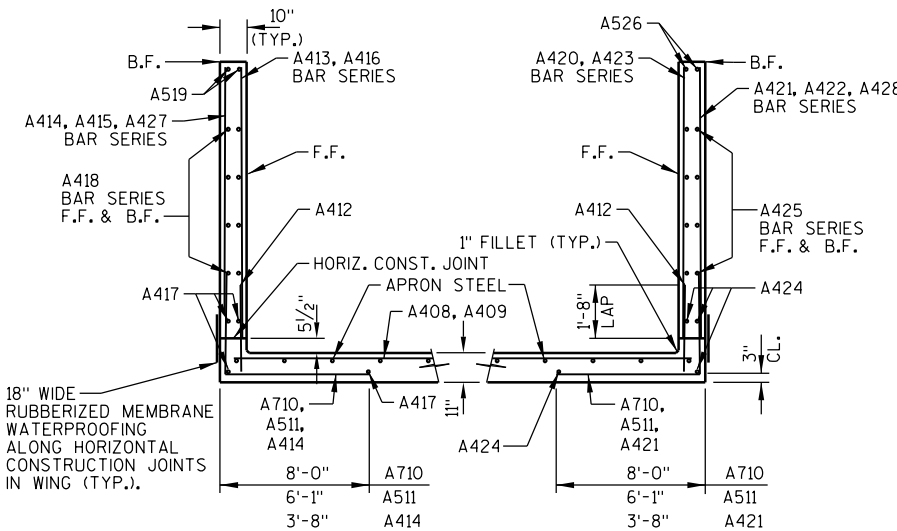
INLET APRON PLAN



WING 3

INLET WING ELEVATIONS

WING 2



WING 3

WING 2

SECTION THRU WINGS

(NORMAL TO WING WALLS)

MARK	A
A401	1'-0"
A710	8'-0"
A511	6'-1"
A414	3'-8"
A421	3'-8"

LEGEND

○ — INDICATES WING NUMBER

F.F. — FRONT FACE

B.F. — BACK FACE

CL. — CLEAR

BAR SERIES TABLE

MARK	NO. REQUIRED	LENGTH
C406	1 SERIES OF 5	7'-10" TO 25'-6"
C407	1 SERIES OF 5	5'-10" TO 25'-8"
C408	1 SERIES OF 22	8'-2" TO 14'-5"
C409	1 SERIES OF 22	9'-6" TO 16'-8"
C413	1 SERIES OF 7	2'-6" TO 4'-9"
C414	1 SERIES OF 9	6'-2" TO 8'-6"
C415	1 SERIES OF 23	6'-8" TO 9'-10"
C416	1 SERIES OF 15	4'-0" TO 10'-2"
C418	2 SERIES OF 6	2'-10" TO 28'-2"
C420	1 SERIES OF 5	2'-6" TO 4'-10"
C421	1 SERIES OF 7	6'-2" TO 8'-6"
C422	1 SERIES OF 17	6'-8" TO 9'-10"
C423	1 SERIES OF 11	4'-5" TO 10'-3"
C425	2 SERIES OF 6	2'-2" TO 21'-4"
C427	1 SERIES OF 14	3'-6" TO 6'-4"
C428	1 SERIES OF 10	3'-10" TO 6'-6"

BUNDLE AND TAG EACH SERIES SEPARATELY

COATED 2,190 LBS.
UNCOATED 940 LBS.

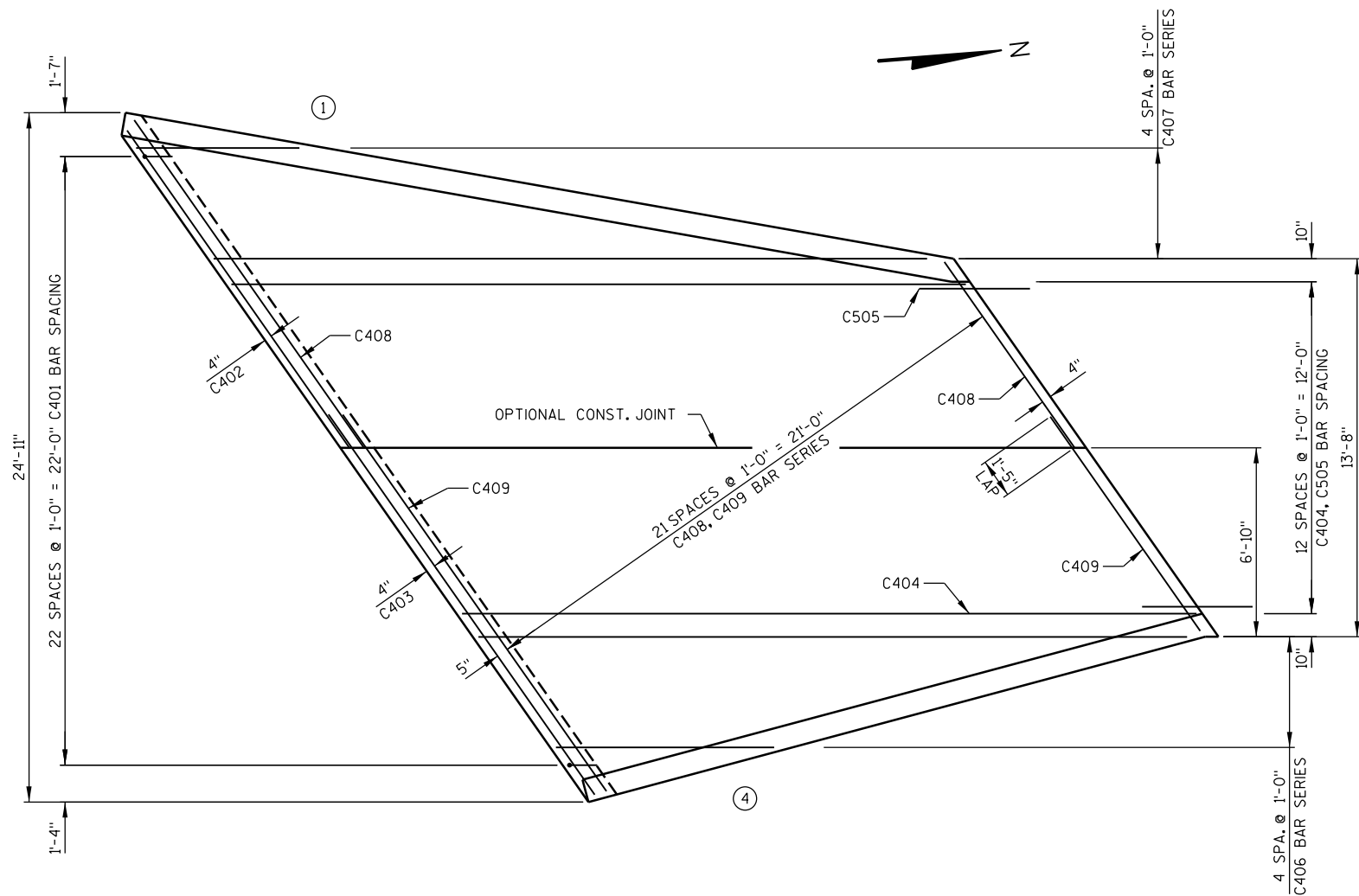
BILL OF BARS

MARK	NUMBER COATED	REQUIRED UNCOATED	LENGTH	BENT	BAR SERIES	LOCATION
C401	-	23	5'-6"	X		OUTLET APRON CUT OFF WALL - VERT.
C402	-	5	14'-0"			OUTLET APRON CUT OFF WALL - TRANS.
C403	-	5	16'-10"			OUTLET APRON CUT OFF WALL - TRANS.
C404	-	13	26'-6"			OUTLET APRON - LONGIT.
C505	-	13	4'-0"			OUTLET APRON CONNECTION DOWELS
C406	-	5	16'-8"		*	OUTLET APRON @ WING 4 - LONGIT.
C407	-	5	15'-9"		*	OUTLET APRON @ WING 1 - LONGIT.
C408	-	22	11'-4"		*	OUTLET APRON - TRANS.
C409	-	22	13'-1"		*	OUTLET APRON - TRANS.
C710	40	-	11'-0"	X		WINGS 1 & 4 - B.F. DOWELS - VERT.
C511	24	-	9'-2"	X		WINGS 1 & 4 - B.F. DOWELS - VERT.
C412	26	-	2'-9"			WINGS 1 & 4 - F.F. DOWELS - VERT.
C413	7	-	3'-8"		*	WING 1 - F.F. - END - VERT.
C414	9	-	7'-4"	X	*	WING 1 - B.F. - END - VERT.
C415	23	-	8'-3"		*	WING 1 - B.F. - VERT.
C416	15	-	7'-1"		*	WING 1 - F.F. - VERT.
C417	4	-	30'-0"			WING 1 & OUTLET APRON - LONGIT.
C418	12	-	15'-6"		*	WING 1 - F.F. & B.F. - LONGIT.
C519	2	-	31'-4"			WING 1 - F.F. & B.F. - TOP - LONGIT.
C420	5	-	3'-8"		*	WING 4 - F.F. - END - VERT.
C421	7	-	7'-4"	X	*	WING 4 - B.F. - END - VERT.
C422	17	-	8'-3"		*	WING 4 - B.F. - VERT.
C423	11	-	7'-4"		*	WING 4 - F.F. - VERT.
C424	4	-	22'-8"			WING 4 & OUTLET APRON - LONGIT.
C425	12	-	11'-9"		*	WING 4 - F.F. & B.F. - LONGIT.
C526	2	-	24'-4"			WING 4 - F.F. & B.F. - TOP - LONGIT.
C427	14	-	4'-11"		*	WING 1 - B.F. - VERT.
C428	10	-	5'-2"		*	WING 4 - B.F. - VERT.

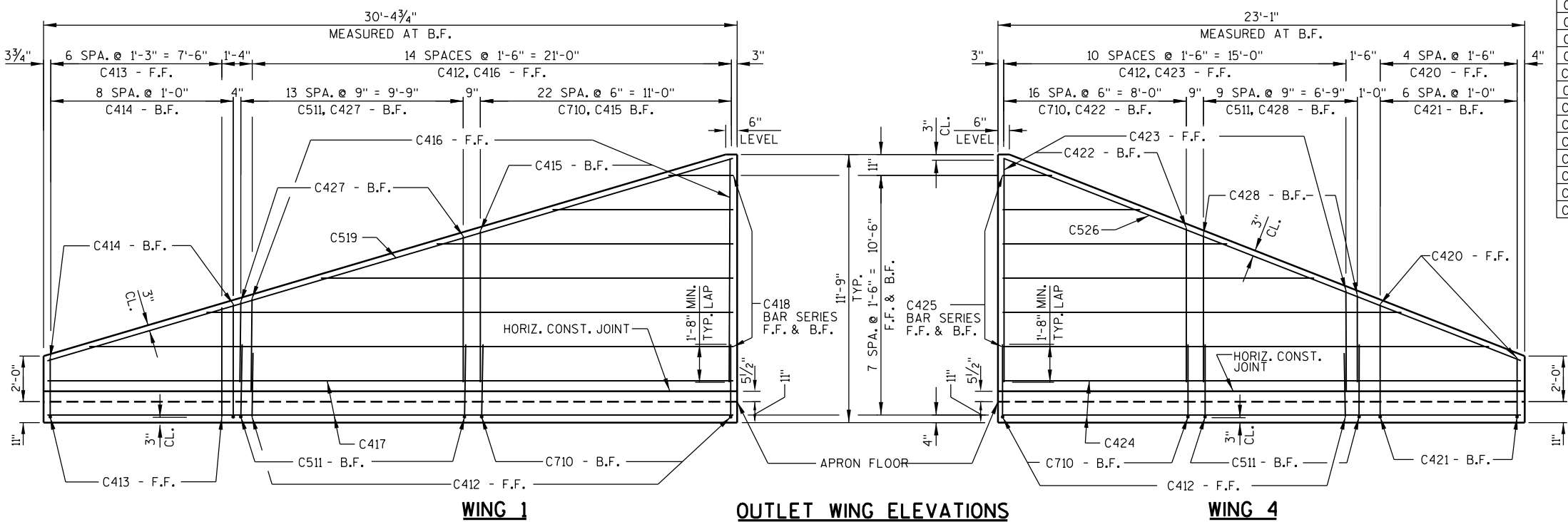
DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.

* - LENGTH SHOWN FOR BAR IS AN AVERAGE LENGTH AND SHOULD ONLY BE USED FOR BAR WEIGHT CALCULATIONS. SEE BAR SERIES TABLE FOR ACTUAL LENGTHS. BENT BARS IF USED IN BAR SERIES TABLE SHALL BE BENT AFTER CUTTING.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-231			
DRAWN BY CAR		PLANS CK'D. JRS	
OUTLET APRON & WING DETAILS			SHEET 6 OF 7

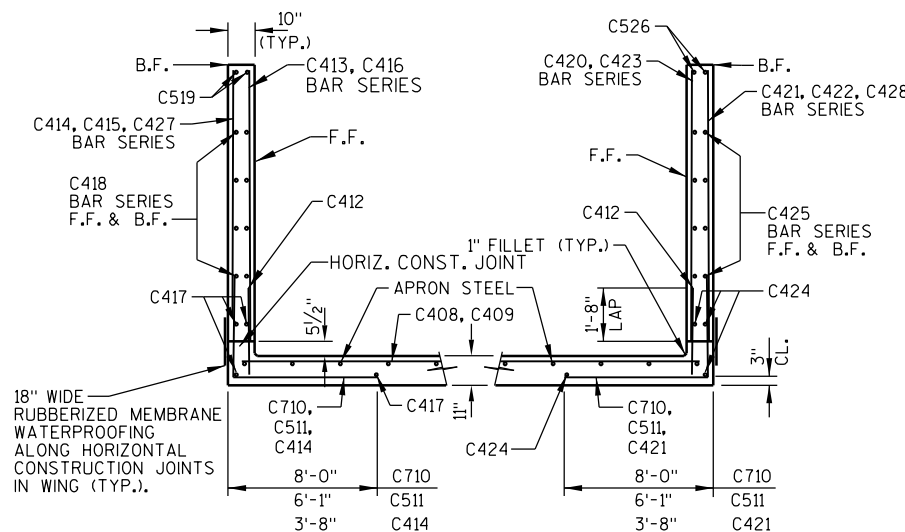


OUTLET APRON PLAN



OUTLET WING ELEVATIONS

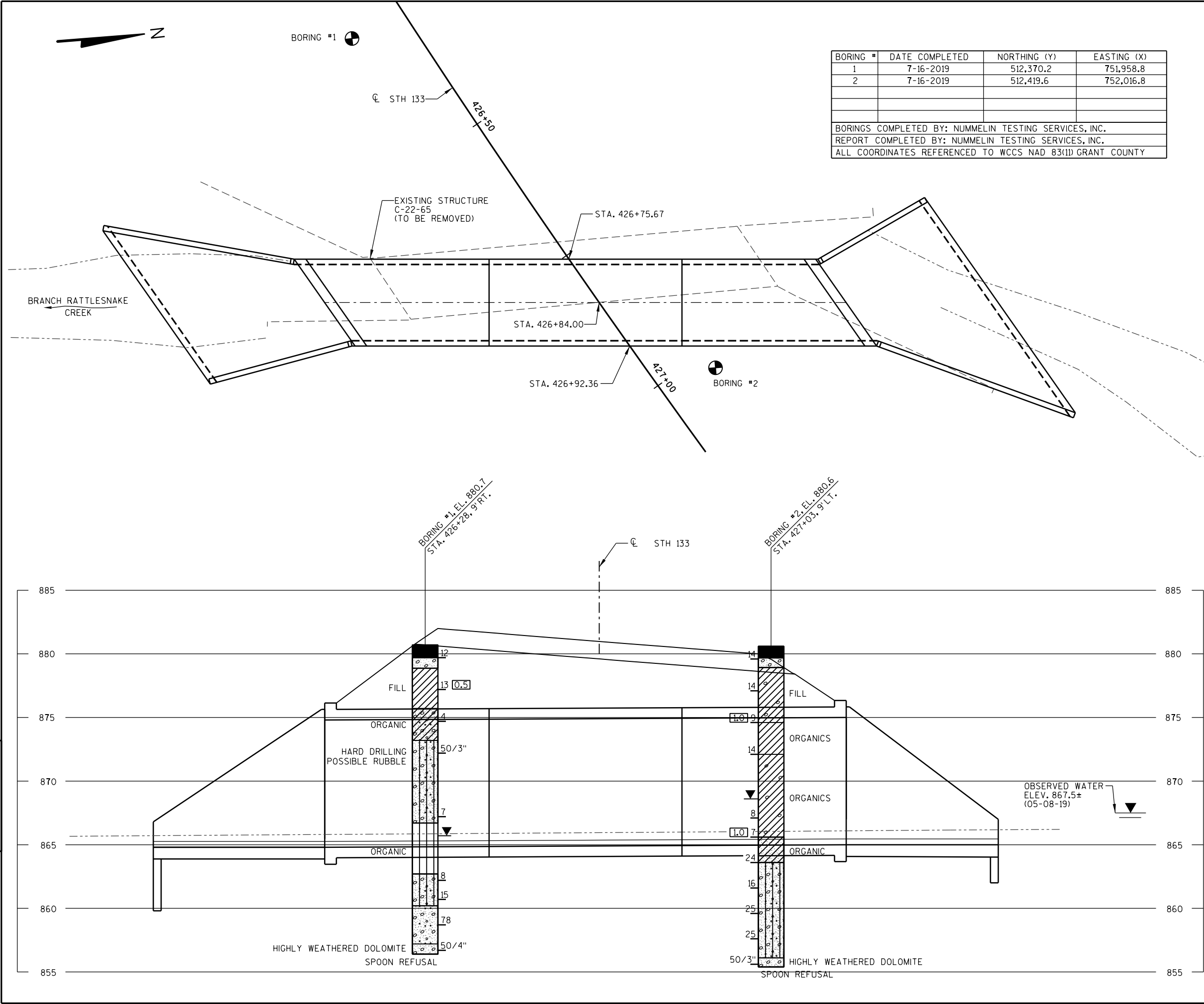
WING 4

SECTION THRU WINGS
(NORMAL TO WINGWALLS)

MARK	A
C401	1'-0"
C710	8'-0"
C511	6'-1"
C414	3'-8"
C421	3'-8"

LEGEND

- — INDICATES WING NUMBER
- F.F. — FRONT FACE
- B.F. — BACK FACE
- CL. — CLEAR



STATE PROJECT NUMBER

5964-01-80

MATERIAL SYMBOLS

ASPHALT

CONCRETE

SAND

BOULDERS OR COBBLES

SHALE

TOPSOIL

FILL

CLAY

LIMESTONE

SANDSTONE

PEAT

GRAVEL

SILT

BEDROCK (UNKNOWN)

IGNEOUS/META

LEGEND OF BORING

BORING # EL. STA./OFF-SET

ST (1) 0.25 (2) 17

F-C COBBLE OR BOULDER

WEATHERED LIMESTONE

CORE RUN #1 - 24'-29' REC=80%, ROD=72%

(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.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE C-22-231			
DRAWN BY		RLR	PLANS CK'D. JRS
SUBSURFACE EXPLORATION		SHEET 7 OF 7	

PROJECT I.D. 5964-01-80 EARTHWORK SUMMARY

STRUCTURE C-22-231

STA	EXCAVATION COMMON CY	EXCAVATION ROCK CY	FILL (1) CY	EXPANDED FILL (2) CY	WASTE CY	BORROW CY
425+47.87	65	0	35	46	19	-19
425+72.57	61	0	29	38	23	-23
425+97.29	76	0	39	51	25	-25
426+28.00	143	0	84	109	34	-34
426+78.00	28	0	16	21	7	-7
426+86.98	116	0	44	57	59	-59
427+28.00	131	0	1	1	130	-130
427+78.00	34	0	0	0	34	-34
427+90.64	72	0	0	0	72	-72
428+15.89	75	0	4	5	70	-70
428+41.16						
SUBTOTALS	801	0	252	328	473	-473
UNUSABLE PAVEMENT (3)						263
TOTALS	801	0	252	328	473	-210
(1) - NOT A BID ITEM - FOR INFORMATIONAL PURPOSES ONLY. (2) - FILL EXPANSION 30% (3) - EXISTING PAVEMENT BASED ON AVE THK OF 11.50" ASPHALT PER BORING LOG.						

PROJECT I.D. 5964-01-80 EARTHWORK SUMMARY

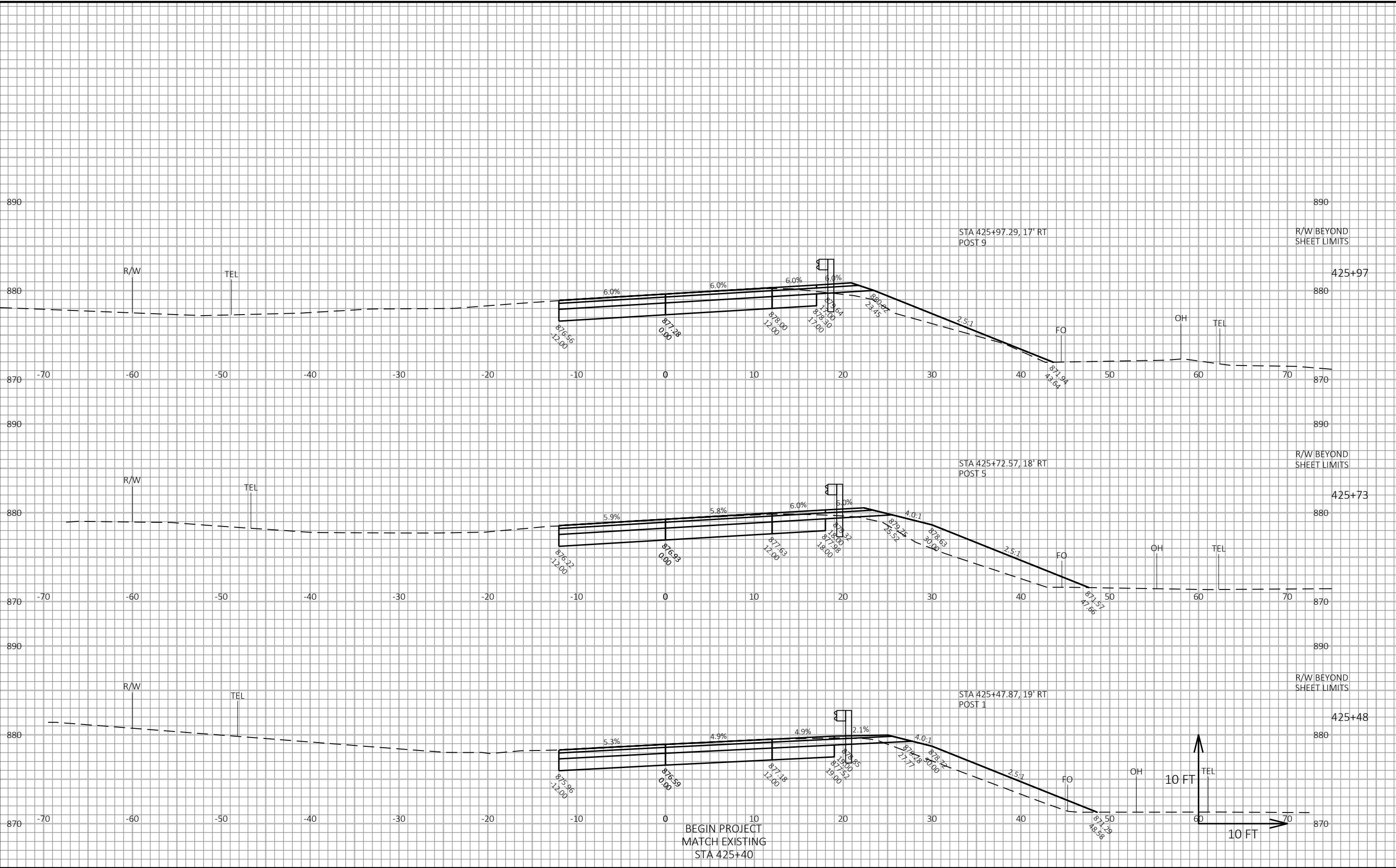
STRUCTURE C-22-230

STA	EXCAVATION COMMON CY	EXCAVATION ROCK CY	FILL (1) CY	EXPANDED FILL (2) CY	WASTE CY	BORROW CY
467+25.62	73	0	14	18	55	-55
467+49.42	4	0	1	1	3	-3
467+50.63	74	0	12	16	58	-58
467+74.42	4	0	1	1	3	-3
467+75.62	71	0	8	10	61	-61
467+99.42	145	0	31	40	105	-105
468+50.00	128	0	59	77	51	-51
468+94.38	71	0	27	35	36	-36
469+18.18	4	0	1	1	3	-3
469+19.37	71	0	25	33	38	-38
469+43.18	4	0	1	1	3	-3
469+44.38	71	0	28	36	35	-35
469+68.18						
SUBTOTALS	720	0	208	269	451	-451
UNUSABLE PAVEMENT (3)						226
TOTALS	720	0	208	269	451	-225
(1) - NOT A BID ITEM - FOR INFORMATIONAL PURPOSES ONLY. (2) - FILL EXPANSION 30% (3) - EXISTING PAVEMENT BASED ON AVE THK OF 11.75" ASPHALT PER BORING LOG.						

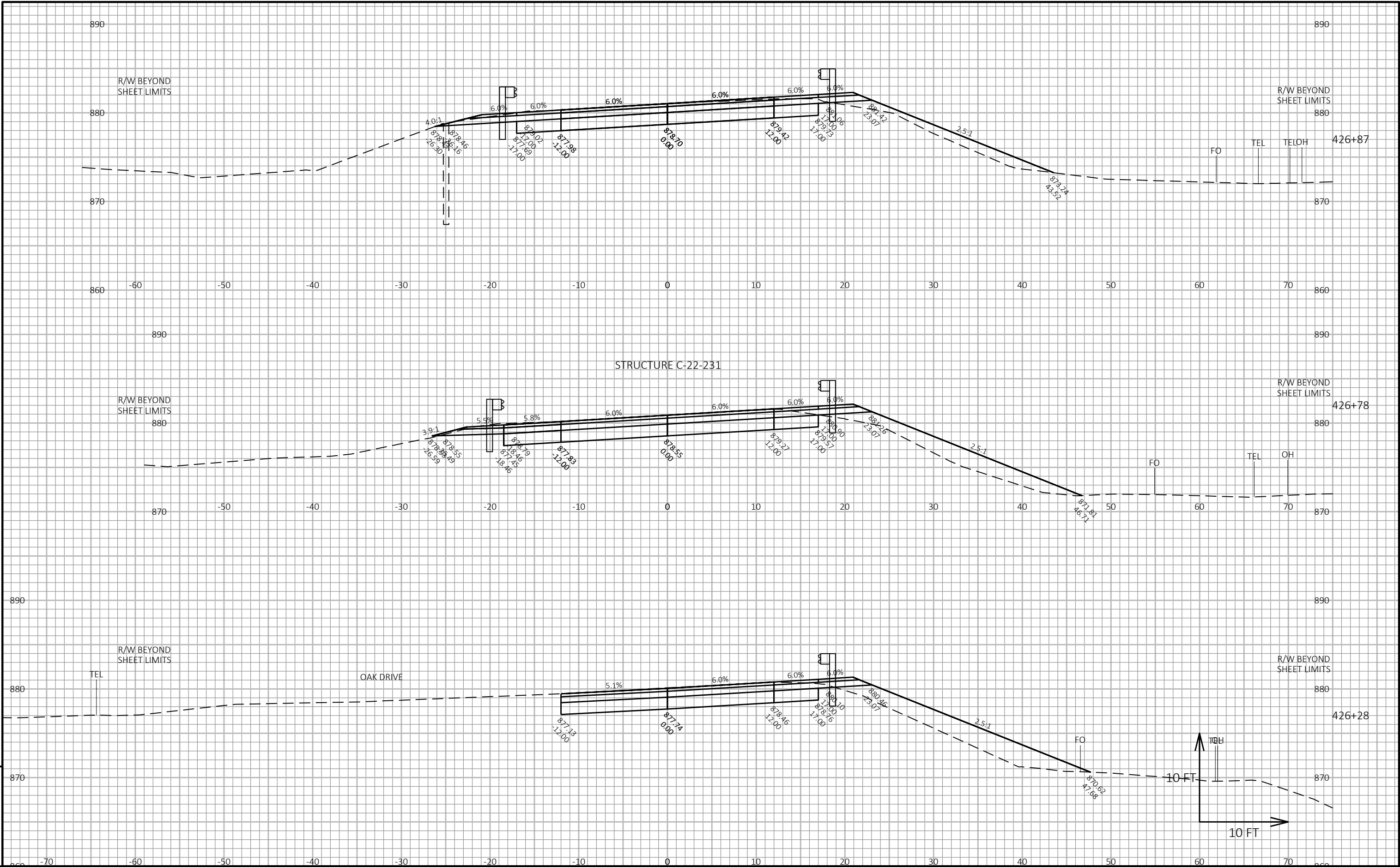
PROJECT I.D. 5964-01-80 EARTHWORK SUMMARY

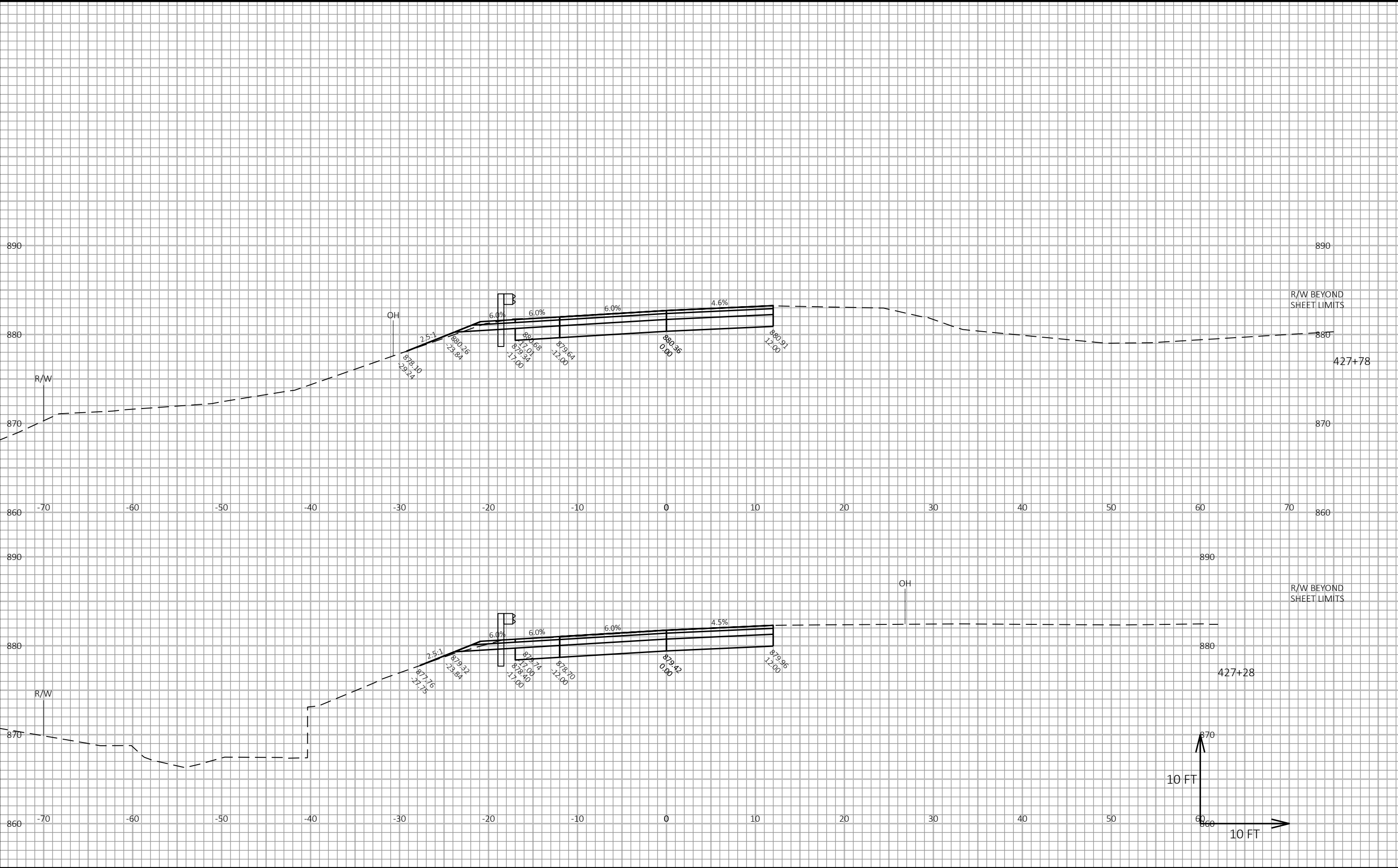
STRUCTURE C-22-229

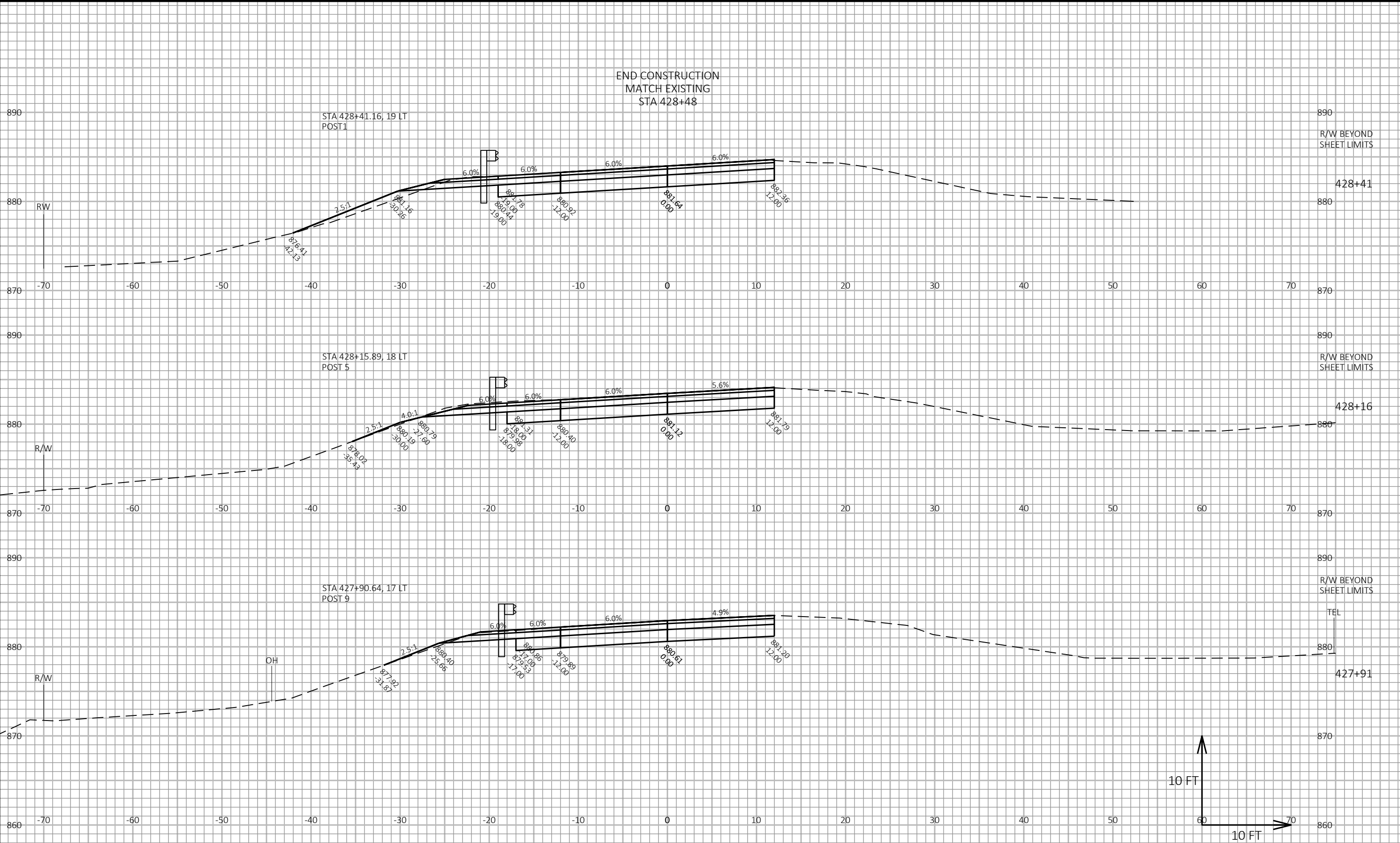
STA	EXCAVATION COMMON CY	EXCAVATION ROCK CY	FILL (1) CY	EXPANDED FILL (2) CY	WASTE CY	BORROW CY
675+42.62	73	0	21	27	46	-46
675+67.60	68	0	17	22	46	-46
675+92.58	20	0	4	5	15	-15
675+99.38	81	0	29	38	43	-43
676+24.36	76	0	61	79	-3	3
676+49.34	91	0	112	146	-55	55
676+80.00	84	0	83	108	-24	24
677+08.20	50	0	53	69	-19	19
677+25.00	69	0	79	103	-34	34
677+50.00	130	0	45	59	71	-71
678+00.00	130	0	8	10	120	-120
678+50.00						
SUBTOTALS	872	0	512	666	206	-206
UNUSABLE PAVEMENT (3)						344
TOTALS	872	0	512	666	206	138
(1) - NOT A BID ITEM - FOR INFORMATIONAL PURPOSES ONLY. (2) - FILL EXPANSION 30% (3) - EXISTING PAVEMENT BASED ON AVE THK OF 14.50" ASPHALT PER BORING LOG.						



PROJECT NO: 5964-01-80	HWY: STH 133	COUNTY: GRANT	CROSS SECTIONS: C-22-231	SHEET E
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PROJECT NO: 5964-01-80

HWY: STH 133

COUNTY: GRANT

CROSS SECTIONS: C-22-231

SHEET

E

FILE NAME : G:\00\00093\00093494\CADD\DESIGN\CORRIDORS\CORRIDOR-STH 133.DWG
LAYOUT NAME - 090204-xs

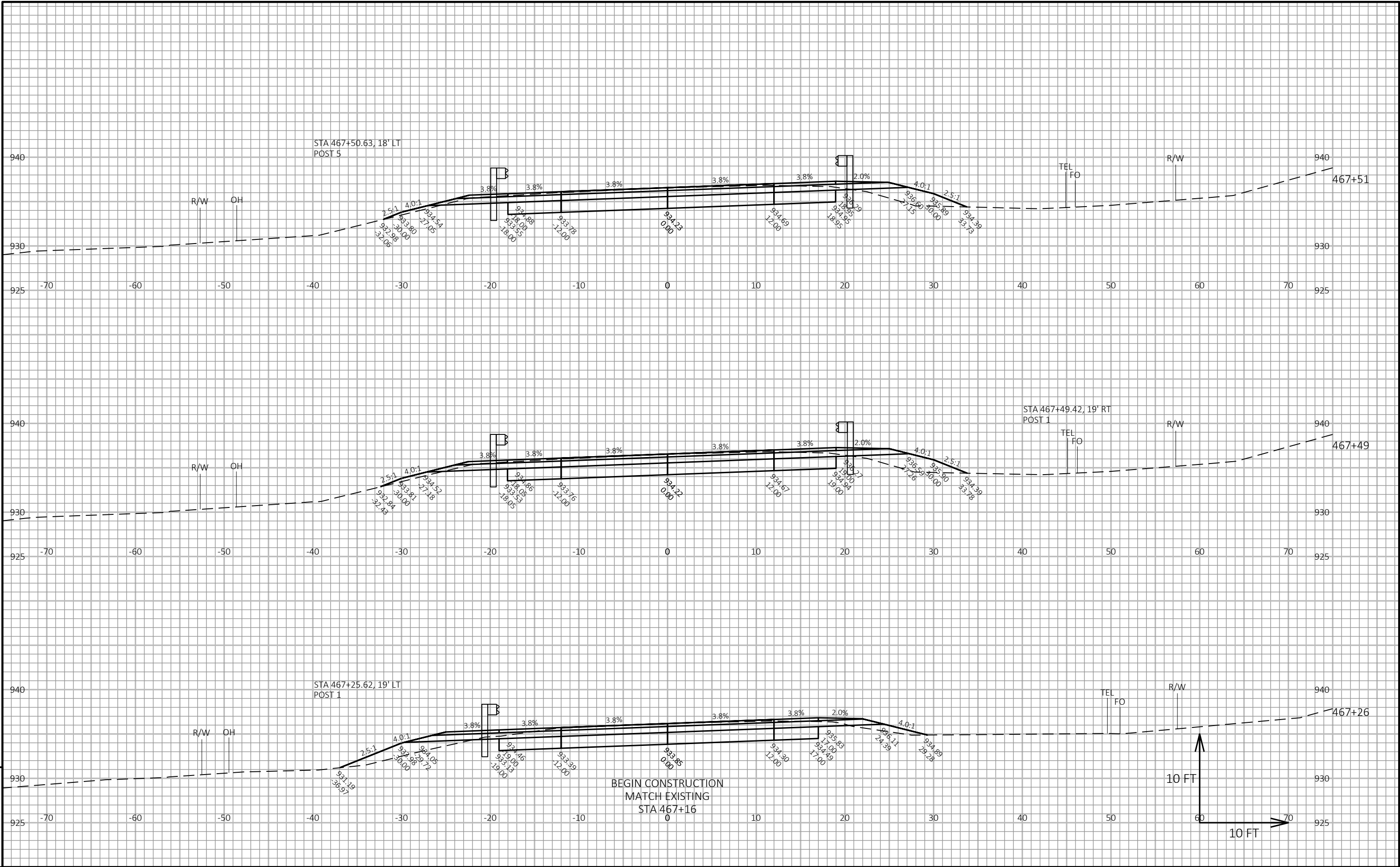
PLOT DATE : 1/3/2020 1:30 PM

PLOT BY : SHAWN DOLENS

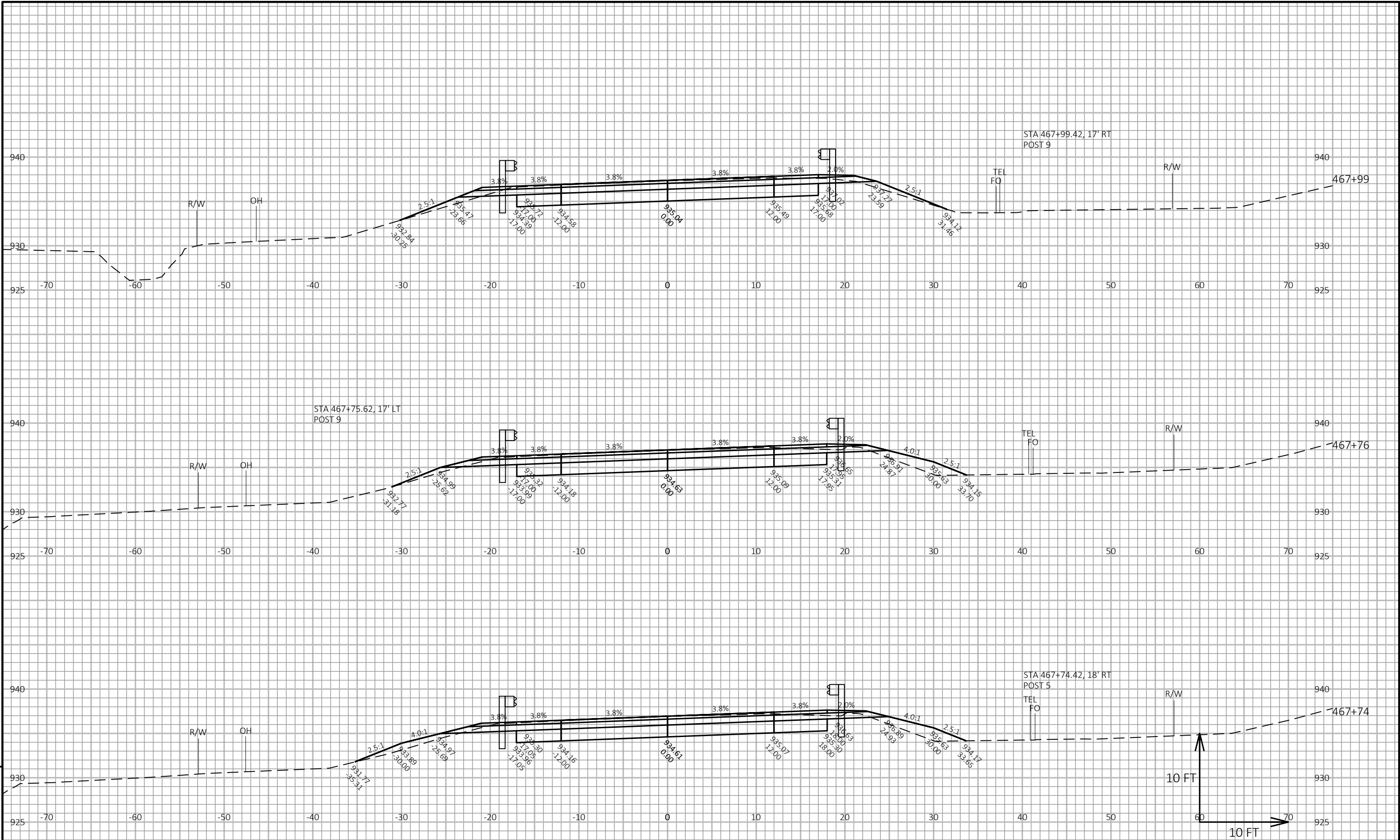
PLOT NAME :

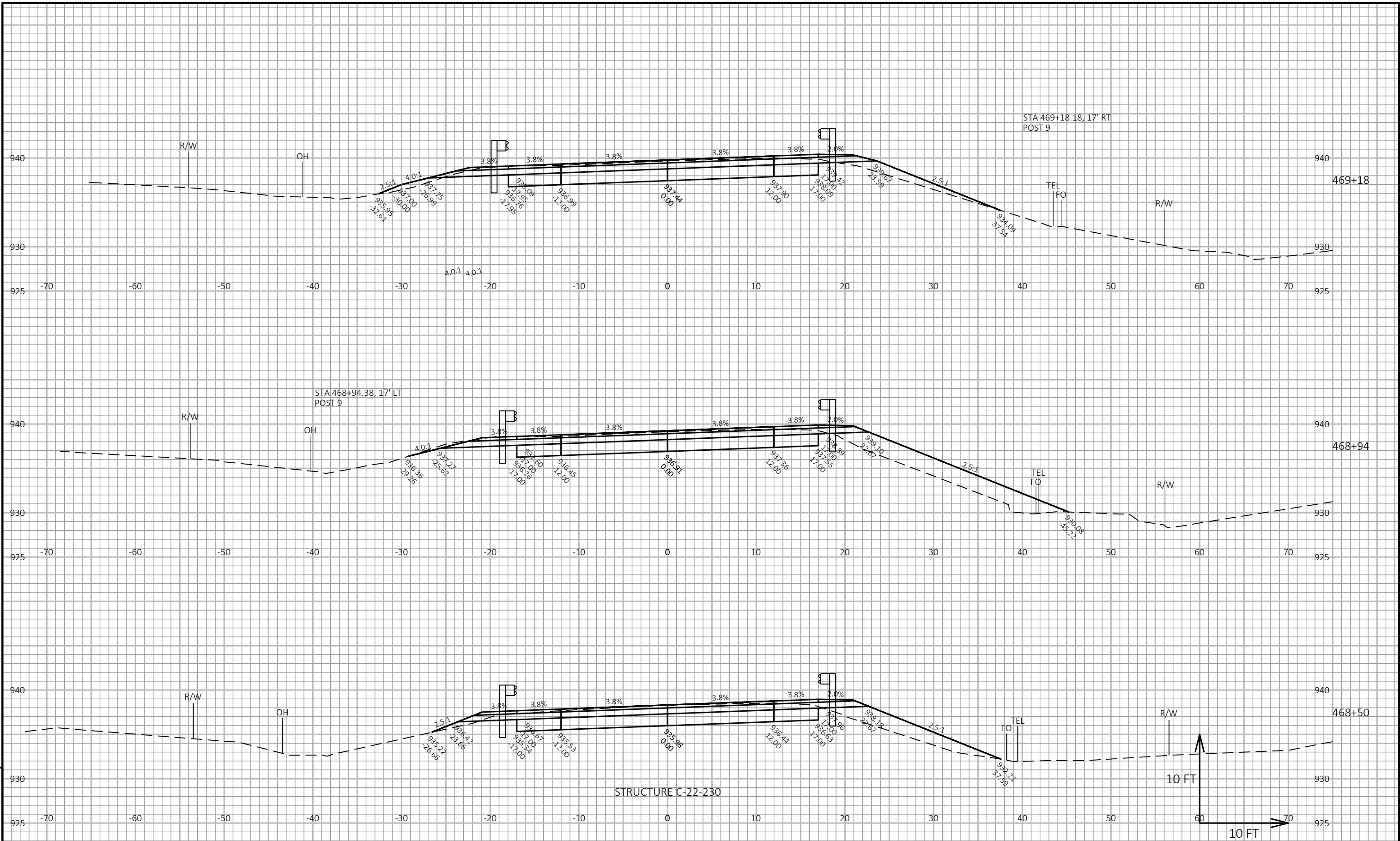
PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

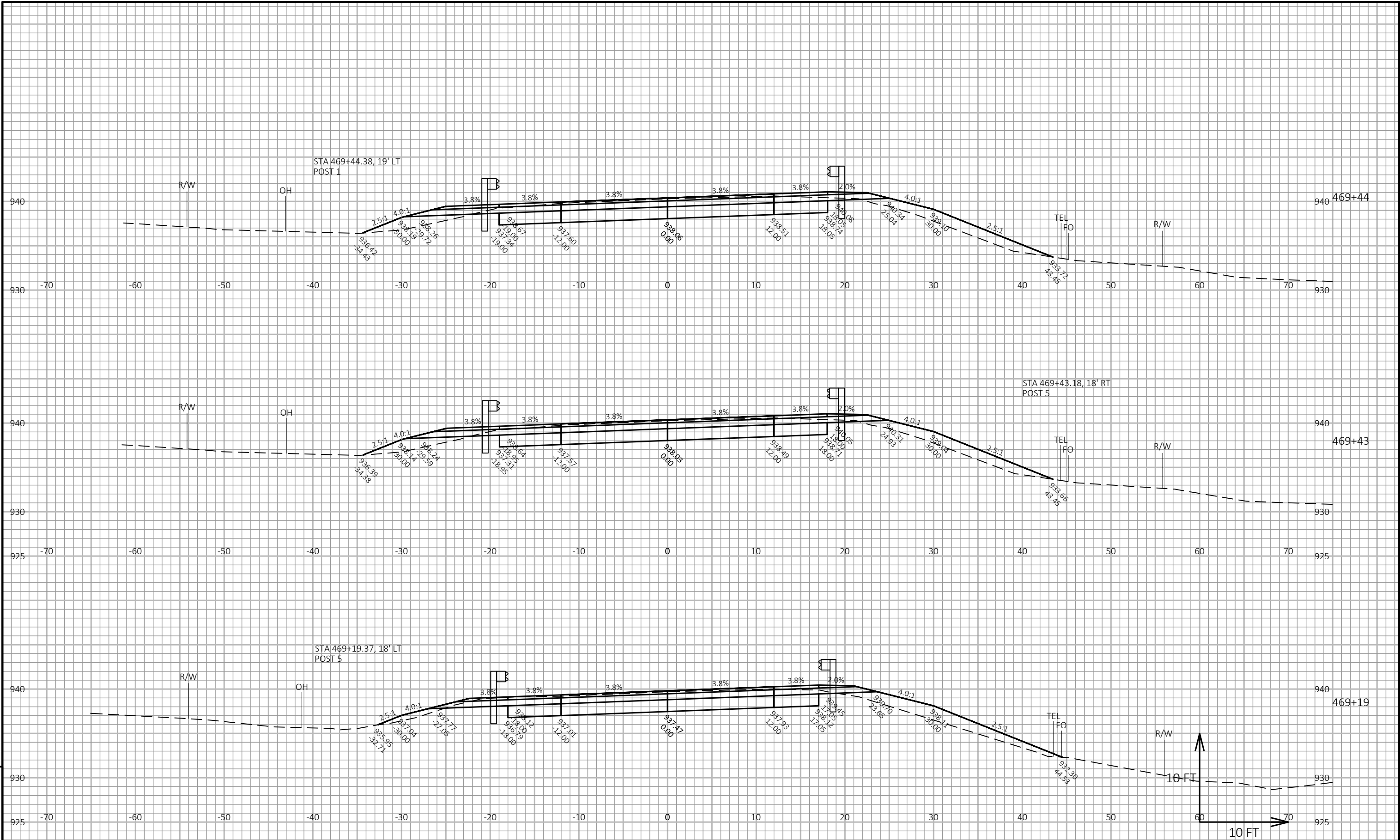
WISDOT/CADD SHEET 49

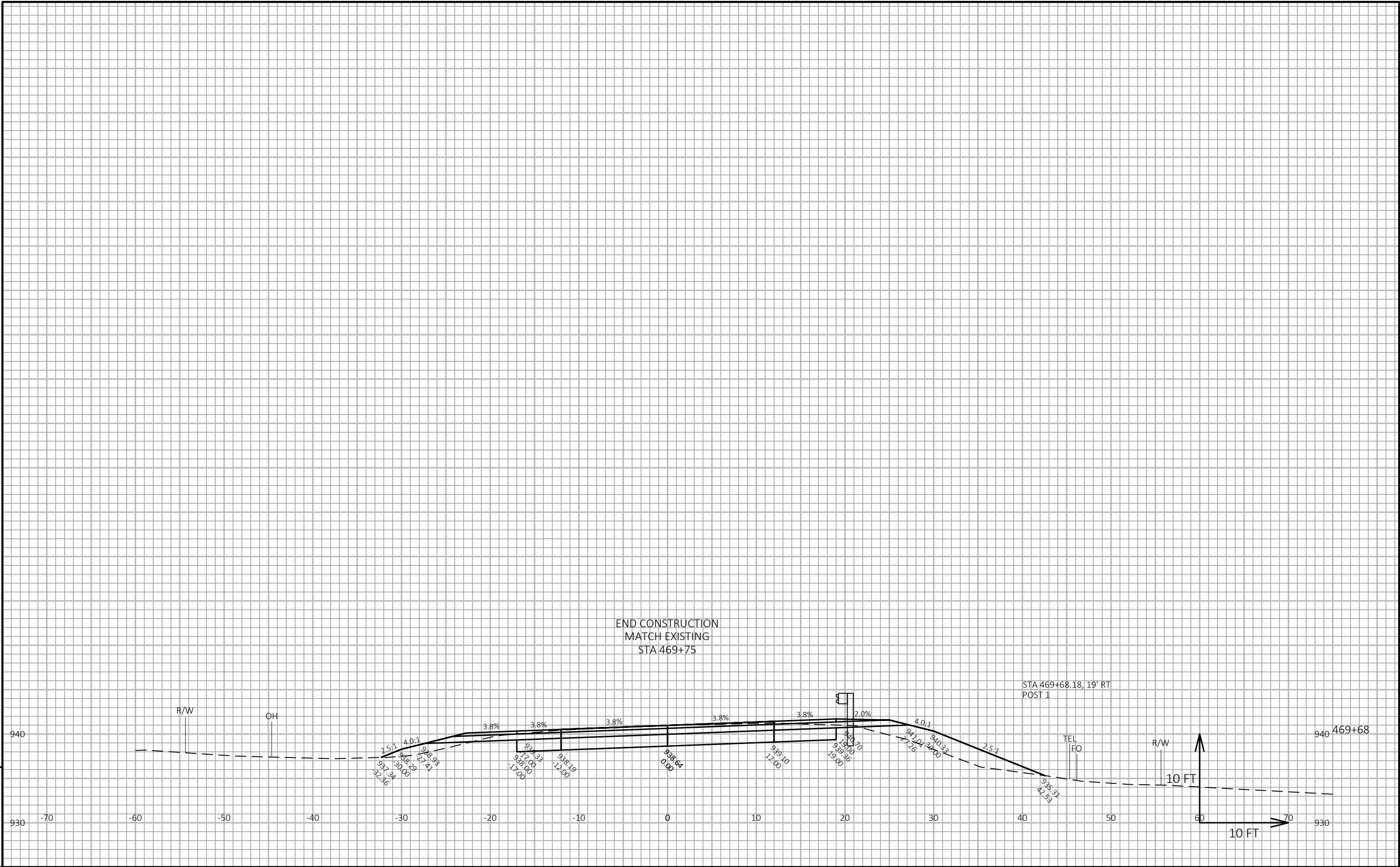


PROJECT NO: 5964-01-80	HWY: STH 133	COUNTY: GRANT	CROSS SECTIONS: C-22-230	SHEET E
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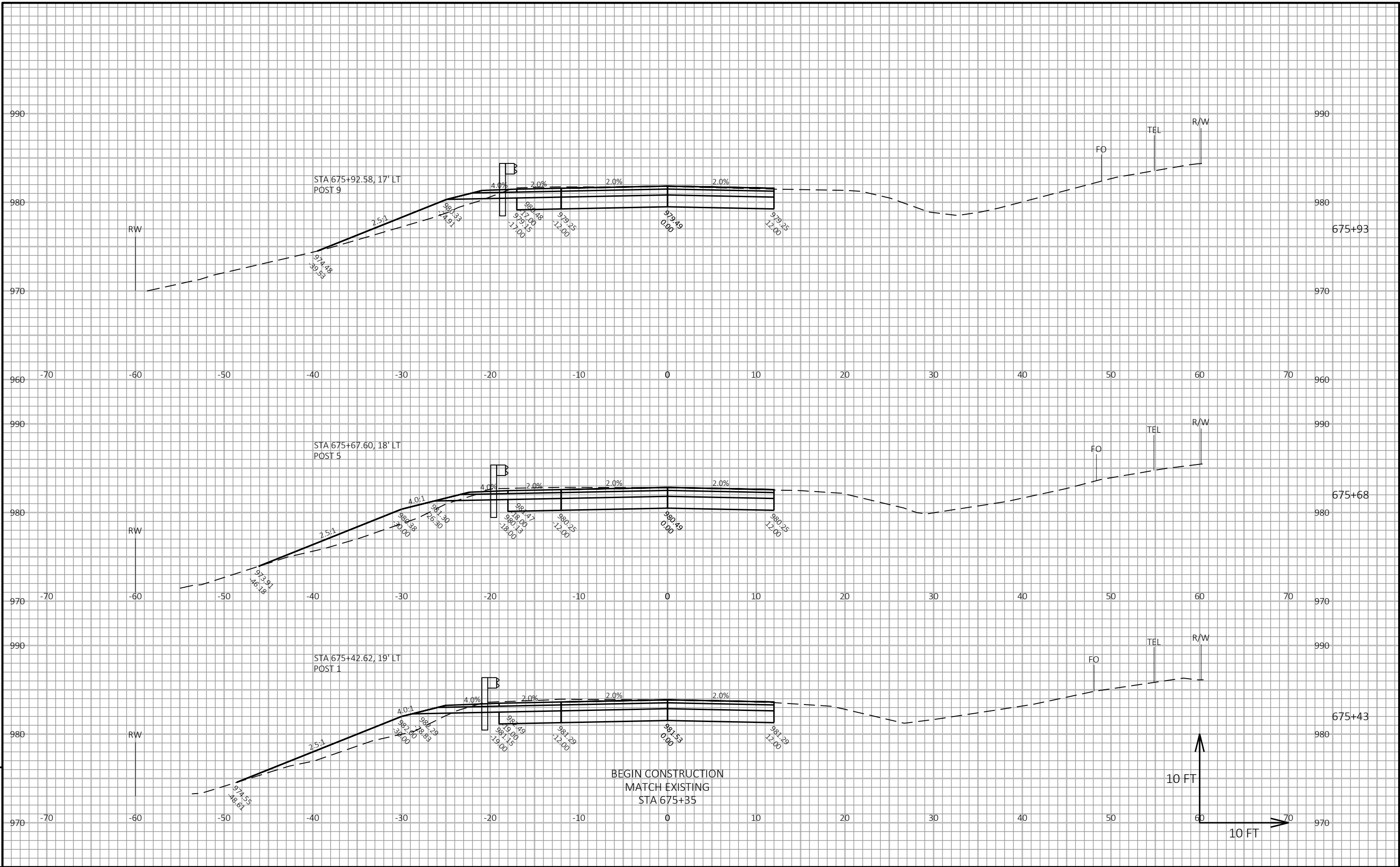


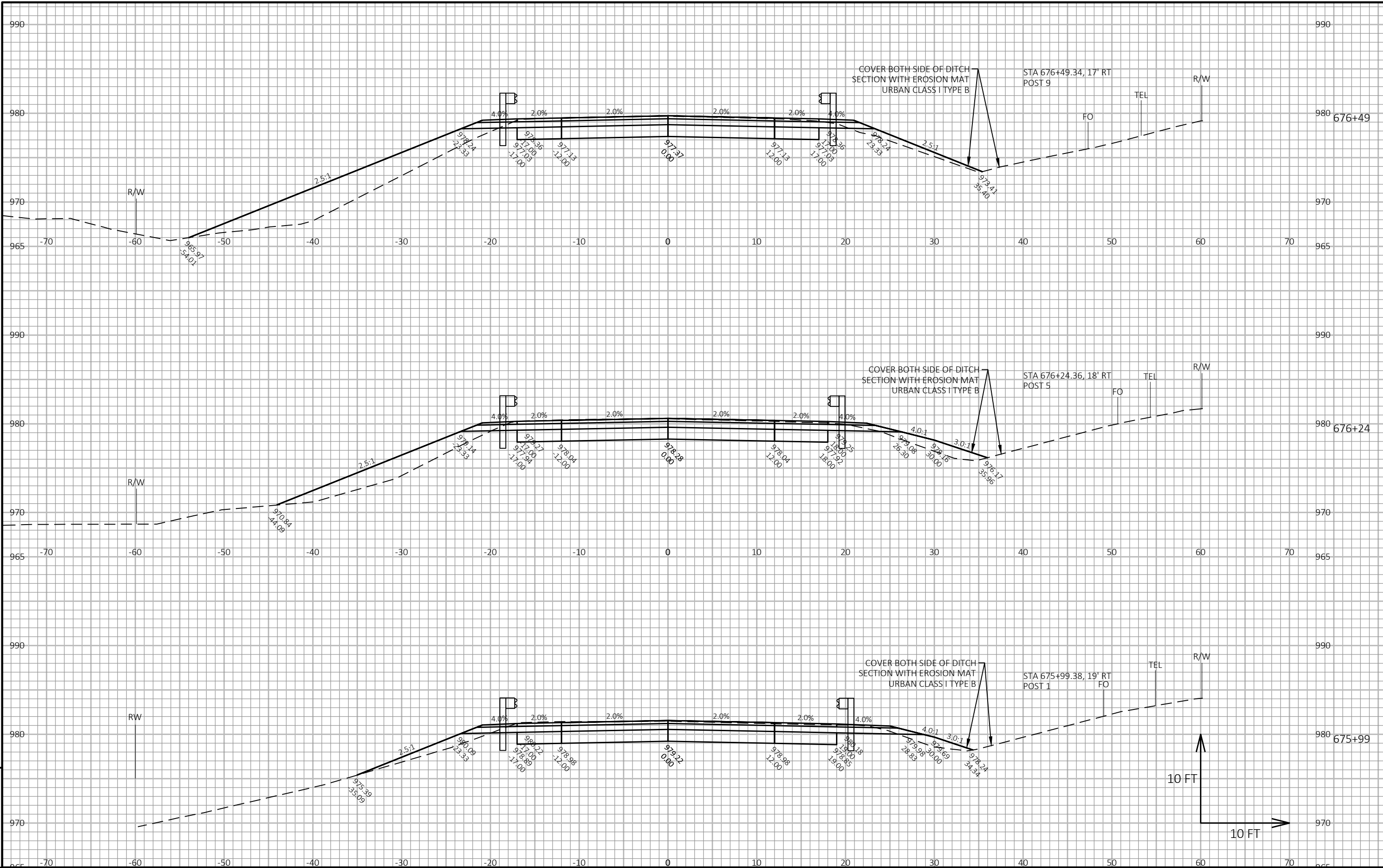


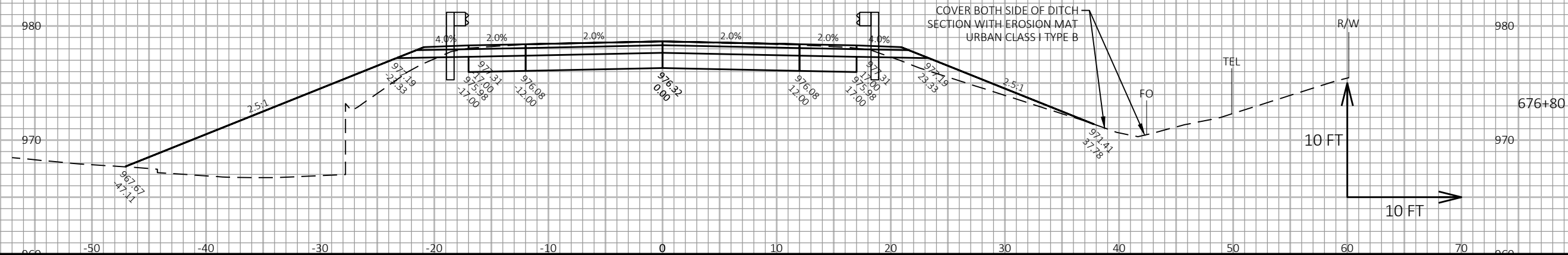
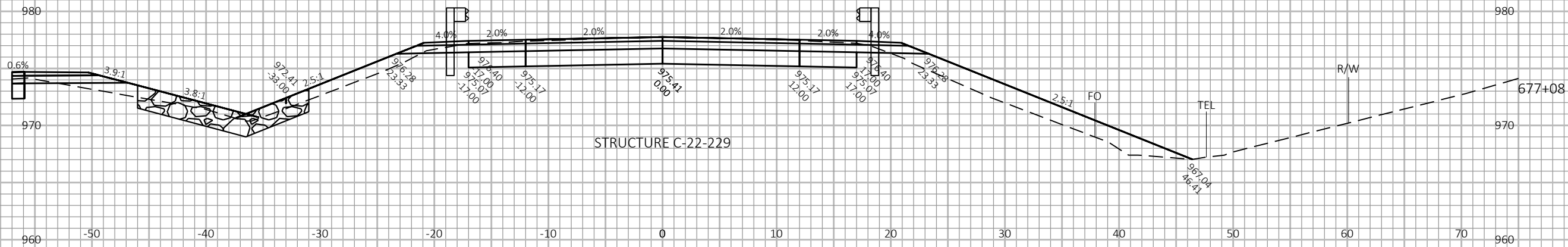


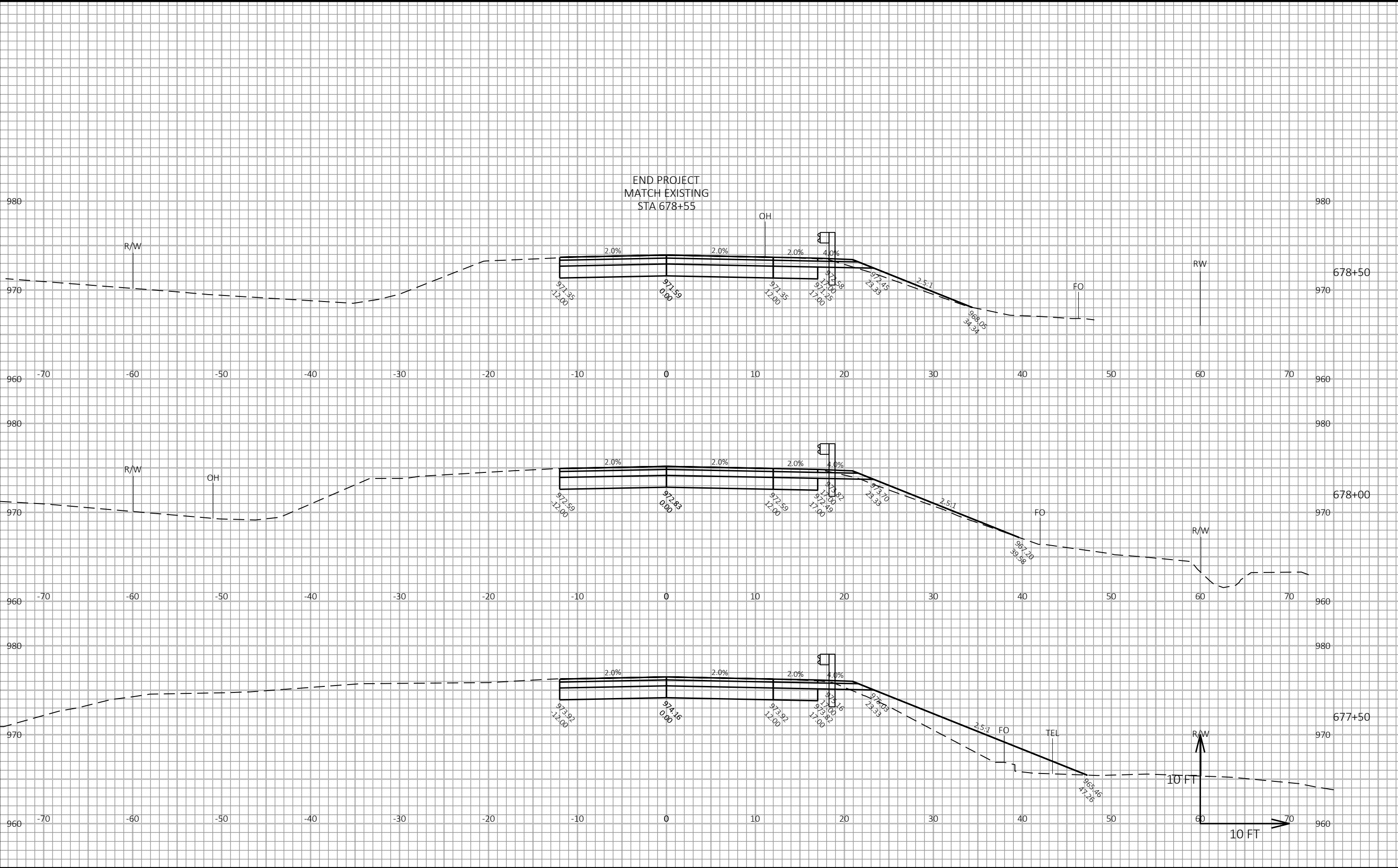


PROJECT NO: 5964-01-80	HWY: STH 133	COUNTY: GRANT	CROSS SECTIONS: C-22-230	SHEET E
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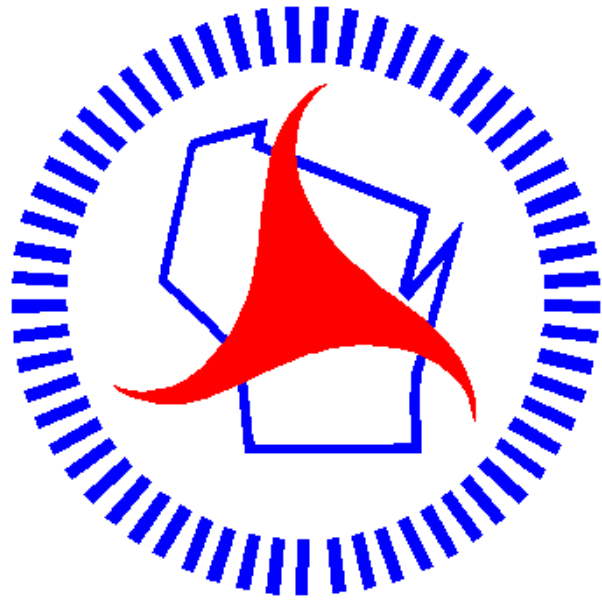








PROJECT NO: 5964-01-80	HWY: STH 133	COUNTY: GRANT	CROSS SECTIONS: C-22-229	SHEET E
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Wisconsin Department of Transportation

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