



STANDARD ABBREVIATIONS

AGG.	AGGREGATE	D. H. V.	DESIGN HOUR VOLUME	I H	INTERSTATE HIGHWAY	P. L. E.	PERMANENT LIMITED EASEMENT	T	TANGENT
AH	AHEAD	DIA.	DIAMETER	INL	INLET	P. C.	POINT OF CURVATURE	TEL.	TELEPHONE
<	ANGLE	DISCH.	DISCHARGE	INV	INVERT	P. I.	POINT OF INTERSECTION	T. O. C.	TOP OF CURB
ASPH.	ASPHALTIC	EA	EACH	INTER.	INTERSECTION	P. T.	POINT OF TANGENCY	T.	(TRUCKS) PERCENT OF
A. D. T.	AVERAGE DAILY TRAFFIC	E	EAST	JCT	JUNCTION	PCC	PORTLAND CEMENT CONCRETE	TYP.	TYPICAL
B. F.	BACK FACE	X	EAST GRID COORDIATE	JT.	JOINT	R	RADIUS OR RANGE	UNCL.	UNCLASSIFIED
BK.	BACK	EB	EAST BOUND	LT	LEFT	R/L	REFERENCE LINE	U. G.	UNDERGROUND (CABLE)
BEG.	BEGIN	ELEC.	ELECTRIC(AL), ELEC. CABLE	L. H. F.	LEFT HAND FORWARD	RT	RIGHT	V. C.	VERTICAL CURVE
B. M	BENCH MARK	EL. , ELEV.	ELEVATION	L.	LENGTH OF CURVE	REQ' D	REQUIRED	W	WEST
BR	BRIDGE	ESALS	EQUIVALENT SINGLE AXLE LOADS	L. F.	LINEAR FOOT(FEET)	R. H. F.	RIGHT HAND FORWARD	WB	WEST BOUND
C/L	CENTER LINE	EXC.	EXCAVATION	LC.	LONG CHORD	R/W	RIGHT OF WAY	YD	YARD
D	CENTRAL ANGLE OR DELTA	F. F.	FACE TO FACE	LS	LUMP SUM	RD.	ROAD		
C. S. D	CONCRETE SURFACE DRAIN	FERT.	FERTILIZER	M P.	MARKER POST	SHLD.	SHOULDER(S)		
CO.	COUNTY	F	FILL	MAX.	MAXIMUM	S	SOUTH		
CTH	COUNTY TRUNK HIGHWAY	FG	FINISH GRADE	MGAL	1000 GALLONS	S. F.	SQUARE FOOT (FEET)		
C. A. B. C.	CRUSHED AGGREGATE BASE COURSE	F/L, F. L.	FLOW LINE	MIN.	MINIMUM	SDD	STANDARD DETAIL DRAWING(S)		
C. Y.	CUBIC YARD	FT	FOOT	N. C.	NORMAL CROWN OR NO CHANGE	STH	STATE TRUNK HIGHWAY		
C. & G.	CURB AND GUTTER	FTG	FOOTING	N	NORTH	STA.	STATION		
CP	CULVERT PIPE	CWT.	HUNDRED WEIGHT	NO.	NUMBER	S. E.	SUPERELEVATION		
D	DEGREE OF CURVE	ID	INSIDE DIAMETER	PAV' T	PAVEMENT	S/L	SURVEY LINE		

GENERAL NOTES

1. WHEN THE QUANTITY OF THE ITEM OF BASE AGGREGATE DENSE OR ASPHALTIC SURFACE IS MEASURED FOR PAYMENT BY THE TON, THE THICKNESS SHOWN ON THE PLAN IS APPROXIMATE. THE ACTUAL THICKNESS WILL DEPEND ON THE DISTRIBUTION OF THE MATERIAL AS DIRECTED BY THE ENGINEER IN THE FIELD.
- THE LOCATION OF EXISTING UTILITY INSTALLATIONS AS SHOWN ON THE PLAN ARE
2. APPROXIMATE.  
THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.
3. REMOVAL OF ASPHALTIC SURFACES WHERE AN ABUTTING ASPHALTIC SURFACE IS TO REMAIN IN PLACE SHALL REQUIRE A SAWCUT MEETING THE APPROVAL OF THE ENGINEER IN THE FIELD.
4. SILT FENCE SHALL BE PLACED AS SHOWN ON THE PLAN OR AS DIRECTED BY THE ENGINEER IN THE FIELD. SILT FENCE SHALL BE PLACED PRIOR TO CONSTRUCTION.
5. PRIOR TO THE PLACEMENT OF STEEL PLATE BEAM GUARD, THE SHOULDERS SHALL BE IN PLACE, SHAPED AND COMPACTED UNLESS SHOWN OTHERWISE.
6. THE LOCATION OF ALL PERMANENT SIGNING SHALL BE VERIFIED BY THE ENGINEER IN THE FIELD PRIOR TO PLACEMENT.

CONTACTS

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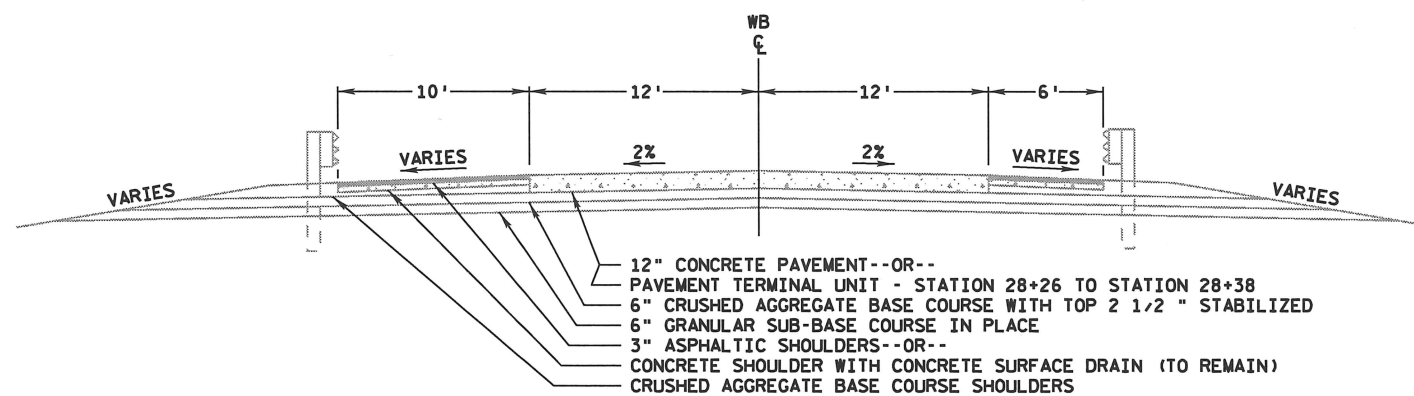
ATC MANAGEMENT, INC - ELECTRICITY  
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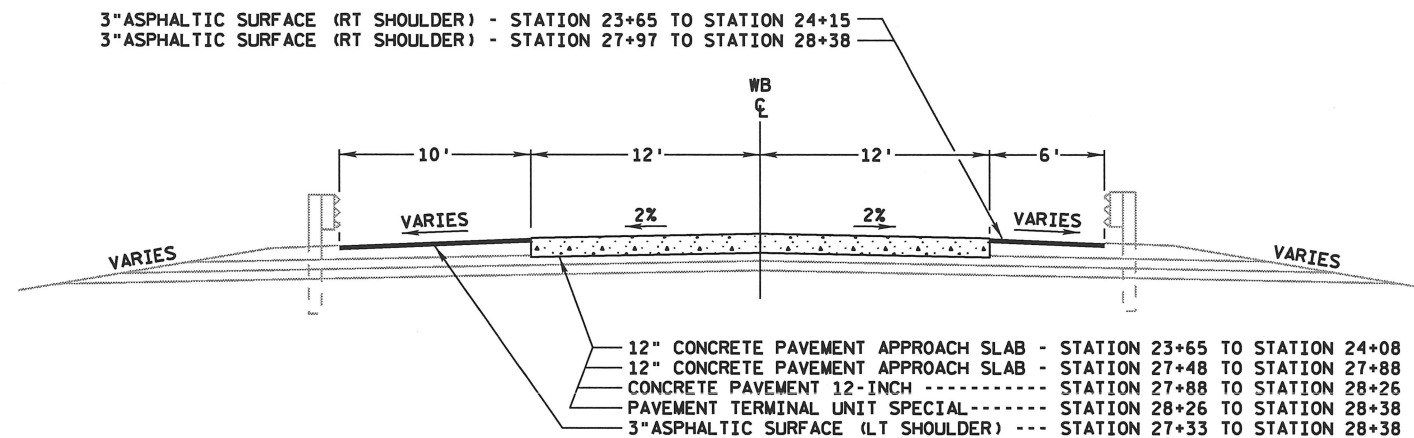
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GAS/PETROLEUM

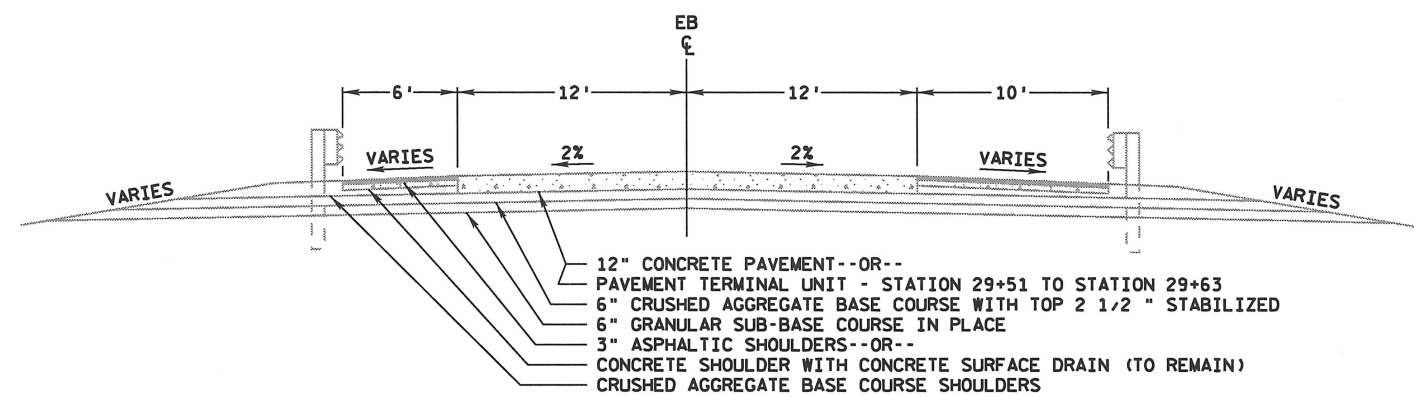
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**EXISTING TYPICAL SECTION - IH 90 WB**

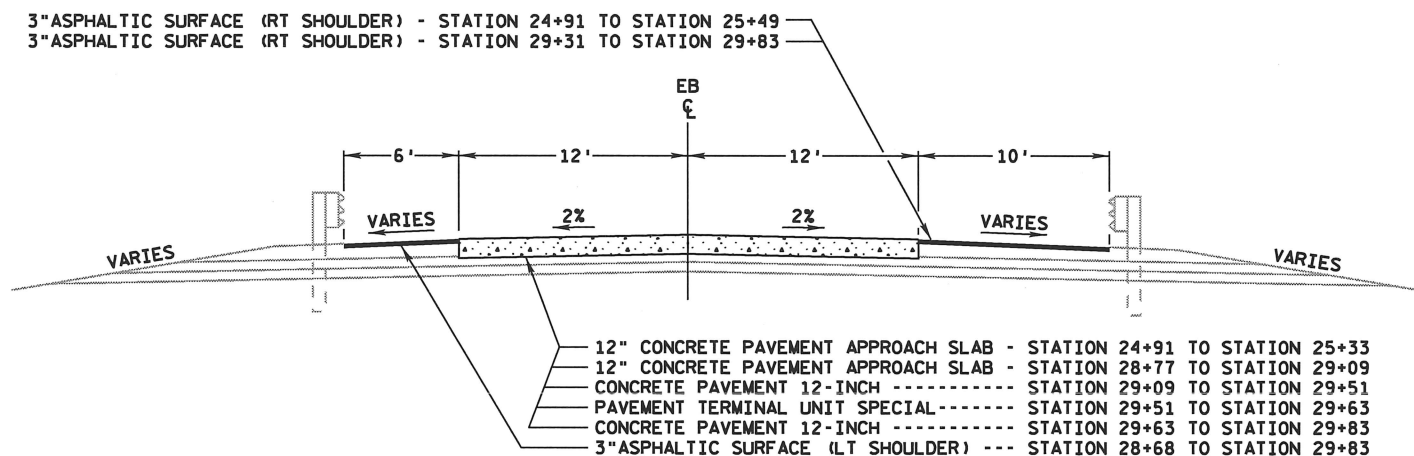
STATION 23+65.00 WB CL TO STATION 24+06.04 WB CL  
STATION 27+48.26 WB CL TO STATION 28+38.00 WB CL

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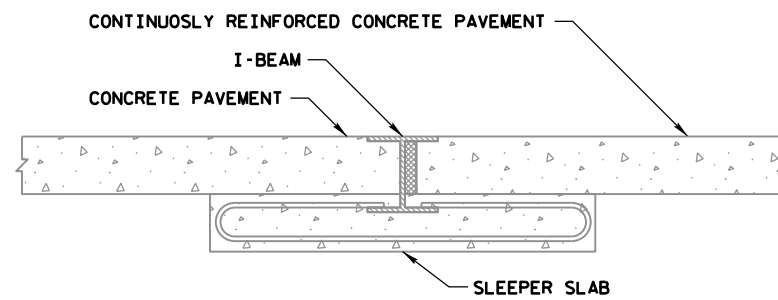
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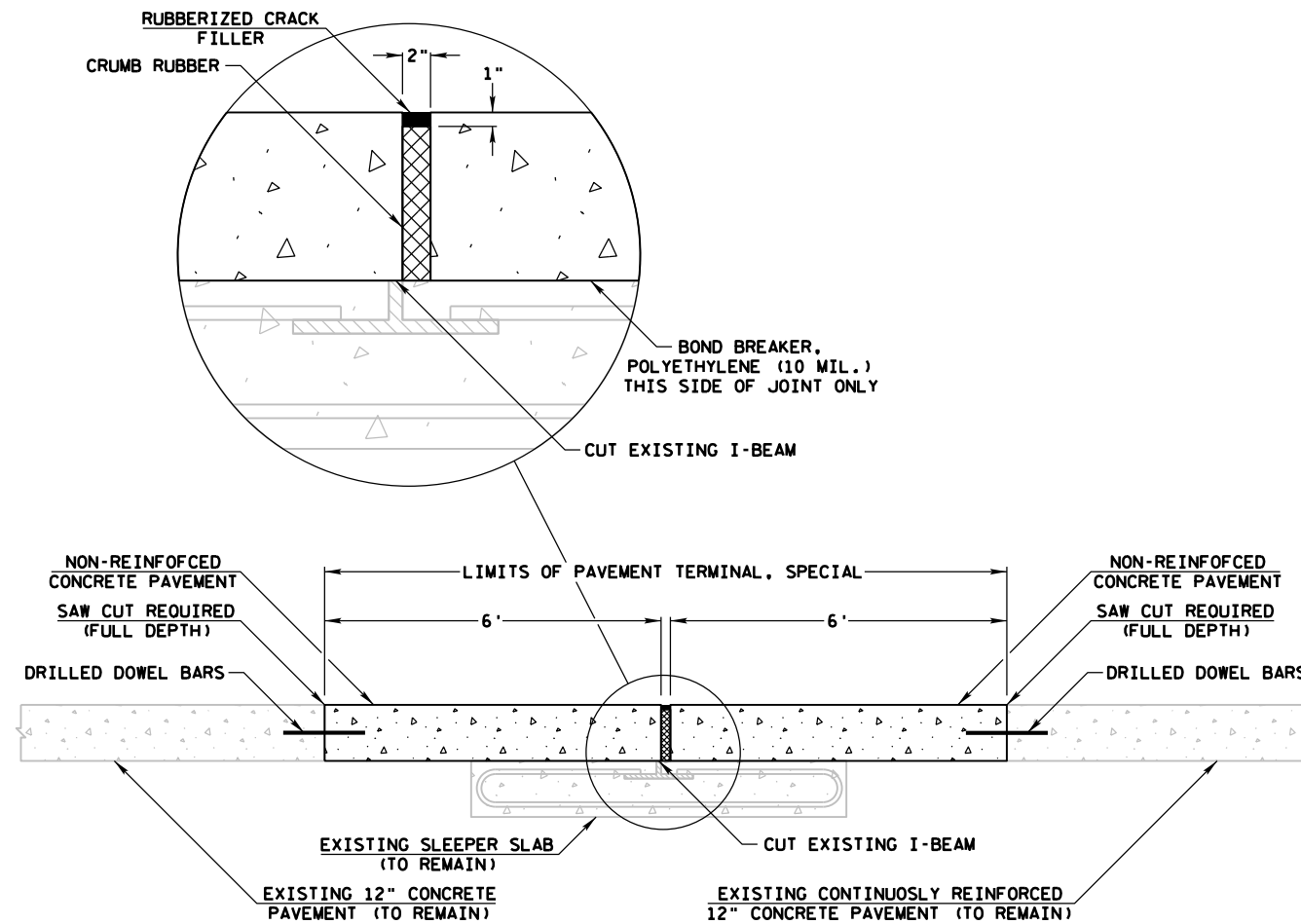
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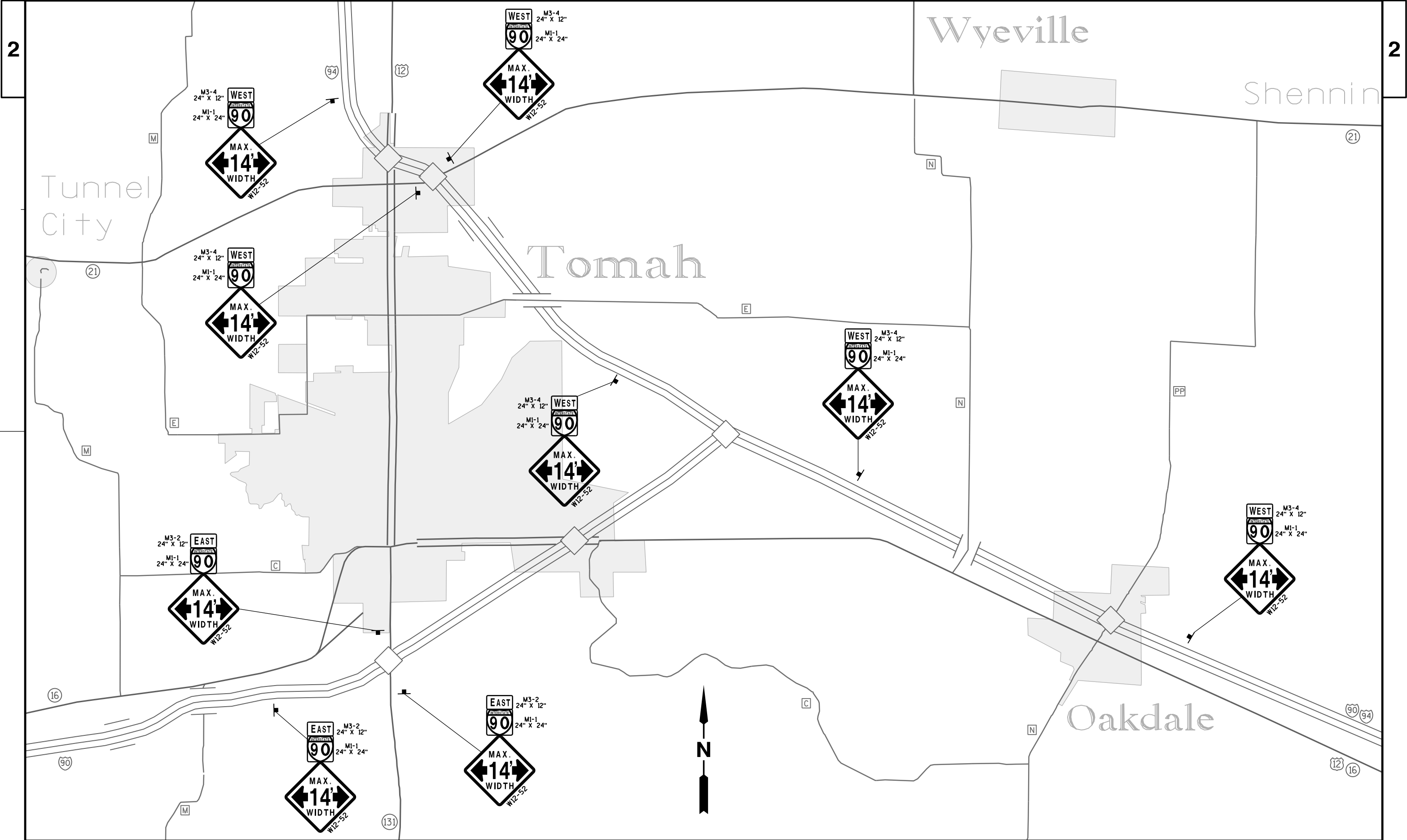
### EXISTING PAVEMENT TERMINAL UNIT

B-41-30 AND B-41-31



### PROPOSED PAVEMENT TERMINAL UNIT SPECIAL

B-41-30 AND B-41-31



PROJECT NO: 1077-03-60

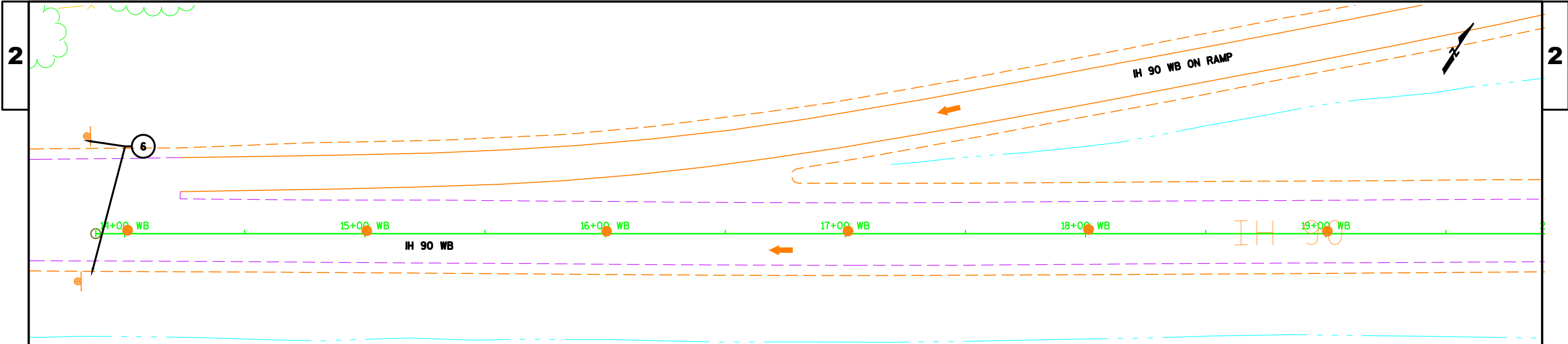
HWY: IH 90

COUNTY: MONROE

TRAFFIC CONTROL - ADVANCED WARNING STAGE 2

SHEET

E



GENERAL NOTES

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

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

ALL SIGNS ARE 48"X48" UNLESS OTHERWISE NOTED.

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

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS, OR THAT WILL BE PLACED IN A CLOSED LANE, MAY BE MOUNTED ON PORTABLE SUPPORTS.

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.

REMOVE PAVEMENT MARKINGS AND PLACE TEMPORARY PAVEMENT MARKING, REMOVABLE TAPE IF LANE CLOSURE IS TO BE IN PLACE FOR 4 OR MORE CONTINUOUS DAYS AND NIGHTS.

CONSIDER ROADWAY GEOMETRICS WHEN LOCATING SIGNS AND ARROWBOARDS SO THE APPROACHING DRIVER HAS A CLEAR VIEW OF THE ARROWBOARDS AND LANE CLOSURE DRUMS FOR A MINIMUM OF 1500 FEET IN FRONT OF DRUM TAPER.

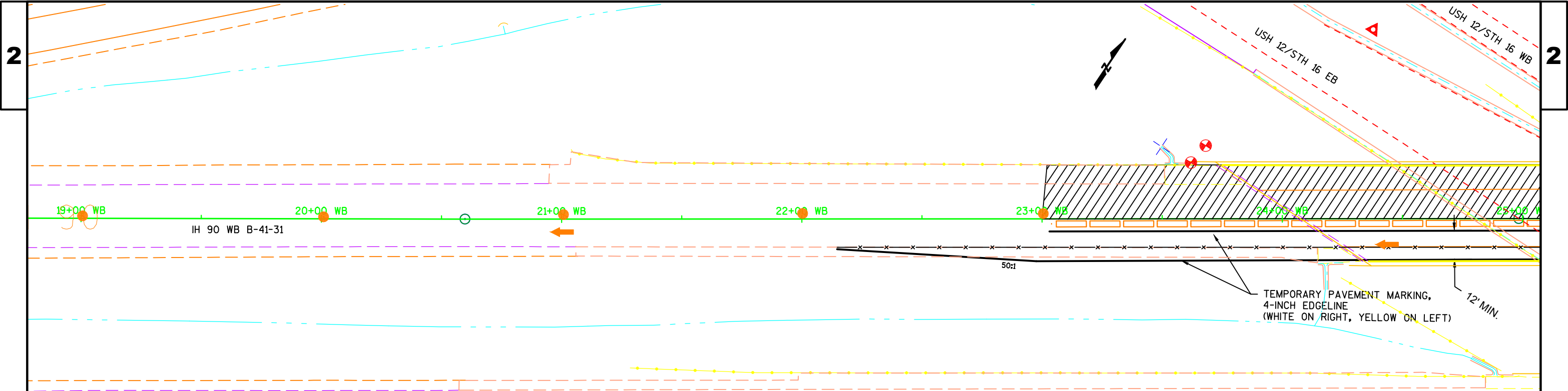
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LEGEND

- TRAFFIC CONTROL DRUM
- ☼ TRAFFIC CONTROL DRUM WITH TYPE C STEADY BURN LIGHT
- ⚡ FLASHING ARROW BOARD
- ▤ SIGN ON PERMANENT SUPPORT
- x—x— REMOVING PAVEMENT MARKING
- ▨ CONCRETE BARRIER TEMPORARY PRECAST
- ▨ WORK AREA
- ➡ DIRECTION OF TRAFFIC

6  
END  
ROAD WORK  
G20-2A  
48"X24"



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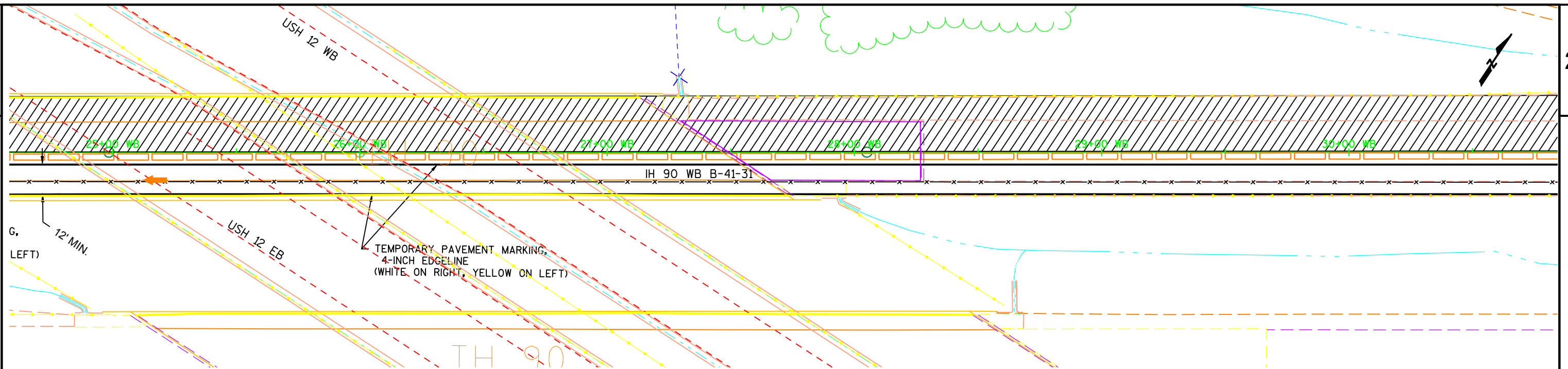
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- TRAFFIC CONTROL DRUM WITH TYPE C STEADY BURN LIGHT
- FLASHING ARROW BOARD
- SIGN ON PERMANENT SUPPORT
- REMOVING PAVEMENT MARKING
- CONCRETE BARRIER TEMPORARY PRECAST
- WORK AREA
- DIRECTION OF TRAFFIC
- TRAFFIC CONTROL BARRIER TYPE III WITH ATTACHED SIGN



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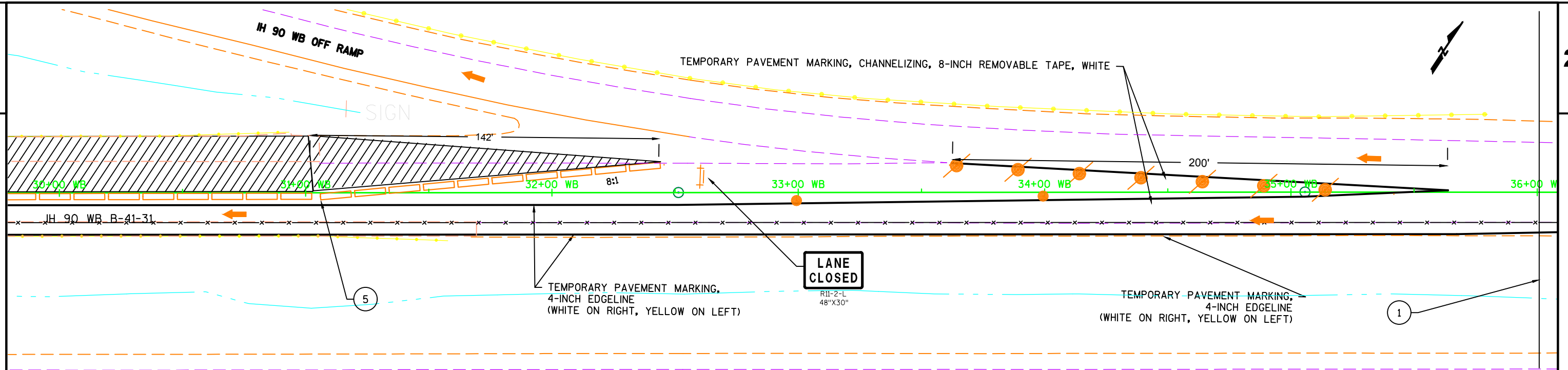
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	TRAFFIC CONTROL DRUM
	TRAFFIC CONTROL DRUM WITH TYPE C STEADY BURN LIGHT
	FLASHING ARROW BOARD
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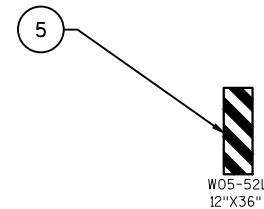
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1 SEE S.D.D. 15D15-02 TRAFFIC CONTROL: EXIT AND ENTRANCE RAMP WITHIN LANE CLOSURE AND S.D.D. 15D03-03 TRAFFIC CONTROL, LANE CLOSURE, SPEEDS GREATER THEN 40 M.P.H. WITH BARRIER FOR FURTHER TRAFFIC CONTROL DETAILS BEYOND STA. 36+00

## LEGEND

- TRAFFIC CONTROL DRUM
- TRAFFIC CONTROL DRUM WITH TYPE C STEADY BURN LIGHT
- ➔ FLASHING ARROW BOARD
- x—x— SIGN ON PERMANENT SUPPORT
- x—x— REMOVING PAVEMENT MARKING
- ▨ CONCRETE BARRIER TEMPORARY PRECAST
- ▨ WORK AREA
- ➔ DIRECTION OF TRAFFIC





## LEGEND

- ↑ TYPE III BARRICADE  
↑ TYPE III BARRICADE WITH ATTACHED SIGN  
● TRAFFIC CONTROL DRUM  
● TRAFFIC CONTROL DRUM WITH TYPE C STEADY BURN LIGHT  
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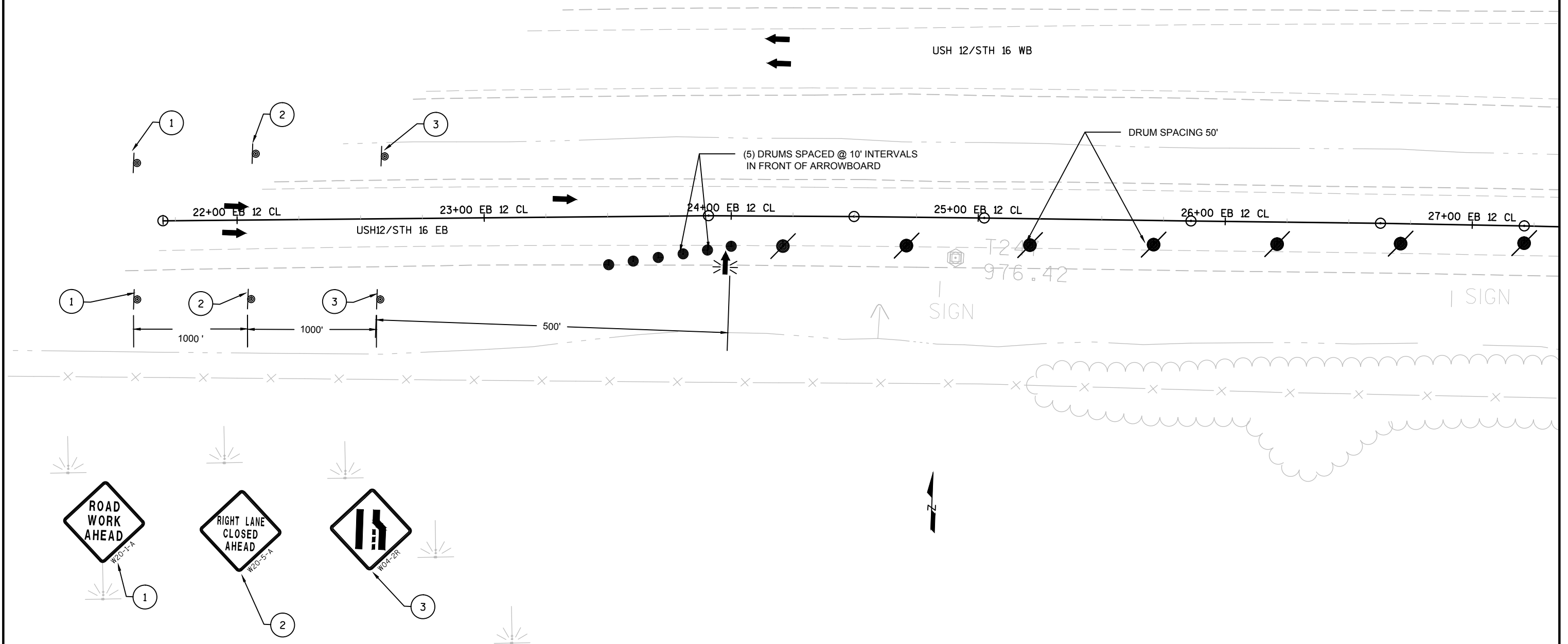
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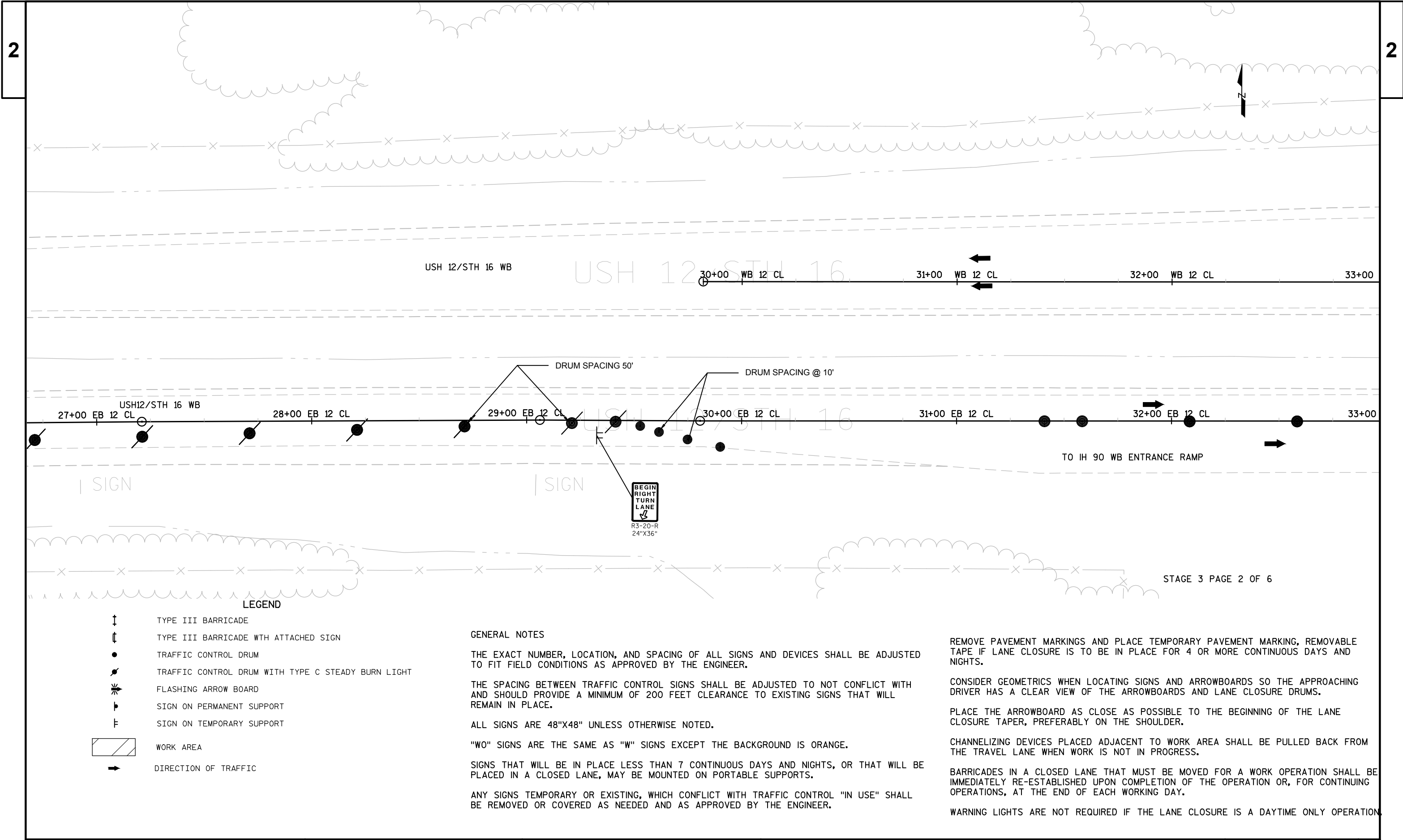
PLACE THE ARROWBOARD AS CLOSE AS POSSIBLE TO THE BEGINNING OF THE LANE CLOSURE TAPER, PREFERABLY ON THE SHOULDER.

CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.








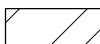

BARRICADES IN A CLOSED LANE THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY RE-ESTABLISHED UPON COMPLETION OF THE OPERATION OR, FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.





## LEGEND

	TYPE III BARRICADE
	TYPE III BARRICADE WITH ATTACHED SIGN
	TRAFFIC CONTROL DRUM
	TRAFFIC CONTROL DRUM WITH TYPE C STEADY BURN LIGHT
	FLASHING ARROW BOARD
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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.

REMOVE PAVEMENT MARKINGS AND PLACE TEMPORARY PAVEMENT MARKING, REMOVABLE TAPE IF LANE CLOSURE IS TO BE IN PLACE FOR 4 OR MORE CONTINUOUS DAYS AND NIGHTS.

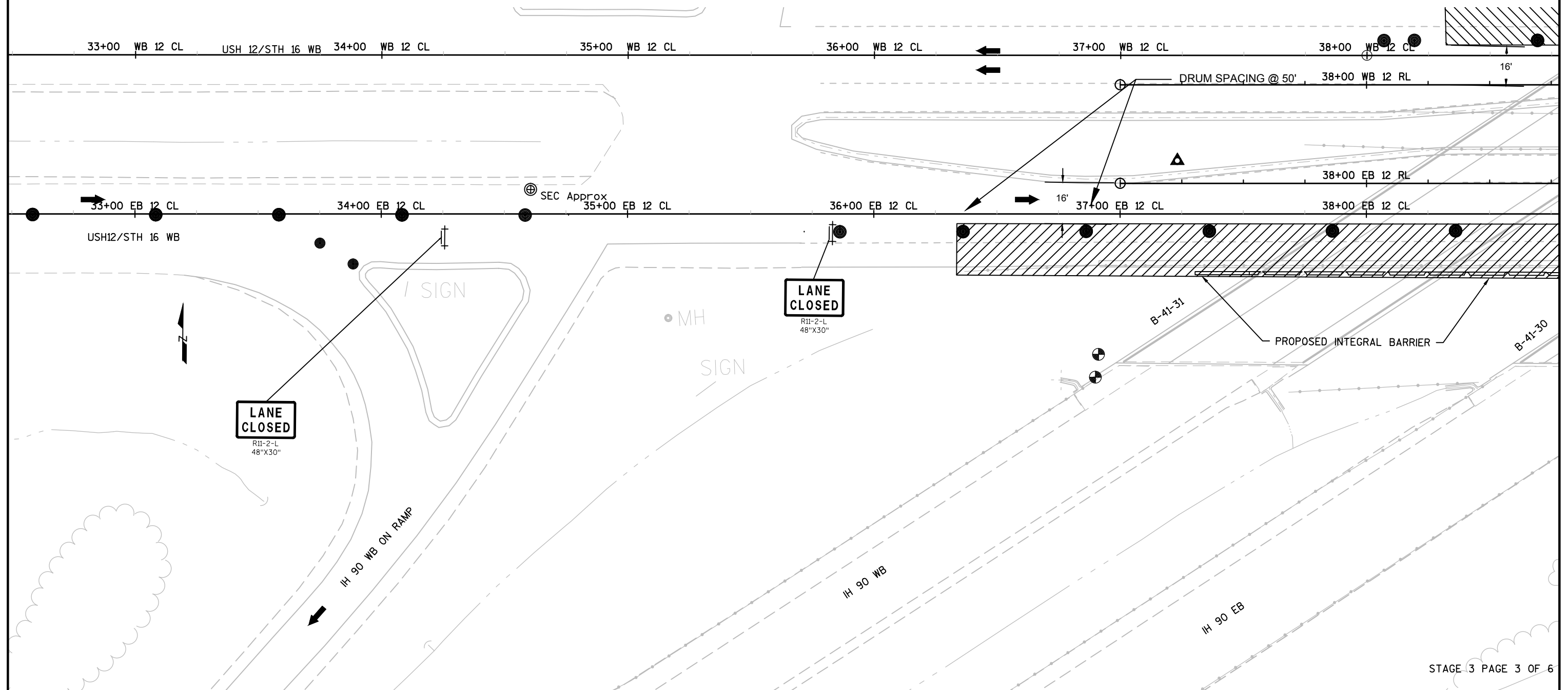
CONSIDER GEOMETRICS WHEN LOCATION SIGNS AND ARROWBOARDS SO APPROACHING DRIVER HAS A CLEAR VIEW OF ARROWBOARDS AND LANE CLOSURE DRUMS.

PLACE THE ARROWBOARD AS CLOSE AS POSSIBLE TO THE BEGINNING OF THE LANE CLOSURE TAPER, PREFERABLY ON THE SHOULDER.

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PROJECT NO:1077-03-60

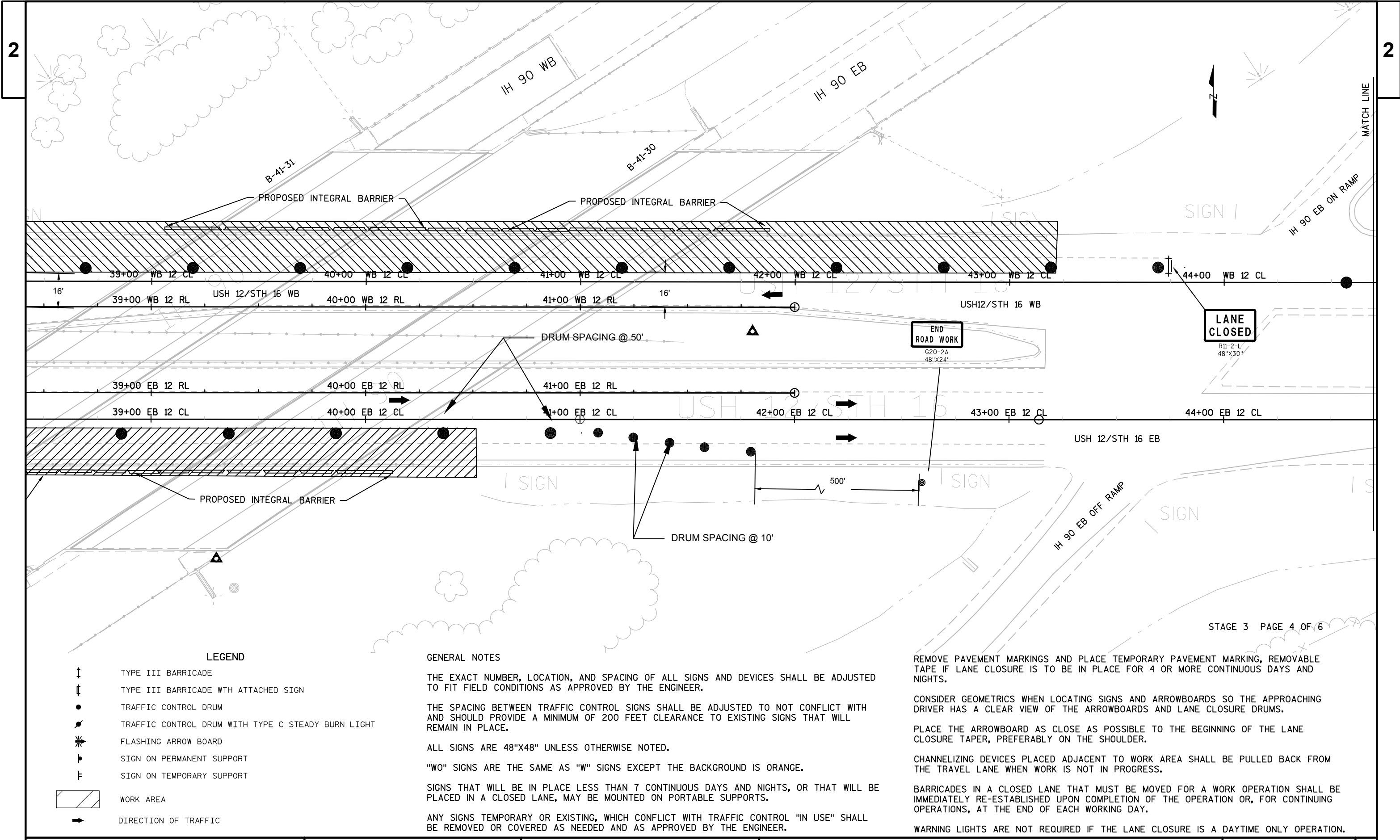
HWY: IH 90

COUNTY: MONROE

TRAFFIC CONTROL: STAGE 3

SHEET

E



LEGEND

- TYPE III BARRICADE
- TYPE III BARRICADE WITH ATTACHED SIGN
- TRAFFIC CONTROL DRUM
- TRAFFIC CONTROL DRUM WITH TYPE C STEADY BURN LIGHT
- FLASHING ARROW BOARD
- SIGN ON PERMANENT SUPPORT
- SIGN ON TEMPORARY SUPPORT
- WORK AREA
- DIRECTION OF TRAFFIC

GENERAL NOTES

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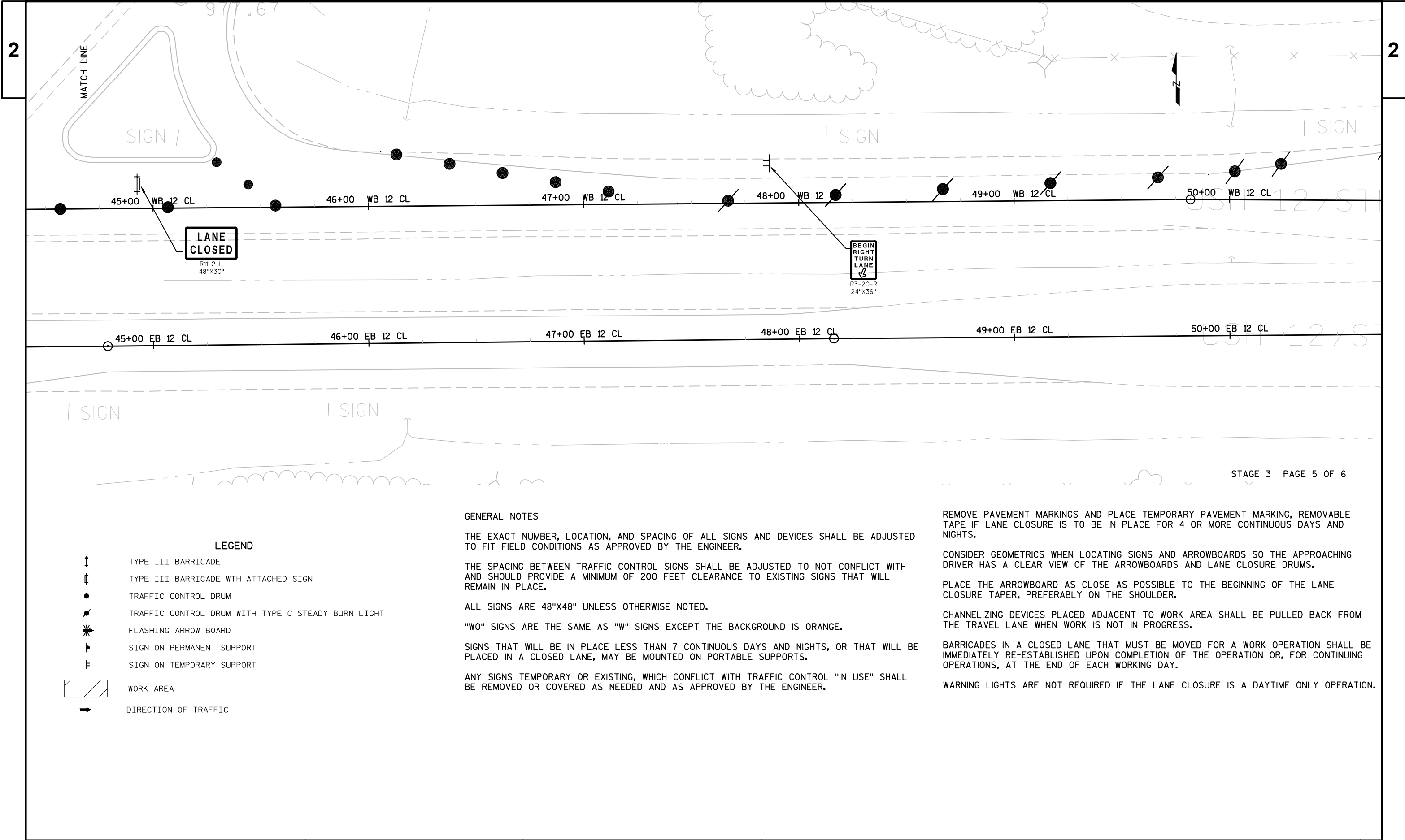
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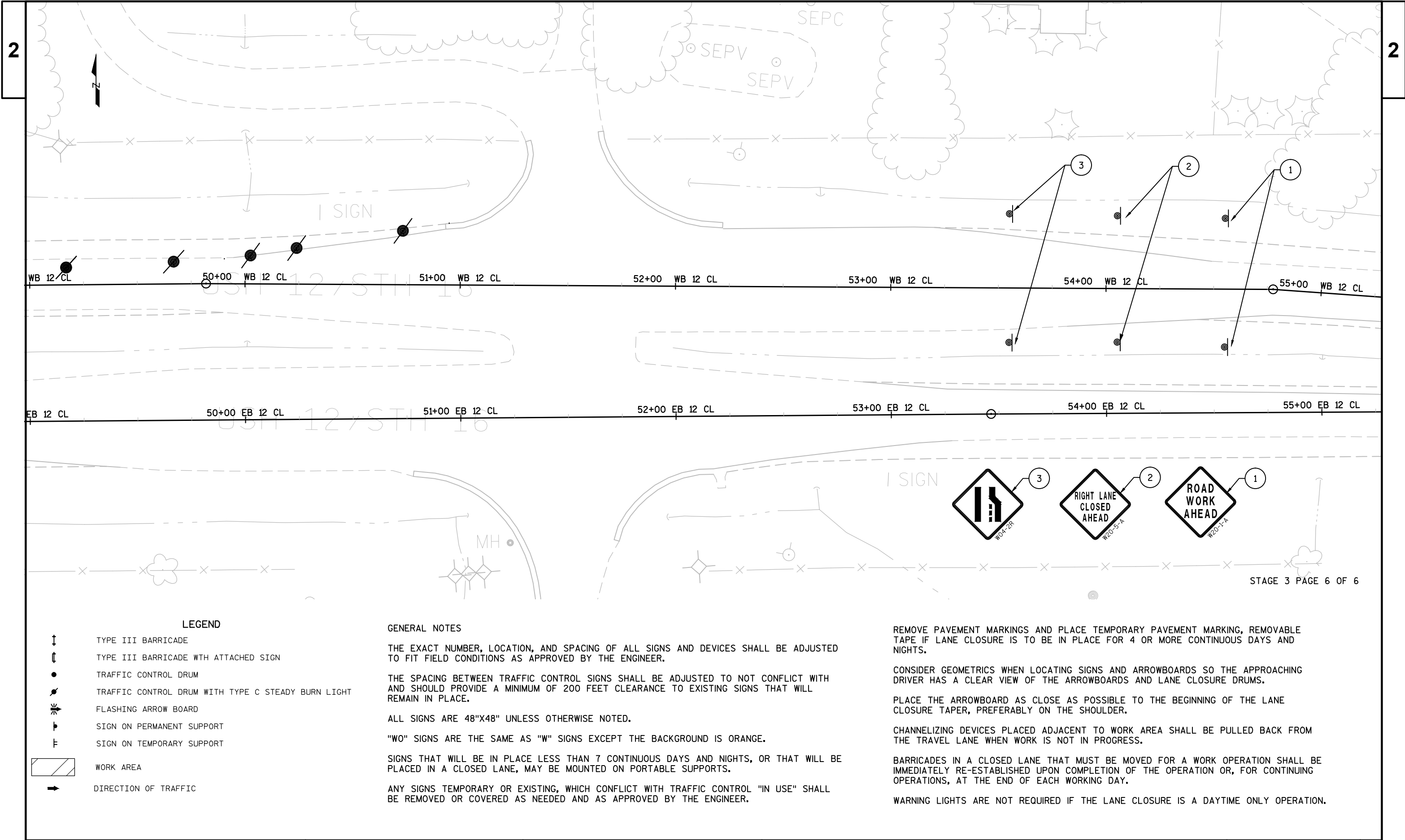
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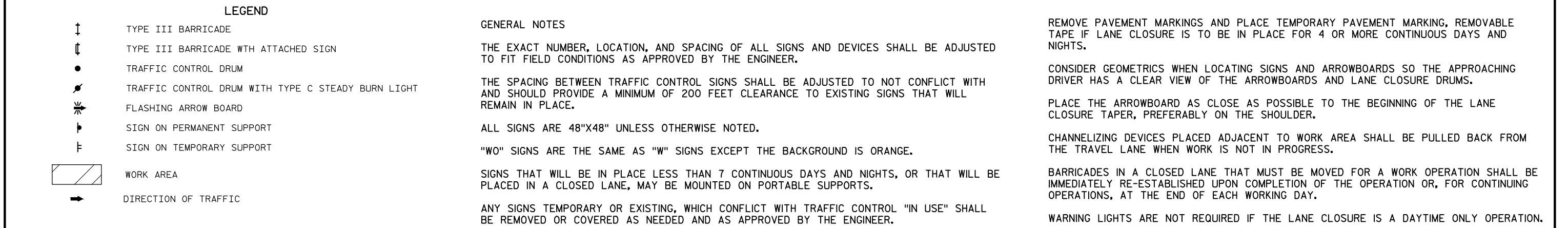
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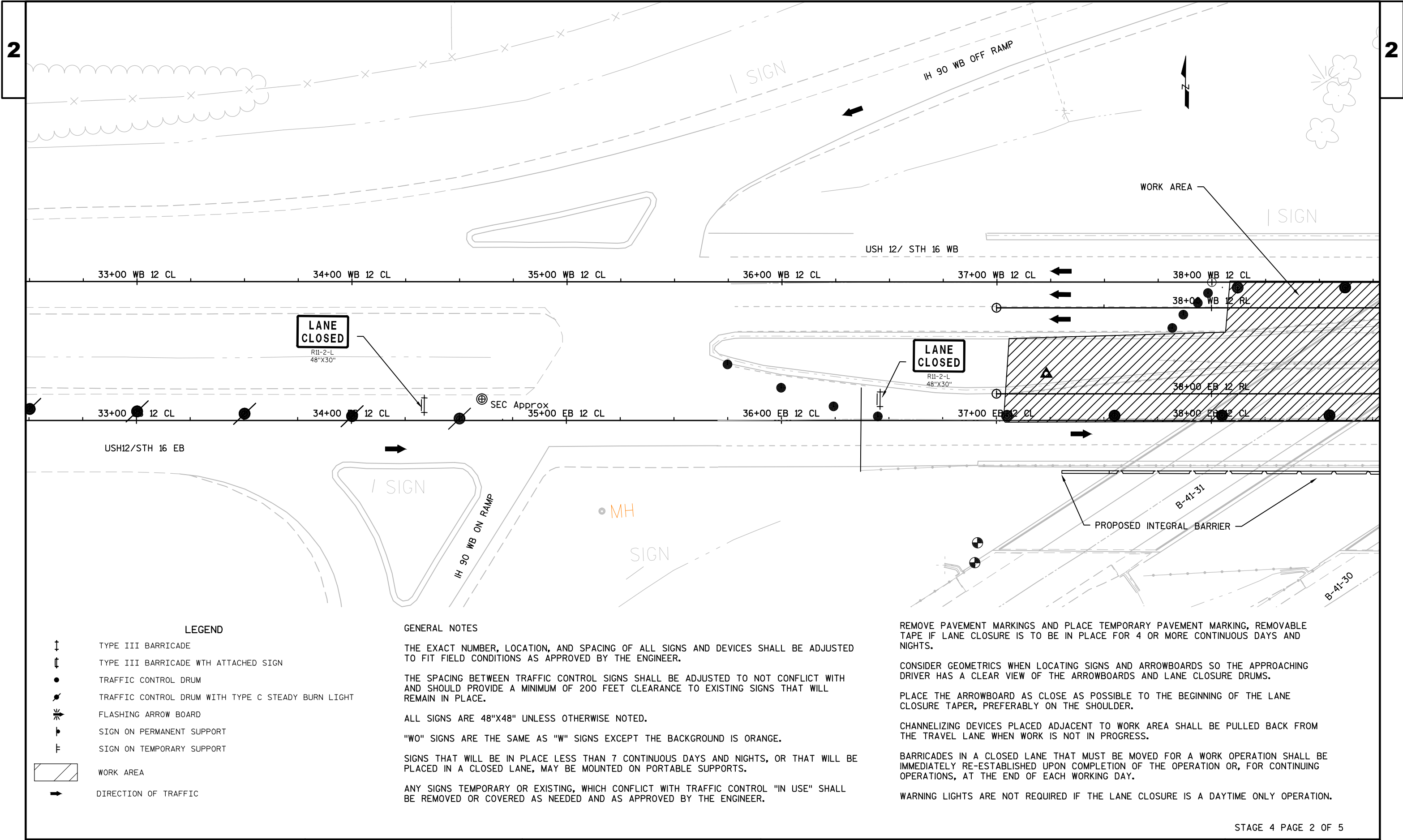






## 2





LEGEND

- TYPE III BARRICADE
- TYPE III BARRICADE WITH ATTACHED SIGN
- TRAFFIC CONTROL DRUM
- TRAFFIC CONTROL DRUM WITH TYPE C STEADY BURN LIGHT
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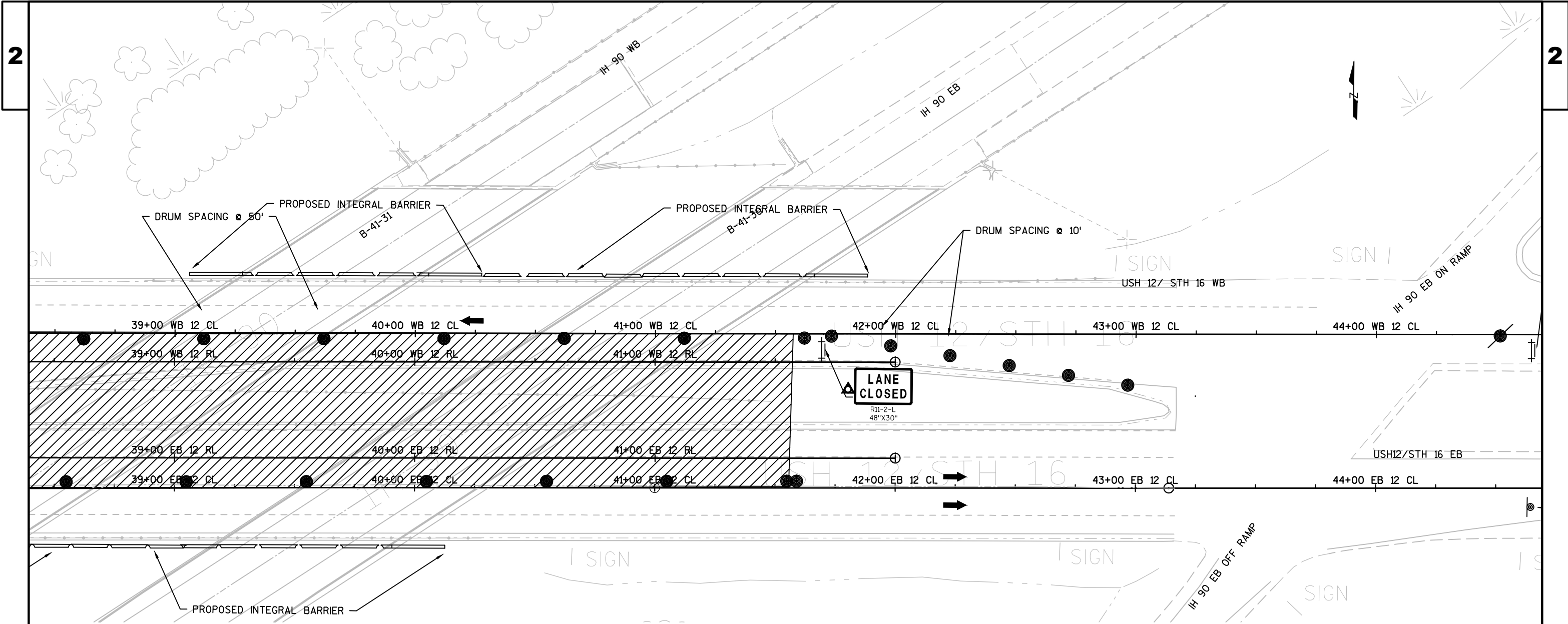
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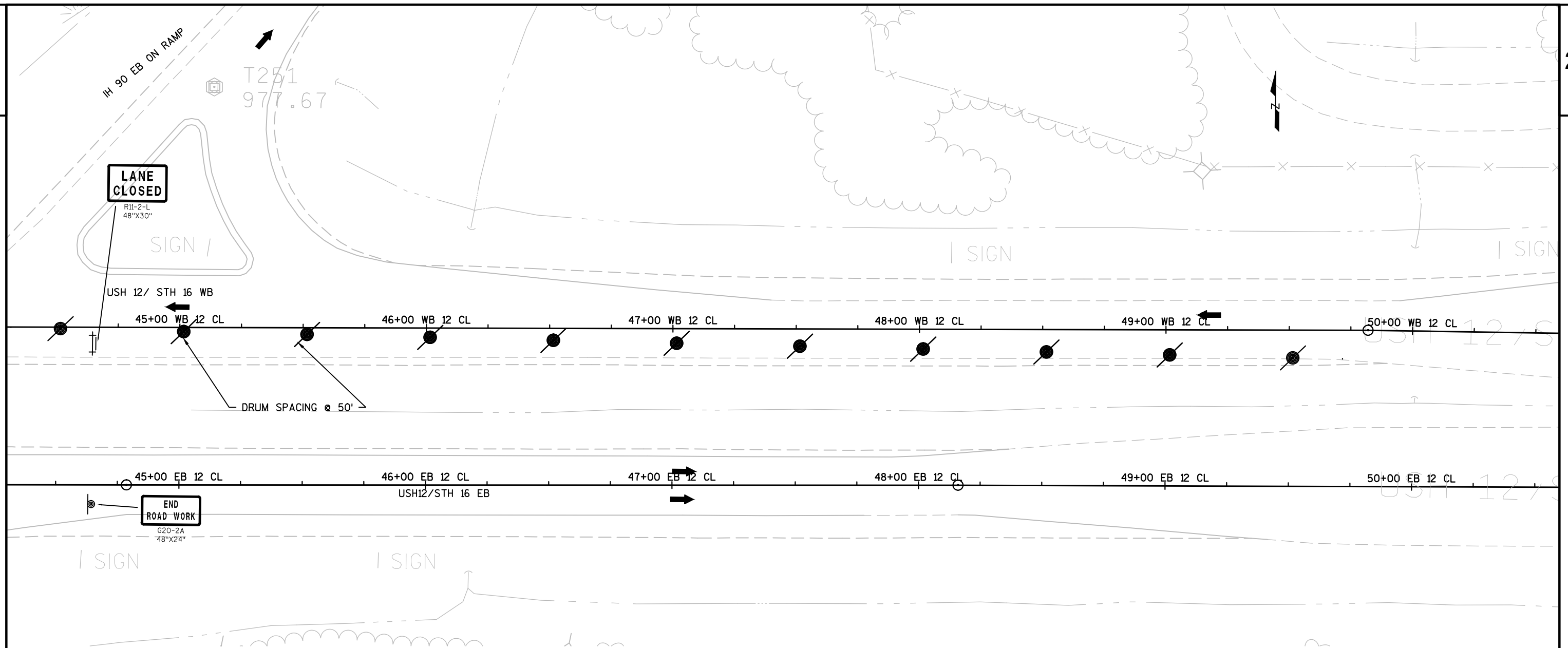
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



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STAGE 4 PAGE 4 OF 5

PROJECT NO:1077-03-60

HWY: IH 90

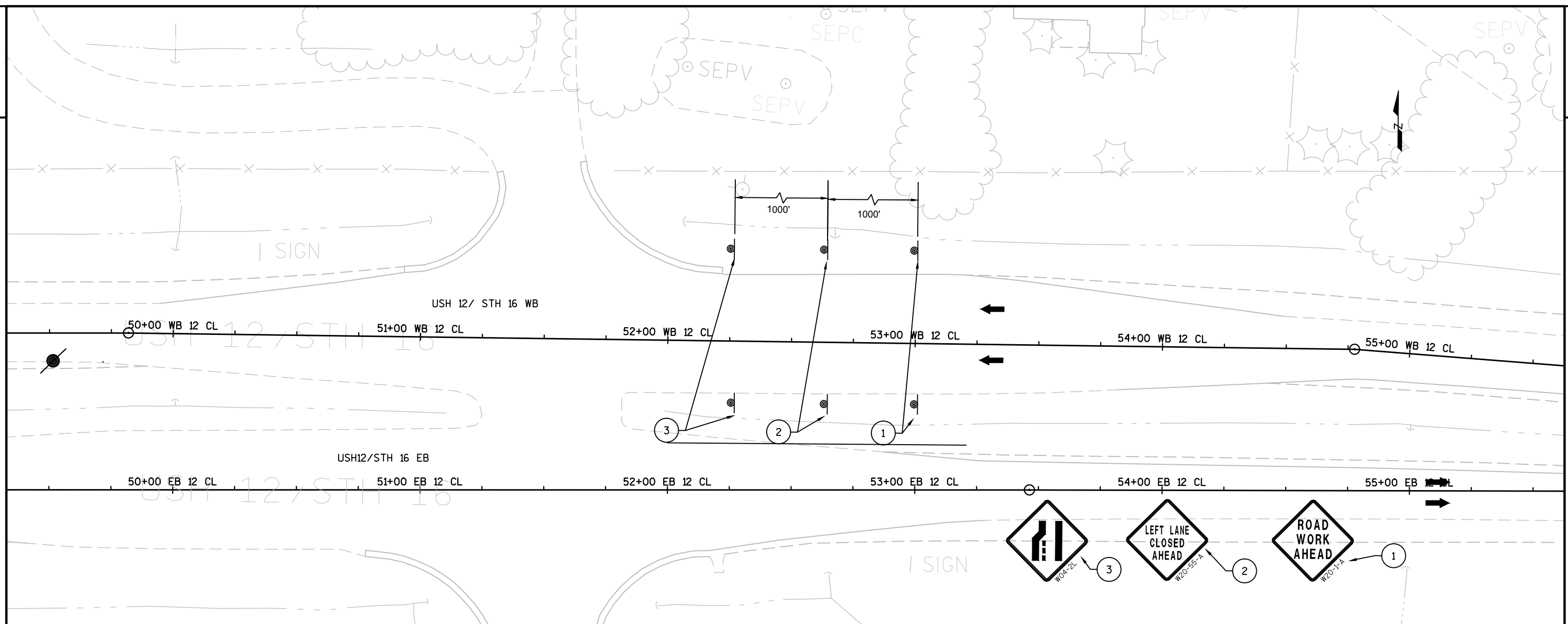
COUNTY: MONROE

TRAFFIC CONTROL: STAGE 4

SHEET

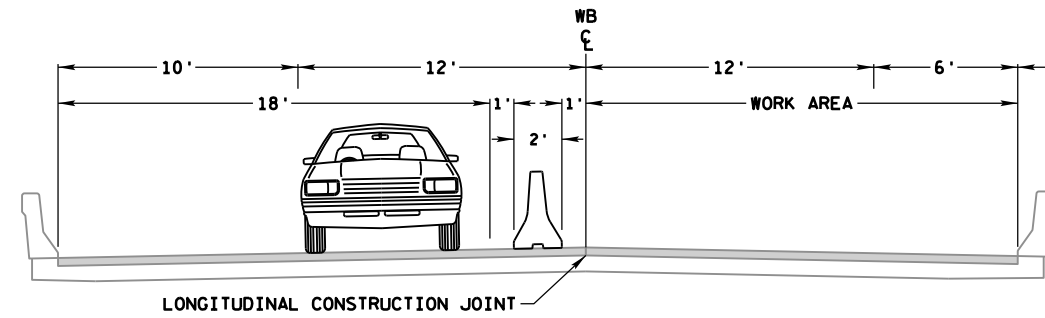
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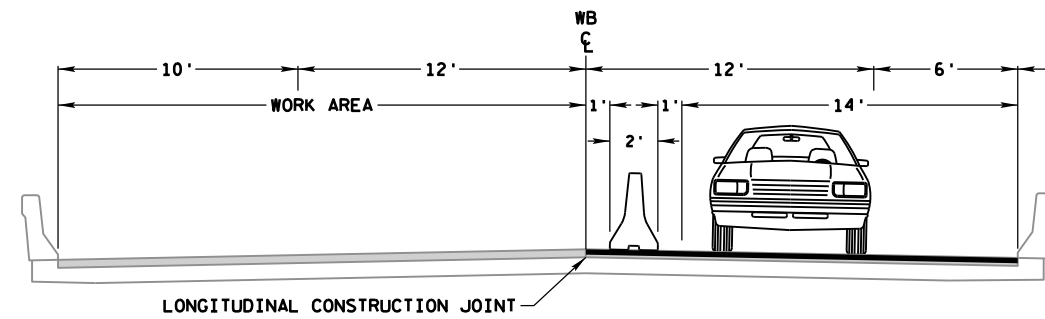
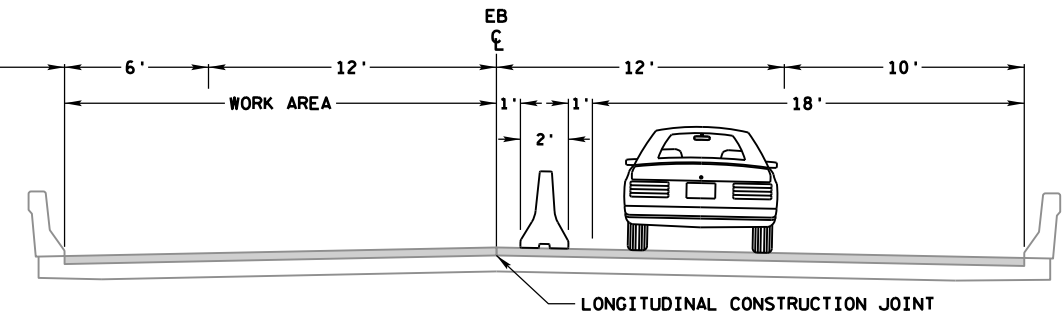


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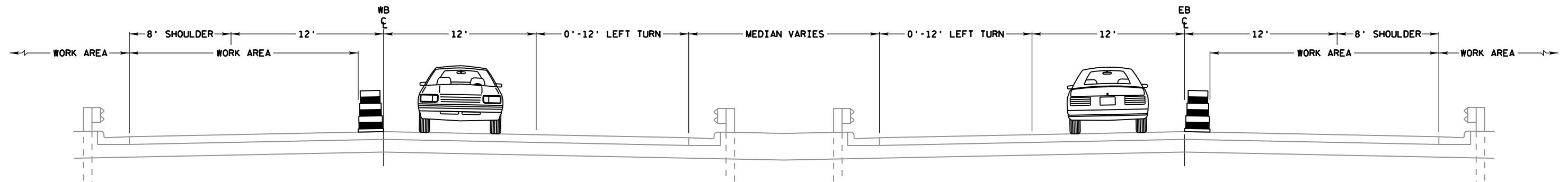
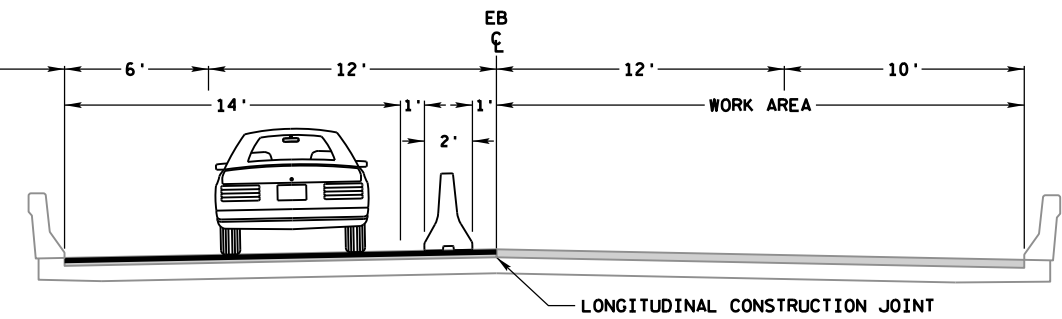
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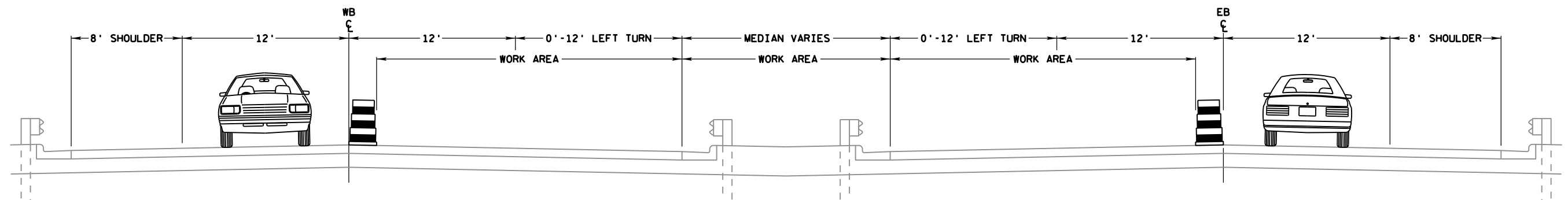
**IH 90 STAGE 1**  
WB B-41-31 / EB B-41-30



**IH 90 STAGE 2**  
WB B-41-31 / EB B-41-30



**USH 12 / STH 16 STAGE 3**



**USH 12 / STH 16 STAGE 3**



Estimate Of Quantities

1077-03-60

Line	Item	Item Description	Unit	Total	Qty
0010	204.0100	Removing Pavement	SY	700.000	700.000
0020	204.0110	Removing Asphaltic Surface	SY	1,091.000	1,091.000
0030	204.0150	Removing Curb & Gutter	LF	751.000	751.000
0040	204.0165	Removing Guardrail	LF	809.000	809.000
0050	206.1000	Excavation for Structures Bridges (structure) 01. B-41-0030	LS	1.000	1.000
0060	206.1000	Excavation for Structures Bridges (structure) 02. B-41-0031	LS	1.000	1.000
0070	213.0100	Finishing Roadway (project) 01.1077-03-60	EACH	1.000	1.000
0080	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	280.000	280.000
0090	312.0110	Select Crushed Material	TON	280.000	280.000
0100	415.0120	Concrete Pavement 12-Inch	SY	298.000	298.000
0110	415.0410	Concrete Pavement Approach Slab	SY	450.000	450.000
0120	455.0605	Tack Coat	GAL	101.000	101.000
0130	465.0105	Asphaltic Surface	TON	161.000	161.000
0140	502.0100	Concrete Masonry Bridges	CY	252.000	252.000
0150	502.0717.S	Crack Sealing Epoxy	LF	900.000	900.000
0160	502.3100	Expansion Device (structure) 01. B-41-0030	LS	1.000	1.000
0170	502.3100	Expansion Device (structure) 02. B-41-0031	LS	1.000	1.000
0180	502.3200	Protective Surface Treatment	SY	3,040.000	3,040.000
0190	502.4205	Adhesive Anchors No. 5 Bar	EACH	80.000	80.000
0200	502.4206	Adhesive Anchors No. 6 Bar	EACH	240.000	240.000
0210	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	39,760.000	39,760.000
0220	506.6000	Bearing Assemblies Expansion (structure) 01. B-41-0030	EACH	3.000	3.000
0230	506.6000	Bearing Assemblies Expansion (structure) 02. B-41-0031	EACH	4.000	4.000
0240	506.7050.S	Removing Bearings (structure) 01. B-41-0030	EACH	3.000	3.000
0250	506.7050.S	Removing Bearings (structure) 02. B-41-0031	EACH	4.000	4.000
0260	509.0301	Preparation Decks Type 1	SY	73.000	73.000
0270	509.0302	Preparation Decks Type 2	SY	35.000	35.000
0280	509.0500	Cleaning Decks	SY	2,912.000	2,912.000
0290	509.1000	Joint Repair	SY	138.000	138.000
0300	509.1500	Concrete Surface Repair	SF	614.000	614.000
0310	509.2000	Full-Depth Deck Repair	SY	2.000	2.000
0320	509.2500	Concrete Masonry Overlay Decks	CY	266.000	266.000
0330	509.9020.S	Epoxy Crack Sealing	LF	226.000	226.000
0340	517.3000.S	Structure Overcoating Cleaning and Priming (structure) 01. B-41-0030	LS	1.000	1.000
0350	517.3000.S	Structure Overcoating Cleaning and Priming (structure) 02. B-41-0031	LS	1.000	1.000

Estimate Of Quantities

1077-03-60

Line	Item	Item Description	Unit	Total	Qty
0360	517.4000.S	Containment and Collection of Waste Materials (structure) 01. B-41-0030	LS	1.000	1.000
0370	517.4000.S	Containment and Collection of Waste Materials (structure) 02. B-41-0031	LS	1.000	1.000
0380	601.0557	Concrete Curb & Gutter 6-Inch Sloped 36-Inch Type D	LF	751.000	751.000
0390	603.8000	Concrete Barrier Temporary Precast Delivered	LF	1,575.000	1,575.000
0400	603.8125	Concrete Barrier Temporary Precast Installed	LF	3,150.000	3,150.000
0410	604.0500	Slope Paving Crushed Aggregate	SY	560.000	560.000
0420	614.0010	Barrier System Grading Shaping Finishing	EACH	2.000	2.000
0430	614.0150	Anchor Assemblies for Steel Plate Beam Guard	EACH	8.000	8.000
0440	614.0200	Steel Thrie Beam Structure Approach	LF	42.000	42.000
0450	614.0305	Steel Plate Beam Guard Class A	LF	50.000	50.000
0460	614.0370	Steel Plate Beam Guard Energy Absorbing Terminal	EACH	2.000	2.000
0470	618.0100	Maintenance And Repair of Haul Roads (project) 01.1077-03-60	EACH	1.000	1.000
0480	619.1000	Mobilization	EACH	1.000	1.000
0490	638.2102	Moving Signs Type II	EACH	1.000	1.000
0500	642.5001	Field Office Type B	EACH	1.000	1.000
0510	643.0100	Traffic Control (project) 01.1077-03-60	EACH	1.000	1.000
0520	643.0300	Traffic Control Drums	DAY	6,622.000	6,622.000
0530	643.0420	Traffic Control Barricades Type III	DAY	280.000	280.000
0540	643.0705	Traffic Control Warning Lights Type A	DAY	200.000	200.000
0550	643.0715	Traffic Control Warning Lights Type C	DAY	1,920.000	1,920.000
0560	643.0800	Traffic Control Arrow Boards	DAY	110.000	110.000
0570	643.0900	Traffic Control Signs	DAY	2,820.000	2,820.000
0580	646.0106	Pavement Marking Epoxy 4-Inch	LF	4,600.000	4,600.000
0590	646.0600	Removing Pavement Markings	LF	4,600.000	4,600.000
0600	649.0402	Temporary Pavement Marking Paint 4-Inch	LF	4,900.000	4,900.000
0610	649.0801	Temporary Pavement Marking Removable Tape 8-Inch	LF	800.000	800.000
0620	650.7000	Construction Staking Concrete Pavement	LF	267.000	267.000
0630	650.9910	Construction Staking Supplemental Control (project) 01. 1077-03-60	LS	1.000	1.000
0640	690.0150	Sawing Asphalt	LF	32.000	32.000
0650	690.0250	Sawing Concrete	LF	281.000	281.000
0660	715.0415	Incentive Strength Concrete Pavement	DOL	500.000	500.000
0670	715.0502	Incentive Strength Concrete Structures	DOL	1,512.000	1,512.000
0680	ASP.1T0A	On-the-Job Training Apprentice at \$5.00/HR	HRS	1,200.000	1,200.000
0690	ASP.1T0G	On-the-Job Training Graduate at \$5.00/HR	HRS	600.000	600.000
0700	SPV.0060	Special 01. Bearing Maintenance B-41-30	EACH	4.000	4.000
0710	SPV.0060	Special 02. Bearing Maintenance B-41-31	EACH	3.000	3.000
0720	SPV.0060	Special 03. Embedded Galvanic Anodes	EACH	131.000	131.000

Estimate Of Quantities

1077-03-60

Line	Item	Item Description	Unit	Total	Qty
0730	SPV.0060	Special 04.Pavement Terminal Unit Special	EACH	2.000	2.000
0740	SPV.0165	Special 01. Fiber Wrap Column Reinforcing	SF	2,820.000	2,820.000
0750	SPV.0180	Special 01. Pigmented Surface Reseal	SY	550.000	550.000

REMOVING PAVEMENT

CATEGORY	STATION TO	STATION	LOCATION	204. 0100 SY	REMARKS
0010	23+65 WB	- 24+08 WB	IH 90 WB	117	B- 41- 31
0010	27+49 WB	- 28+29 WB	IH 90 WB	214	B- 41- 31
0010	24+91 EB	- 25+33 EB	IH 90 EB	117	B- 41- 30
0010	28+77 EB	- 29+51 EB	IH 90 EB	198	B- 41- 30
0010	29+63 EB	- 29+83 EB	IH 90 EB	54	B- 41- 30
TOTAL 0010				700	

REMOVING ASPHALTIC SURFACE

CATEGORY	STATION TO	STATION	LOCATION	204. 0110 SY	REMARKS
0010	23+65 WB	- 25+15 WB	IH 90 WB RT	72	B- 41- 31 SHOULDER
0010	27+33 WB	- 28+38 WB	IH 90 WB LT	62	B- 41- 31 SHOULDER
0010	27+97 WB	- 28+38 WB	IH 90 WB RT	46	B- 41- 31 SHOULDER
0010	24+91 EB	- 25+48 EB	IH 90 EB RT	63	B- 41- 30 SHOULDER
0010	28+69 EB	- 29+83 EB	IH 90 EB LT	134	B- 41- 30 SHOULDER
0010	29+31 EB	- 29+83 EB	IH 90 EB RT	46	B- 41- 30 SHOULDER
0010	39+00 WB	12 CL - 43+17 WB	12 CL USH 12/STH 16 WB LT	371	SHOULDER
0010	36+91 EB	12 CL - 40+25 EB	12 CL USH 12/STH 16 EB RT	297	SHOULDER
TOTAL 0010				1, 091	

REMOVING CURB & GUTTER

					204. 0150					
CATEGORY	STATION			TO	STATION			LOCATION	LF	REMARKS
0010	39+00	WB	12 CL	-	43+17	WB	12 CL	USH 12/STH 16 LT	417	IN FRONT OF INTERGAL BARRIER WALL
0010	36+91	EB	12 CL	-	40+25	EB	12 CL	USH 12/STH 16 RT	334	IN FRONT OF INTERGAL BARRIER WALL
TOTAL 0010									751	

REMOVING GUARDRAIL

204. 0165												
CATEGORY	STATION				TO	STATION				LOCATION	LF	REMARKS
0010	38+87	WB	12	CL	-	42+91	WB	12	CL	USH 12/STH 16 LT	416	
0010	36+37	EB	12	CL	-	40+29	EB	12	CL	USH 12/STH 16 RT	393	
TOTAL 0010											809	

3

3

CONCRETE PAVEMENT APPROACH SLAB

CONCRETE PAVEMENT 12-INCH					
CATEGORY	STATION TO	STATION	LOCATION	415. 0120 SY	REMARKS
0010	27+88 WB -	28+29 WB	I H 90 WB	132	
0010	29+09 EB -	29+51 EB	I H 90 EB	112	
0010	29+63 EB -	29+83 EB	I H 90 EB	54	
TOTAL 0010				298	

CATEGORY	STATION TO	STATION	LOCATION	415. 0410 SY	REMARKS
0010	23+65 WB -	24+08 WB	I H 90 WB	117	B- 41- 31
0010	27+49 WB -	27+88 WB	I H 90 WB	108	B- 41- 31
0010	24+91 EB -	25+33 EB	I H 90 EB	117	B- 41- 30
0010	28+77 EB -	29+09 EB	I H 90 EB	108	B- 41- 30
TOTAL 0010				450	

ASPHALTIC ITEM SUMMARY

CATEGORY	STATION TO	STATION	LOCATION	455. 0605 TACK COAT GAL	465. 0105 ASPHALTIC SURFACE TON	REMARKS
0010	23+65 WB -	24+15 WB	I H 90 WB RT	4	7	B- 41- 31 SHOULDER
0010	27+33 WB -	28+35 WB	I H 90 WB LT	8	13	B- 41- 31 SHOULDER
0010	27+97 WB -	28+35 WB	I H 90 WB RT	3	4	B- 41- 31 SHOULDER
0010	24+91 EB	25+49 EB	I H 90 EB RT	5	8	B- 41- 30 SHOULDER
0010	29+31 EB -	29+83 EB	I H 90 EB RT	4	6	B- 41- 30 SHOULDER
0010	28+68 EB -	29+83 EB	I H 90 EB LT	10	15	B- 41- 30 SHOULDER
0010	37+30 EB 12 CL -	40+13 EB 12 CL	USH 12/STH 16 EB RT SHOULDER	11	17	AREA BETWEEN INTEGRAL BARRIER AND C&G SHOULDER
0010	36+91 EB 12 CL -	40+25 EB 12 CL	USH 12/STH 16 EB RT SHOULDER	21	34	
0010	39+06 WB 12 CL -	41+88 WB 12 CL	USH 12/STH 16 WB LT SHOULDER	9	15	AREA BETWEEN INTEGRAL BARRIER AND C&G SHOULDER
0010	39+00 WB 12 CL -	43+17 WB 12 CL	USH 12/STH 16 WB LT SHOULDER	26	42	
TOTAL 0010				101	161	

CONCRETE CURB AND GUTTER 6-INCH SLOPED 36-INCH TYPE D

CATEGORY	STATION TO	STATION	LOCATION	601. 0557 LF	REMARKS
0010	39+00 WB 12 CL -	42+38 WB 12 CL	USH 12/STH 16 LT	338	IN FRONT OF INTERGAL BARRIER
0010	39+00 WB 12 CL -	43+17 WB 12 CL	USH 12/STH 16 LT	79	DRIVEWAY SECTION CURB
0010	36+91 EB 12 CL -	40+25 EB 12 CL	USH 12/STH 16 RT	334	IN FRONT OF INTERGAL BARRIER
TOTAL 0010				751	

SPECIAL 04. PAVEMENT TERMINAL UNIT SPECIAL

CATEGORY	STATION TO	STATION	LOCATION	SPV. 0060 EACH	REMARKS
0010	28+26 WB -	28+38 WB	I H 90 WB	1	B- 41- 31
0010	29+51 EB -	29+63 EB	I H 90 EB	1	B- 41- 30
TOTAL 0010				2	

STATE PROJECT NO: 1077-03-60

HWY IH 90

COUNTY: MONROE

MISCELLANEOUS QUANTITIES

SHEET NO:

E

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3

BEAM GUARD SUMMARY

				614. 0200		614. 0370	
				STEEL	614. 0305	STEEL PLATE	
				THRIE BEAM	STEEL PLATE	BEAM GUARD	
				STRUCTURE	BEAM GUARD	ENERGY	
				APPROACH	CLASS A	ABSORBING TERMINAL	
CATEGORY	STATION TO	STATION	LOCATION	LF	LF	EACH	REMARKS
0010	36+34 EB 12 CL -	37+30 EB 12 CL	USH 12/ STH 16 EB RT	21	25	1	
0010	41+88 WB 12 CL -	42+84 WB 12 CL	USH 12/ STH 16 WB LT	21	25	1	
TOTAL 0010				42	50	2	

BARRIER SYSTEM GRADING SHAPING FINISHING

				614. 0010	
CATEGORY	STATION	LOCATION		EACH	REMARKS
0010	36+34 EB 12 CL	USH 12/ STH 16 EB RT		1	E. A. T.
0010	41+88 WB 12 CL	USH 12/ STH 16 WB LT		1	E. A. T.
TOTAL 0010				2	

APPROXIMATE QUANTITIES FOR INFORMATION PURPOSES ONLY

LOCATION			FILL	COMMON	SALVAGE	SEED	SEED	SEEDING	FERTILIZER			
POST #1			( - 1. 25)	EXCAVATIO								
STATION	LOCATION	FILL	CY	N	TOPSOIL	AREA	MIX 30	TEMPORARY	TYPE B	MULCH	EACH	REMARKS
		CY		CY	SY	SY	LBS	LBS	CWT	SY		
36+34 EB 12 CL	22' RT	0	0	0	45	45	0. 83	1. 25	0. 03	45	1	NO EARTH WORK ANTICIPATED
42+84 WB 12 CL	22' LT	0	0	0	45	45	0. 83	1. 25	0. 03	45	1	NO EARTH WORK ANTICIPATED
TOTALS		N/A	N/A	N/A	90	90	1. 66	2. 50	0. 06	90	2	



TRAFFIC CONTROL SIGNS						
CATEGORY	LOCATION	643. 0900 DAY	NO. SIGNS	SIGN NO.	SIGN	REMARKS
0010	IH 90 EB ADVANCED WARNING AREA LT & RT	50	2	W20- 1- F	ROAD WORK 1 MILE	STAGE 1
0010	IH 90 EB ADVANCED WARNING AREA LT & RT	50	2	W20- 5- A	RIGHT LANE CLOSED AHEAD	STAGE 1
0010	IH 90 EB ADVANCED WARNING AREA LT & RT	50	2	W20- 5- B	RIGHT LANE CLOSED 1500 FT	STAGE 1
0010	IH 90 EB ADVANCED WARNING AREA LT & RT	50	2	W04- 2R	SYMBOL MERGE LEFT	STAGE 1
0010	IH 90 EB RT	25	1	W5- 52 R	18"X54"	STAGE 1
0010	IH 90 EB RT	25	1	R11- 2- L	LANE CLOSED 48"X30"	STAGE 1
0010	IH 90 EB LT & RT	50	2	G20- 2A	END ROAD WORK 48"X24"	STAGE 1
0010	IH 90 EB ON RAMP LT & RT	50	2	W20- 1- A	ROAD WORK AHEAD	STAGE 1
0010	IH 90 EB OFF RAMP LT & RT	50	2	W20- 1- A	ROAD WORK AHEAD	STAGE 1
0010	IH 90 WB LT & RT	50	2	G20- 2A	END ROAD WORK 48"X24"	STAGE 1
0010	IH 90 WB RT	25	1	W5- 52 L	18"X54"	STAGE 1
0010	IH 90 WB LT	50	2	R11- 2- L	LANE CLOSED 48"X30"	STAGE 1
0010	IH 90 WB ADVANCED WARNING AREA LT & RT	50	2	W04- 2R	SYMBOL MERGE RIGHT	STAGE 1
0010	IH 90 WB ADVANCED WARNING AREA LT & RT	50	2	W05- B	RIGHT LANE CLOSED 1500 FT	STAGE 1
0010	IH 90 WB ADVANCED WARNING AREA LT & RT	50	2	W20- 5- A	RIGHT LANE CLOSED AHEAD	STAGE 1
0010	IH 90 WB ADVANCED WARNING AREA LT & RT	50	2	W20- 1- F	ROAD WORK 1 MILE	STAGE 1
0010	IH 90 WB ON RAMP LT & RT	50	2	W20- 1- A	ROAD WORK AHEAD	STAGE 1
0010	IH 90 WB OFF RAMP LT & RT	50	2	W20- 1- A	ROAD WORK AHEAD	STAGE 1
0010	IH 90 EB ADVANCED WARNING AREA LT & RT	50	2	W20- 1- F	ROAD WORK 1 MILE	STAGE 2
0010	IH 90 EB ADVANCED WARNING AREA LT & RT	50	2	W20- 55- A	LEFT LANE CLOSED AHEAD	STAGE 2
0010	IH 90 EB ADVANCED WARNING AREA LT & RT	50	2	W20- 55- B	LEFT LANE CLOSED 1500 FT	STAGE 2
0010	IH 90 EB ADVANCED WARNING AREA LT & RT	50	2	W04- 2	SYMBOL MERGE RIGHT	STAGE 2
0010	IH 90 EB LT	25	1	W5- 52 L	18"X54"	STAGE 2
0010	IH 90 EB LT & RT	50	2	G20- 2A	END ROAD WORK 48"X24"	STAGE 2
0010	IH 90 EB ON RAMP LT & RT	50	2	W20- 1- A	ROAD WORK AHEAD	STAGE 2
0010	IH 90 EB OFF RAMP LT & RT	50	2	W20- 1- A	ROAD WORK AHEAD	STAGE 2
0010	IH 90 WB LT & RT	50	2	G20- 2A	END ROAD WORK 48"X24"	STAGE 2
0010	IH 90 WB RT	100	4	R11- 2- L	LANE CLOSED 48"X30"	STAGE 2
0010	IH 90 WB RT	25	1	W5- 52 L	18"X54"	STAGE 2
0010	IH 90 WB ADVANCED WARNING AREA LT & RT	50	2	W04- 2	SYMBOL MERGE RIGHT	STAGE 2
0010	IH 90 WB ADVANCED WARNING AREA LT & RT	50	2	W20- 55- B	LEFT LANE CLOSED 1500 FT	STAGE 2
0010	IH 90 WB ADVANCED WARNING AREA LT & RT	50	2	W20- 55- A	LEFT LANE CLOSED AHEAD	STAGE 2
0010	IH 90 WB ADVANCED WARNING AREA LT & RT	50	2	W20- 1- F	ROAD WORK 1 MILE	STAGE 2
0010	IH 90 WB ON RAMP LT & RT	50	2	W20- 1- A	ROAD WORK AHEAD	STAGE 2
0010	IH 90 WB OFF RAMP LT & RT	50	2	W20- 1- A	ROAD WORK AHEAD	STAGE 2
0010	IH 90 EB ADVANCED WARNING AREA	75	3	W12- 52	MAX. 14 FT WIDTH	STAGE 2
0010	IH 90 EB ADVANCED WARNING AREA	75	3	M1- 1	IH 90	STAGE 2
	IH 90 EB ADVANCED WARNING AREA	75	3	M3- 2	EAST	STAGE 2
0010	IH 90 EB ADVANCED WARNING AREA	75	3	W057- 052	MILES AHEAD	STAGE 2
0010	IH 90 WB ADVANCED WARNING AREA	150	6	W12- 52	MAX. 14 FT WIDTH	STAGE 2
0010	IH 90 WB ADVANCED WARNING AREA	150	6	M1- 1	IH 90	STAGE 2
	IH 90 WB ADVANCED WARNING AREA	150	6	M3- 4	WEST	STAGE 2
0010	IH 90 WB ADVANCED WARNING AREA	150	6	W057- 052	MILES AHEAD	STAGE 2
SUBTOTAL		2, 575				

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TRAFFIC CONTROL SIGNS CONTINUED

CATEGORY	LOCATION	643. 0900 DAY	NO. SIGNS	SIGN NO.	SIGN	REMARKS
0010	USH 12 EB ADVANCED WARNING AREA LT & RT	14	2	W20- 1- A	ROAD WORK AHEAD	STAGE 3
0010	USH 12 EB ADVANCED WARNING AREA LT & RT	14	2	W20- 5- A	RIGHT LANE CLOSED AHEAD	STAGE 3
0010	USH 12 EB ADVANCED WARNING AREA LT & RT	14	2	W04- 2L	SYMBOL MERGE LEFT	STAGE 3
0010	USH 12 EB RT	7	1	R3- 20- R	BEGIN RIGHT TURN LANE 24"X36"	STAGE 3
0010	USH 12 EB RT	14	2	R11- 2- L	LANE CLOSED 48"X30"	STAGE 3
0010	USH 12 EB RT	7	1	G20- 2A	END ROAD WORK 48"X24"	STAGE 3
0010	USH 12 WB ADVANCED WARNING AREA LT & RT	14	2	W20- 1- A	ROAD WORK AHEAD	STAGE 3
0010	USH 12 WB ADVANCED WARNING AREA LT & RT	14	2	W20- 5- A	RIGHT LANE CLOSED AHEAD	STAGE 3
0010	USH 12 WB ADVANCED WARNING AREA LT & RT	14	2	W04- 2L	SYMBOL MERGE LEFT	STAGE 3
0010	USH 12 WB LT	14	2	R11- 2- L	LANE CLOSED 48"X30"	STAGE 3
0010	USH 12 WB RT	7	1	G20- 2A	END ROAD WORK 48"X24"	STAGE 3
0010	USH 12 EB ADVANCED WARNING AREA LT & RT	14	2	W20- 1- A	ROAD WORK AHEAD	STAGE 4
0010	USH 12 EB ADVANCED WARNING AREA LT & RT	14	2	W20- 55- A	LEFT LANE CLOSED AHEAD	STAGE 4
0010	USH 12 EB ADVANCED WARNING AREA LT & RT	14	2	W04- 2L	SYMBOL MERGE RIGHT	STAGE 4
0010	USH 12 EB LT	7	1	R11- 2- L	LANE CLOSED 48"X30"	STAGE 4
0010	USH 12 WB RT	14	2	R11- 2- L	LANE CLOSED 48"X30"	STAGE 4
0010	USH 12 EB RT	7	1	G20- 2A	END ROAD WORK 48"X24"	STAGE 4
0010	USH 12 WB ADVANCED WARNING AREA LT & RT	14	2	W04- 2L	SYMBOL MERGE RIGHT	STAGE 4
0010	USH 12 WB ADVANCED WARNING AREA LT & RT	14	2	W20- 55- A	LEFT LANE CLOSED AHEAD	STAGE 4
0010	USH 12 WB ADVANCED WARNING AREA LT & RT	14	2	W20- 1- A	ROAD WORK AHEAD	STAGE 4
SUBTOTAL		245				
TOTAL 0010		2, 820				

646. 0106 PAVEMENT MARKING EPOXY 4-INCH

CATEGORY	STATION TO	STATION	LOCATION	WHITE LF	YELLOW LF	REMARKS
0010	6+00 EB -	16+00 EB	IH 90 EB CL	250		WHITE DASHES
0010	23+50 EB -	31+00 EB	IH 90 EB RT EDGELINE		750	
0010	22+00 EB -	31+00 EB	IH 90 EB LT EDGELINE	900		
0010	23+50 WB -	33+50 WB	IH 90 WB LT EDGELINE	1, 000		
0010	21+00 WB -	38+00 WB	IH 90 WB RT EDGELINE		1, 700	
SUBTOTAL				2, 150	2, 450	
TOTAL 0010				4, 600		

MOVING SIGNS TYPE II

CATEGORY	STATION	LOCATION	638. 2102 EACH	REMARKS
0010	42+91 WB 12 CL	USH 12/STH 16 LT	1	MOVE PRIOR TO BEAM GUARD REMOVAL
TOTAL 0010			1	

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TRAFFIC CONTROL SUMMARY

CATEGORY	STATION TO	STATION	LOCATION	NO. DRUMS	643. 0300	NO. BARRI CADES	643. 0420	NO. WARNING LIGHTS TYPE A	643. 0705	NO. WARNING LIGHTS TYPE C	643. 0715	NO. ARROW BOARDS	643. 0800	STAGE
					TRAFFIC CONTROL DRUMS DAY		TRAFFIC CONTROL BARRICADES TYPE III DAY		TRAFFIC CONTROL WARNING LIGHTS TYPE A DAY		TRAFFIC CONTROL WARNING LIGHTS TYPE C DAY		TRAFFIC CONTROL ARROW BOARDS DAY	
0010	5+00 EB -	25+00 EB	I H 90 EB RT	52	1300	2	50	2	50	15	375	1	25	STAGE 1
0010	14+00 WB	60+40 WB	I H 90 EB LT	80	1760	2	50	2	50	18	450	1	25	STAGE 1
0010	1+50 EB -	30+00 EB	I H 90 EB LT	49	1078					18	450	1	25	STAGE 2
0010	21+50 WB -	55+00 WB	I H 90 WB RT	52	1144	4	100	4	100	9	225	1	25	STAGE 2
0010	23+40 EB 12 CL -	42+00 EB 12 CL	USH 12 EB CL RT	50	500	2	20			12	120	1	10	STAGE 3
0010	38+00 WB 12 CL -	51+00 WB 12 CL	USH 12 WB CL RT	29	290	2	20			9	90			STAGE 3
0010	29+50 EB 12 CL -	42+00 EB 12 CL	USH 12 EB CL LT	25	250	2	20			10	100			STAGE 4
0010	37+75 WB 12 CL -	49+50 WB 12 CL	USH 12 WB CL LT	30	300	2	20			11	110			STAGE 4
TOTAL 0010					6, 622		280		200		1, 920		110	

REMOVING PAVEMENT MARKINGS

CATEGORY	STATION TO	STATION	STRUCTURE	LOCATION	646. 0600	REMARKS
					LF	
0010	22+00 EB -	31+00 EE	B-41-30	I H 90 EB LT EDGELINE	900	STAGE 1
0010	21+00 WB -	38+00 WE	B-41-31	I H 90 WB RT EDGELINE	1700	STAGE 1
0010	6+00 EB -	16+00 EE	B-41-30	I H 90 EB CL	250	STAGE 2
0010	23+50 EB -	31+00 EE	B-41-30	I H 90 EB RT EDGELINE	750	STAGE 2
0010	23+50 WB -	33+50 WE	B-41-31	I H 90 WB LT EDGELINE	1000	STAGE 2
TOTAL 0010					4, 600	

CONCRETE BARRIER TEMPORARY PRECAST

CATEGORY	STATION TO	STATION	LOCATION	603. 8000	603. 8125	REMARKS
				CONCRETE BARRIER TEMPORARY PRECAST DELIVERED LF	CONCRETE BARRIER TEMPORARY PRECAST INSTALLED LF	
0010	23+00 WB -	32+50 WB	I H 90 WB	950	1900	B-41-31
0010	23+75 EB -	30+00 EB	I H 90 EB	625	1250	B-41-30
TOTAL 0010				1, 575	3, 150	

TEMPORARY PAVEMENT MARKING REMOVABLE TAPE 8-INCH

CATEGORY	STATION TO	STATION	LOCATION	649. 0801	REMARKS
				WHITE LF	
0010	13+50 EB -	15+50 EB	I H 90 EB OFF RAMP LT	400	STAGE 2
0010	33+50 WB -	35+50 WB	I H 90 WB OFF RAMP LT	400	STAGE 2
TOTAL 0010				800	

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649. 0402

TEMPORARY PAVEMENT MARKING PAINT 4-INCH

CATEGORY	STATION TO	STATION	STRUCTURE	LOCATION	YELLOW EDGE LINE LF	WHITE EDGE LINE LF	REMARKS
0010	21+50 EB -	21+50 EB	B- 41- 30	I H 90 EB RT EDGE LINE		950	STAGE 1
0010	21+50 EB -	31+50 EB	B- 41- 30	I H 90 EB LT EDGE LINE	1000		STAGE 1
0010	22+00 WB -	39+10 WB	B- 41- 31	I H 90 WB RT EDGE LINE		1690	STAGE 1
0010	23+00 WB -	35+60 WB	B- 41- 31	I H 90 WB LT EDGE LINE	1260		STAGE 1
0010	7+00 EB -	30+00 EB	B- 41- 30	I H 90 EB LT EDGE LINE	2160		STAGE 2
0010	23+40 EB -	32+00 EB	B- 41- 30	I H 90 EB RT EDGE LINE		860	STAGE 2
0010	22+50 WB -	34+00 WB	B- 41- 31	I H 90 WB RT EDGE LINE		1210	STAGE 2
0010	21+50 WB -	33+60 WB	B- 41- 31	I H 90 WB LT EDGE LINE	1215		STAGE 2
SUBTOTAL					2260	2640	

TOTAL 0010	4900
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CONSTRUCTION STAKING CONCRETE PAVEMENT

CATEGORY	STATION TO	STATION	LOCATION	650. 7000 LF	REMARKS
0010	23+65 WB -	24+08 WB	I H 90 WB	43	B- 41- 31 APPROACH SLAB
0010	27+49 WB -	27+88 WB	I H 90 WB	39	B- 41- 31 APPROACH SLAB
0010	27+88 WB -	28+23 WB	I H 90 WB	35	B- 41- 31
0010	28+23 WB -	28+35 WB	I H 90 WB	12	B- 41- 31 PAVEMENT TERMINAL UNIT
0010	24+91 EB -	25+33 EB	I H 90 EB	42	B- 41- 30 APPROACH SLAB
0010	28+77 EB -	29+09 EB	I H 90 EB	32	B- 41- 30 APPROACH SLAB
0010	29+09 EB -	29+51 EB	I H 90 EB	32	B- 41- 30
0010	29+51 EB -	296+63 EB	I H 90 EB	12	B- 41- 30 PAVEMENT TERMINAL UNIT
0010	29+63 EB -	296+83 EB	I H 90 EB	20	B- 41- 30
TOTAL 0010				267	

SAWING ASPHALT

CATEGORY	STATION	LOCATION	690. 0150 LF	REMARKS
0010	39+06 WB 12 CL	USH 12/STH 16 LT	8	SHOULDER
0010	43+17 WB 12 CL	USH 12/STH 16 LT	8	SHOULDER
0010	36+91 EB 12 CL	USH 12/STH 16 RT	8	SHOULDER
0010	40+13 EB 12 CL	USH 12/STH 16 RT	8	SHOULDER
TOTAL 0010			32	

SAWING CONCRETE

CATEGORY	STATION TO	STATION	LOCATION	690. 0250 LF	REMARKS
0010	23+65 WB		I H 90 WB CL	28	B- 41- 31
0010	23+65 WB -	23+89 WB	I H 90 WB LT	24	B- 41- 31
0010	24+15 WB -	24+25 WB	I H 90 WB RT	10	B- 41- 31
0010	27+68 WB -	27+98 WB	I H 90 WB RT	30	B- 41- 31
0010	27+29 WB -	27+32 WB	I H 90 WB LT	3	B- 41- 31
0010	28+38 WB		I H 90 WB CL	34	B- 41- 31
0010	24+91 EB		I H 90 EB CL	35	B- 41- 30
0010	24+91 EB -	25+17 EB	I H 90 EB LT	26	B- 41- 30
0010	25+48 EB -	25+53 EB	I H 90 EB RT	5	B- 41- 30
0010	28+59 EB -	28+69 EB	I H 90 EB LT	10	B- 41- 30
0010	28+94 EB -	29+30 EB	I H 90 EB RT	36	B- 41- 30
0010	29+83 EB		I H 90 EB CL	40	B- 41- 30
TOTAL 0010				281	

STATE PROJECT NO: 1077-03-60

HWY IH 90

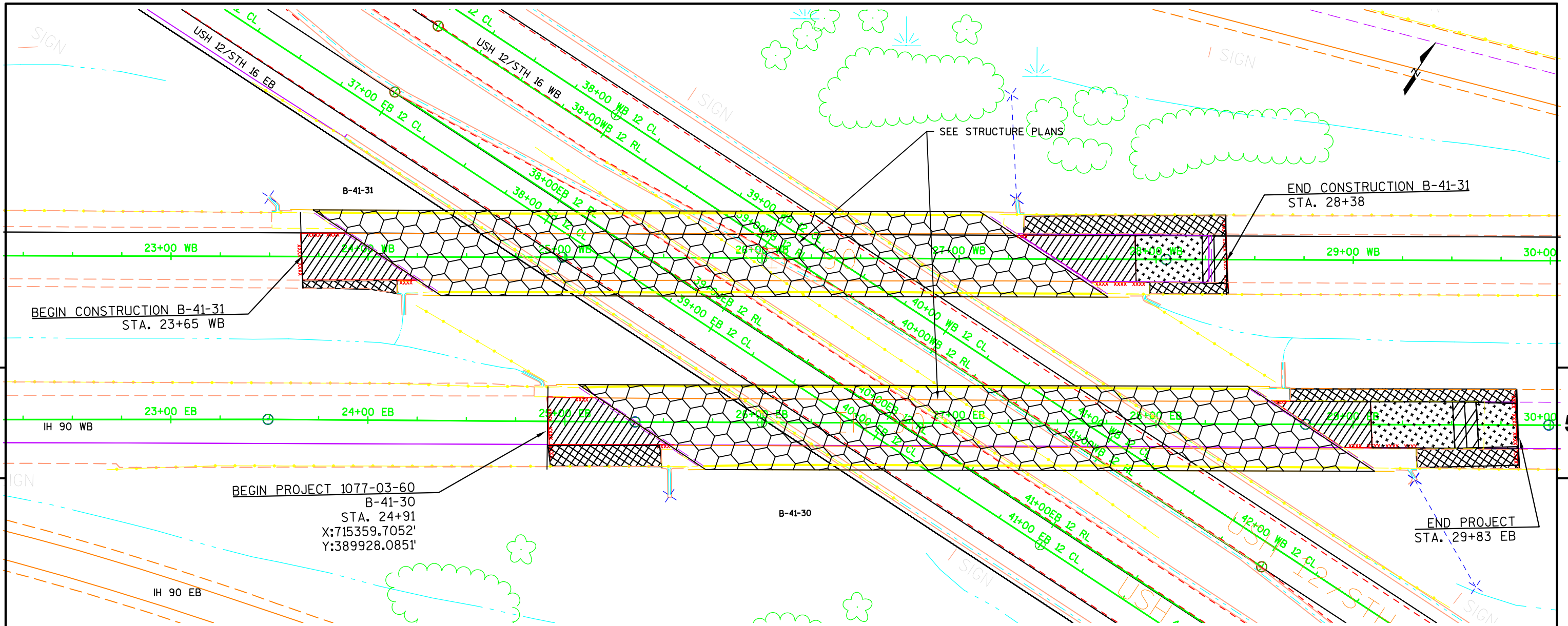
COUNTY: MONROE

MISCELLANEOUS QUANTITIES

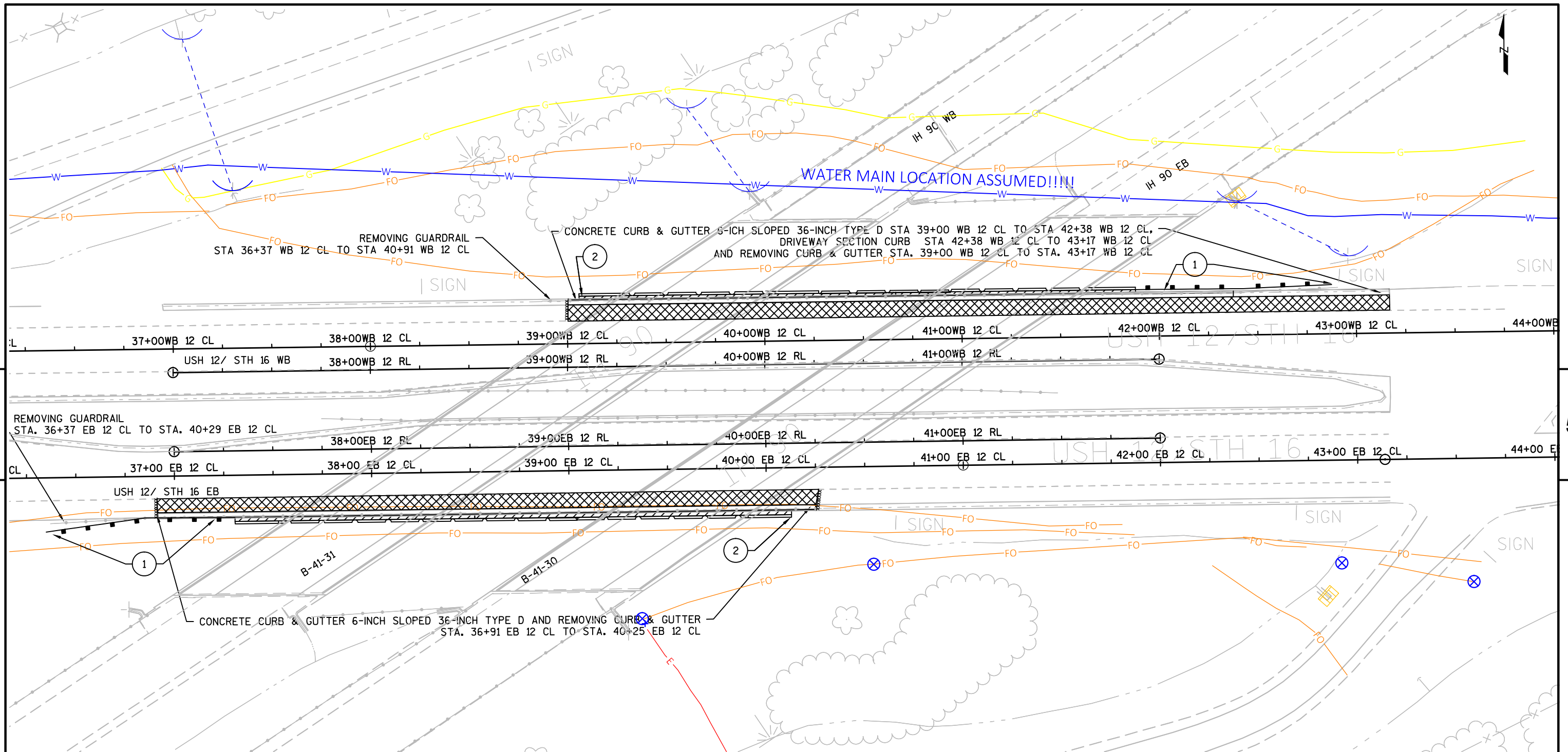
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LEGEND	
	SAW CUT
	ASPHALTIC SURFACE
	CONCRETE PAVEMENT APPROACH SLAB
	CONCRETE PAVEMENT 12-INCH
	PAVEMENT TERMINAL UNIT SPECIAL
	STRUCTURE WORK SEE STRUCTURE PLANS



5

5

1 BARRIER SYSTEM GRADING SHAPING FINISHING;  
STEEL THRIE BEAM STRUCTURE APPROACH;  
STEEL PLATE BEAM GUARD, CLASS A; AND  
STEEL PLATE BEAM GUARD, ENERGY ABSORBING TERMINAL

2 ANCHOR ASSEMBLIES FOR STEEL PLATE BEAM GUARD

LEGEND

ASPHALTIC SURFACE ON SHOULDER

ASPHALTIC SURFACE BETWEEN INTEGRAL BARRIER AND CONCRETE CURB & GUTTER 6-INCH SLOPED 36-INCH TYPE D

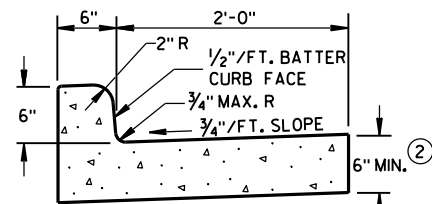
SAW CUT

INTEGRAL BARRIER - SEE STRUCTURE PLANS

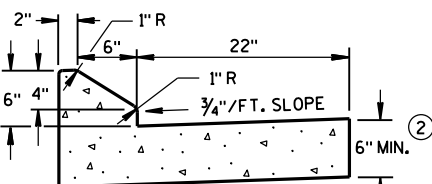
Standard Detail Drawing List

08D01-19	CONCRETE CURB, CONCRETE CURB AND GUTTER AND TIES
13B02-08A	CONCRETE PAVEMENT APPROACH SLAB
13C01-18	CONCRETE PAVEMENT LONGI TUDI NAL JOINTS AND TIES
13C09-13A	CONCRETE PAVEMENT REPAIR AND REPLACEMENT
13C09-13B	CONCRETE PAVEMENT REPAIR AND REPLACEMENT
13C09-13C	CONCRETE PAVEMENT REPAIR AND REPLACEMENT
13C11-11A	RURAL DOWELED CONCRETE PAVEMENT
13C11-11B	RURAL DOWELED CONCRETE PAVEMENT
14B07-14A	CONCRETE BARRIER TEMPORARY PRECAST, 12' -6"
14B07-14B	CONCRETE BARRIER TEMPORARY PRECAST, 12' -6"
14B07-14C	CONCRETE BARRIER TEMPORARY PRECAST, 12' -6"
14B07-14D	CONCRETE BARRIER TEMPORARY PRECAST, 12' -6"
14B07-14E	CONCRETE BARRIER TEMPORARY PRECAST, 12' -6"
14B07-14F	CONCRETE BARRIER TEMPORARY PRECAST, 12' -6"
14B07-14G	CONCRETE BARRIER TEMPORARY PRECAST, 12' -6"
14B07-14H	CONCRETE BARRIER TEMPORARY PRECAST, 12' -6"
14B15-09A	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-09B	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-09C	STEEL PLATE BEAM GUARD, CLASS "A", INSTALLATION & ELEMENTS
14B18-06A	STEEL PLATE BEAM GUARD, CLASS "A" (AT BRIDGES, OBSTACLES AND SI DEROADS/DRI VEWAYS)
14B20-11A	STEEL THRI E BEAM STRUCTURE APPROACH
14B20-11D	STEEL THRI E BEAM STRUCTURE APPROACH, CONNECTION TO SLOPED END PARAPETS
14B24-08A	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMIN AL
14B24-08B	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMIN AL
14B24-08C	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMIN AL
15C08-16A	PAVEMENT MARKING (MAINLINE)
15D03-03	TRAFFIC CONTROL, LANE CLOSURE, SPEEDS GREATER THAN 40 M.P.H. WITH BARRIER
15D15-02	TRAFFIC CONTROL, EXIT AND ENTRANCE RAMP WITHIN LANE CLOSURE
15D20-04	TRAFFIC CONTROL, SINGLE LANE CLOSURE, NON-FREEWAY/EXPRESSWAY
15D21-04	TRAFFIC CONTROL, INTERSECTION WITHIN SINGLE LANE CLOSURE
15D27-03	TRAFFIC CONTROL, SHOULDER CLOSURE ON DIVIDED ROADWAY, SPEEDS GREATER THAN 40 MPH

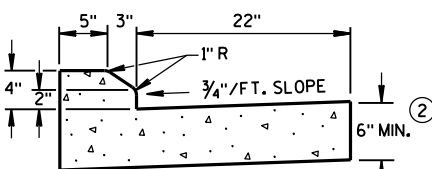




TYPES A & D ①

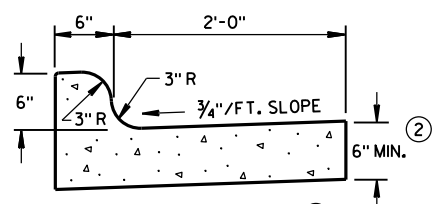


6" SLOPED CURB TYPES G & J ①



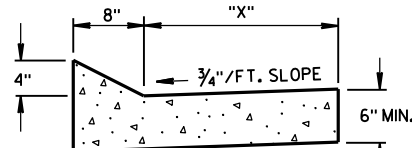
4" SLOPED CURB TYPES G & J ①

CONCRETE CURB & GUTTER 30"



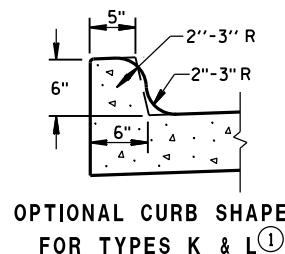
TYPES K & L ①

CONCRETE CURB & GUTTER 30"

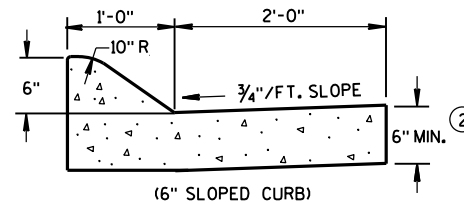


TYPES TBT & TBTT ①  
CONCRETE CURB & GUTTER

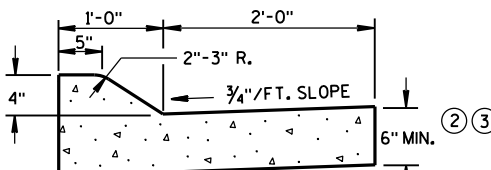
TBT & TBTT	"X"
30"	22"
36"	28"



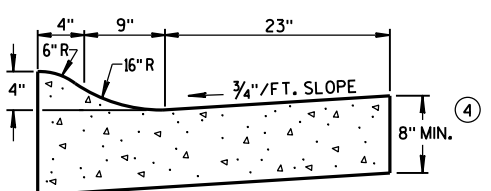
OPTIONAL CURB SHAPE  
FOR TYPES K & L ①



(6" SLOPED CURB)



(4" SLOPED CURB)  
TYPES A & D ①



4" SLOPED CURB TYPES R & T ① ⑤  
CONCRETE CURB & GUTTER 36"

## GENERAL NOTES

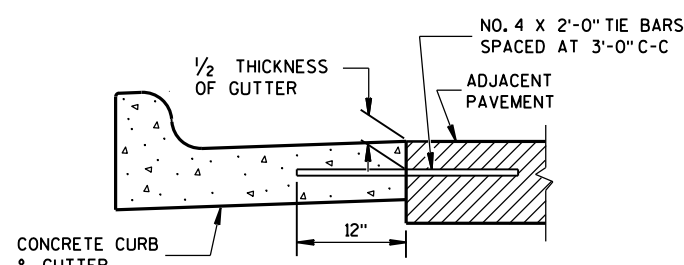
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.  
PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

INTEGRAL CURB & GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB & GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE. A LONGITUDINAL CONSTRUCTION JOINT IS NOT REQUIRED WITH INTEGRAL CURB AND GUTTER.

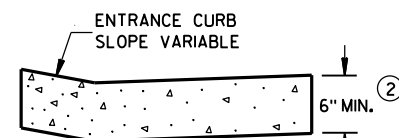
WHERE THE TRANSVERSE JOINTS IN THE PAVEMENT ARE REQUIRED TO BE SEALED, THE JOINTS IN THE INTEGRAL CURB AND GUTTER SHALL BE SEALED TO THE FACE OF CURB WITH THE SAME TYPE OF SEALANT. THE COST OF FURNISHING AND INSTALLING THIS SEALANT SHALL BE INCIDENTAL TO THE ITEM CONCRETE CURB AND GUTTER.

UNLESS OTHERWISE SHOWN ON THE TYPICAL CROSS SECTIONS, THE BASE AGGREGATE AND COMMON EXCAVATION LIMITS ARE 2'-0" BEHIND THE BACK OF CURBS.

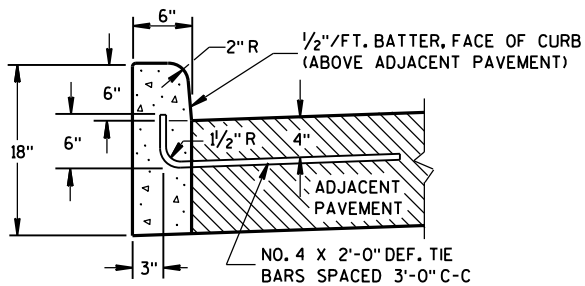
- TIE BARS ARE REQUIRED FOR CURB AND GUTTER TYPES A, G, K, R AND TBTT.
- THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- USE 8" MINIMUM GUTTER THICKNESS WHEN USED WITH AN ADJACENT CONCRETE TRUCK APRON PLACED BEHIND BACK OF CURB.
- THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 8" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- THE FACE OF CURB IS 6" FROM THE BACK OF CURB.
- WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATION(S) WILL BE SHOWN ELSEWHERE IN THE PLAN.



TYPICAL TIE BAR LOCATION ①

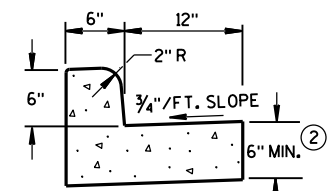


DRIVEWAY ENTRANCE CURB  
(WHEN DIRECTED BY THE ENGINEER)

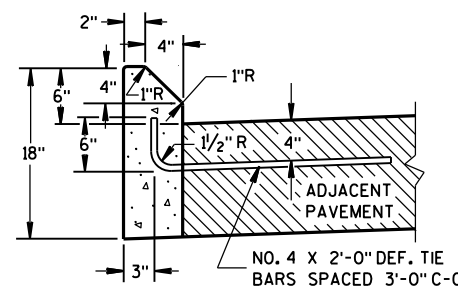


TYPES A & D ①

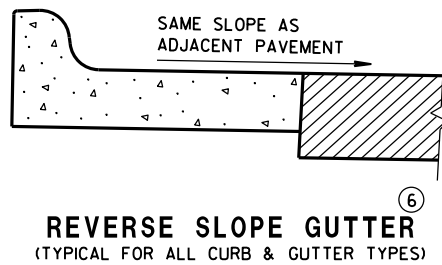
CONCRETE CURB



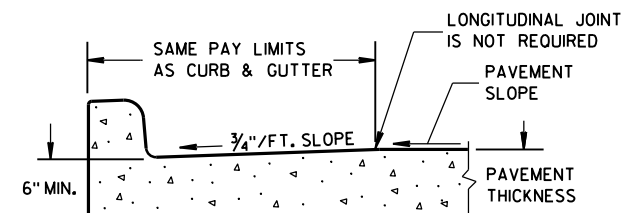
TYPES A & D  
CONCRETE CURB & GUTTER 18"



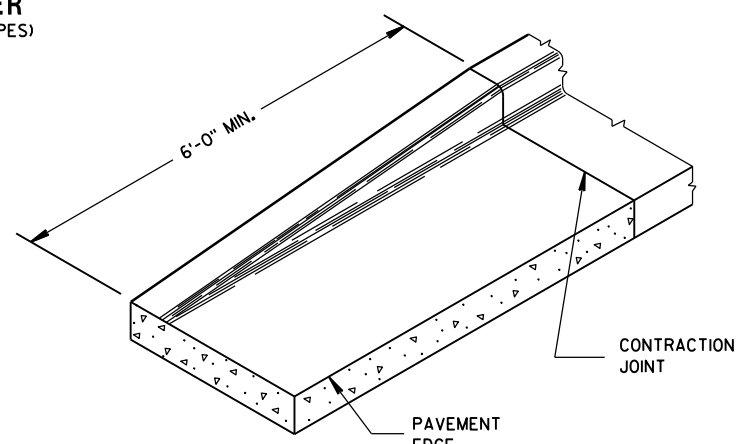
TYPES G & J ①



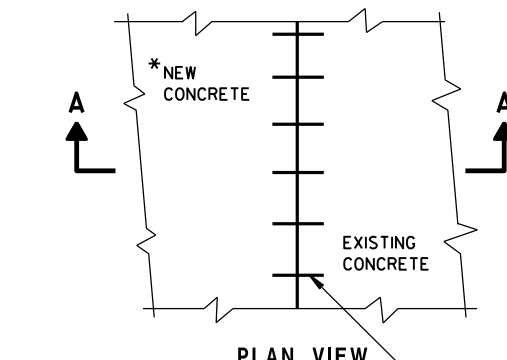
REVERSE SLOPE GUTTER  
(TYPICAL FOR ALL CURB & GUTTER TYPES)



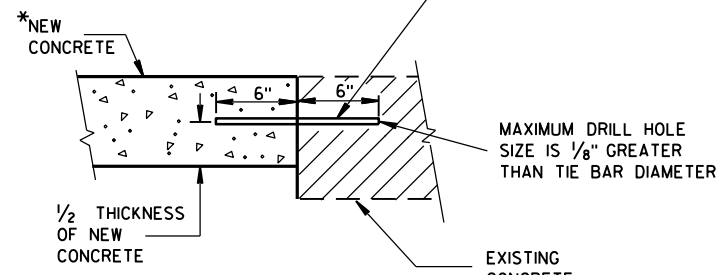
PARTIAL SECTION OF PAVEMENT  
WITH INTEGRAL CURB & GUTTER



END SECTION CURB & GUTTER



PLAN VIEW



SECTION A-A  
TIE BARS DRILLED  
INTO EXISTING PAVEMENT

\* NEW CURB & GUTTER,  
SURFACE DRAINS,  
CONCRETE PAVEMENT  
OR OTHER NEW CONCRETE.

NO. 6 TIE BARS SPACED 2'-6" C-C,  
INSTALLED PERPENDICULAR  
TO THE LONGITUDINAL JOINT.

MAXIMUM DRILL HOLE  
SIZE IS 1/8" GREATER  
THAN TIE BAR DIAMETER

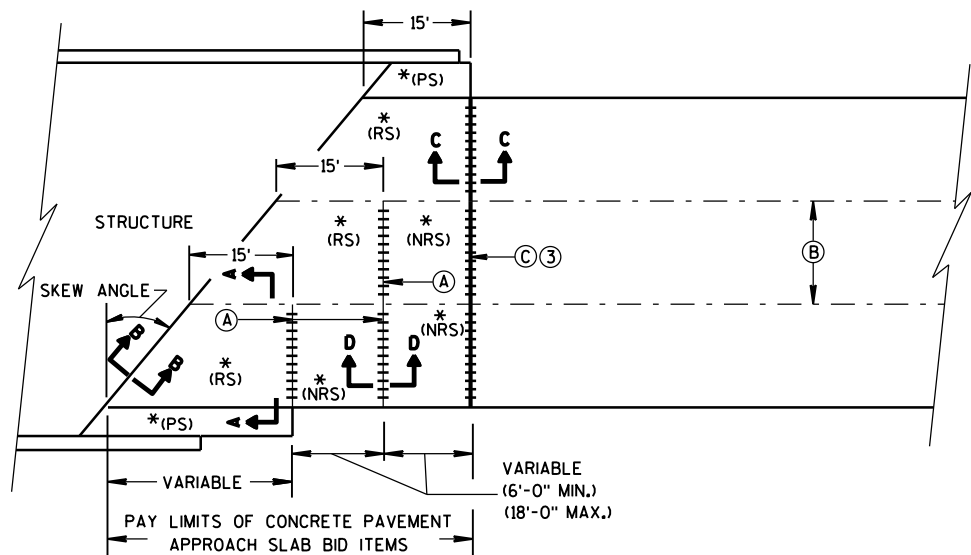
EXISTING CONCRETE

CONCRETE CURB, CONCRETE  
CURB & GUTTER AND TIES

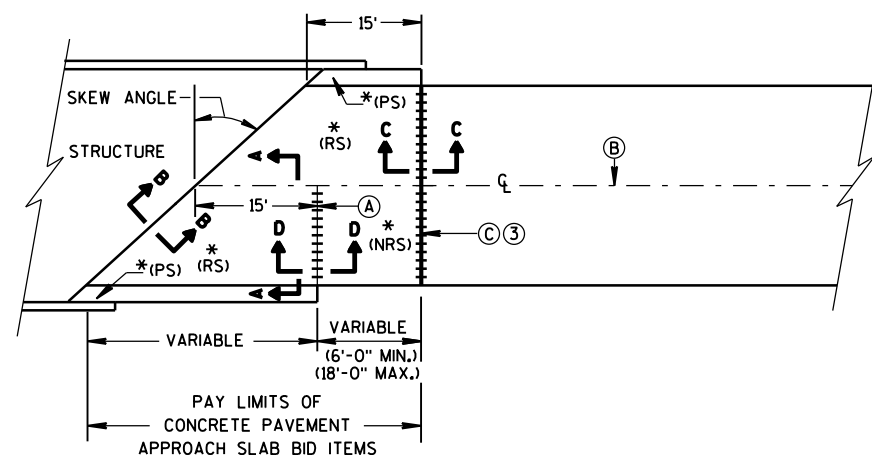
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
June, 2016 /S/ Jerry H. Zogg  
DATE ROADWAY STANDARDS DEVELOPMENT  
ENGINEER  
FHWA

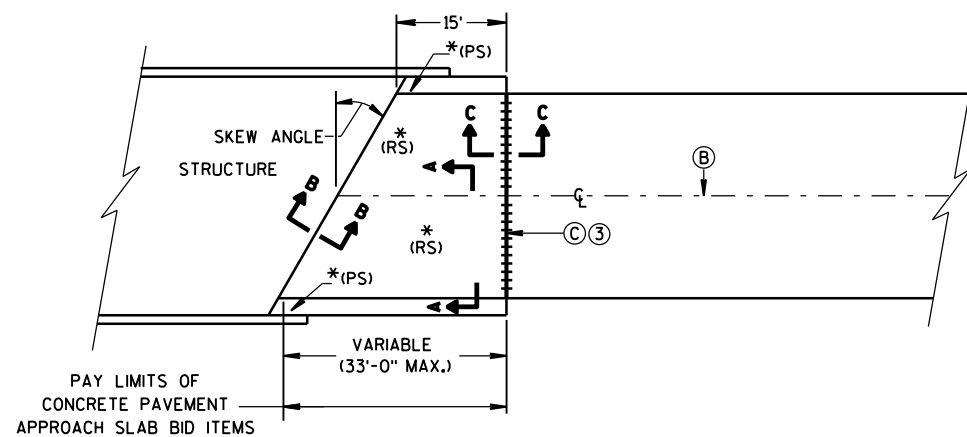




**SKewed APPROACH  
(PAVEMENT MORE THAN 2 LANES)**



**SKews > 20°  
(PAVEMENT WIDTH ≤ 30')**

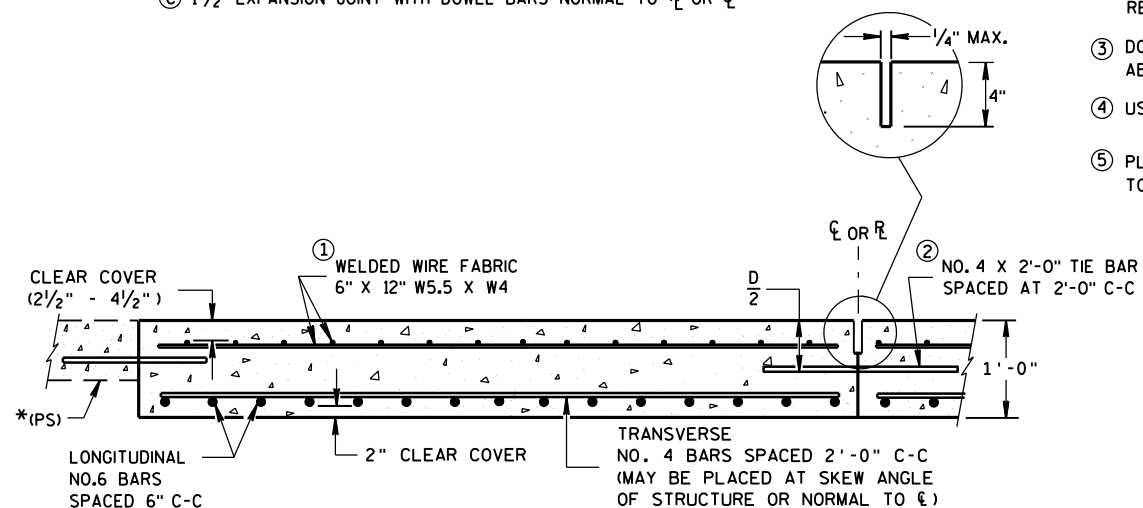


**SKews ≤ 20°  
(PAVEMENT WIDTH ≤ 30')  
APPROACH SLAB AND ADJACENT PAVEMENT**

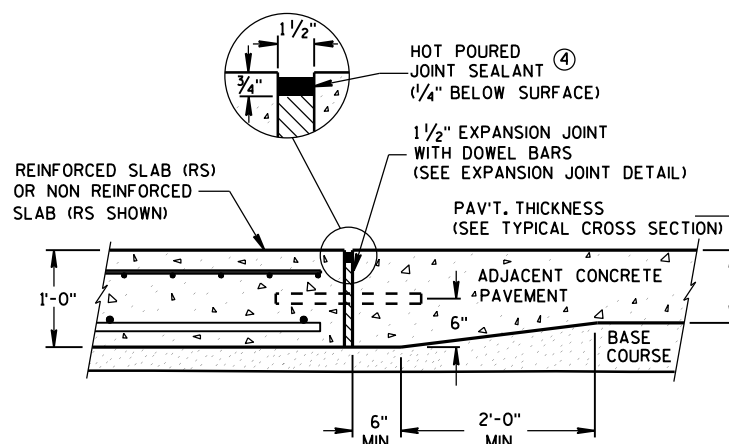
\* (RS) = REINFORCED CONCRETE SLAB  
\* (PS) = PAVED CONCRETE SHOULDER OR CONCRETE DRAINAGE SLAB  
(SEE DETAILS ELSEWHERE IN THE PLAN)  
\* (NRS) = NON-REINFORCED CONCRETE SLAB

\*\*\* STANDARD DOWEL BAR DIAMETER  
(SEE SDD 13C11, & SDD 13C13)

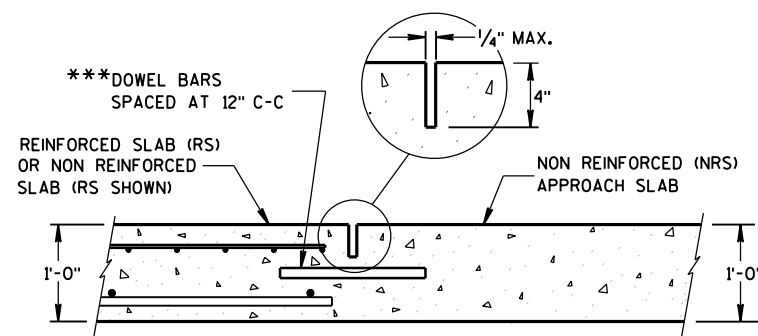
- (A) STANDARD CONTRACTION JOINT NORMAL TO  $\ell$  OR  $\ell_c$   
(B) STANDARD LONGITUDINAL JOINT WITH TIE BARS.  
(C) 1½" EXPANSION JOINT WITH DOWEL BARS NORMAL TO  $\ell$  OR  $\ell_c$



**SECTION A-A  
REINFORCEMENT POSITIONING DETAIL**



**SECTION C-C  
TRANSITION DETAIL  
APPROACH SLAB TO ADJACENT PAVEMENT**



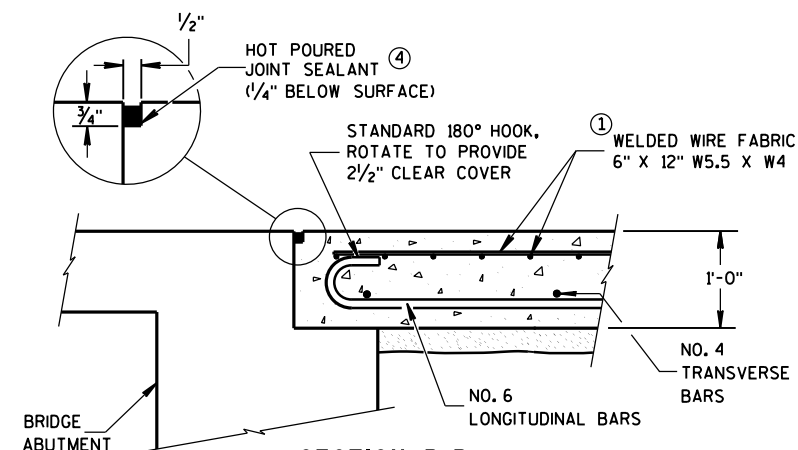
**SECTION D-D  
CONTRACTION JOINT**

## GENERAL NOTES

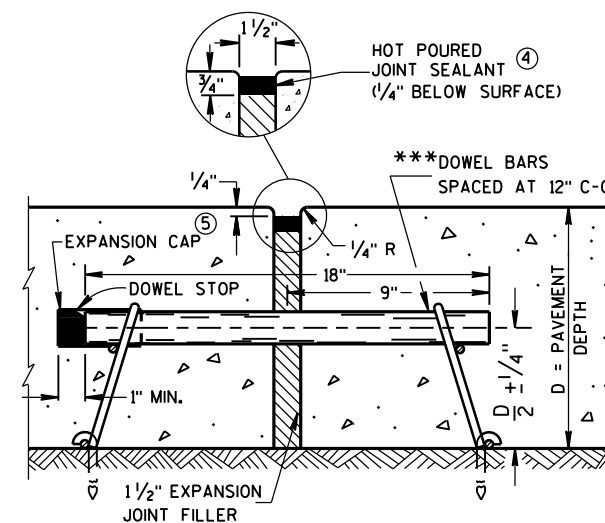
THE CONTRACTOR MAY SPLICE NO. 6 BARS IN THE APPROACH SLAB FOR SKEWED STRUCTURES ONLY. STAGGER SPLICES WITH A MAXIMUM OF ONE SPLICE PER BAR. THE LENGTH OF LAP IS 20 INCHES.

TACK WELD DOWEL BARS TO THE BASKETS ON ALTERNATE ENDS.

- THE CONTRACTOR MAY USE NO. 4 BARS SPACED AT 2'-0" C-C IN BOTH THE LONGITUDINAL AND TRANSVERSE DIRECTIONS FOR TOP REINFORCEMENT AS AN ALTERNATIVE TO THE WELDED WIRE FABRIC.
- THE CONTRACTOR MAY OMIT TIE BARS BETWEEN REINFORCED SLABS WHERE SLAB REINFORCEMENT BARS EXTEND ACROSS THE CENTERLINE OR REFERENCE LINE.
- DO NOT CONSTRUCT AN EXPANSION JOINT OR INSTALL DOWEL BARS WHEN ABUTTING AN HMA PAVEMENT.
- USE A JOINT SEALANT MEETING THE REQUIREMENTS OF ASTM D6690.
- PLACE EXPANSION CAP ON THE END OF THE DOWEL THAT IS NOT TACK WELDED TO THE BASKET. DO NOT FORCE DOWEL BAR PAST THE DOWEL STOP.



**SECTION B-B  
BEND DETAIL  
BOTTOM REINFORCEMENT**

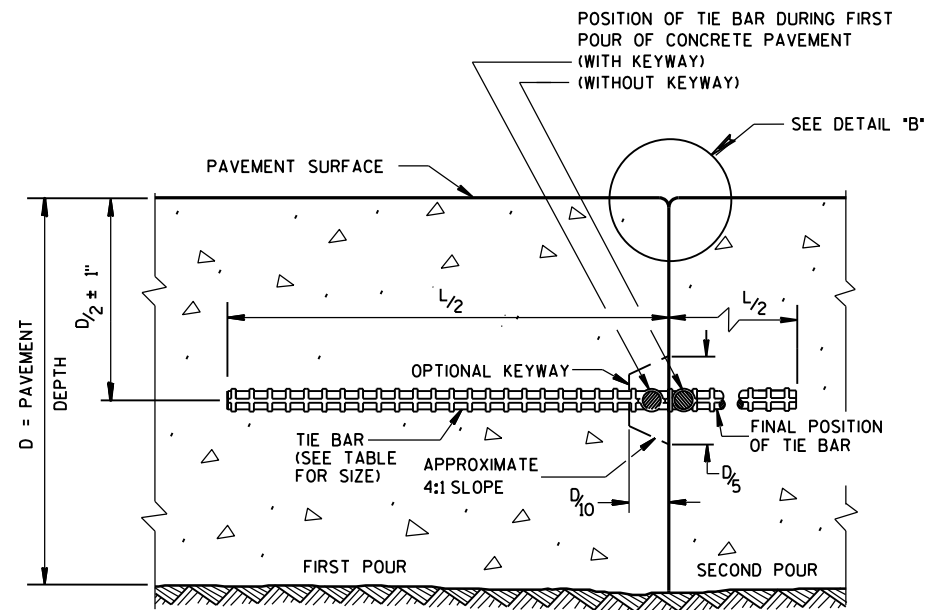


**EXPANSION JOINT DETAIL**

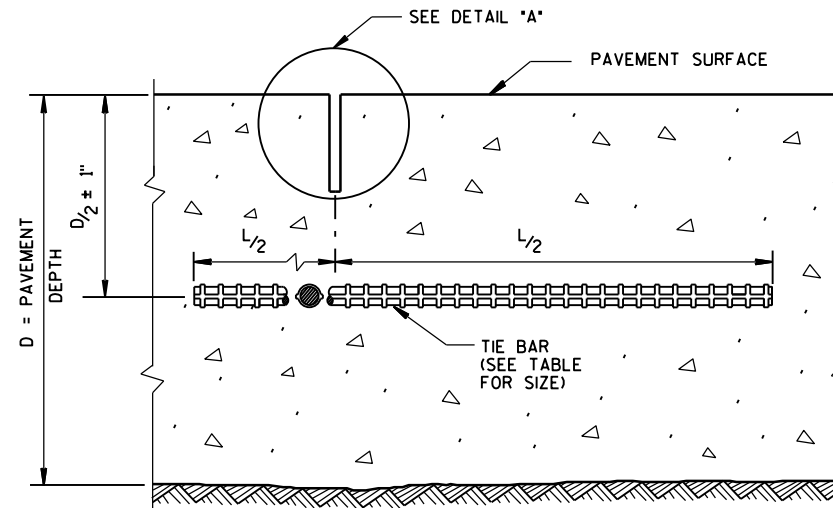
**CONCRETE PAVEMENT  
APPROACH SLAB**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
June, 2015 /S/ Peter Kemp, P.E.  
DATE PAVEMENT SUPERVISOR  
FHWA



CONSTRUCTION JOINT

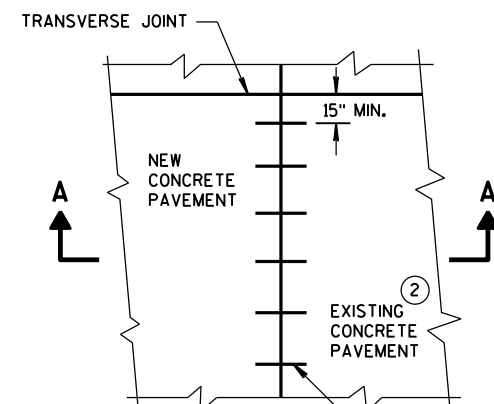


SAWED JOINT

## GENERAL NOTES

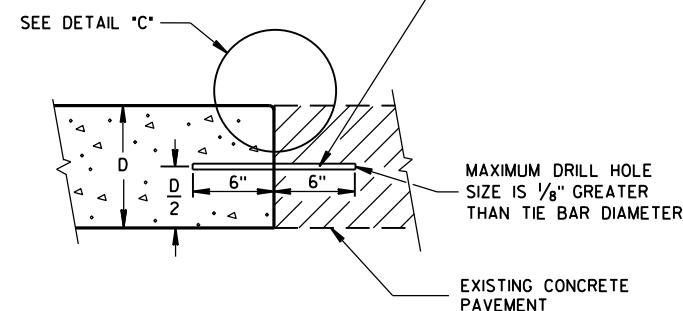
- DO NOT SEAL OR FILL LONGITUDINAL JOINTS.
- CREATE A LONGITUDINAL JOINT FOR PAVEMENT WIDTHS GREATER THAN 15 FEET.
- CORRELATE LONGITUDINAL JOINTS WITH LANE LINES WHEN POSSIBLE.

- ANCHOR TIE BARS INTO DRILLED HOLES WITH AN EPOXY.
- PAVEMENT THAT WAS IN PLACE PRIOR TO THE CONTRACT.

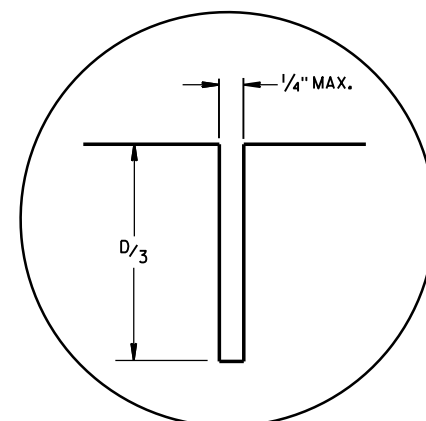


PLAN VIEW

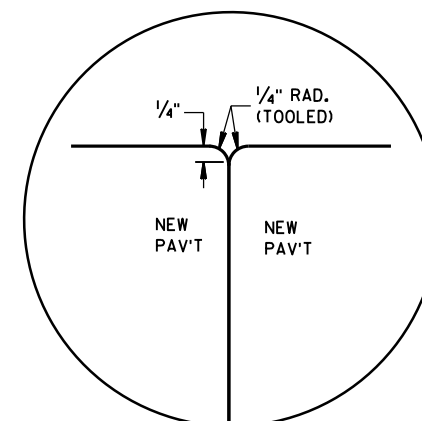
NO. 6 TIE BARS SPACED 30" C-C, INSTALLED PERPENDICULAR TO THE LONGITUDINAL JOINT. ①



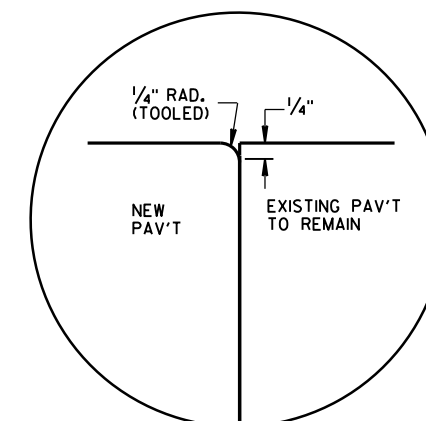
SECTION A-A  
LONGITUDINAL CONSTRUCTION JOINT  
TIE BARS ANCHORED  
INTO EXISTING PAVEMENT



DETAIL "A"



DETAIL "B"



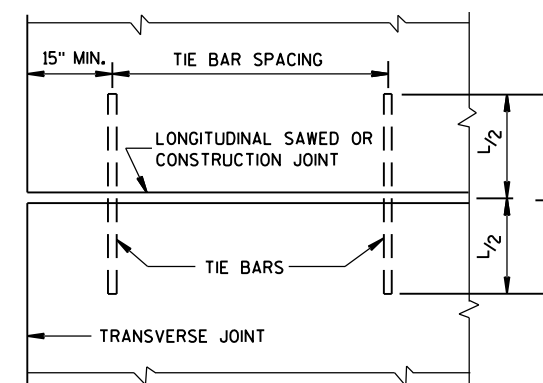
DETAIL "C"

TIE BAR TABLE

PAVEMENT DEPTH (D)	TIE BAR SIZE	TIE BAR LENGTH (L)	MAX. TIE BAR SPACING
< 10 1/2"	NO. 4	30"	36"
≥ 10 1/2"	NO. 5	36"	36"
	NO. 4 *	30"	24" **

\* SUBSTITUTE BENT BARS AT LONGITUDINAL JOINTS WHEN EQUIPMENT LIMITATIONS DURING CONSTRUCTION WARRANT (e.g. AUXILIARY LANES OR TURN LANES)

\*\* CONFORM TO 15" MINIMUM SPACING FROM TRANSVERSE JOINTS; SPACING BETWEEN TIE BARS WILL BE 30" AT TRANSVERSE JOINTS.

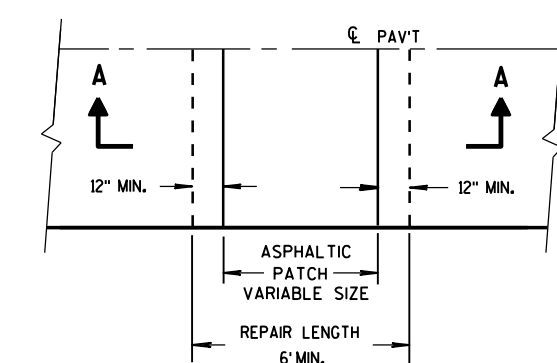


PLAN VIEW  
SHOWING LOCATION OF TIE BARS

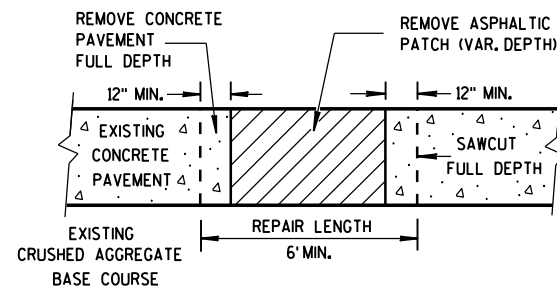
## CONCRETE PAVEMENT LONGITUDINAL JOINTS AND TIES

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

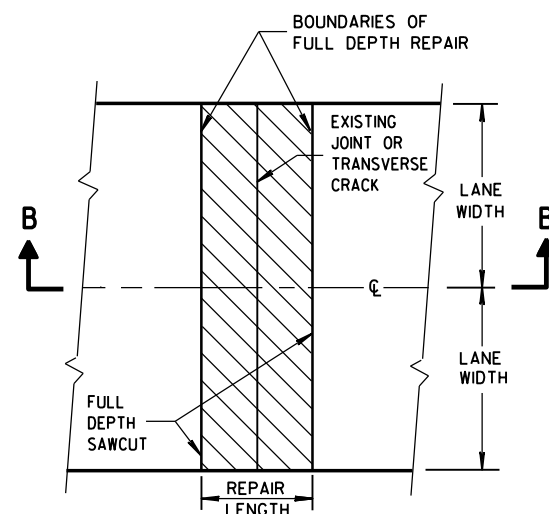
APPROVED  
June, 2015 /S/ Peter Kemp, P.E.  
DATE PAVEMENT SUPERVISOR  
FHWA



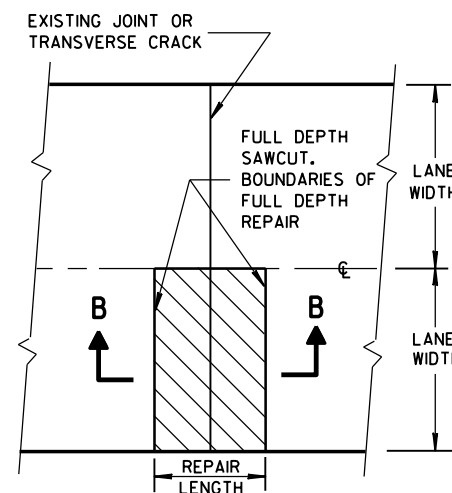
PLAN VIEW



SECTION A-A  
HMA PATCH REMOVAL



PLAN VIEW  
(DOUBLE LANE REPAIR)



PLAN VIEW  
(SINGLE LANE REPAIR)

FULL DEPTH CONCRETE PAVEMENT REMOVAL

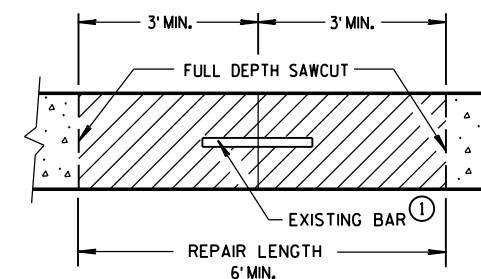
GENERAL NOTES

SAW CUT, DRILL, AND LIFT OUT EXISTING CONCRETE PAVEMENT WITHIN THE BOUNDARIES OF CONCRETE REPAIR AREAS. THE CONTRACTOR MAY MAKE ADDITIONAL SAW CUTS INSIDE THE REPAIR LIMITS TO REDUCE WEIGHT AND SIZE OF CONCRETE PIECES.

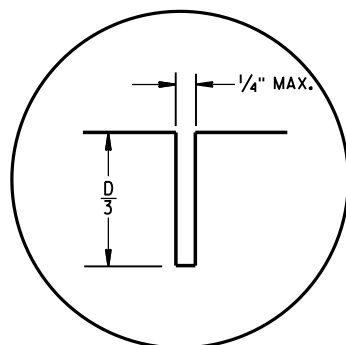
PROVIDE A 6-FOOT MINIMUM DISTANCE FROM BOUNDARIES OF CONCRETE REPAIR AREAS TO ADJACENT TRANSVERSE JOINT OR CRACK IN THE SAME LANE.

THE LENGTH OF THE REPAIRS MAY VARY FROM THE DIMENSIONS SHOWN IF THE EXISTING CONCRETE PAVEMENT IS NONDOWELED AND THE PAVEMENT IS TO BE OVERLAID AFTER REPAIRING.

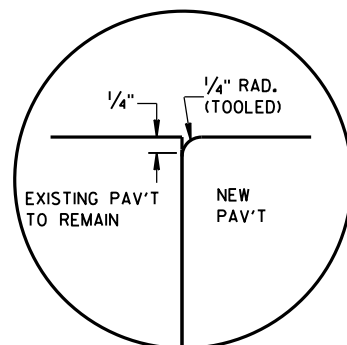
① DOWEL BARS MIGHT NOT EXIST.



SECTION B-B  
CONCRETE REMOVAL

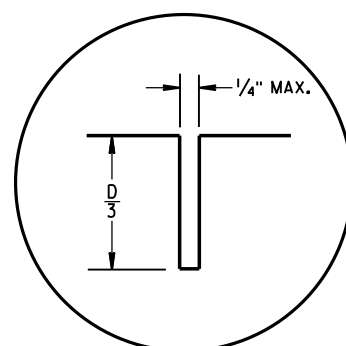


C1

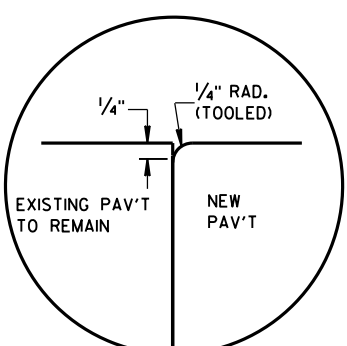


C2

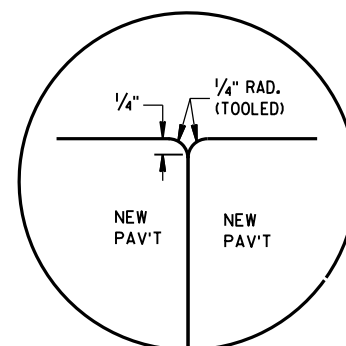
## TRANSVERSE JOINTS



L1



L2



L3

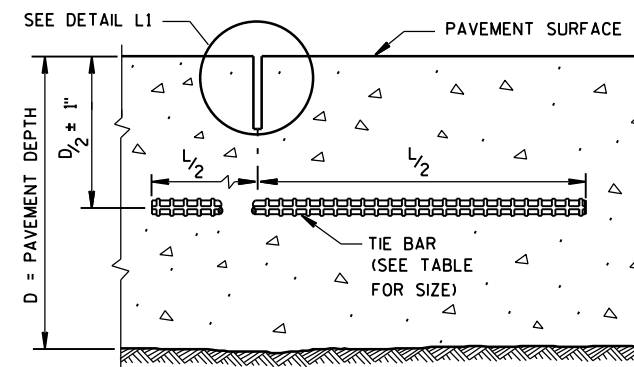
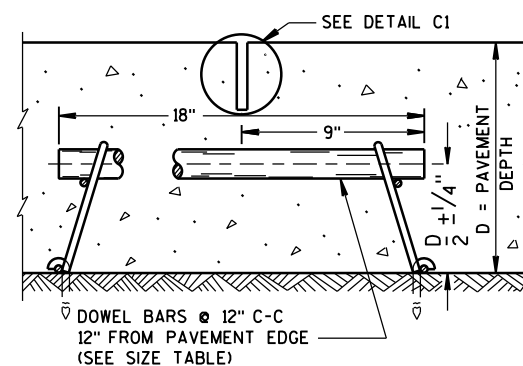
## LONGITUDINAL JOINTS

TIE BAR TABLE

PAVEMENT DEPTH (D)	TIE BAR SIZE	TIE BAR LENGTH (L)	MAX. TIE BAR SPACING
< 10 1/2"	NO. 4	30"	36"
≥ 10 1/2"	NO. 5	36"	36"
	NO. 4 *	30"	24" **

\* SUBSTITUTE BENT BARS AT LONGITUDINAL JOINTS WHEN EQUIPMENT LIMITATIONS DURING CONSTRUCTION WARRANT (e.g. AUXILIARY LANES OR TURN LANES)

\*\* CONFORM TO 15" MINIMUM SPACING FROM TRANSVERSE JOINTS; SPACING BETWEEN TIE BARS WILL BE 30" AT TRANSVERSE JOINTS.

SECTION C-C  
SAWED LONGITUDINAL JOINTSECTION F-F  
CONTRACTION JOINT

## GENERAL NOTES

INSTALL DOWEL BARS PARALLEL TO THE PAVEMENT CENTERLINE AND PAVEMENT SURFACE.

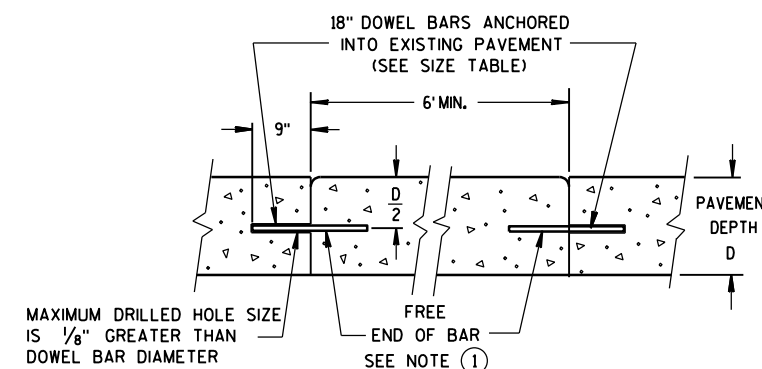
CONCRETE PAVEMENT REPAIRS OF EXISTING NONDOWELED CONCRETE PAVEMENTS DO NOT NEED TO BE DOWELED.

DO NOT SEAL OR FILL JOINTS.

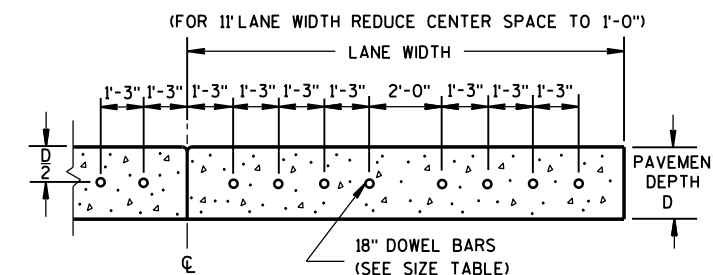
ANCHOR DOWEL BARS AND TIE BARS INTO DRILLED HOLES WITH AN EPOXY.

FOR MULTI-LANE CONCRETE PAVEMENT REPLACEMENTS, PROVIDE A MINIMUM DISTANCE OF 15 INCHES FROM ALL TRANSVERSE JOINTS OR EDGES OF REPLACEMENT TO THE CENTER OF THE TIE BAR NEAREST THAT JOINT OR EDGE.

① APPLY A THIN UNIFORM COATING OF SURFACE TREATMENT TO THE FREE END OF DOWEL BARS TO PREVENT BONDING.



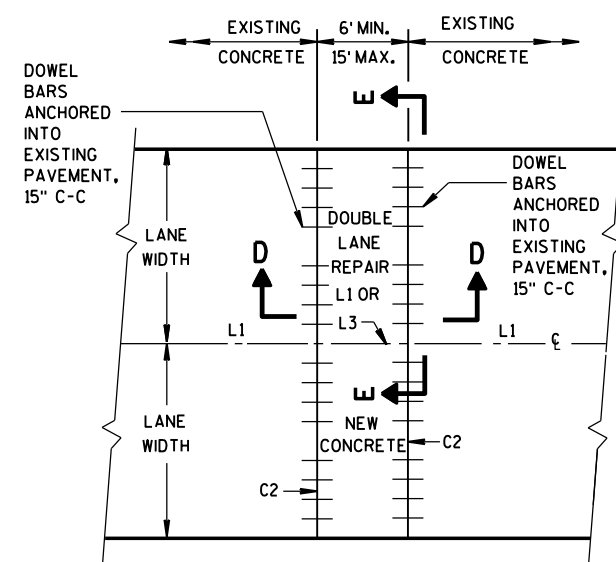
SECTION D-D

SECTION E-E  
DRILLED DOWEL BAR CONSTRUCTION JOINTPAVEMENT DEPTH, DOWEL BAR SIZE  
AND JOINT SPACING TABLE

PAVEMENT DEPTH (D)	DOWEL BAR DIAMETER	CONTRACTION JOINT SPACING
5 1/2", 6", 6 1/2"	NONE	12'
7", 7 1/2"	1"	14'
8", 8 1/2"	1 1/4"	15'
9", 9 1/2"	1 1/4"	15'
10" & ABOVE	1 1/2"	15'

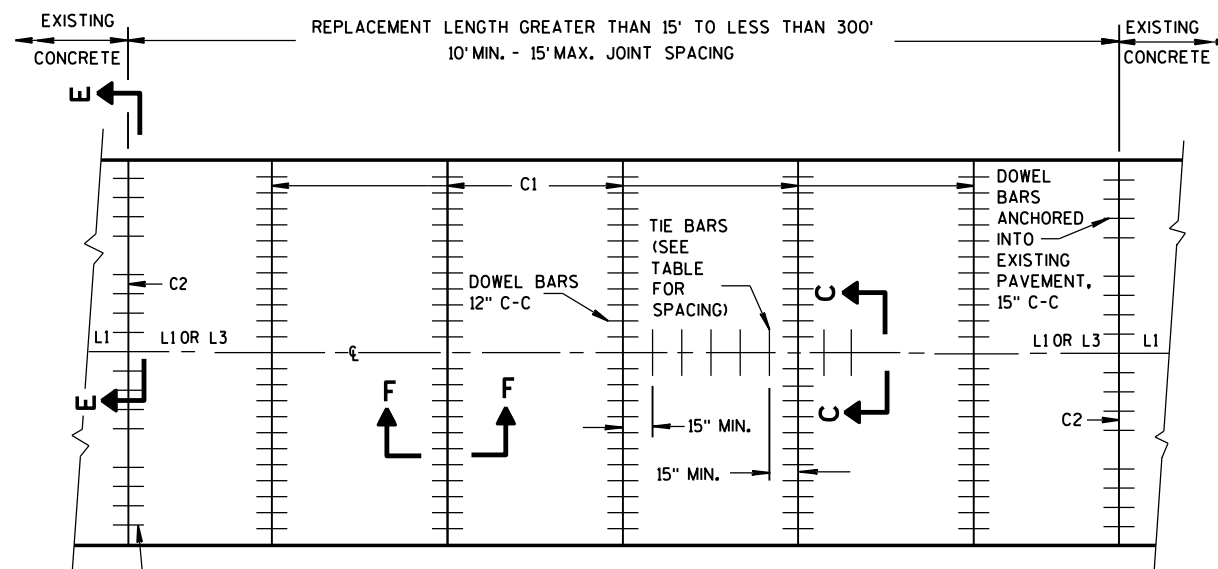
CONCRETE PAVEMENT  
REPAIR AND REPLACEMENT

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



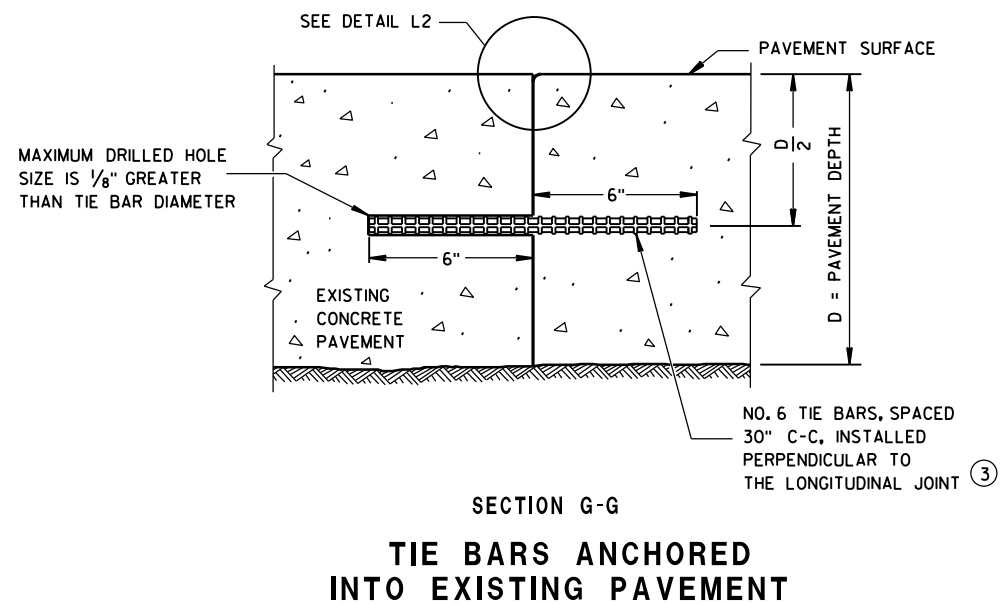
PLAN VIEW

MULTI-LANE CONCRETE PAVEMENT REPAIR



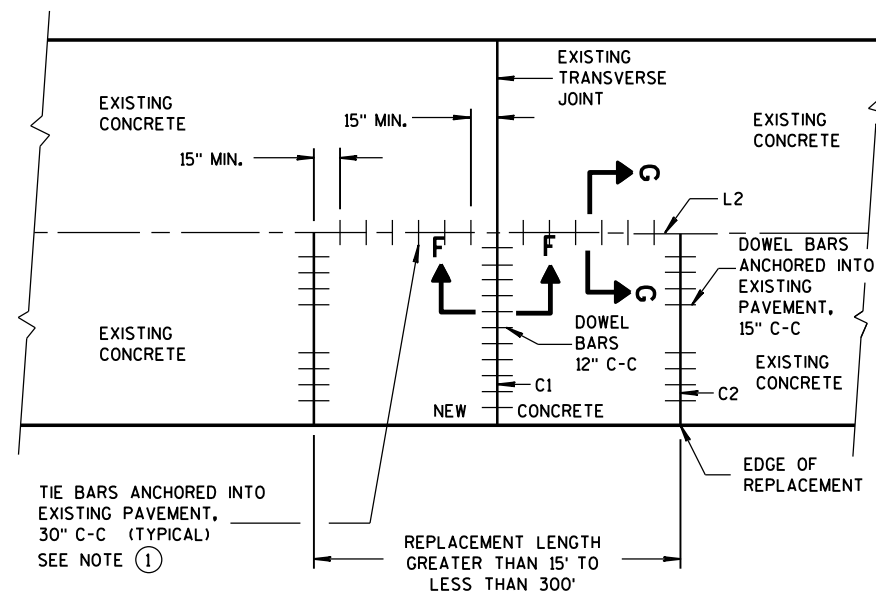
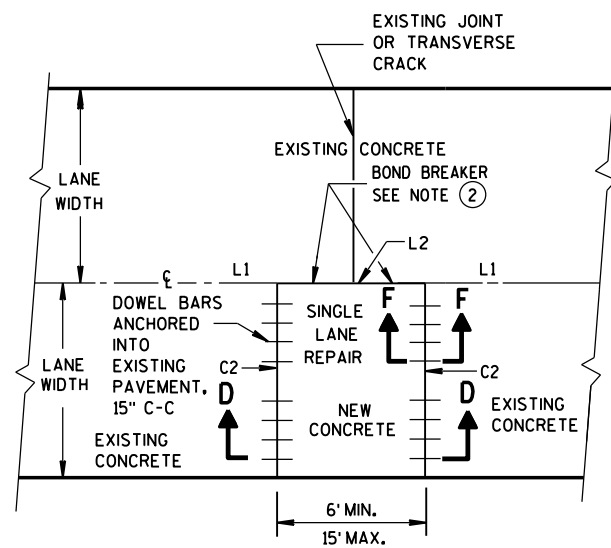
PLAN VIEW

MULTI-LANE CONCRETE PAVEMENT REPLACEMENT



## GENERAL NOTES

- ① WITH THE APPROVAL OF THE ENGINEER, FOR SINGLE LANE PAVEMENT REPLACEMENTS LESS THAN 30 FEET IN LENGTH, THE CONTRACTOR MAY INSTALL DRILLED TIE BARS ON 6:1 SKEW HORIZONTALLY, DIRECTION OF SKEW ALTERNATING WITH EACH SUCCESSIVE BAR. DRIVE SKEWED TIE BARS TO A DEPTH OF 6 INCHES IN A HOLE OF SUCH A DIAMETER AS TO PROVIDE A TIGHT DRIVEN FIT.
- ② USE AN ENGINEER-APPROVED BOND BREAKER (E.G. RELEASE AGENT, CURING COMPOUND) FOR SINGLE LANE REPAIRS UP TO 15 FEET IN LENGTH.
- ③ ANCHOR TIE BARS INTO DRILLED HOLES WITH AN EPOXY.

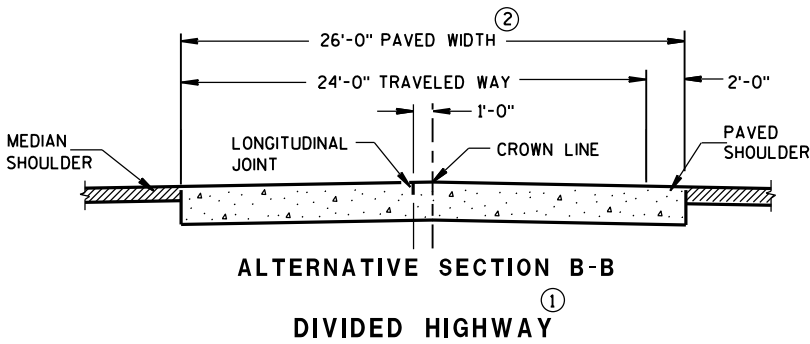
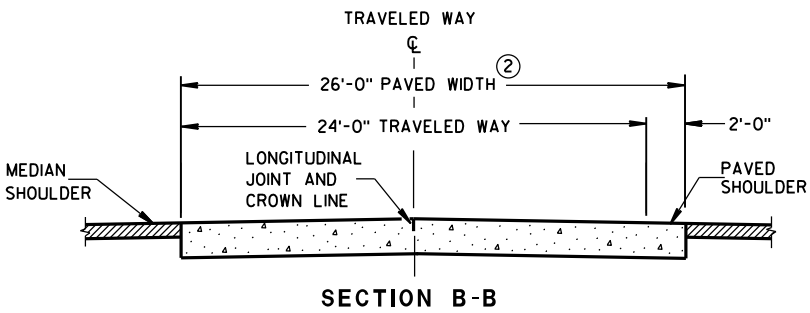
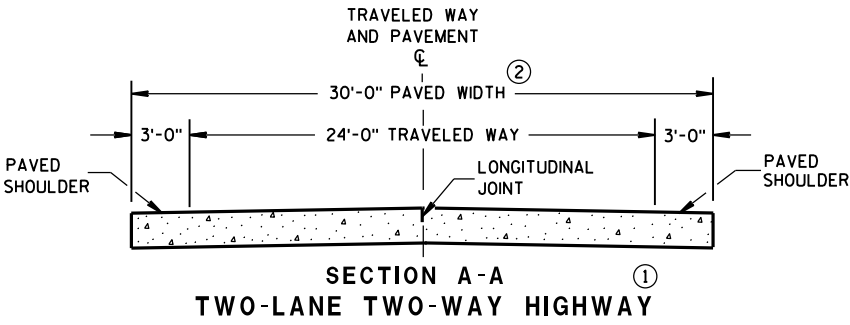


**CONCRETE PAVEMENT  
REPAIR AND REPLACEMENT**

**STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION**

APPROVED  
Sept., 2015  
DATE  
FHWA

/S/ Peter Kemp, P.E.  
PAVEMENT SUPERVISOR



GENERAL NOTES

CONTRACTION JOINTS

CONSTRUCT TRANSVERSE CONTRACTION JOINTS NORMAL TO THE CENTERLINE. SHOW THE LOCATION OF CONTRACTION JOINTS THROUGH INTERSECTIONS ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT SEAL OR FILL CONTRACTION JOINTS.

INSTALL DOWEL BARS PARALLEL TO THE PAVEMENT CENTERLINE AND PAVEMENT SURFACE.

FOR PAVEMENT SLABS OF VARYING WIDTHS, LOCATE THE OUTER MOST DOWEL BAR SO THAT THE CENTER OF THE BAR IS A MINIMUM OF 6 INCHES AND A MAXIMUM OF 18 INCHES FROM THE FREE EDGE OF PAVEMENT.

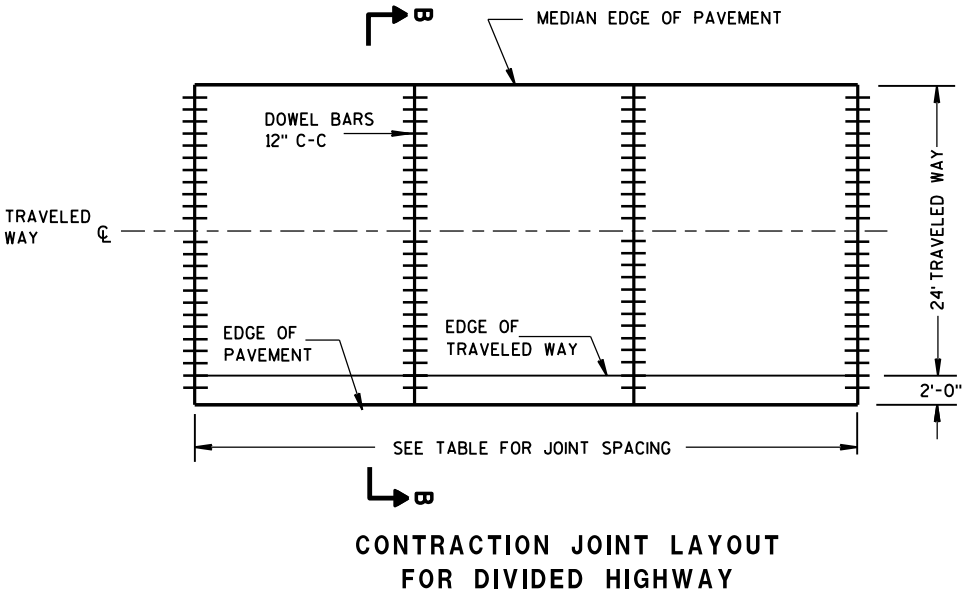
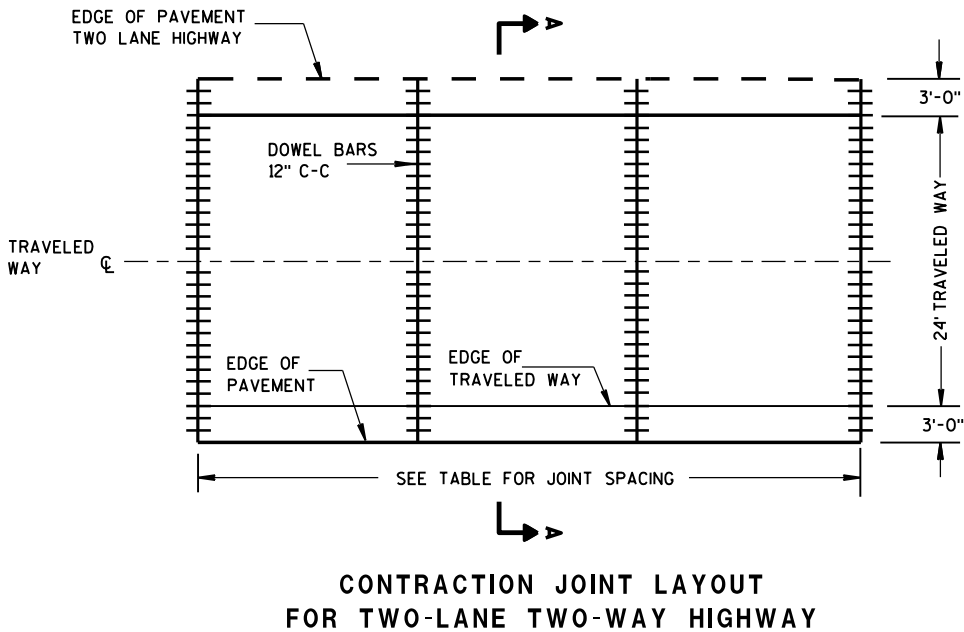
CONSTRUCTION JOINTS

LOCATE CONSTRUCTION JOINTS A MINIMUM OF 6 FEET FROM THE NEAREST CONTRACTION JOINT AND ALIGN PARALLEL TO CONTRACTION JOINTS.

- ① REFER TO TYPICAL CROSS SECTIONS FOR ADDITIONAL DETAILS.
- ② MEASURE THE ENTIRE PAVED WIDTH INCLUDING THE PORTION(S) LABELED PAVED SHOULDER AS CONCRETE PAVEMENT.

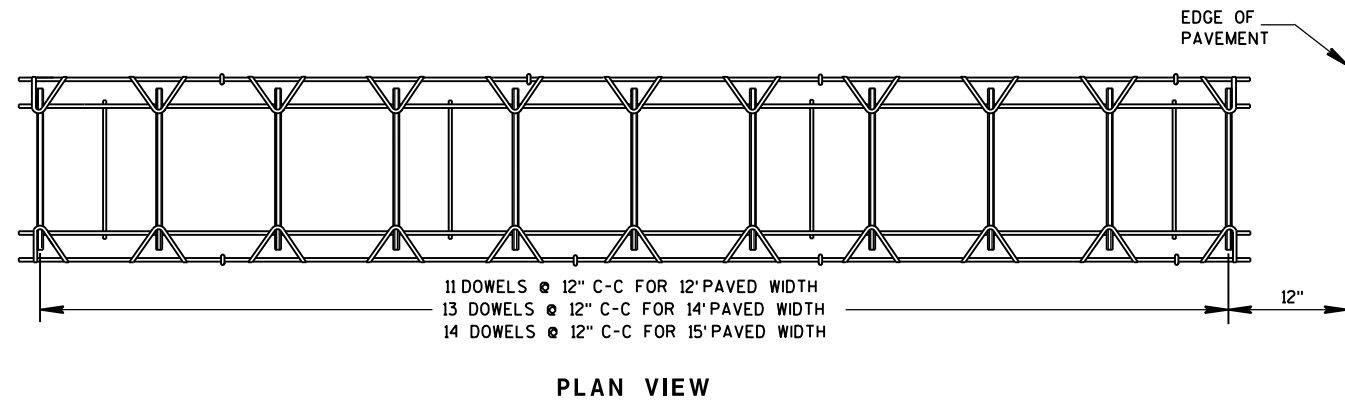
PAVEMENT DEPTH, DOWEL BAR SIZE AND JOINT SPACING TABLE

PAVEMENT DEPTH (D)	DOWEL BAR DIAMETER	CONTRACTION JOINT SPACING
5 1/2", 6", 6 1/2"	NONE	12'
7", 7 1/2"	1"	14'
8", 8 1/2"	1 1/4"	15'
9", 9 1/2"	1 1/4"	15'
10" & ABOVE	1 1/2"	15'

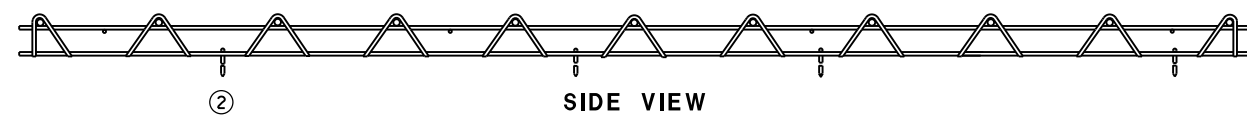


RURAL DOWELED  
CONCRETE PAVEMENT

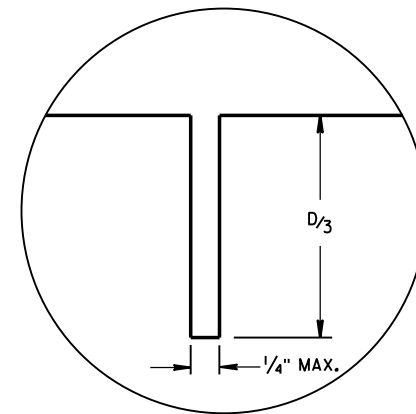
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



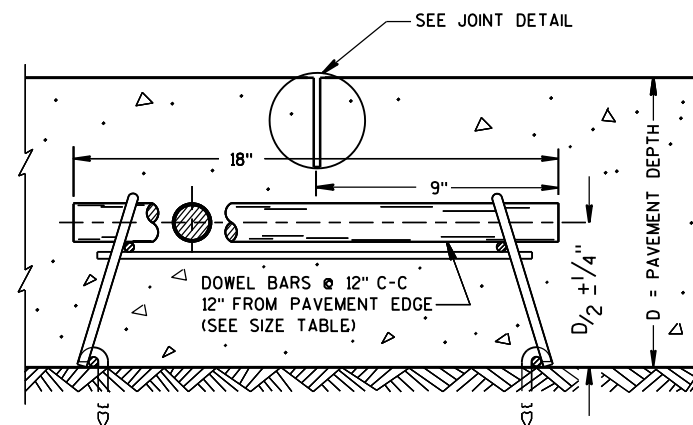
PLAN VIEW



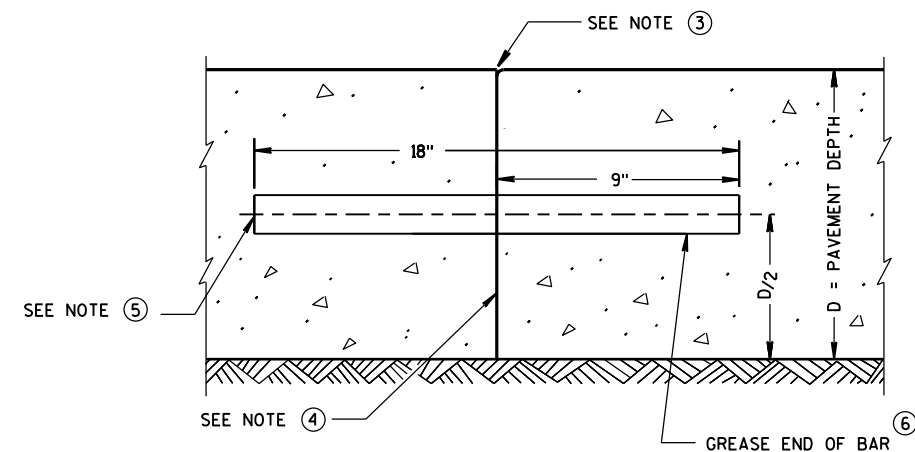
CONTRACTION JOINT DOWEL ASSEMBLY ①



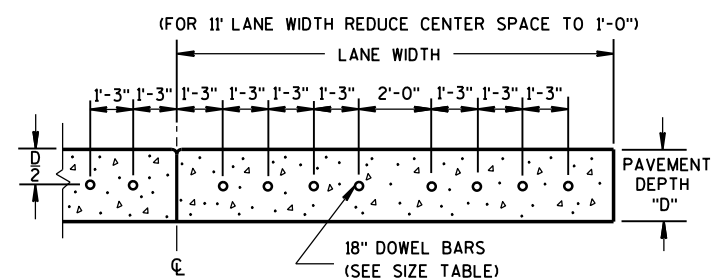
JOINT DETAIL



DOWELED CONTRACTION JOINT



TRANSVERSE CONSTRUCTION JOINT



DRILLED DOWEL BAR CONSTRUCTION JOINT ⑦

## GENERAL NOTES

- ① OBTAIN THE ENGINEER'S APPROVAL FOR THE USE OF ALTERNATIVE DESIGNS OF THE DOWEL ASSEMBLY. USE MECHANICAL DOWEL BAR INSERTERS OR DOWEL ASSEMBLIES WHEN CONSTRUCTING CONTRACTION JOINTS.
- ② SECURE BASKETS WITH ANCHORS TO HOLD DOWEL BARS IN THE CORRECT POSITION AND ALIGNMENT. TYPE, LOCATION, NUMBER AND LENGTH OF ANCHORS ARE DEPENDENT UPON FIELD CONDITIONS.
- ③ FORM OR SAW CONSTRUCTION JOINTS. PROVIDE A  $1/4$ -INCH RADIUS AT FORMED JOINTS.
- ④ PROVIDE A SMOOTH VERTICAL FACE FOR THE ENTIRE DEPTH OF THE PAVEMENT WHEN FORMING CONSTRUCTION JOINTS.
- ⑤ INSTALL DOWEL BARS AT CONSTRUCTION JOINTS BY FORMING OR DRILLING. INSTALL FORMED DOWEL BARS 12 INCHES C-C AND 12 INCHES FROM PAVEMENT EDGE. REMOVE EXCESS CONCRETE FROM THE FREE END OF THE DOWEL BAR IF DOWEL BARS ARE FORMED THROUGH A HEADER BOARD. INSTALL DRILLED DOWEL BARS ACCORDING TO *DRILLED DOWEL BAR CONSTRUCTION JOINT* DETAIL.
- ⑥ APPLY A THIN UNIFORM COATING OF SURFACE TREATMENT TO THE FREE END OF DOWEL BARS TO PREVENT BONDING.
- ⑦ ANCHOR DOWEL BARS INTO DRILLED HOLES WITH AN EPOXY. MAXIMUM DRILLED HOLE SIZE IS  $1/8$ -INCH GREATER THAN DOWEL BAR DIAMETER, 9 INCHES IN LENGTH.

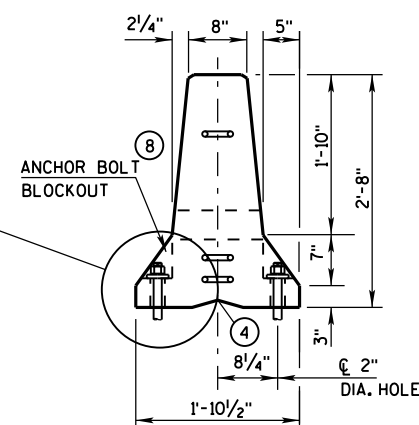
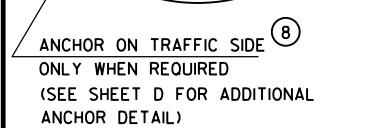
RURAL DOWELED  
CONCRETE PAVEMENTSTATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

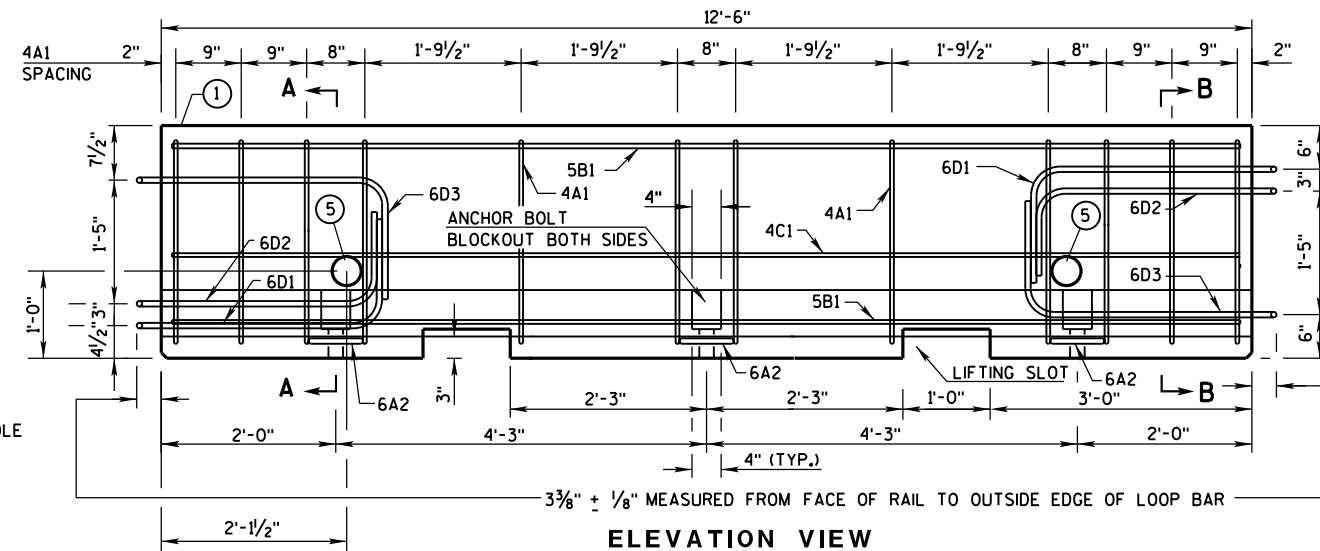
5/3/2013  
DATE

FHWA

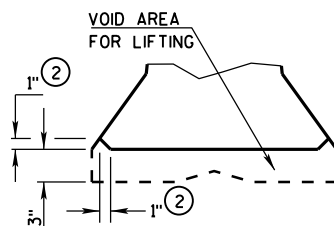
/S/ Deb Bischoff  
PAVEMENT POLICY & DESIGN ENGINEER



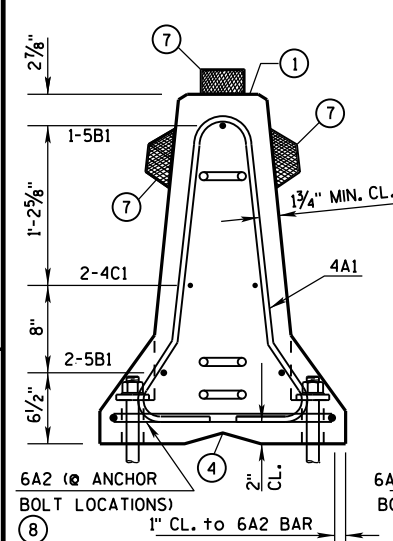
**END VIEW**



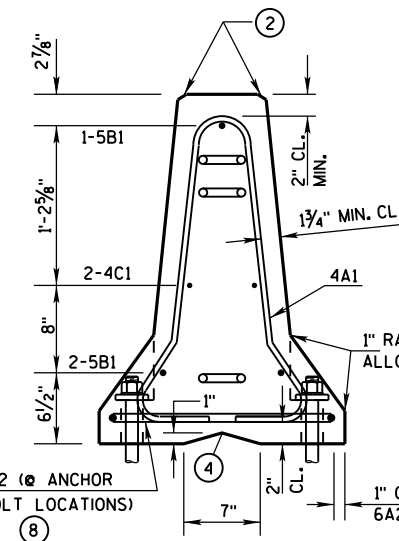
**ELEVATION VIEW**



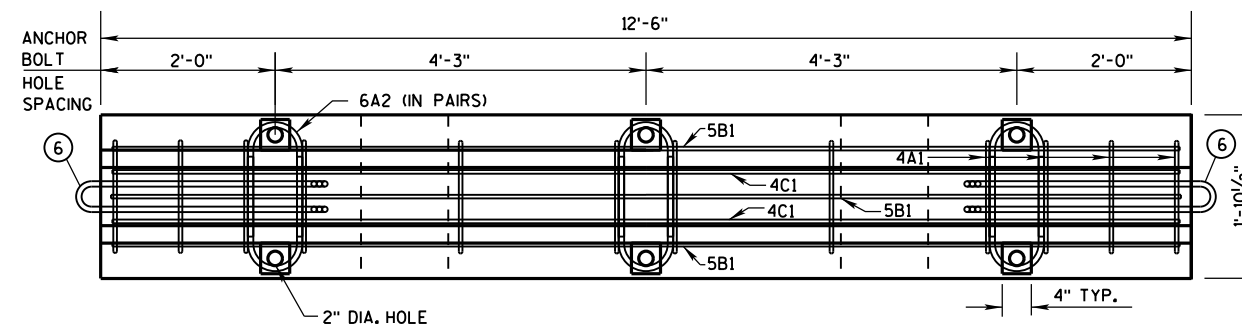
**DETAIL "B"**  
**LIFTING SLOT DETAIL**



**SECTION A-A**  
(STIRRUP PLACEMENT)

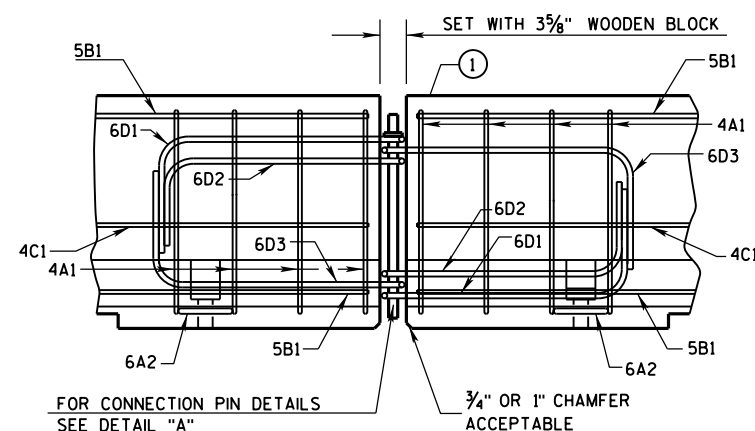


**SECTION B-B**  
(STIRRUP PLACEMENT)

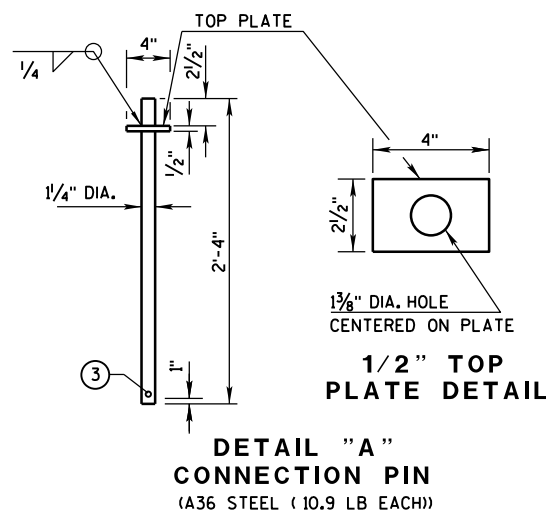


### PLAN VIEW

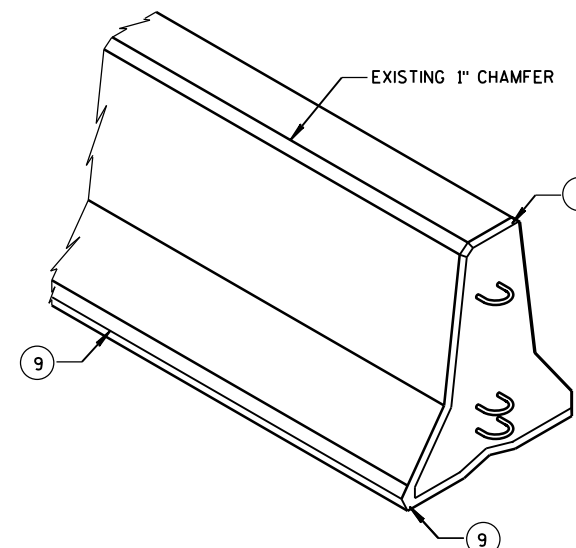
### DETAILS OF BARRIER SECTION



## DETAILS OF BARRIER CONNECTION



**DETAIL "A"**  
**CONNECTION PIN**  
(A36 STEEL (10.9 LB EACH))



## GENERAL NOTES

THESE GENERAL NOTES APPLY TO SHEETS 14B7-14(d) THRU 14B7-14(h).

DO NOT INTERMIX CONCRETE BARRIER TEMPORARY PRECAST, 12'-6" (CBTP12.5) WITH OTHER TEMPORARY CONCRETE BARRIERS.

USE ASTM A-615, GRADE 60, DEFORMED STEEL BARS FOR BARS 4A1, 6A2, 5B1 AND 4C1 IN THE BARRIER SECTION AND FOR 4V1, 4V2, 4V3, 4V4, 4V5, 4V6, 4F1, 4F2 AND 5F3 IN THE BARRIER TAPER SECTION.

LOOP BARS 6D1, 6D2 AND 6D3 SHALL BE  $\frac{3}{4}$ " SMOOTH STEEL BARS WITH A MINIMUM YIELD STRENGTH OF 60 KSI, A TENSILE STRENGTH OF NOT LESS THAN 1.25 TIMES THE YIELD STRENGTH BUT A MINIMUM OF 80 KSI, A MINIMUM 14% ELONGATION IN 8 INCHES AND PASSING A 180 DEGREE BEND TEST USING A 3- $\frac{1}{2}$ " PIN BEND DIAMETER FOR BEND TESTS. THE LOOPS SHALL BE INSTALLED WITHIN  $\frac{1}{8}$ " OF THE PLAN DIMENSION.

CONSTRUCT LIFTING SLOTS AS SPECIFIED ON THE PLANS TO FACILITATE THE DRAINAGE OF WATER AFTER INSTALLATION.

PLACE BARRIER ON A PAVED SURFACE. REMOVE ALL LOOSE DIRT AND SAND FROM THE ROADWAY SURFACE PRIOR TO PLACEMENT OF THE BARRIER.

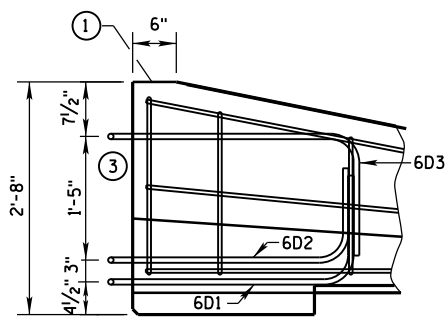
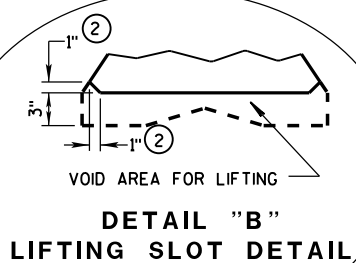
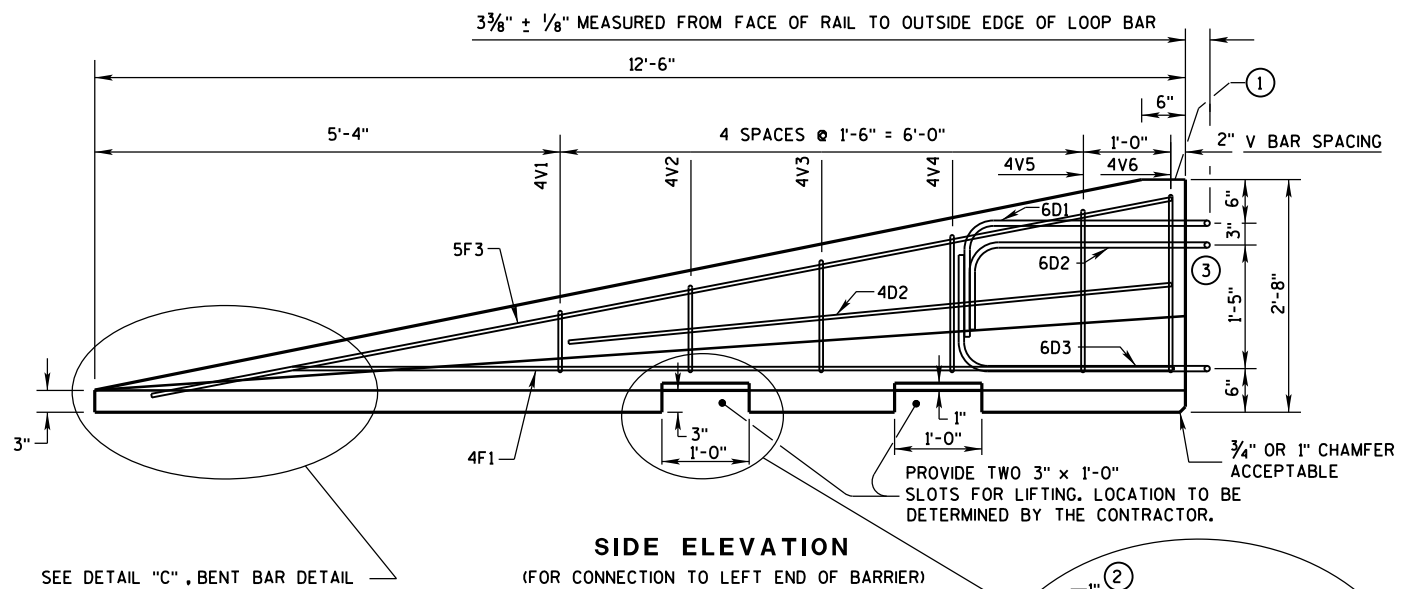
INSTALL MECHANICAL OR ADHESIVE ANCHORS PER MANUFACTURER'S RECOMMENDATIONS.  
PROVIDE MANUFACTURER'S INFORMATION TO PROJECT ENGINEER.

- ① MARK ONE END OF EACH BARRIER PERMANENTLY BY FORMING INTO THE BARRIER THE FOLLOWING INFORMATION:
  - a. TYPE: WICBTP
  - b. MANUFACTURER
  - c. DATE MANUFACTURED (MONTH AND YEAR)
- ② 1" CHAMFER TO PREVENT SPALLING.
- ③ A  $\frac{3}{8}$ " HOLE IN THE CONNECTION PIN, AT THE LOCATION SHOWN, IS ACCEPTABLE, BUT NOT REQUIRED..
- ④ "V" NOTCH IS OPTIONAL.
- ⑤ THE 4" DIAMETER, 11 GAUGE STEEL, ROUND MECHANICAL TUBING SLEEVE FOR LIFTING (OPTIONAL).
- ⑥ NEVER USE LOOP BARS (6D1, 6D2 OR 6D3) TO LIFT, MOVE OR REPOSITION THE BARRIER.
- ⑦ USE DELINEATORS CONFORMING TO SECTION 633 OF THE STANDARD SPECIFICATIONS. CONTRACTOR MAY USE ALTERNATE SHAPES AND HOUSING. INSTALL DELINEATORS ACCORDING TO MANUFACTURER'S INSTRUCTION. INSTALL YELLOW REFLECTORS WHEN BARRIER IS LOCATED TO THE LEFT OF TRAFFIC AND WHITE REFLECTORS WHEN BARRIER IS LOCATED TO THE RIGHT OF TRAFFIC. SPACE DELINEATORS A MAXIMUM OF 25 FEET APART. PROVIDE TOP MOUNTED DELINEATORS IN ADDITION TO THE SIDE MOUNTED DELINEATORS ON ALL BARRIER INSTALLATIONS LOCATED ON A CURVED ALIGNMENT LONGER THAN 200 FEET AND ON BARRIERS USED TO SEPARATE OPPOSING TRAFFIC.
- ⑧ SEE SHEET D FOR ANCHORING CRITERIA.
- ⑨ 1" CHAMFER OPTIONAL.

CONCRETE BARRIER  
TEMPORARY PRECAST, 12'-6"

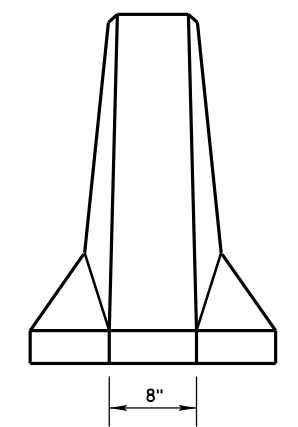
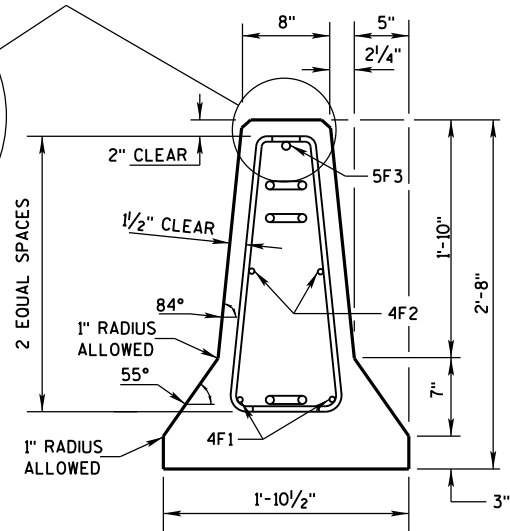
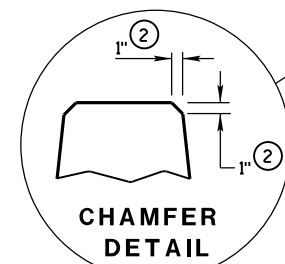
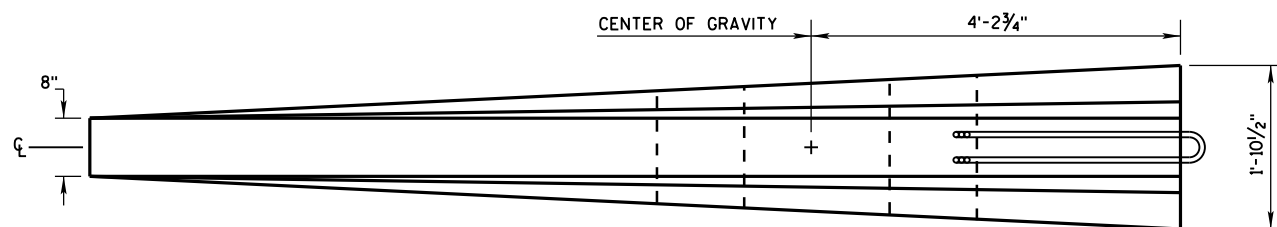
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



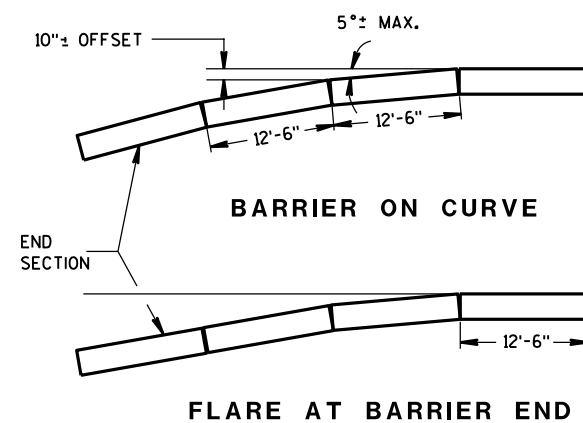


## GENERAL NOTES

- ① MARK ONE END OF EACH BARRIER PERMANENTLY BY FORMING INTO THE BARRIER THE FOLLOWING INFORMATION:
  - a. TYPE WICBTP
  - b. MANUFACTURER
  - c. DATE MANUFACTURED (MONTH AND YEAR)
- ② 1" CHAMFER TO PREVENT SPALLING.
- ③ NEVER USE LOOP BARS (6D1, 6D2 OR 6D3) TO LIFT, MOVE OR REPOSITION THE BARRIER.



## DETAILS OF BARRIER TAPER SECTION



POSTED SPEED, (MPH)	FLARE RATE
40 OR LESS	6:1
45 OR GREATER	8:1

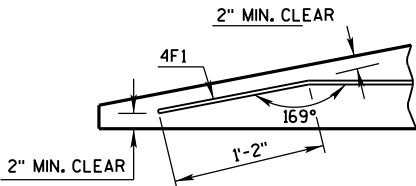
CONCRETE BARRIER  
TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

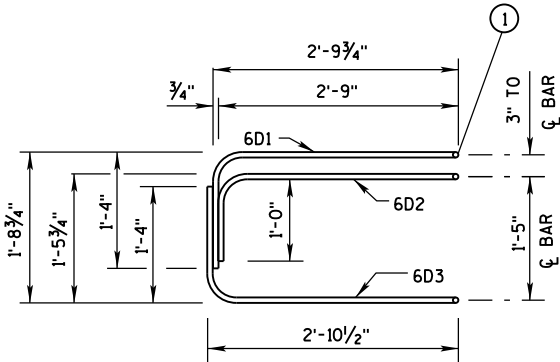
BARRIER TAPER SECTION  
BILL OF MATERIALS

(PER 12'-6" BARRIER TAPER SECTION)

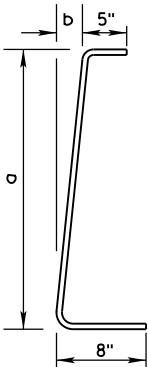
BAR	BAR SIZE	NO. OF BARS	LENGTH FT.
4V1	4	2	1'-11"
4V2	4	2	2'-2"
4V3	4	2	2'-6"
4V4	4	2	2'-9"
4V5	4	2	3'-2"
4V6	4	2	3'-4"
4F1	4	2	12'-0"
4F2	4	2	7'-6"
5F3	5	1	11'-9"
LOOP ASSEMBLY			
6D1	6	1	8'-5"
6D2	6	1	7'-7"
6D3	6	1	8'-6"



DETAIL "C"  
BENT BAR DETAIL



ELEVATION  
LOOP BAR ASSEMBLY



BAR	a	b
V1	10"	1"
V2	1'-1"	1 1/4"
V3	1'-5"	1 5/8"
V4	1'-8"	1 7/8"
V5	2'-0 1/2"	2 3/8"
V6	2'-3"	2 3/4"

4V BARS  
2 AT EACH SIZE REQUIRED  
FOR STIRRUP ASSEMBLY

TAPER BARRIER SECTION

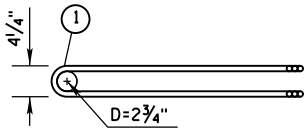
GENERAL NOTES

① NEVER USE LOOP BARS (6D1, 6D2 OR 6D3) TO LIFT, MOVE OR REPOSITION THE BARRIER.

BARRIER SECTION  
BILL OF MATERIALS

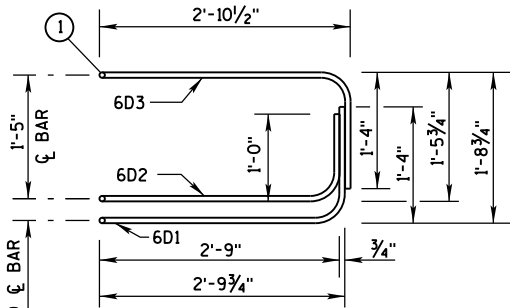
(PER 12'-6" BARRIER SECTION)

BAR	BAR SIZE	NO. OF BARS	LENGTH FT.
4A1	4	12	6'-0"
6A2	6	6	2'-11"
5B1	5	3	12'-2"
4C1	4	2	12'-2"
LOOP ASSEMBLY			
6D1	6	2	8'-5"
6D2	6	2	7'-7"
6D3	6	2	8'-6"

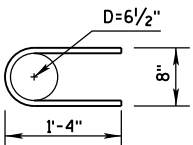


PLAN VIEW  
LOOP BAR ASSEMBLY

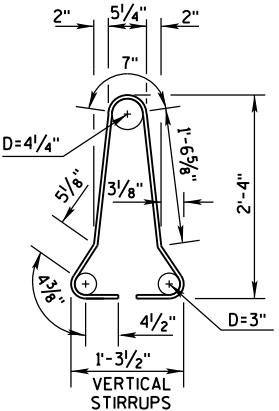
(MARKED END SHOWN, INVERT FOR OTHER END)



ELEVATION VIEW



6A2

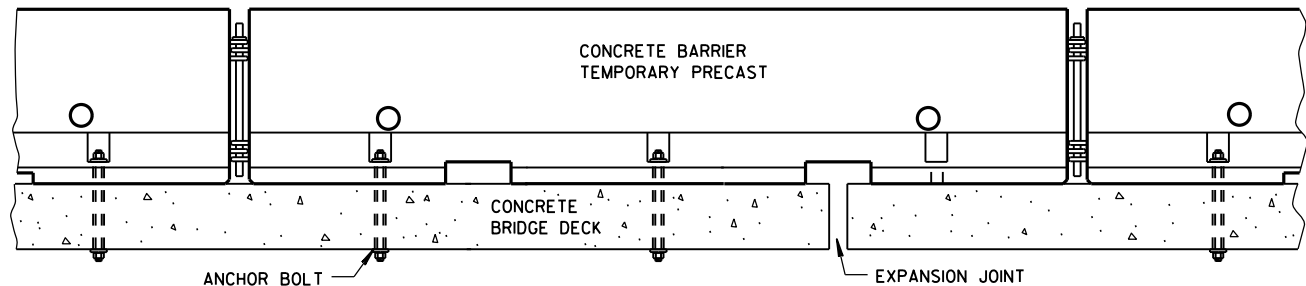
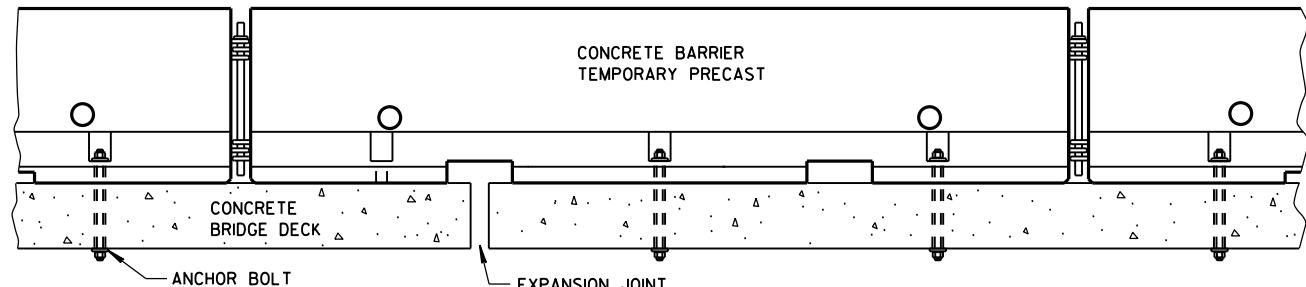


4A1

BARRIER SECTION

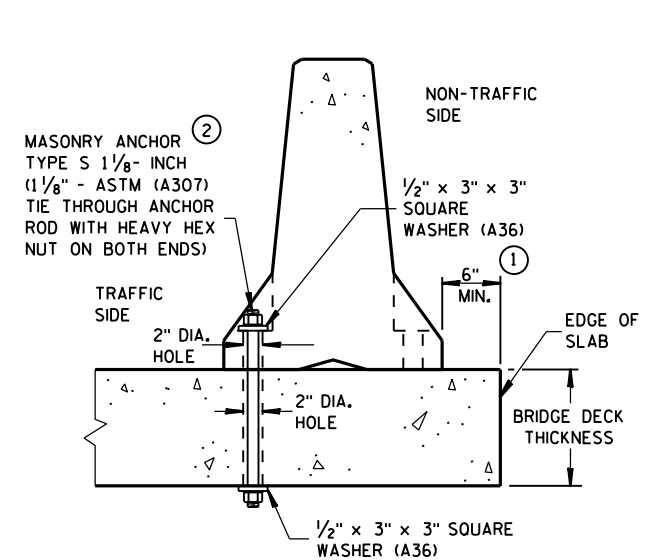
CONCRETE BARRIER  
TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



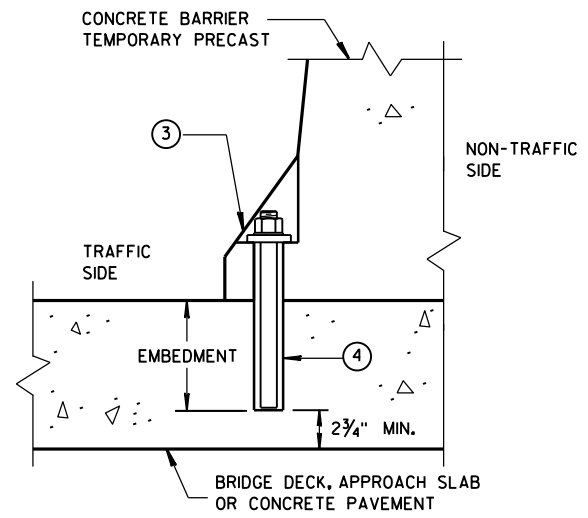
### TREATMENT AT BRIDGE DECK EXPANSION JOINTS

(NO SINGLE CONCRETE BARRIER SECTION SHALL BE ANCHORED TO BOTH THE BRIDGE DECK AND THE APPROACH SLAB. ALL ANCHOR BOLT LOCATIONS SHALL BE ANCHORED TO THE DECK IN ACCORDANCE WITH THE DETAIL. NO MORE THAN ONE ANCHOR BOLT SHALL BE ELIMINATED FROM A BARRIER SECTION WHEN SPANNING AN EXPANSION JOINT.)



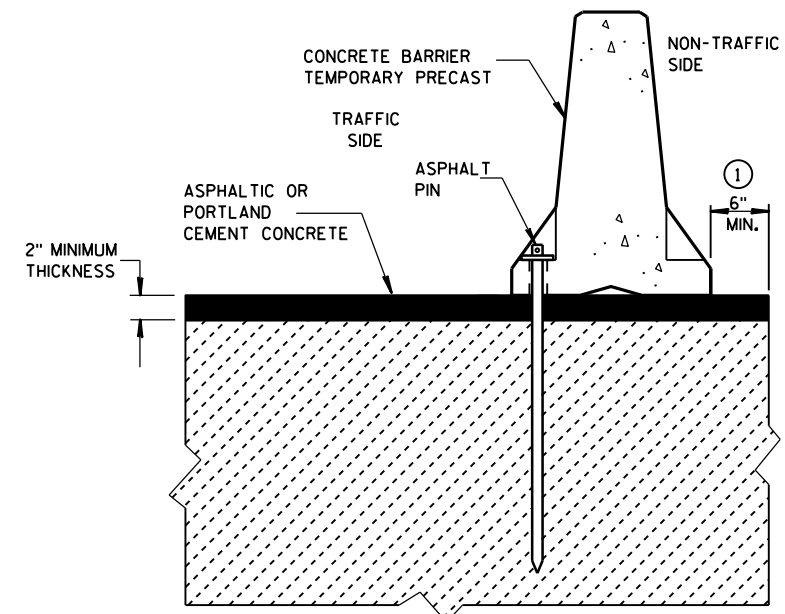
### THROUGH BOLTED ANCHOR INSTALLATION ON BRIDGE DECK

(DO NOT USE ON CONCRETE BRIDGE DECK WITH ASPHALT OVERLAY)



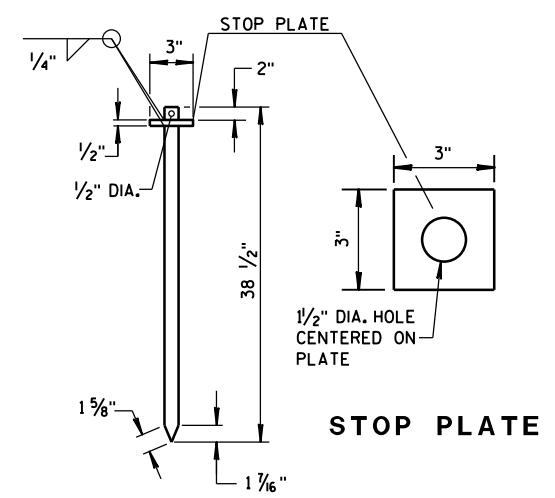
### REMOVABLE ADHESIVE BONDED ANCHOR INSTALLATION ON CONCRETE BRIDGE DECK, CONCRETE APPROACH SLAB, OR CONCRETE PAVEMENT

(DO NOT USE ON CONCRETE WITH AN ASPHALTIC OVERLAY)

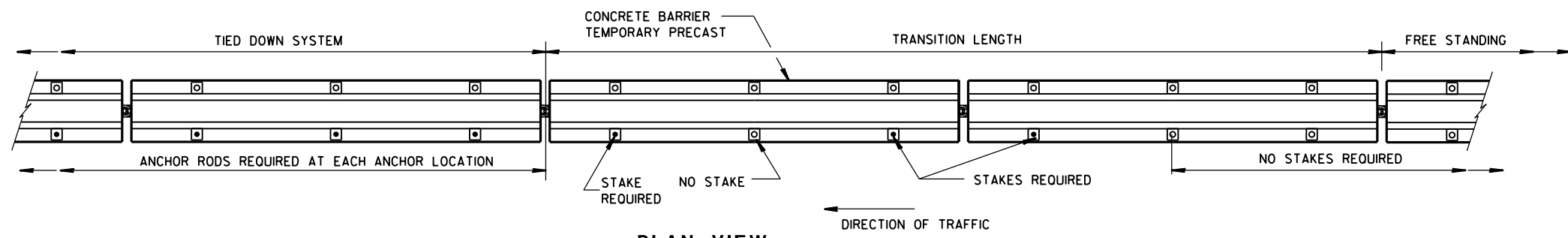


### STAKE DOWN INSTALLATION FOR ASPHALTIC OR PORTLAND CEMENT CONCRETE SURFACE

(STAKING IS INCIDENTAL TO CONCRETE BARRIER TEMPORARY PRECAST)



ASPHALT PIN  
(ASTM A36 STEEL)



### PLAN VIEW FREE STANDING TRANSITION TO TIED-DOWN SYSTEM

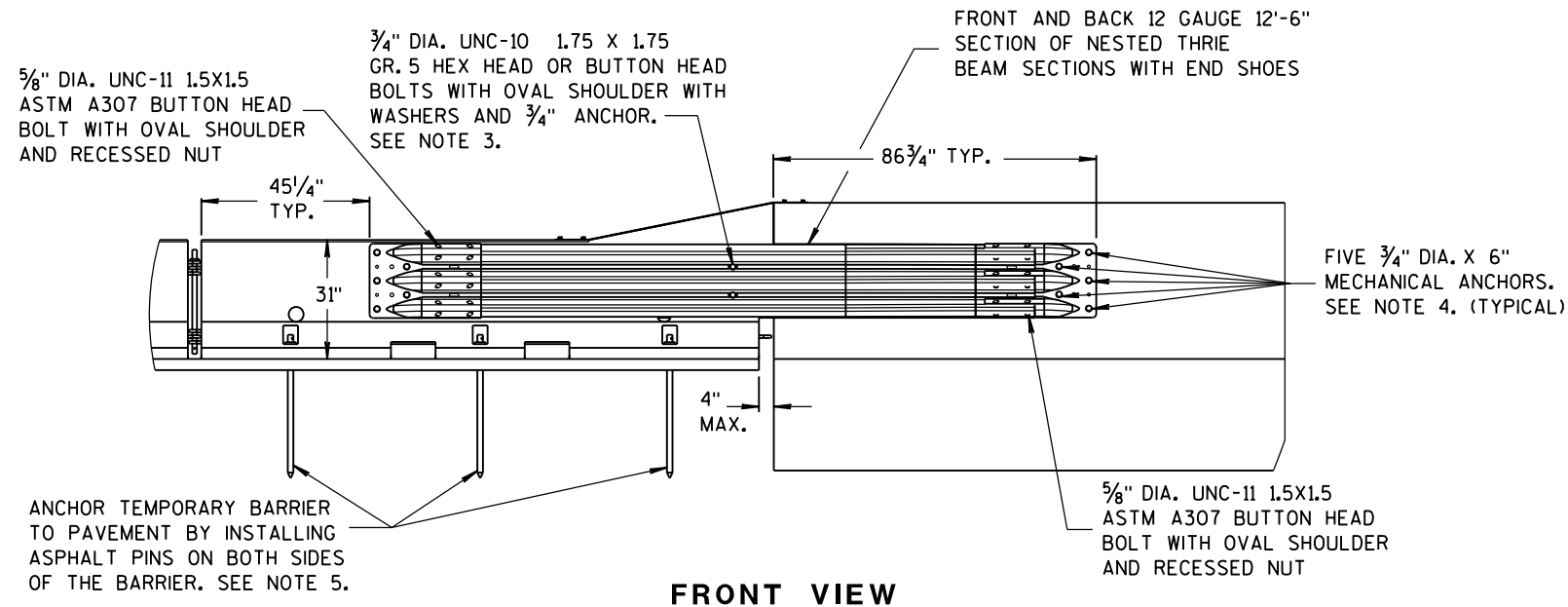
(PLACE TRANSITION IN A TANGENT SECTION OF BARRIER PARALLEL TO THE ROADWAY. IF TRANSITION OCCURS ON STRUCTURAL SLAB, ANCHOR AS SHOWN.)

### GENERAL NOTES

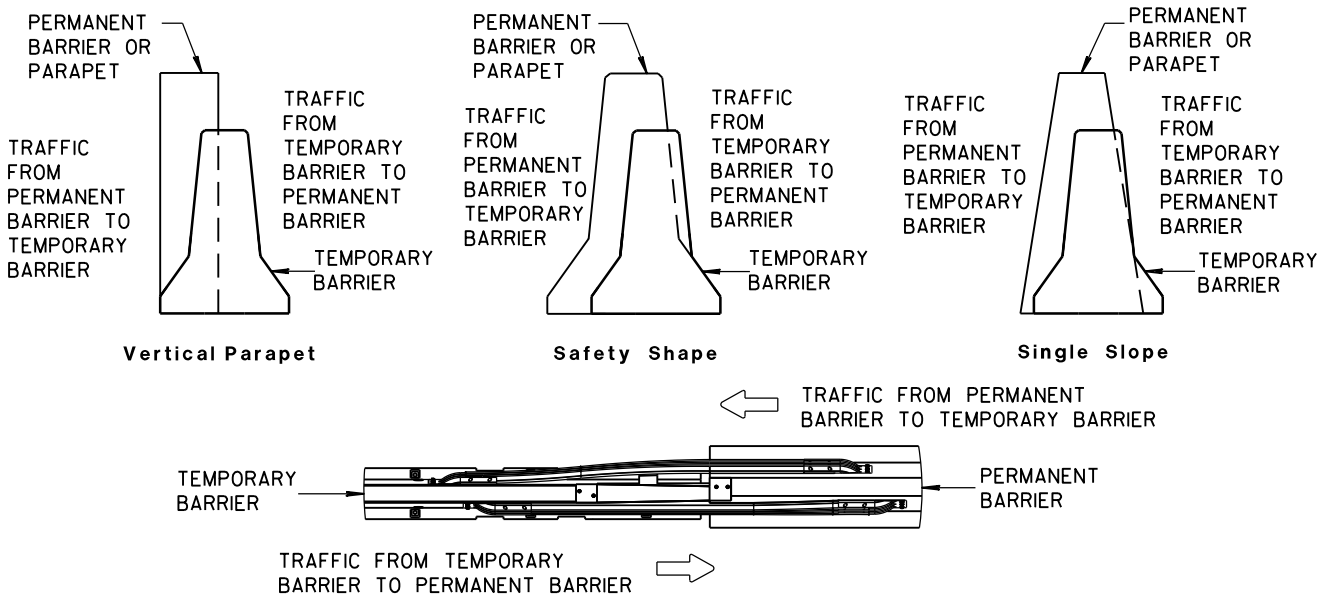
- ① CONCRETE BARRIER TEMPORARY PRECAST, 12'-6" SHALL BE ANCHORED IF:  
THE DISTANCE TO A 2 FOOT OR GREATER DROPOFF THAT IS STEEPER THAN 3H : 1V,  
FOR EXAMPLE THE EDGE OF A BRIDGE DECK OR A DROPOFF AT THE EDGE OF PAVEMENT,  
IS LESS THAN 4 FEET FROM THE SIDE OF THE BARRIER CLOSEST TO THE DROPOFF  
AND THE POSTED SPEED IS 45 MPH OR GREATER, OR  
  
THE DISTANCE TO A 2 FOOT OR GREATER DROPOFF THAT IS STEEPER THAN 3H : 1V,  
FOR EXAMPLE THE EDGE OF A BRIDGE DECK OR A DROPOFF AT THE EDGE OF PAVEMENT,  
IS LESS THAN 2 FEET FROM THE SIDE OF THE BARRIER CLOSEST TO THE DROPOFF  
AND THE POSTED SPEED IS 40 MPH OR LESS.
- ② ANCHORING IS INCIDENTAL TO CONCRETE BARRIER TEMPORARY PRECAST.  
  
WITH THE APPROVAL OF THE ENGINEER, REMOVABLE ADHESIVE BONDED ANCHOR BOLT  
INSTALLATION MAY BE USED IN LIEU OF THROUGH BOLTED ANCHOR INSTALLATION. THE ADHESIVE  
BONDED ANCHOR BOLT MUST BE REMOVABLE. USE ASTM (A307) MASONRY ANCHORS TYPE  
S 1 1/8"-INCH, EMBEDDED TO A DEPTH SUFFICIENT TO DEVELOP THE ULTIMATE CAPACITY OF THE  
ANCHOR BOLT AND PROVIDE DOCUMENTATION TO CONFIRM THIS.  
  
UPON REMOVAL OR RELOCATION OF THE BARRIER UNITS, REMOVE ALL ANCHOR BOLTS AND COMPLETELY  
FILL IN THE REMAINING HOLES IN CONCRETE BRIDGE DECKS, CONCRETE APPROACH SLABS AND CON-  
CRETE PAVEMENTS THAT ARE TO REMAIN, WITH A NON-SHRINK COMMERCIAL GROUT OR MATERIAL  
IDENTIFIED ON THE CURRENT WISDOT APPROVED PRODUCTS LIST.
- ③ 1/8" DIAMETER A307 THREADED ROD, 1/2" x 3" x 3" SQUARE PLATE WASHER WITH ASTM A36 STEEL,  
ASTM A563A HEAVY HEX NUT.
- ④ ADHESIVE ANCHORS WITH A MINIMUM BOND STRENGTH OF 1,800 PSI AND 5/4" EMBEDMENT. SEE 603.2  
AND 603.3.1.2 OF THE WISCONSIN STANDARD SPECIFICATIONS FOR MORE INFORMATION ON ADHESIVE ANCHORS.

CONCRETE BARRIER  
TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



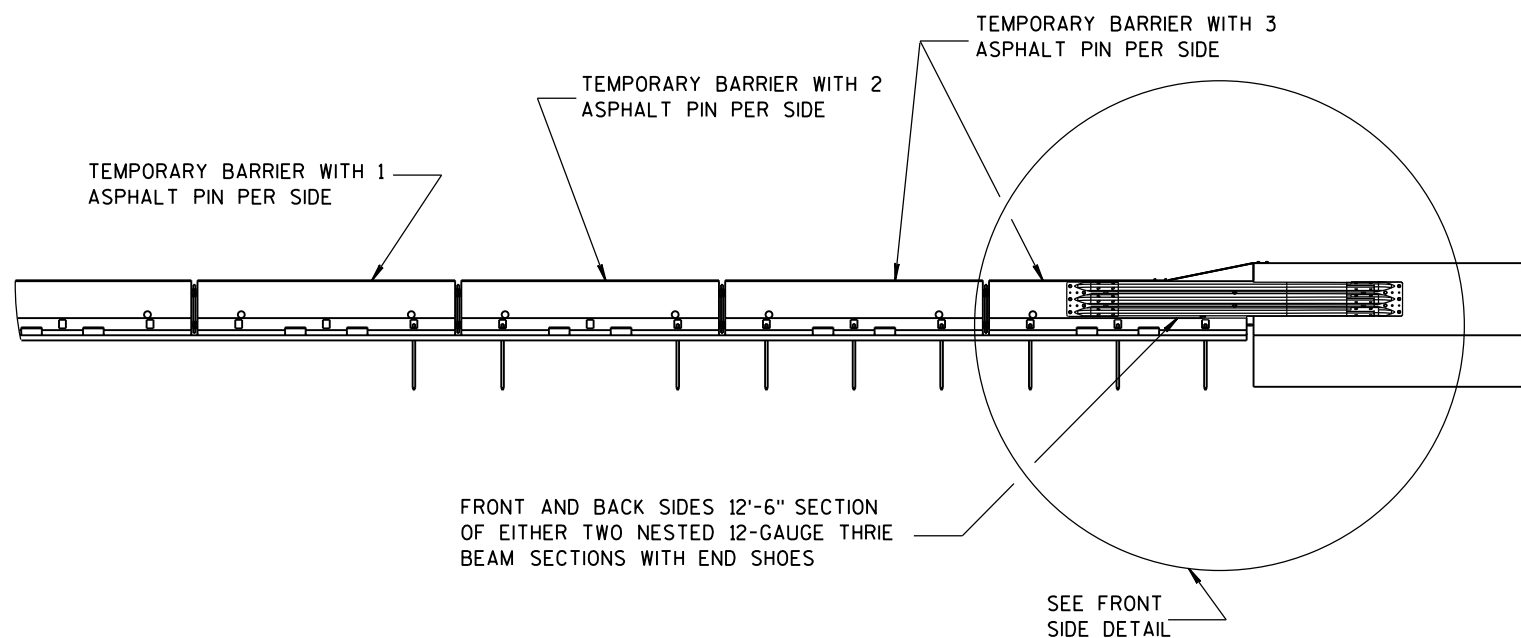
FRONT VIEW



TEMPORARY BARRIER PLACEMENT FOR BI-DIRECTIONAL TRANSITION TO TIED-DOWN SYSTEM

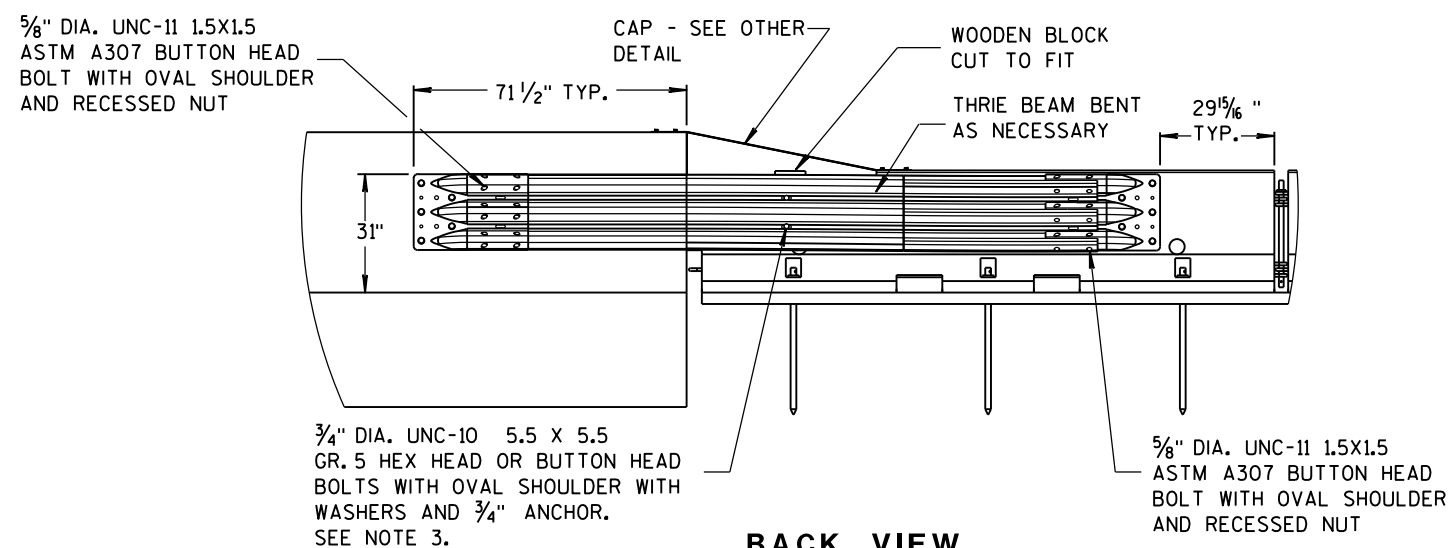
# NOTES

1. CAP END PLATE PLACED FLUSH WITH UPSTREAM END OF PERMANENT BARRIER OR PARAPET.
2. THRIE BEAM PIECES ARE OFFSET 15 1/4" TO PREVENT INTERFERENCE FROM THE ANCHORS ON OPPOSING SIDES.
3. MINIMUM MECHANICAL OR ADHESIVE ANCHOR STRENGTH REQUIREMENTS: ULTIMATE TENSILE LOAD 9.48 KIPS AND ULTIMATE SHEAR LOAD 10.48 KIPS.
4. MINIMUM MECHANICAL OR ADHESIVE ANCHOR STRENGTH REQUIREMENTS: ULTIMATE TENSILE LOAD 17.9 KIPS AND ULTIMATE SHEAR LOAD 21.96 KIPS.
5. MAY BE USED ON CONCRETE OR ASPHALT PAVEMENTS. ASPHALT OPTION SHOWN. FOR CONCRETE OPTION SEE OTHER DETAILS.
6. MINIMUM MECHANICAL OR ADHESIVE ANCHOR STRENGTH REQUIREMENTS: ULTIMATE TENSILE LOAD 12.14 KIPS AND ULTIMATE SHEAR LOAD 17.5 KIPS.

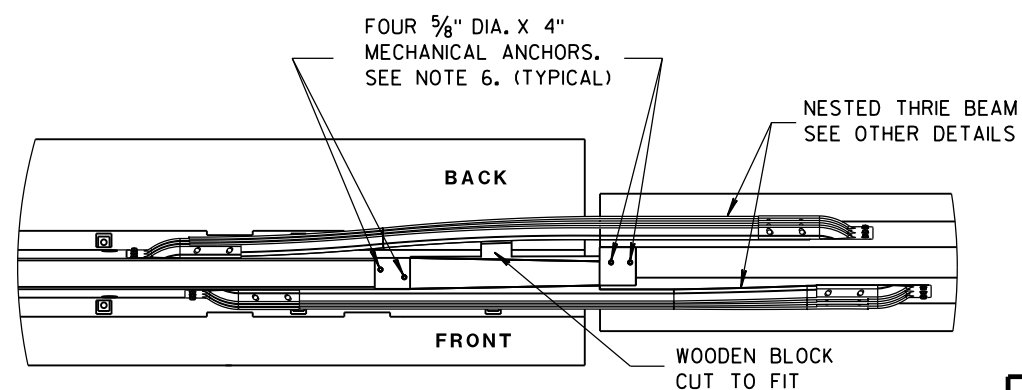


FRONT VIEW

BI-DIRECTIONAL TRANSITION TO TIED-DOWN SYSTEM



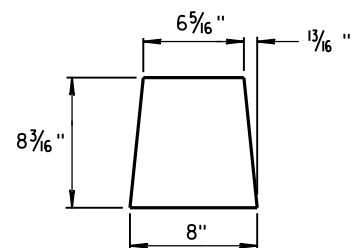
BACK VIEW



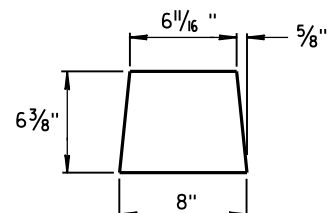
PLAN VIEW

CONCRETE BARRIER  
TEMPORARY PRECAST, 12'-6"

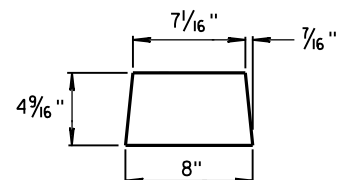
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



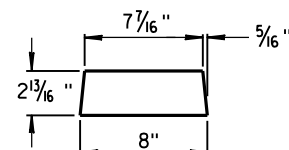
**GUSSET 1**



**GUSSET 2**

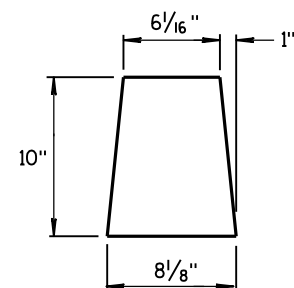


**GUSSET 3**

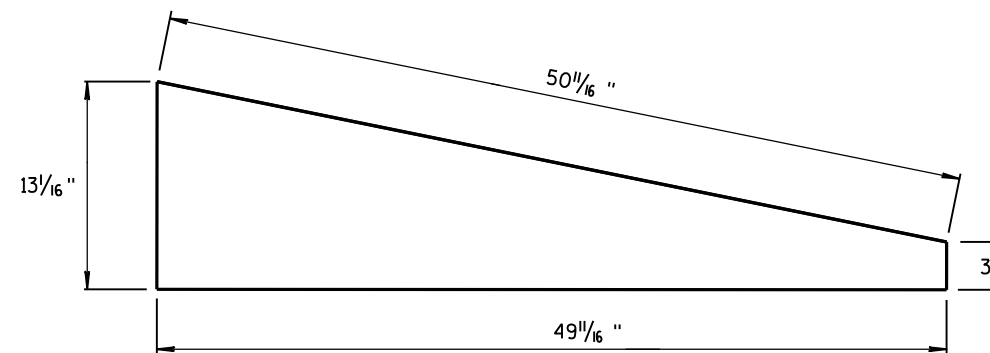


**GUSSET 4**

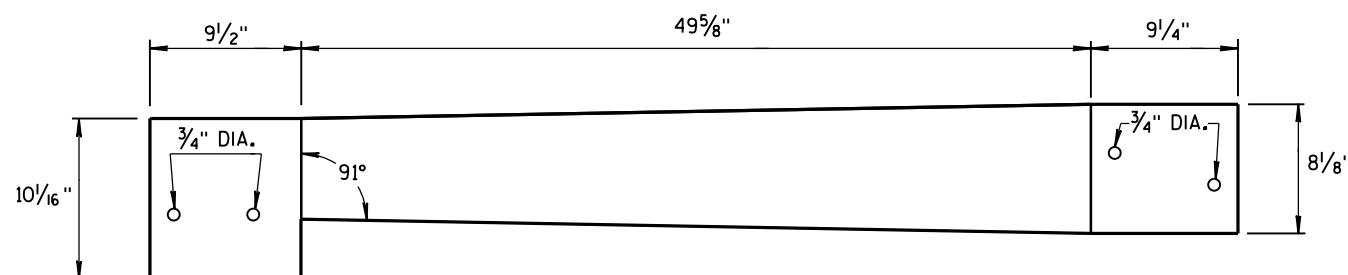
**GUSSETS**



**END PLATE**



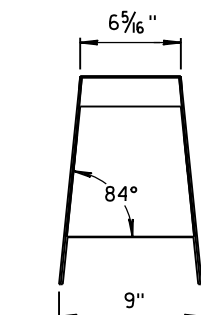
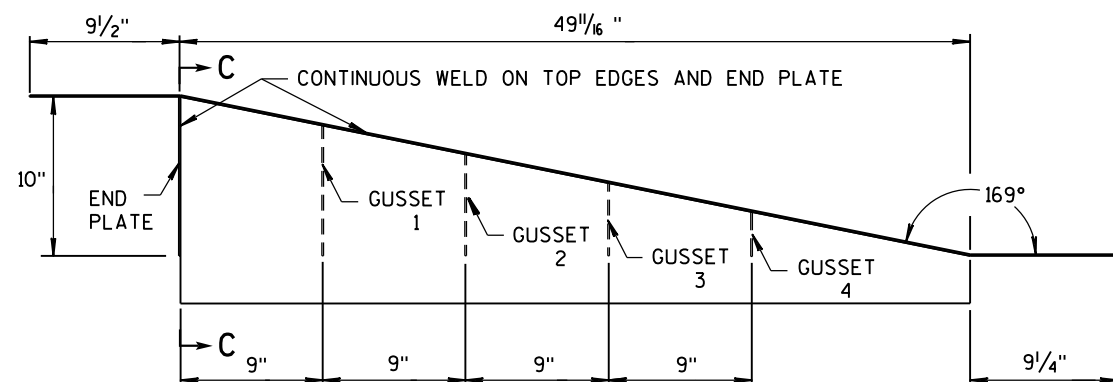
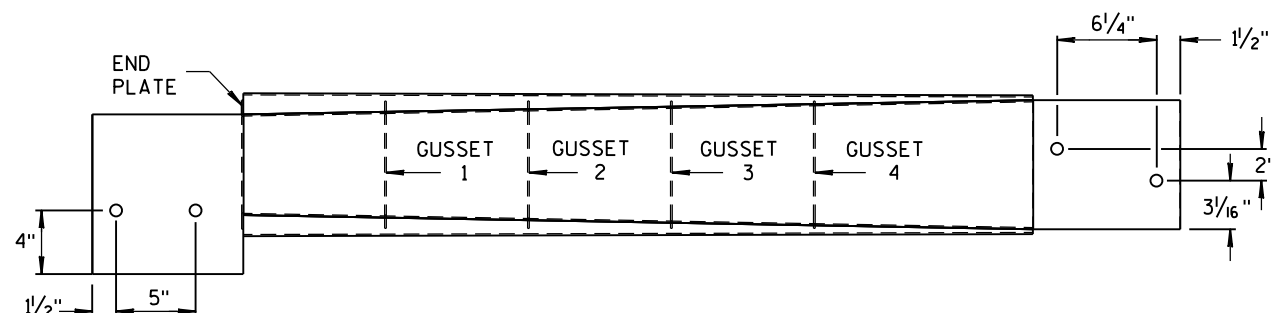
**SIDE PLATE**



**TOP PLATE**

**SIDE, TOP AND END PLATES FOR CAP  
FROM TEMPORARY CONCRETE BARRIER  
TO 42" PERMANENT CONCRETE BARRIER**

SIDE PLATES, TOP PLATE, END PLATE AND GUSSETS ARE 12 GAUGE ASTM A36 GALVANIZED STEEL.



**SECTION C-C**

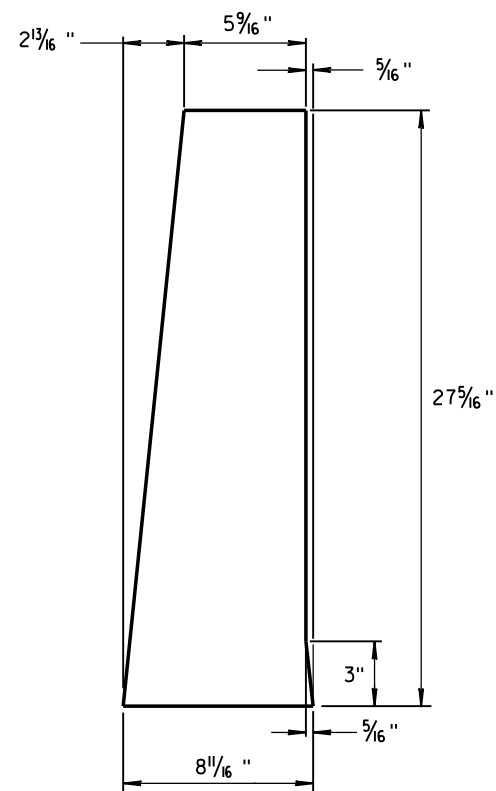
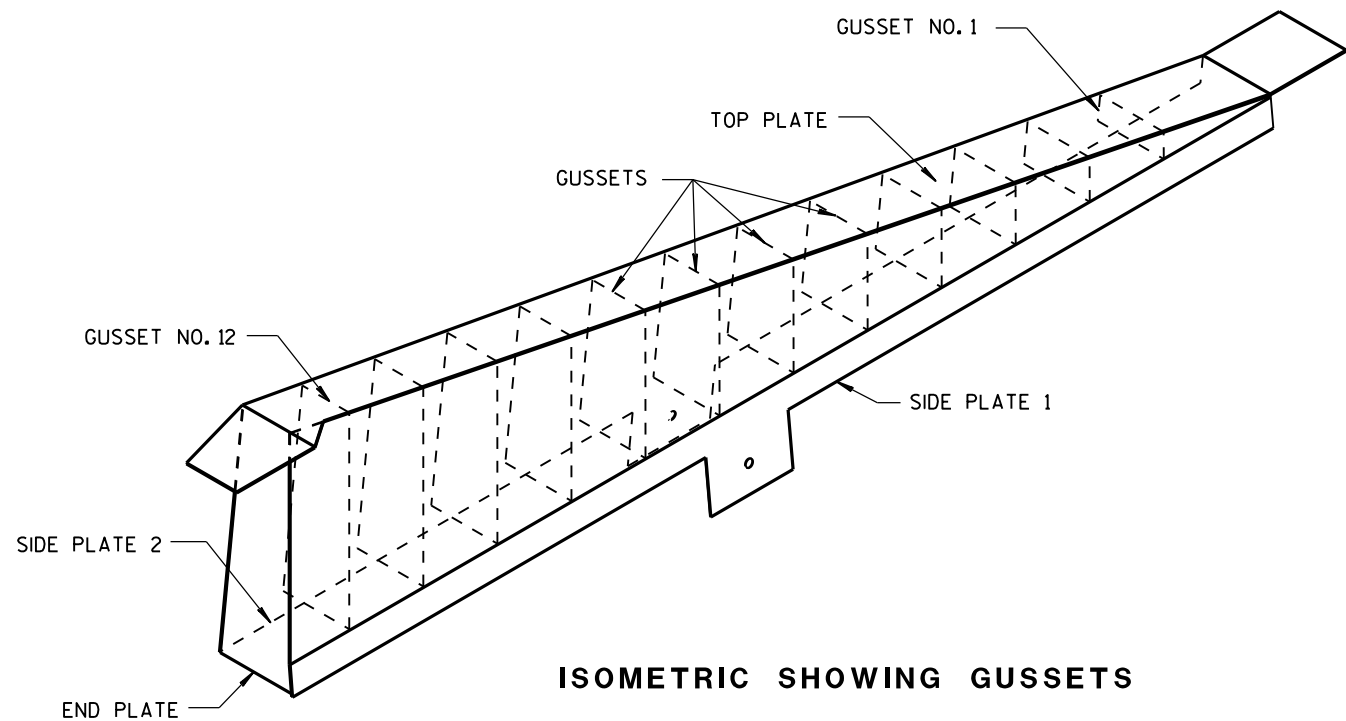
**NOTES**

1. FOUR GUSSETS AND END PLATE ARE STITCH WELDED ON THREE SIDES.
2. TWO TRIANGULAR SIDE PLATES ARE STITCH WELDED TO TOP PLATE, END PLATE, AND GUSSETS.

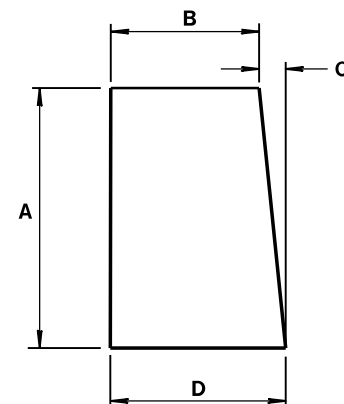
**CAP DETAILS FOR TEMPORARY CONCRETE  
BARRIER TO 42" PERMANENT CONCRETE BARRIER**

**CONCRETE BARRIER  
TEMPORARY PRECAST, 12'-6"**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



1/8" STEEL PLATE

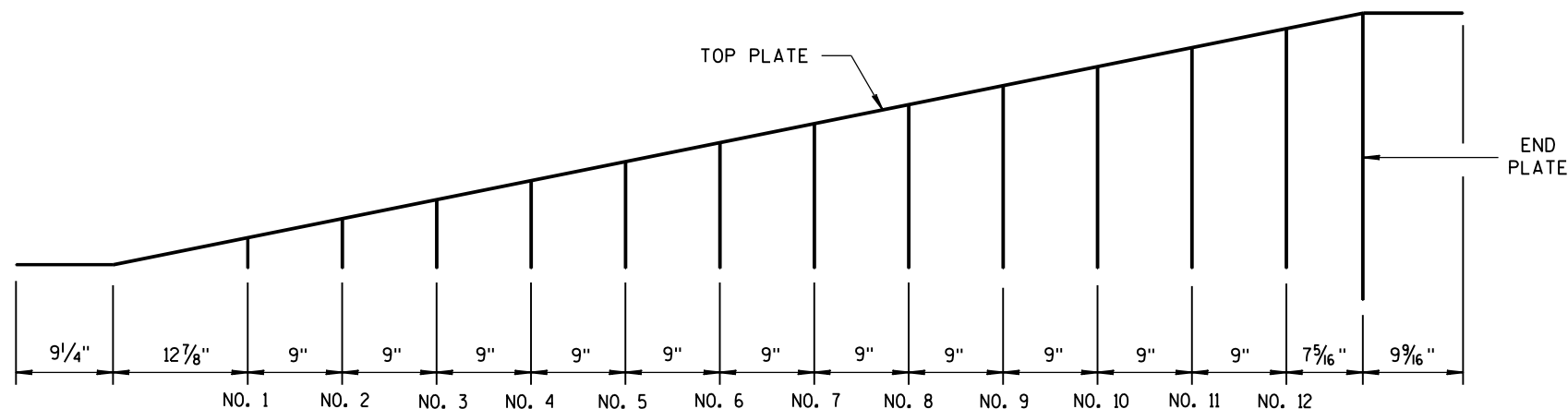


ALL GUSSETS 1/8" STEEL PLATE

GUSSET DIMENSIONS				
GUSSET NO.	A	B	C	D
1	2 7/8"	7 3/4"	1/4"	8
2	4 1/16 "	7 9/16 "	1/2"	8
3	6 1/2"	7 3/8"	1 1/16 "	8 1/16 "
4	8 5/16"	7 3/16"	7/8"	8 1/16 "
5	10 1/8"	7"	1 1/16 "	8 1/16 "
6	11 5/16 "	6 13/16 "	1 1/4"	8 1/16 "
7	13 3/4"	6 5/8"	1 7/16 "	8 1/16 "
8	15 9/16 "	6 7/16 "	1 9/16 "	8 1/16 "
9	17 3/8"	6 1/4"	1 13/16 "	8 1/16 "
10	19 3/16"	6 1/16"	1 15/16 "	8 1/16 "
11	21"	5 7/8"	2 3/16 "	8 1/16 "
12	22 13/16 "	5 11/16 "	2 5/16 "	8 1/16 "

SIDE PLATES, TOP PLATE, END PLATE AND GUSSETS ARE 12 GAUGE ASTM A36 STEEL AND GALVANIZED.

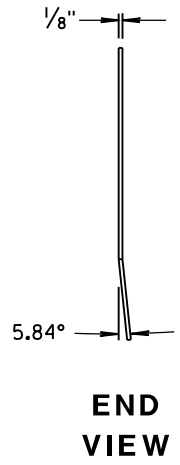
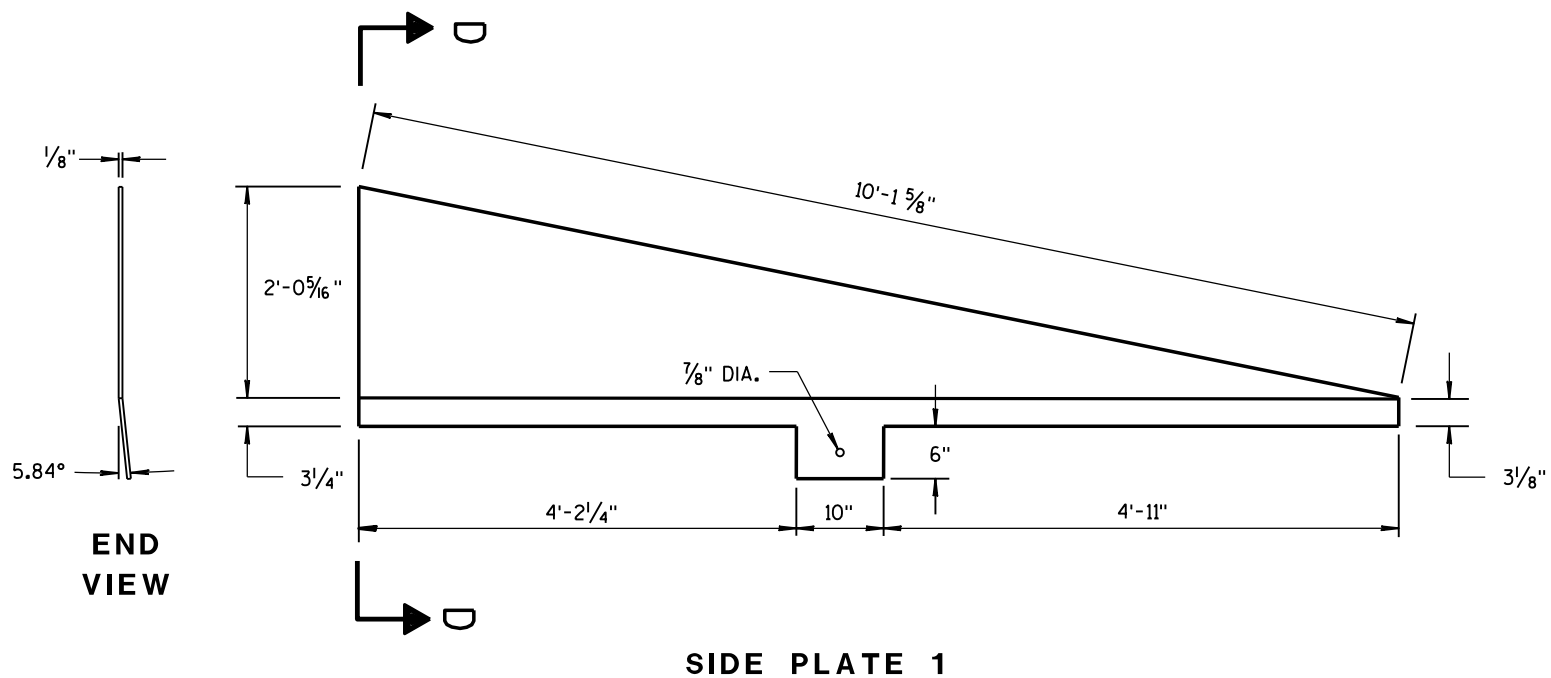
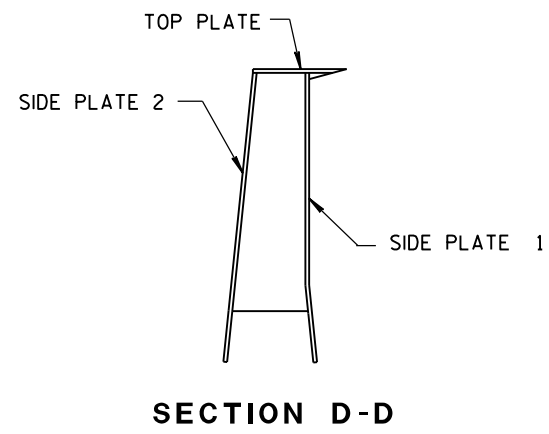
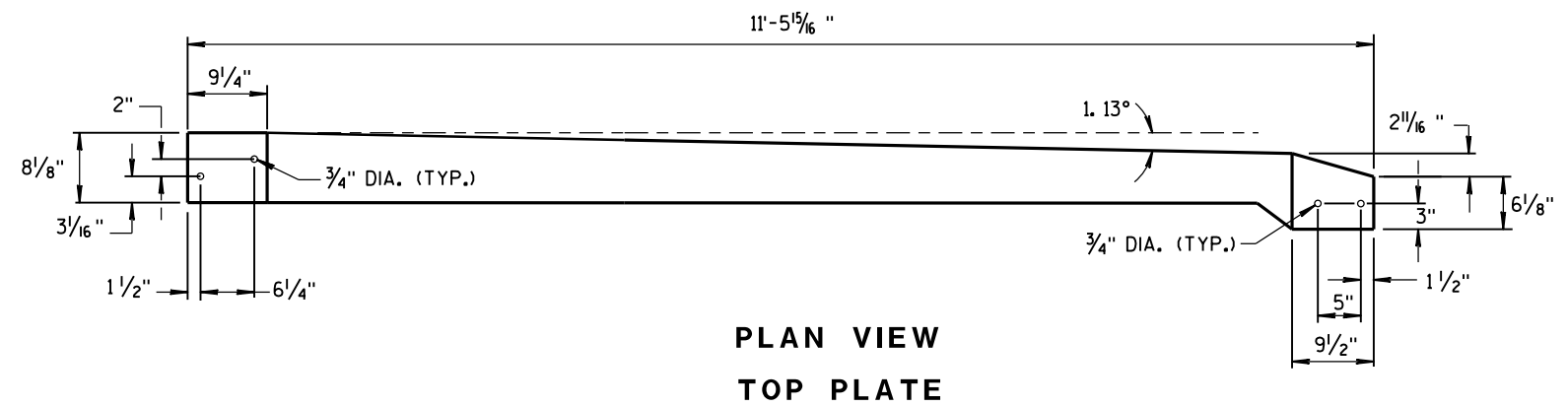
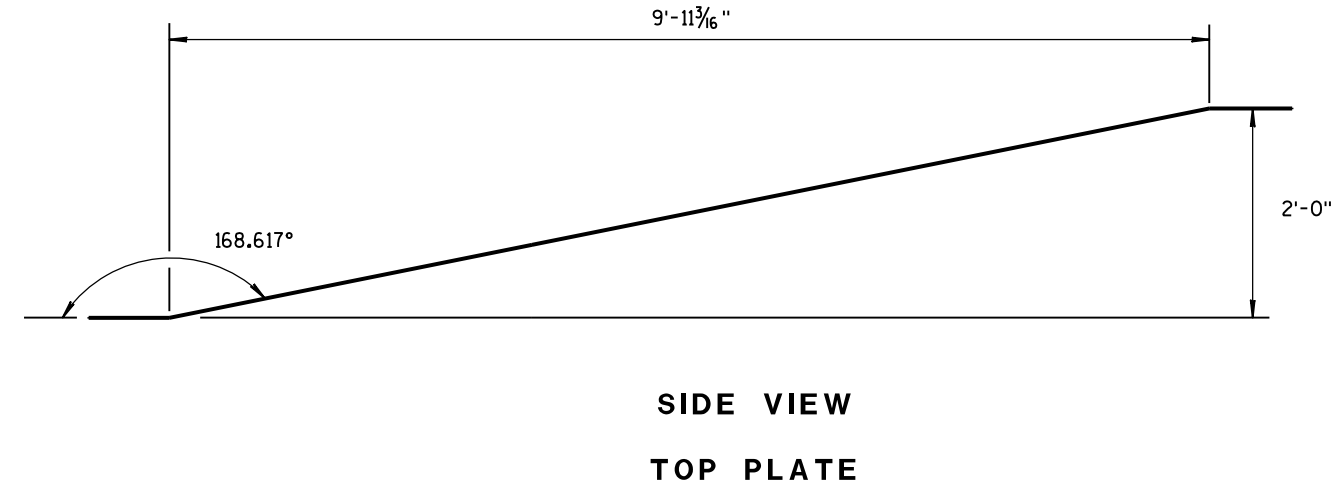
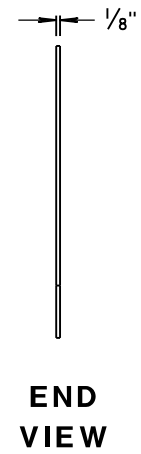
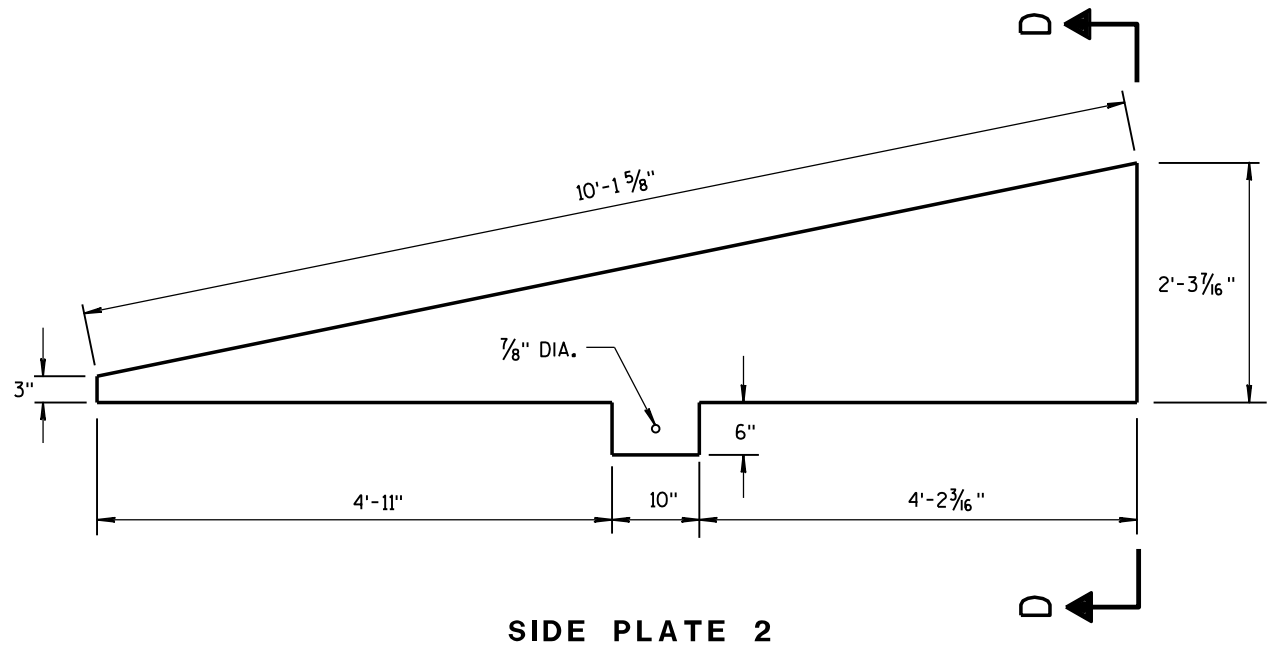
GUSSETS AND END PLATE ARE STITCH WELDED ON 3 SIDES. TWO TRIANGULAR SIDE PLATES ARE STITCH WELDED TO TOP PLATE, END PLATE AND GUSSETS.



CAP DETAILS FOR TEMPORARY CONCRETE BARRIER TO 56" PERMANENT CONCRETE BARRIER

CONCRETE BARRIER  
TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



CAP DETAILS FOR TEMPORARY CONCRETE BARRIER TO 56" PERMANENT CONCRETE BARRIER

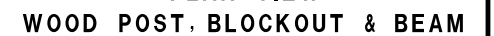
CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June 2014 DATE	/S/ Jerry H. Zogg ROADWAY STANDARD DEVELOPMENT ENGINEER
FHWA	

## 6

- S.D.D. 14 B 15-9a

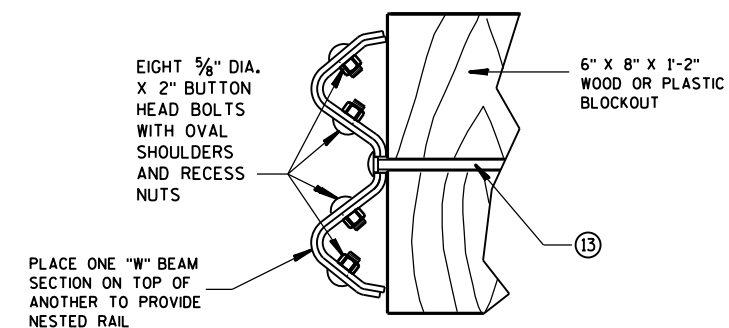
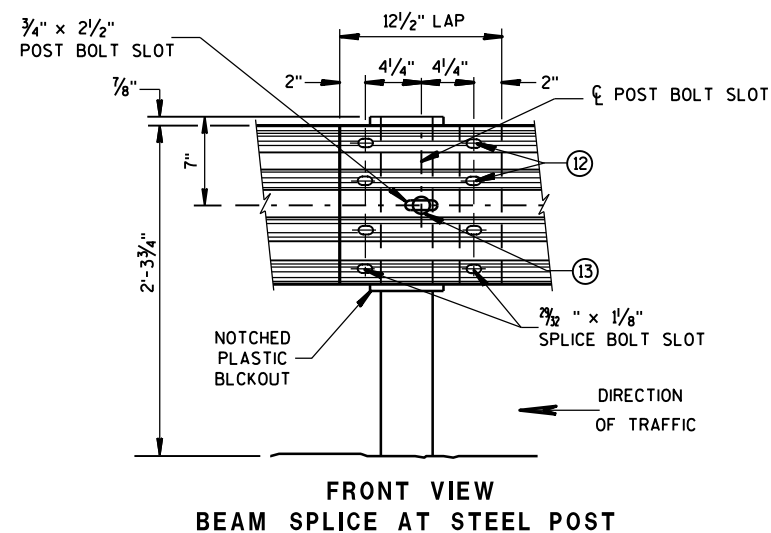
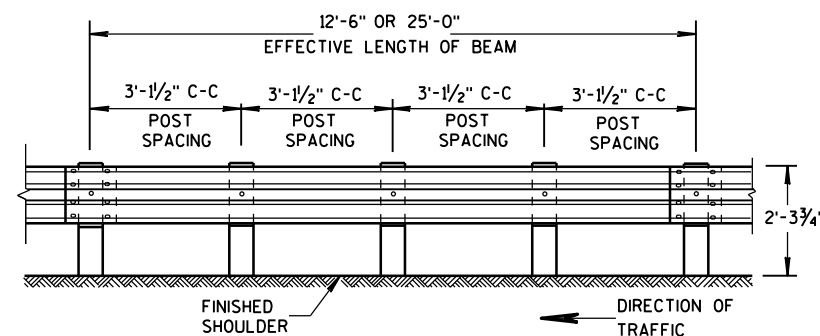
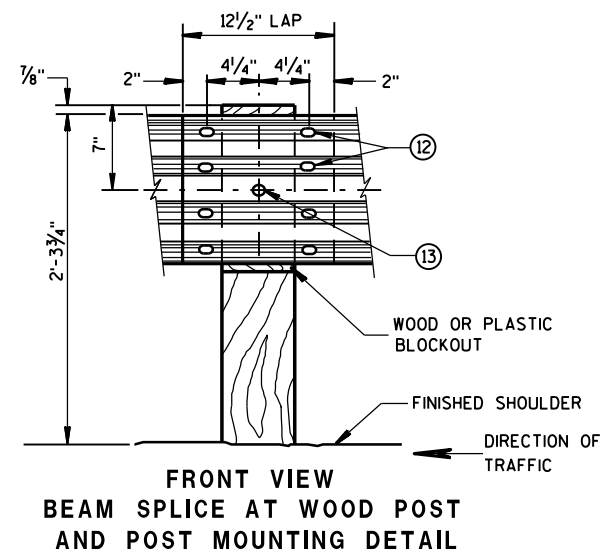
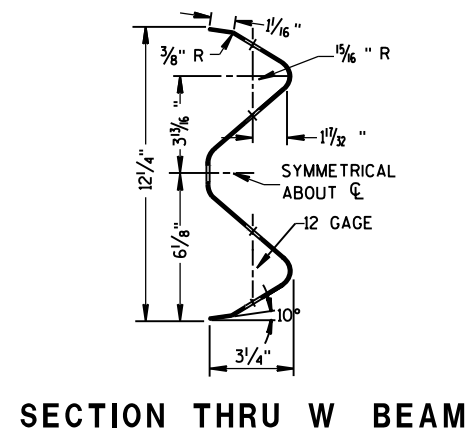
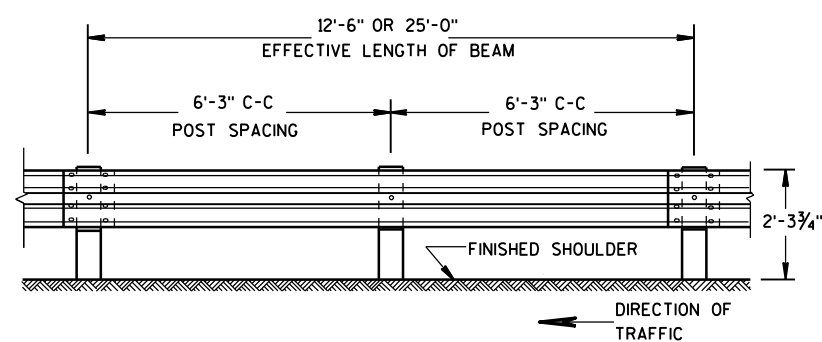


### TYPICAL INSTALLATION OF STEEL PLATE BEAM GUARD

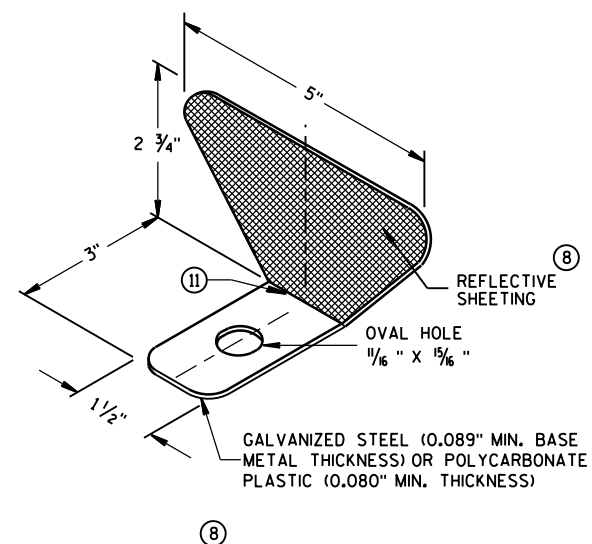
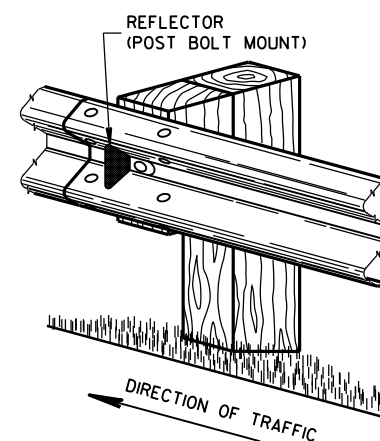


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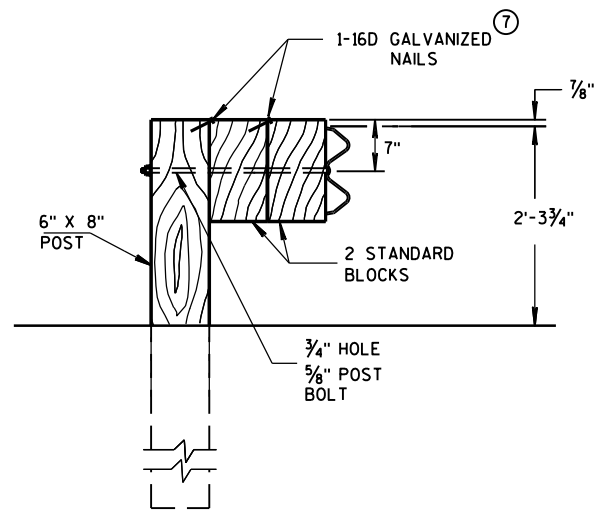




	BEAM GUARD LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200' > 200'	50' C-C 100' C-C	1 1	3
TWO WAY TRAFFIC	< 200' > 200'	25' C-C 50' C-C	1 1 <sup>(10)</sup>	6
TWO WAY TRAFFIC	< 200' > 200'	50' C-C 100' C-C	2 2 <sup>(11)</sup>	3

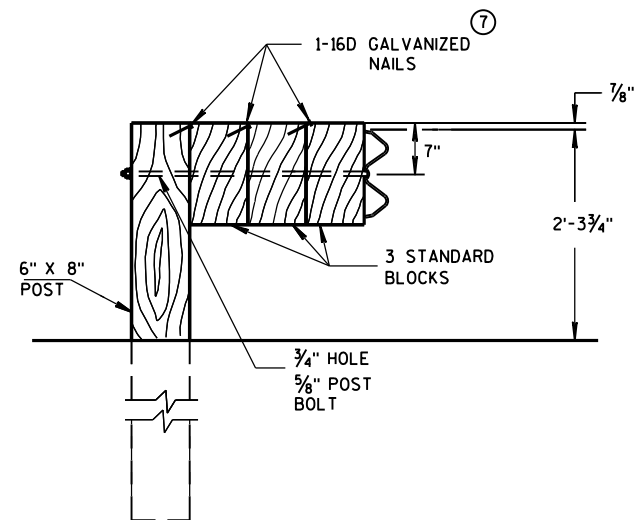


- ## GENERAL NOTES
- ⑧ PROVIDE SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH YELLOW REFLECTIVE SHEETING. SHEETING IS TYPE H. SEE STANDARD SPECIFICATION 637.
  - ⑨ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
  - ⑩ REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.
  - ⑪ PROVIDE AN ANGLE OF BEND OF  $90^{\circ} \pm 1^{\circ}$  FOR TWO-SIDED REFLECTORS.
  - ⑫ 8 -  $\frac{5}{8}$ "  $\phi$  X 2" BUTTON HEAD BOLTS WITH OVAL SHOULDERS & RECESS NUTS.
  - ⑬  $\frac{5}{8}$ " DIA. BUTTON HEAD BOLT AND RECESS NUT WITH  $\frac{5}{8}$ " DIA. F844 FLAT WASHER UNDER NUT.



#### DETAIL FOR DOUBLE BLOCKS

THE NUMBER OF DOUBLE BLOCK POSTS  
WITHIN A BARRIER RUN IS UNLIMITED

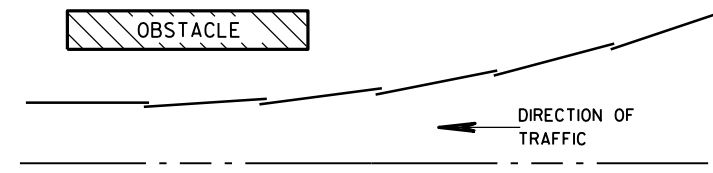


#### DETAIL FOR TRIPLE BLOCKS

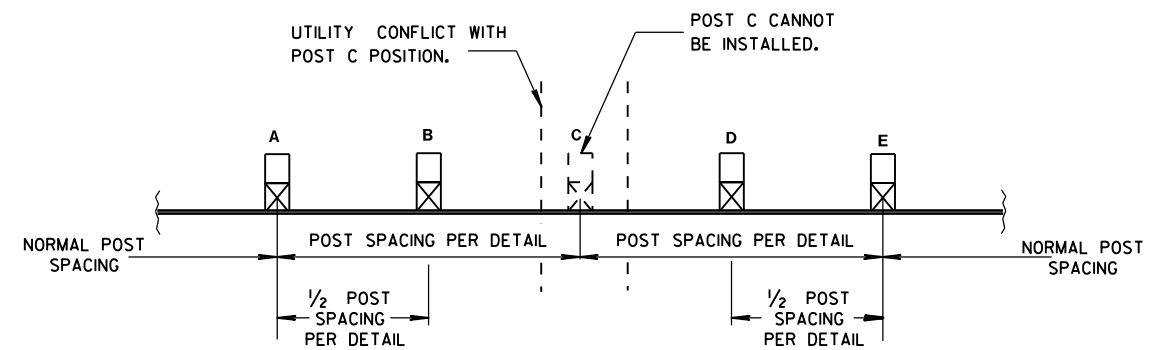
TRIPLE BLOCK DETAIL IS LIMITED TO ONE  
LOCATION WITHIN A BEAM GUARD RUN.

NOTES: USE DOUBLE OR TRIPLE BLOCKS WHEN UNDERGROUND OBSTACLES  
PREVENT THE POST FROM BEING INSTALLED.

DO NOT USE EXTRA 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.



#### PLAN VIEW BEAM LAPPING DETAIL



#### POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION

STEEL PLATE BEAM GUARD,  
CLASS "A",  
INSTALLATION & ELEMENTS

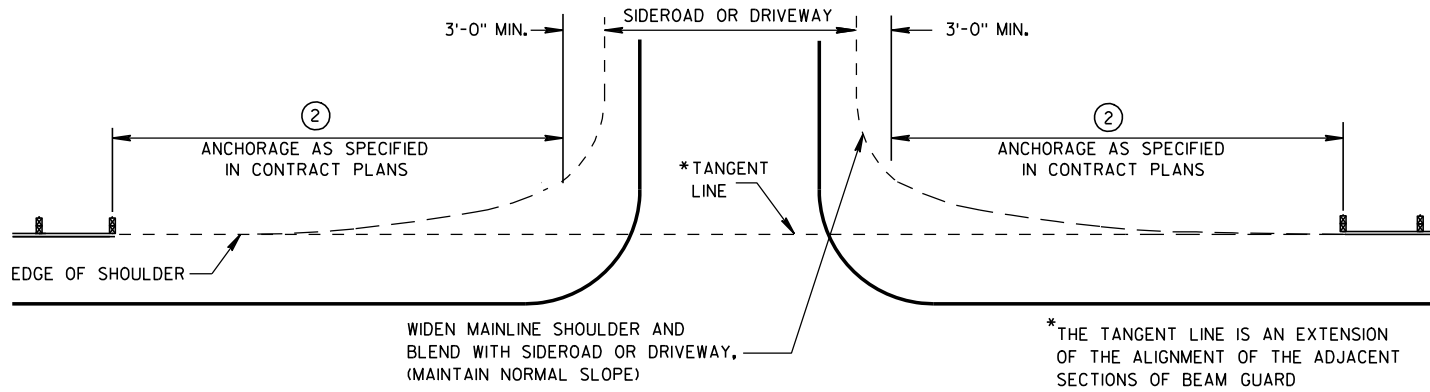
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

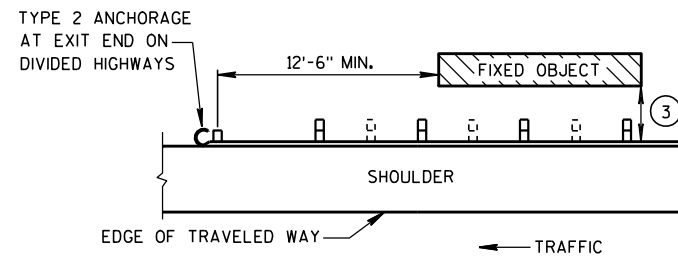
June 2016  
DATE

FHWA

/S/ Jerry H. Zogg  
ROADWAY STANDARDS DEVELOPMENT  
ENGINEER



### BEAM GUARD AT SIDEROADS OR DRIVEWAYS



### BEAM GUARD AT OBSTACLES EXIT END - ONE WAY TRAFFIC

### GENERAL NOTES

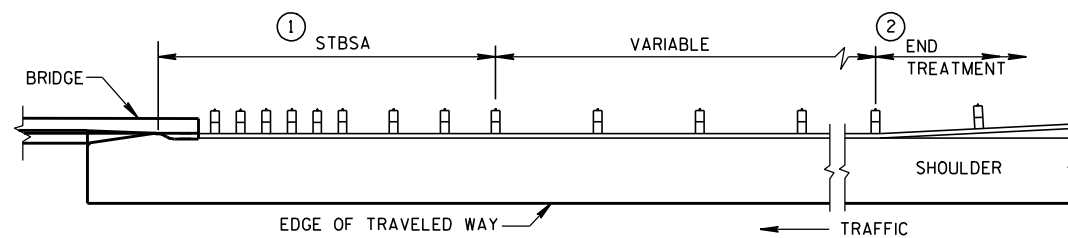
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE PERTINENT STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

W6 X 9 OR W6 X 8.5 STEEL POSTS WITH NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POSTS WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.

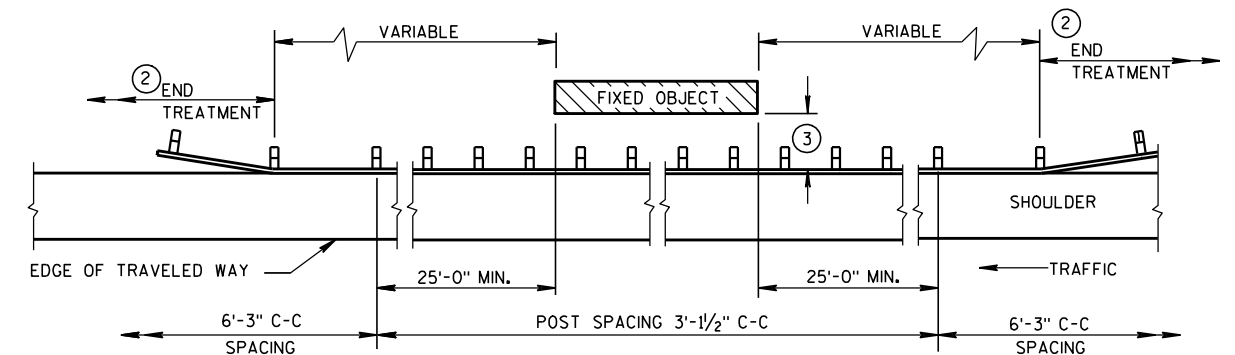
THE LOCATIONS AND LENGTHS OF BEAM GUARD ARE SHOWN ELSEWHERE IN THE PLAN.

- ① STEEL THRIE BEAM STRUCTURAL APPROACH (STBSA) - SEE CURRENT SDD 14B20.
- ② USE AN APPROVED END TREATMENT FOR THE TRAFFIC APPROACH SIDE OF BRIDGE/OBSTACLES. USE TYPE 2 ANCHORAGE ONLY AT THE DOWNSTREAM ENDS OF BEAM GUARD LOCATED ALONG ROADWAYS WITH ONE WAY TRAFFIC.

MINIMUM LATERAL DISTANCE FROM FACE OF BEAM GUARD TO FIXED OBJECT	POST SPACING
3'-6"	3' - 1½"
4'-6"	6' - 3"



### BEAM GUARD AT FULL WIDTH BRIDGES

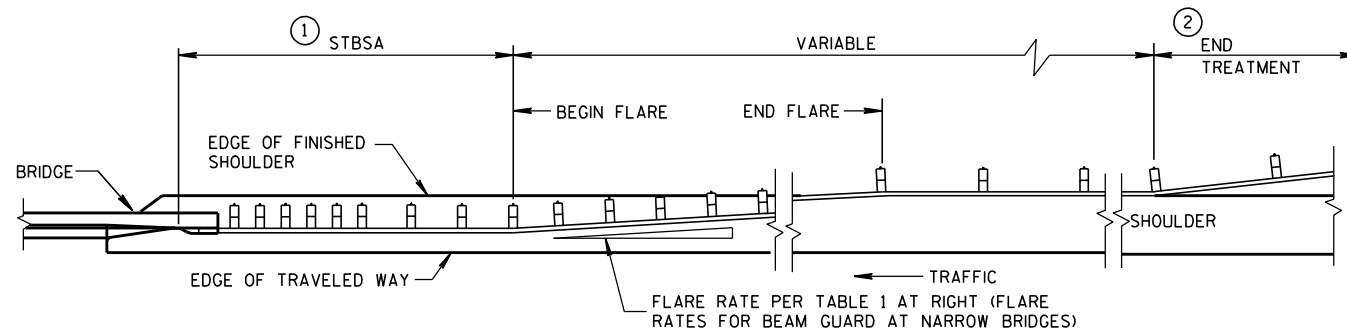


### BEAM GUARD AT OBSTACLES - TWO WAY TRAFFIC

(RAIL TO OBSTACLE CLEARANCE 3'-6" TO 4'-6")

TABLE 1  
FLARE RATES FOR BEAM  
GUARD AT NARROW BRIDGES

POSTED SPEED (MPH)	FLARE RATE
25	13:1
30	15:1
35	16:1
40	18:1
45	21:1
50	24:1
55	26:1
65	30:1

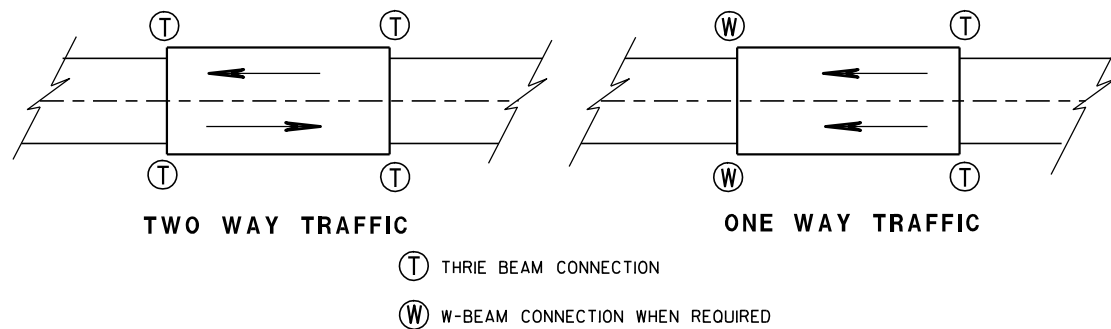
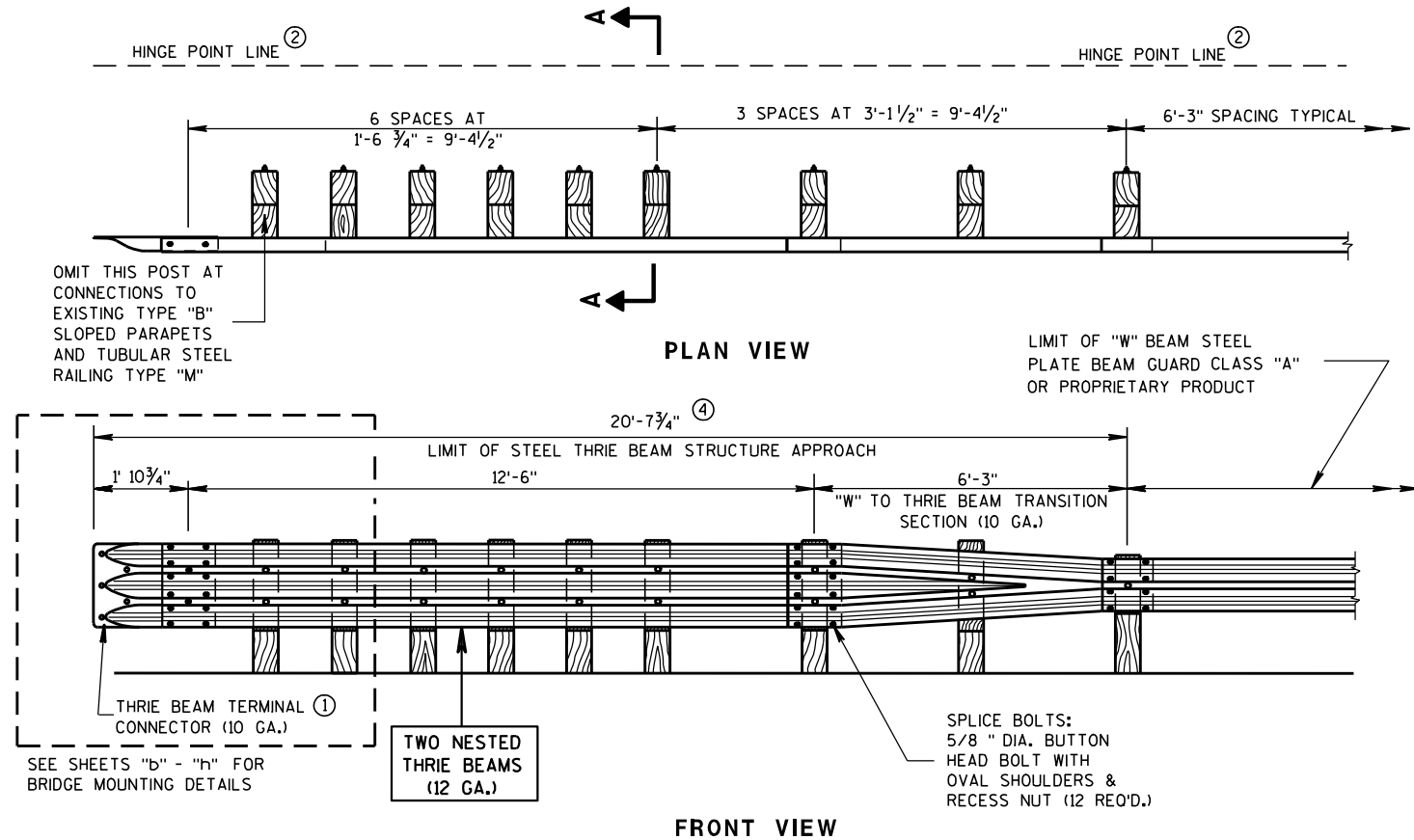


### BEAM GUARD AT NARROW BRIDGES (FLARED TO SHOULDER EDGE, THEN PARALLEL TO ROADWAY)

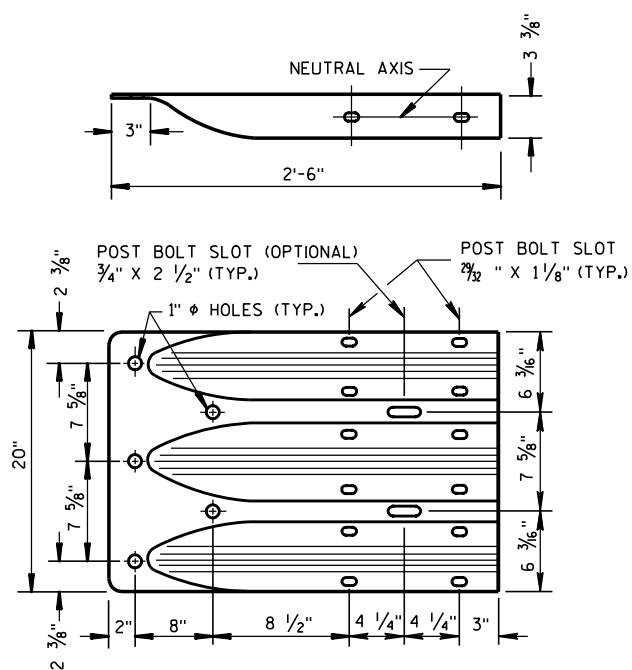
STEEL PLATE BEAM GUARD  
CLASS "A"  
AT BRIDGES, OBSTACLES  
AND SIDEROADS/DRIVEWAYS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

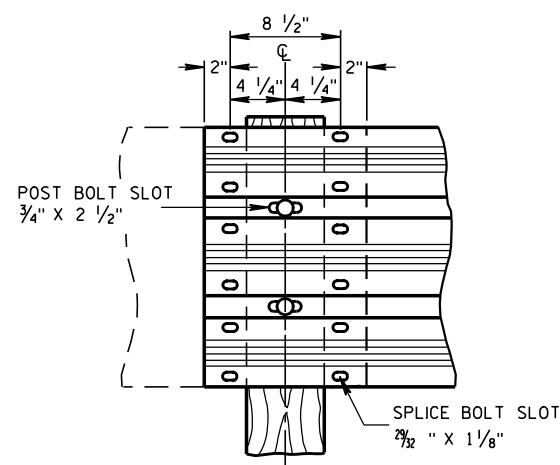
APPROVED  
8-21-07  
DATE  
/S/ Jerry H. Zogg  
ROADWAY STANDARDS DEVELOPMENT  
ENGINEER  
FHWA



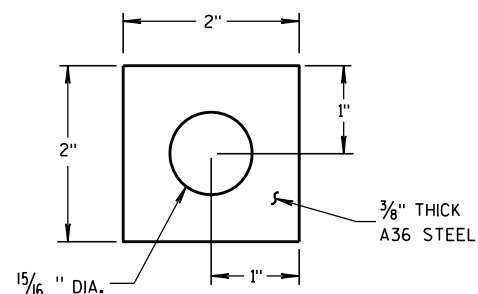
**TYPICAL LOCATIONS OF THRIE BEAM AND W-BEAM CONNECTIONS TO BRIDGE**



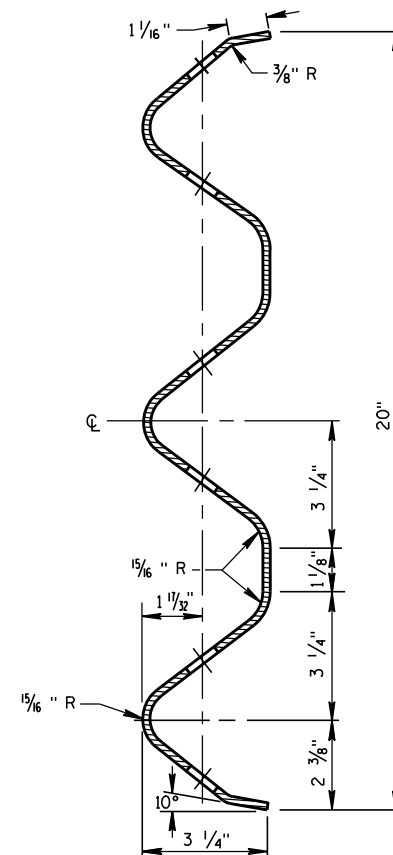
**THRIE BEAM TERMINAL CONNECTOR**



**THRIE BEAM SPLICE**



**PLATE WASHER DETAIL**



**SECTION THRU THRIE BEAM RAIL ELEMENT**

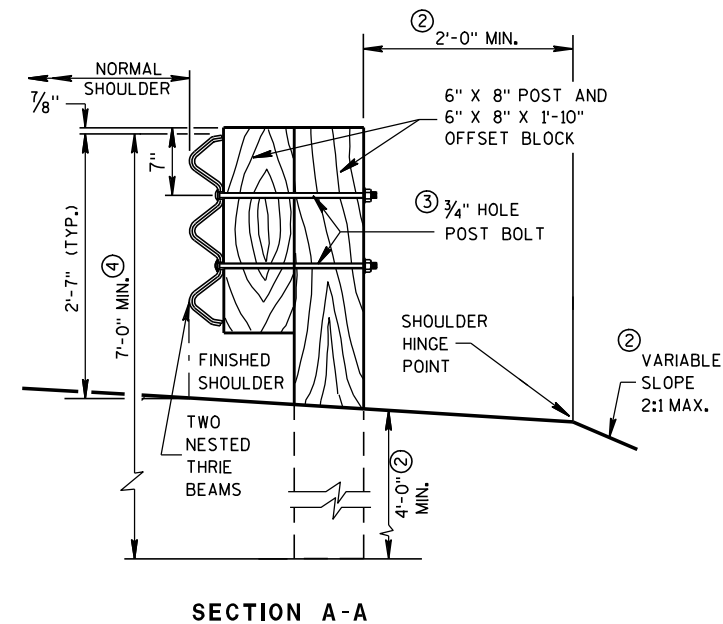
## GENERAL NOTES

BOLT THE THRIE BEAM TO ALL POSTS AND BLOCKOUTS. DRILL OR PUNCH BOLT HOLES IN THE BEAM IF THE POST SPACING IS LESS THAN 6'-3".

DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.

IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2", AND 12" DIAMETER AROUND POST. SEE 14B15 FOR MORE DETAILS.

- ① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.
- ② MINIMUM EMBEDMENT SHALL BE 4'-0". WHERE EXISTING CONDITIONS DO NOT PERMIT THE APPROPRIATE EARTHWORK SHOWN ON THE PLAN TYPICAL SECTIONS OR DETAILS, THE ENGINEER MAY ALLOW THE REDUCTION OR ELIMINATION OF THE 2 FOOT DISTANCE TO THE HINGE POINT. OTHERWISE BUILD AS THE PLAN SHOWS OR AS THE ENGINEER DIRECTS. IF THE 2 FOOT DISTANCE TO THE HINGE POINT IS REDUCED OR ELIMINATED, INCREASE THE POST EMBEDMENT DEPTH TO 4'-6" OR MORE.
- ③ POST BOLTS ARE 5/8" DIAMETER ASTM A307 BUTTON HEAD BOLT. A POST BOLT REQUIRES A 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX AND A 5/8" DIAMETER F844 FLAT WASHER. LENGTH OF POST BOLT MAY VARY.
- ④ ALL WOOD POSTS MUST BE 6" X 8" AND AT LEAST 7'-0" LONG.



## STEEL THRIE BEAM STRUCTURE APPROACH

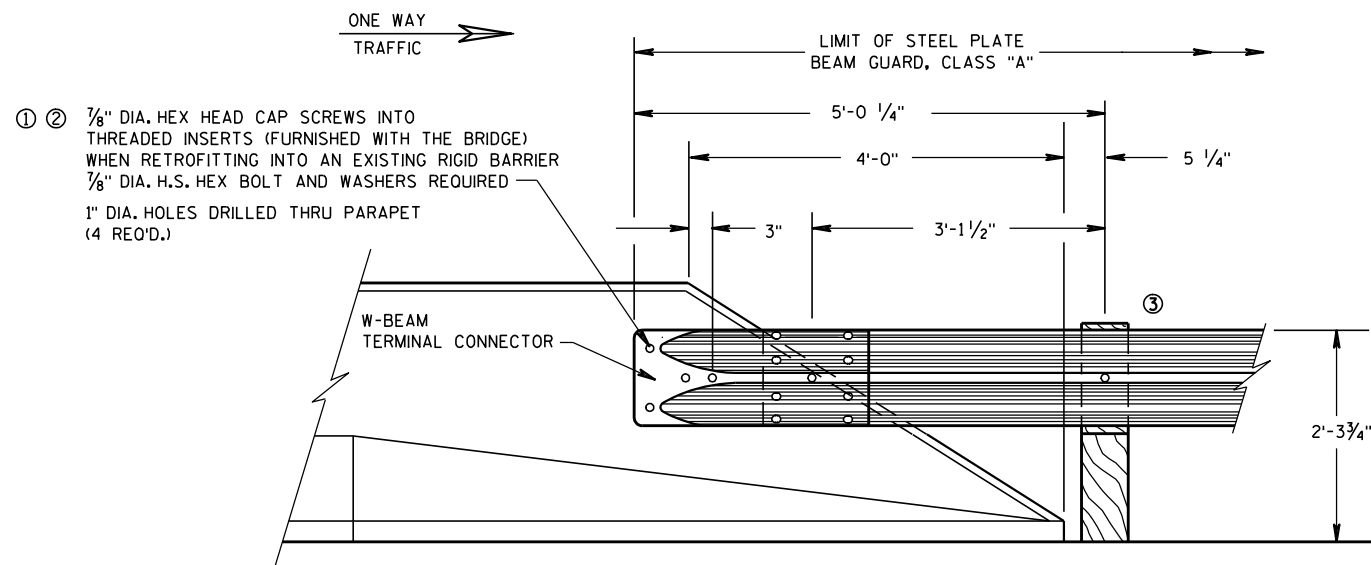
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DEPARTMENT OF TRANSPORTATION

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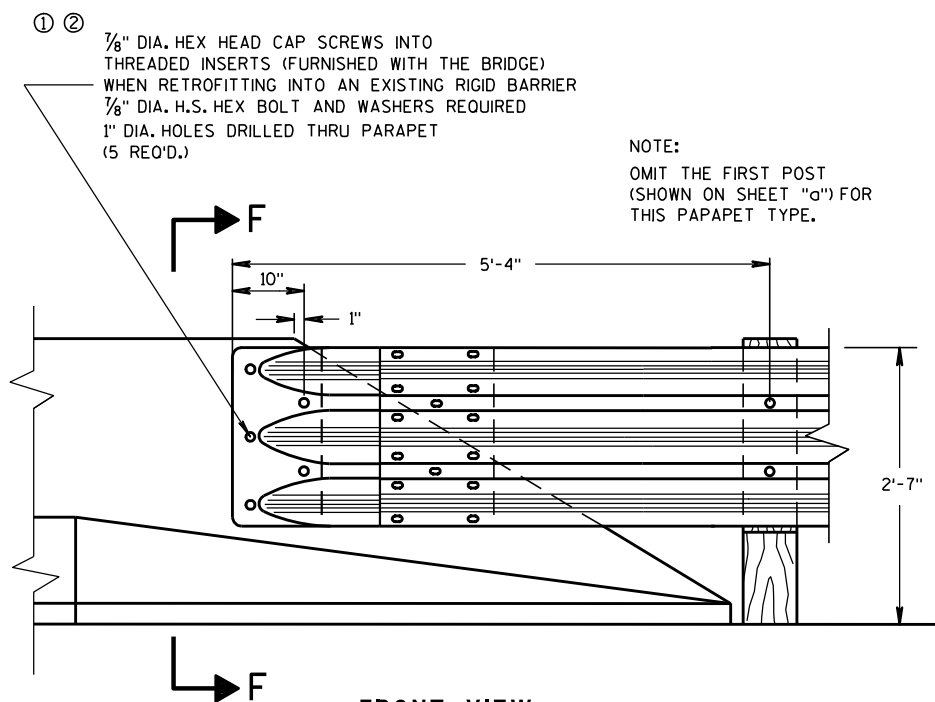
8/31/2012  
DATE

FHWA

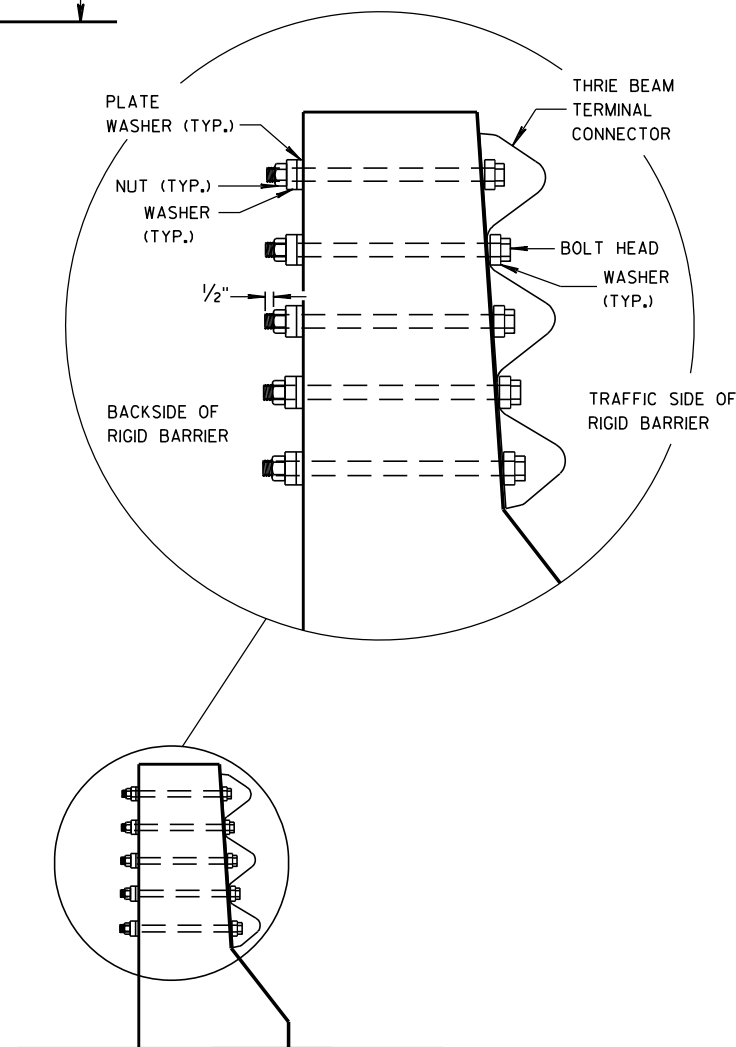
/s/ Jerry H. Zogg  
ROADWAY STANDARDS DEVELOPMENT  
ENGINEER



**FRONT VIEW**  
**W BEAM CONNECTION TO**  
**PARAPETS WITH SLOPED ENDS**  
 (USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)



**FRONT VIEW**  
**THRIE BEAM CONNECTION TO BRIDGE**  
**PARAPETS WITH SLOPED ENDS**



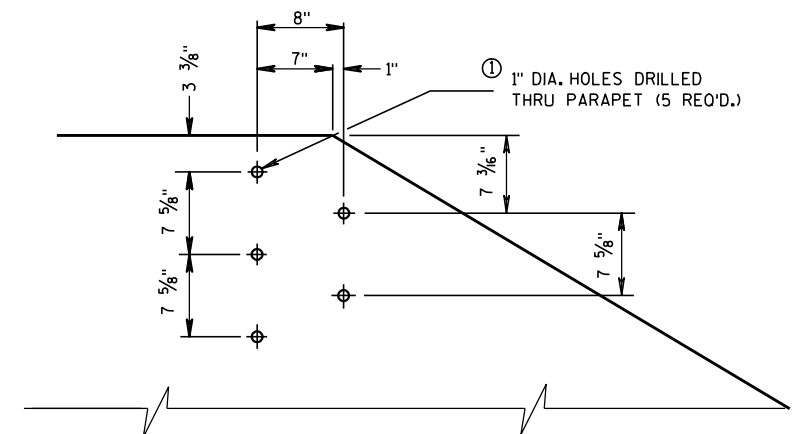
**SECTION F-F**

### GENERAL NOTES

THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSITION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.

BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A325, A449 AND GALVANIZED PER STANDARD SPECIFICATIONS 614.

- ① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM TERMINAL CONNECTOR. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ③ W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POST WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.  
DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.



**DRILL HOLE LOCATION AND PATTERN**  
**FOR THRIE BEAM CONNECTION**

**STEEL THRIE BEAM STRUCTURE**  
**APPROACH CONNECTION TO**  
**SLOPED END PARAPETS**

STATE OF WISCONSIN  
 DEPARTMENT OF TRANSPORTATION

APPROVED

8/31/2012

DATE

FHWA

/S/ Jerry H. Zogg  
 ROADWAY STANDARDS DEVELOPMENT  
 ENGINEER

BILL OF MATERIALS

NOTE NO.	QTY.	DESCRIPTION
①	4	WOOD BREAKAWAY TERMINAL POST: 5 1/2" X 7 1/2" X 3'-9"
②	**	STEEL TUBE: OPTION 1 - QUANTITY OF 4 TS 8" X 6" X 0.188", 4'-6" LONG OR OPTION 2 - QUANTITY OF 2 TS 8" X 6" X 0.188", 6'-0" AND 2 TS 8" X 6" X 0.188", 4'-6" LONG
③	2	SOIL PLATE: 2'-0" X 1'-6" X 1/4" **
④	4	WOOD BREAKAWAY CRT POST: 6" X 8" X 6'-0"
⑤	6	WOOD OFFSET BLOCKS: 6' X 8" X 1'-2"
⑥	1	PIPE SLEEVE: 2" X 5 1/2" STANDARD PIPE
⑦	1	BEARING PLATE
⑧	1	BCT CABLE ASSEMBLY
⑨	1	CABLE ANCHOR BOX
⑩	1	STRUT & YOKE
⑪	1	STEEL PLATE BEAM, END PANEL 12 GA. 13'-6 1/2" LONG FOR SKT-350, ET-2000 AND ET-2000 PLUS
⑫	3	STEEL PLATE BEAM: 12 GA. 13'-6 1/2"
⑬	1	ET-2000/ET-2000 PLUS GUARDRAIL EXTRUDER OR SKT-350 IMPACT HEAD: AS FURNISHED BY MANUFACTURER
⑭	1	0.040" ALUMINUM SHEET WITH REFLECTIVE SHEETING TYPE F PER SECTION 637 OF THE STANDARD SPECIFICATIONS
⑮	1	E.A.T. MARKER POST

GENERAL NOTES

FOLLOW MANUFACTURE'S BOLTING RECOMMENDATIONS, IF NONE ARE AVAILABLE, INSTALL 3/8"  $\phi$  X 1'-6" BUTTON HEAD BOLTS AT ALL POSTS EXCEPT FOR POST 1.

(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) THE 13 SLOT FIRST RAIL PANEL MAY BE USED IN LIEU OF THE 3 SLOT RAIL PANEL ON SKT-350 ONLY.

(D) THE TOP OF THE STEEL TUBE ON POSTS 1 THROUGH 4 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.

(E) THE CENTER OF THE UPPER 3/2" DIAMETER HOLE ON POST 5 THROUGH 8 SHALL BE 3/4" ABOVE THE FINISHED GROUND LINE.

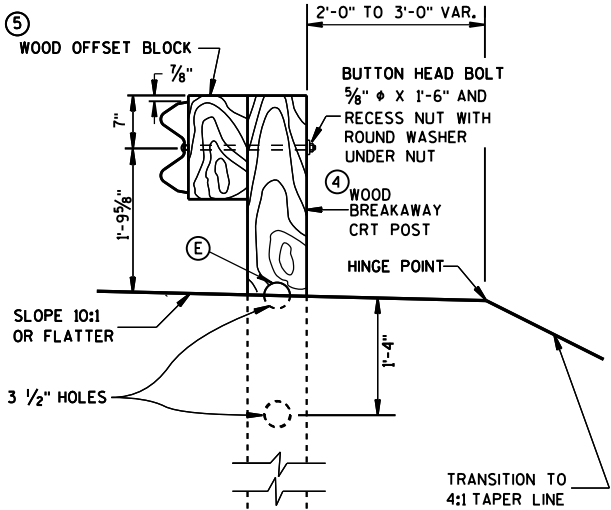
(F) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS, ONE SCREW PER CORNER.

STEEL POSTS SHALL NOT BE ALLOWED FOR USE WITH ENERGY ABSORBING TERMINALS.

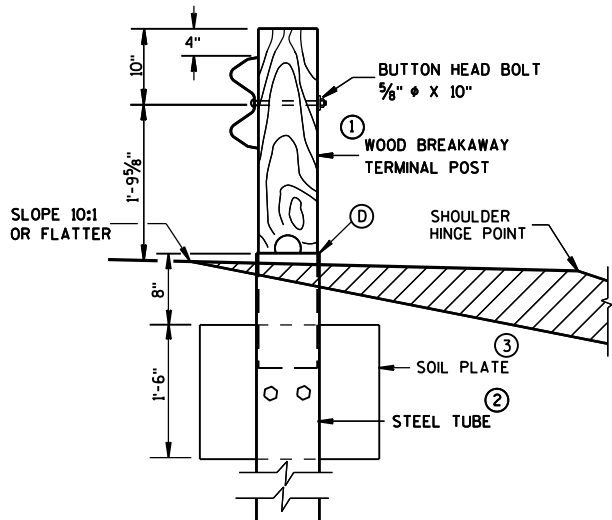
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

\* DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.

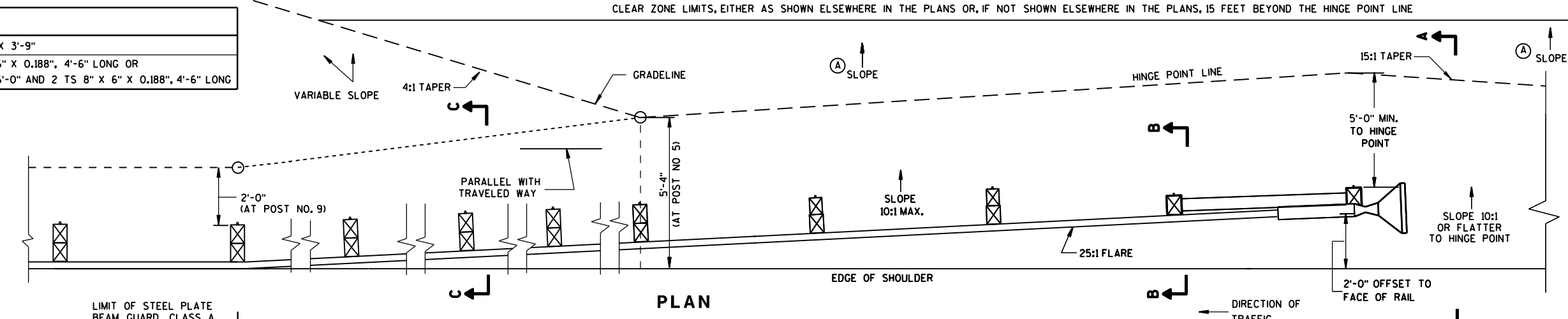
\*\* SDD SHOWS 4 - 54 INCH STEEL TUBES WITH SOIL PLATES INSTALLED ON POST 1 AND POST 2. POST 3 AND 4 DO NOT NEED SOIL PLATES. AN ALTERNATIVE INSTALLATION WOULD CONSIST OF 2 - 72 INCH STEEL TUBES ON POST 1 AND POST 2 AND 54 INCH SOIL TUBES ON POSTS 3 AND 4. THE ALTERNATIVE INSTALLATION DOES NOT REQUIRE SOIL PLATES.



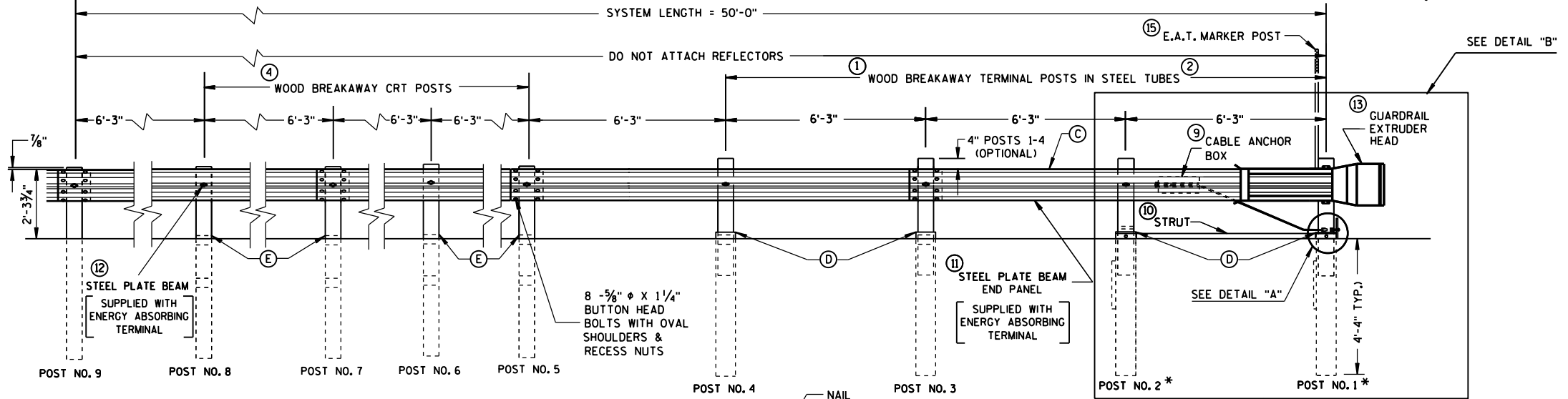
SECTION C-C  
TYPICAL AT POST NOS. 6, 8



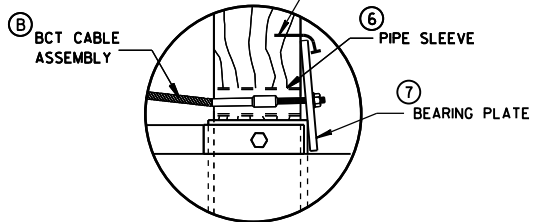
SECTION B-B  
TYPICAL AT POST NO. 2 \*



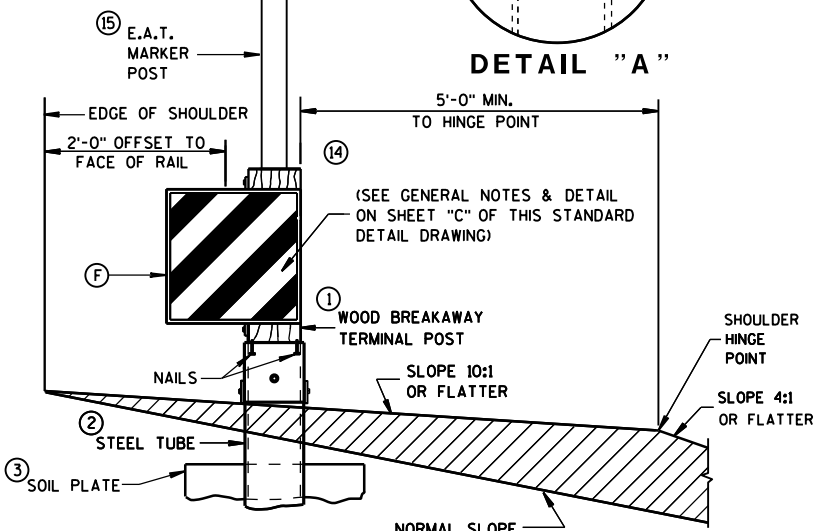
PLAN



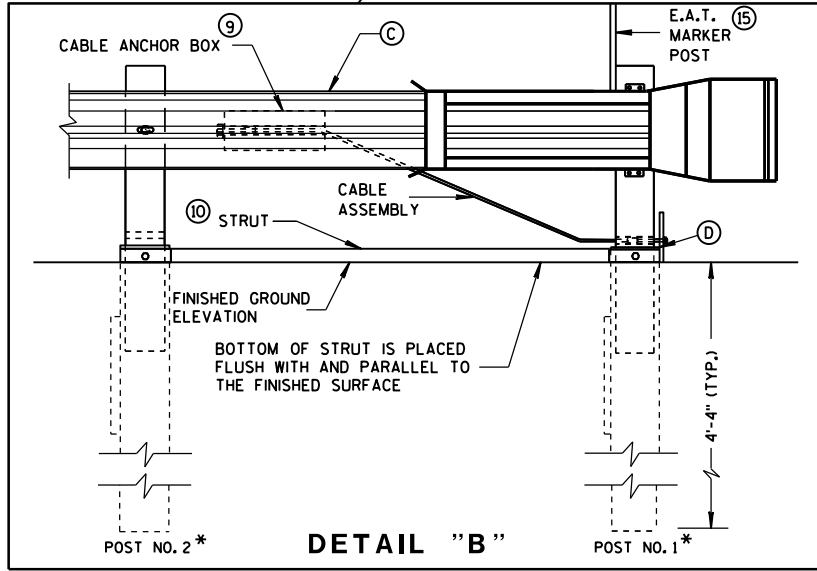
ELEVATION



DETAIL "A"



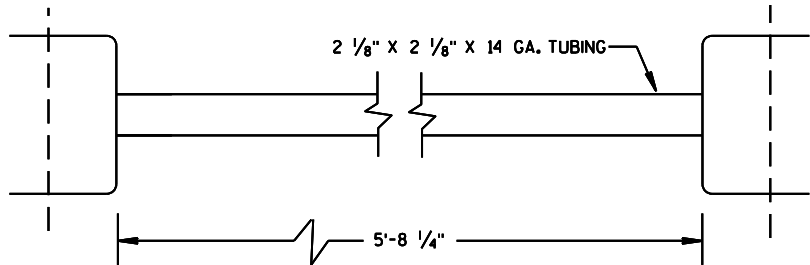
SECTION A-A  
TYPICAL AT POST NO. 1 \*



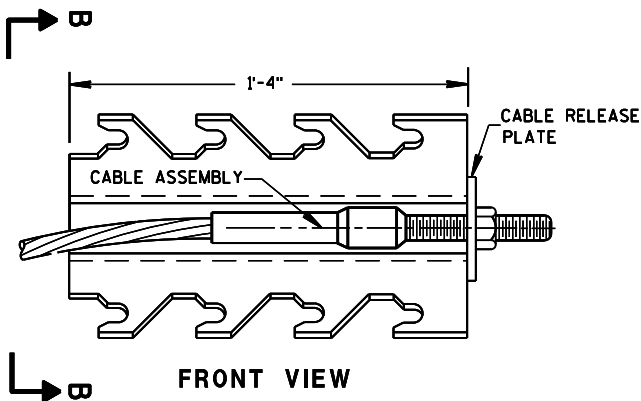
DETAIL "B"

STEEL PLATE BEAM GUARD  
ENERGY ABSORBING TERMINAL

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

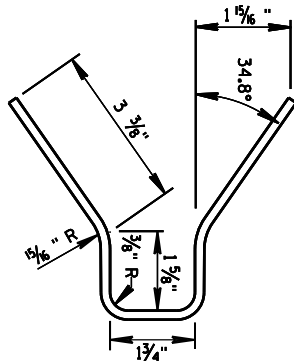


⑩ STRUT DETAIL (SKT-350)

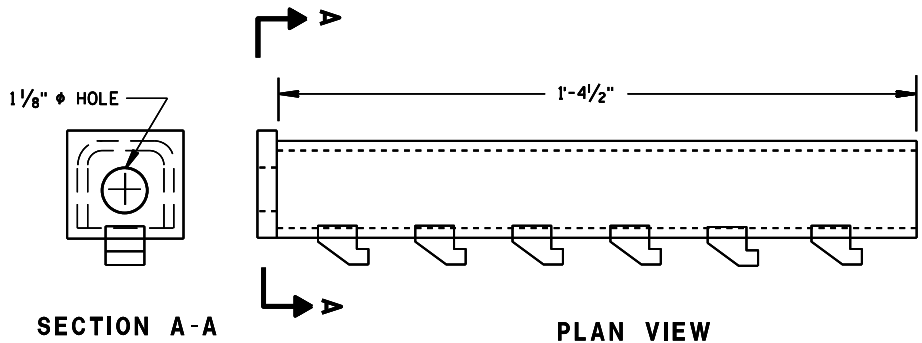


⑨ CABLE ANCHOR BOX (SKT-350)

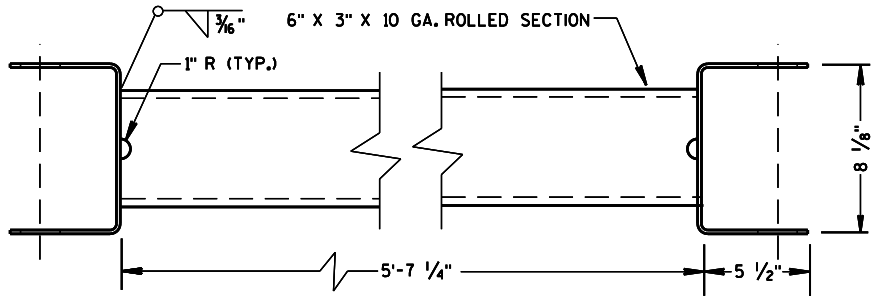
(SKT-350)



SECTION B-B

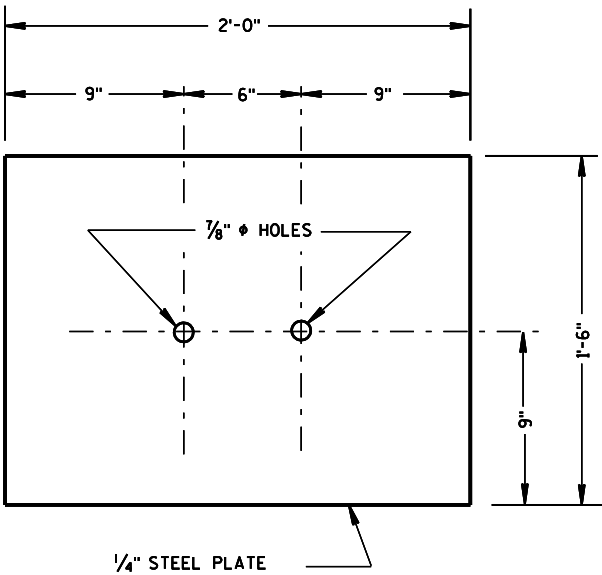


⑨ CABLE ANCHOR BOX (ET-2000/ET-2000 PLUS)

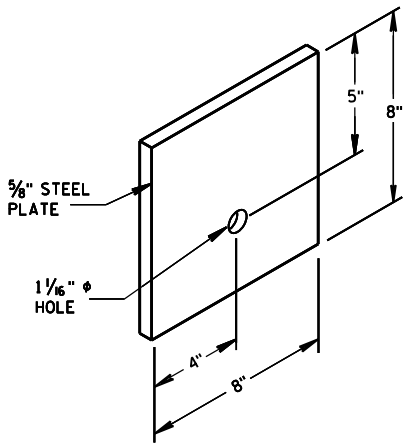


⑩ STRUT DETAIL (ET-2000/ET-2000 PLUS)

(ET-2000/ET-2000 PLUS)



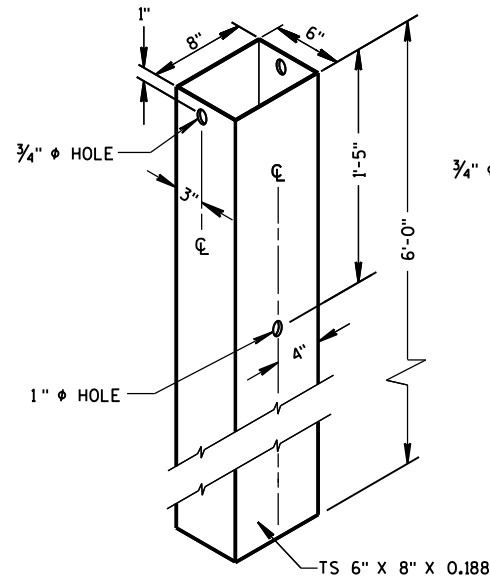
③ SOIL PLATE  
(SKT-350, ET-2000/ET-2000 PLUS)



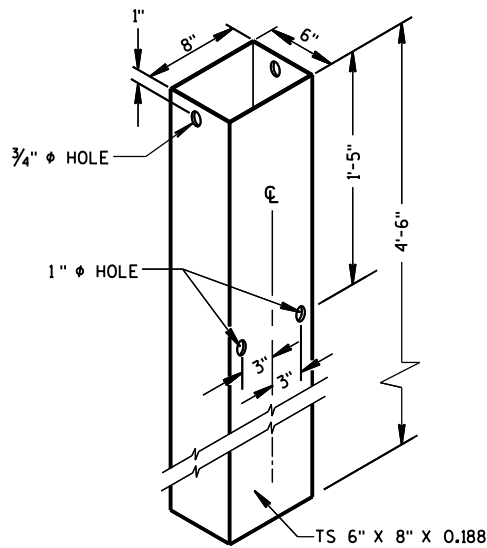
⑦ STEEL BEARING PLATE  
(SKT-350, ET-2000/ET-2000 PLUS)

STEEL PLATE BEAM GUARD  
ENERGY ABSORBING TERMINAL

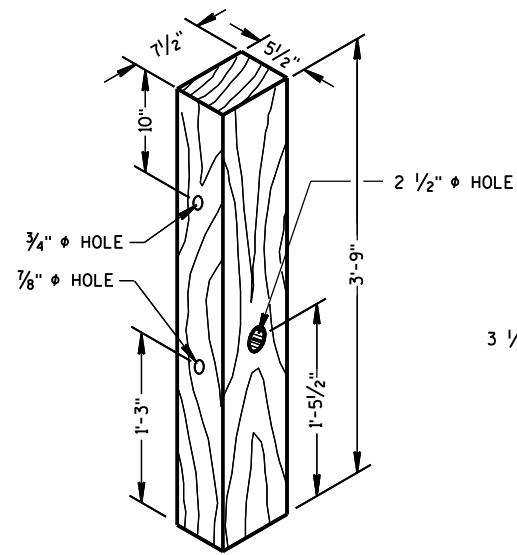
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



② **72" STEEL TUBE**  
(POSTS NO. 1-4)

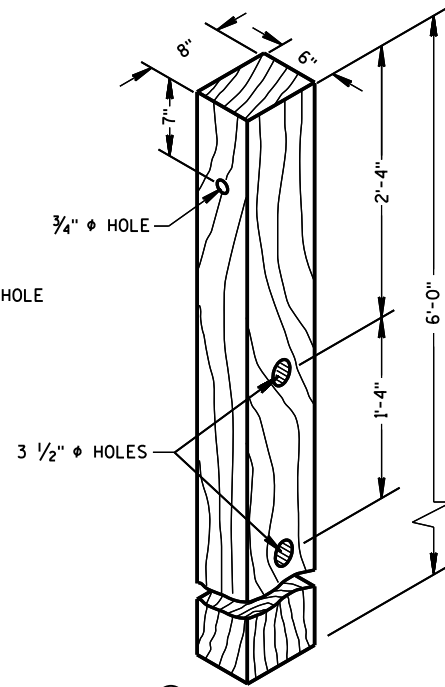


② **54" STEEL TUBE**  
(POSTS NO. 1-4)



① **TERMINAL POST**  
(POSTS NO. 1-4)

### WOOD BREAKAWAY POSTS



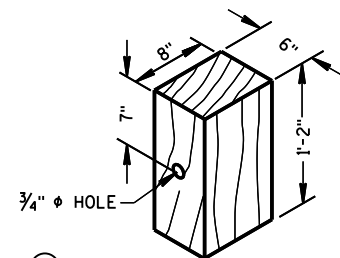
④ **CRT POST**  
(POSTS NO'S 5-8)

### GENERAL NOTES

WHEN ROCK IS ENCOUNTERED DURING EXCAVATION, A 12 INCH DIA. POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK MAY BE USED IF APPROVED BY THE ENGINEER. GRANULAR MATERIAL SHALL BE PLACED IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 1/2" INCHES DEEP TO PROVIDE DRAINAGE. THE SOIL TUBES SHALL BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH ADEQUATELY COMPACTED MATERIAL EXCAVATED FROM THE HOLE.

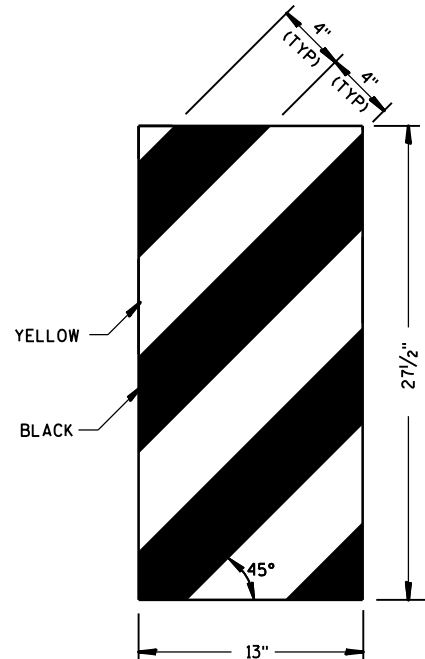
SEE APPROVED PRODUCTS LIST FOR ACCEPTABLE E. A. T. MARKER POST.

ⓐ 1/2" DIA. X 3" LAG BOLT WITH WASHER.

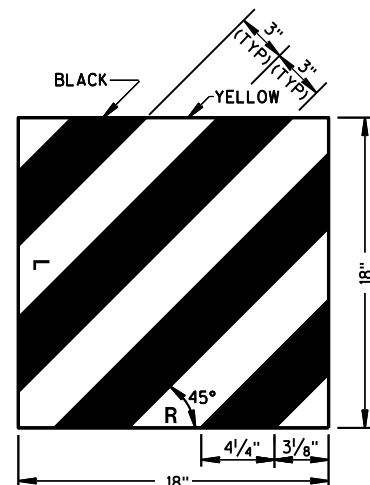


⑤ **WOOD OFFSET BLOCK**  
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2

TYPE H  
YELLOW REFLECTIVE  
SHEETING 3" X 9"  
SEE STANDARD  
SPECIFICATION 637

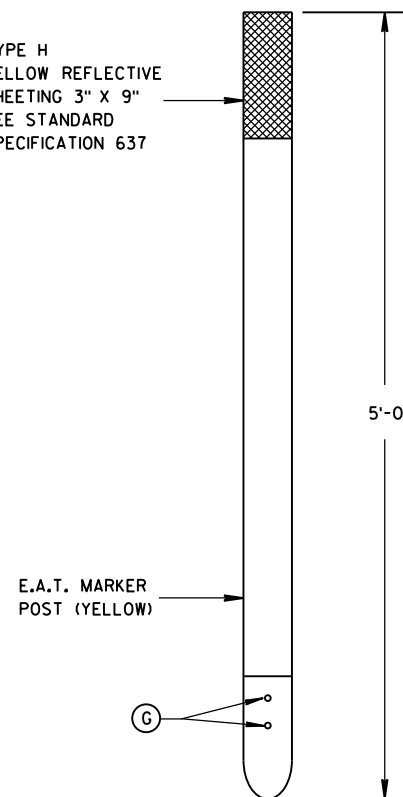


**ET-2000 PLUS ONLY**

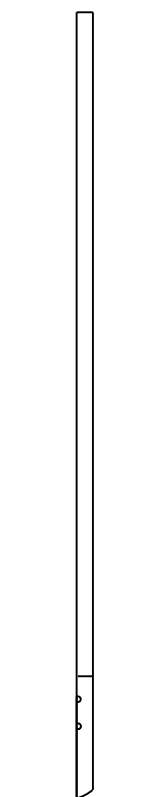


**ET-2000 AND SKT-350**

⑭ **REFLECTIVE SHEETING DETAILS**

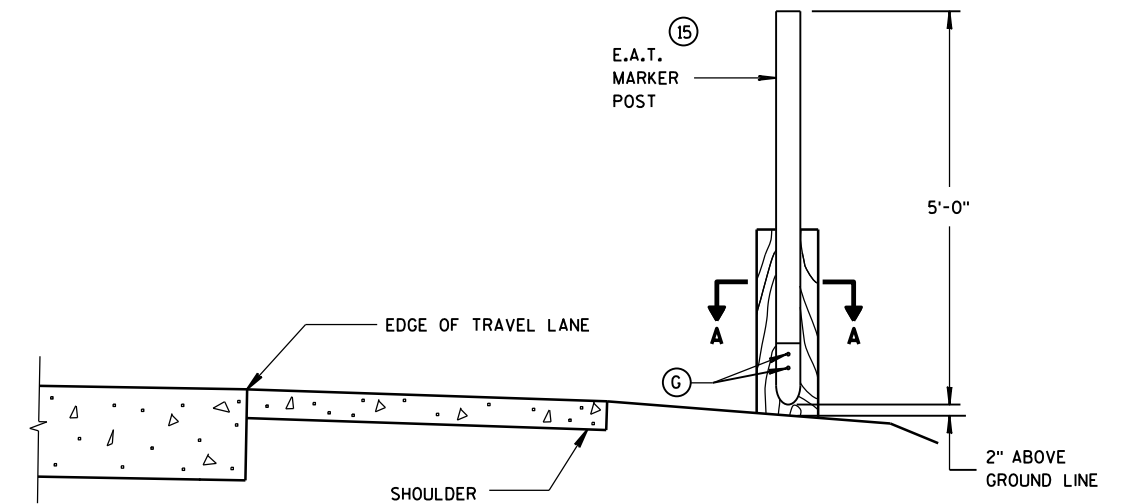


**FRONT VIEW**

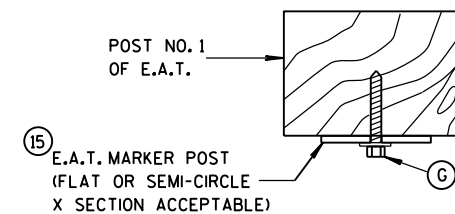


**SIDE VIEW**

⑮ **E.A.T. MARKER POST**



**TYPICAL INSTALLATION OF E.A.T. MARKER POST BACKSIDE OF POST NO. 1**  
(E.A.T. AND RAIL REMOVED FOR CLARITY)



**SECTION A-A**

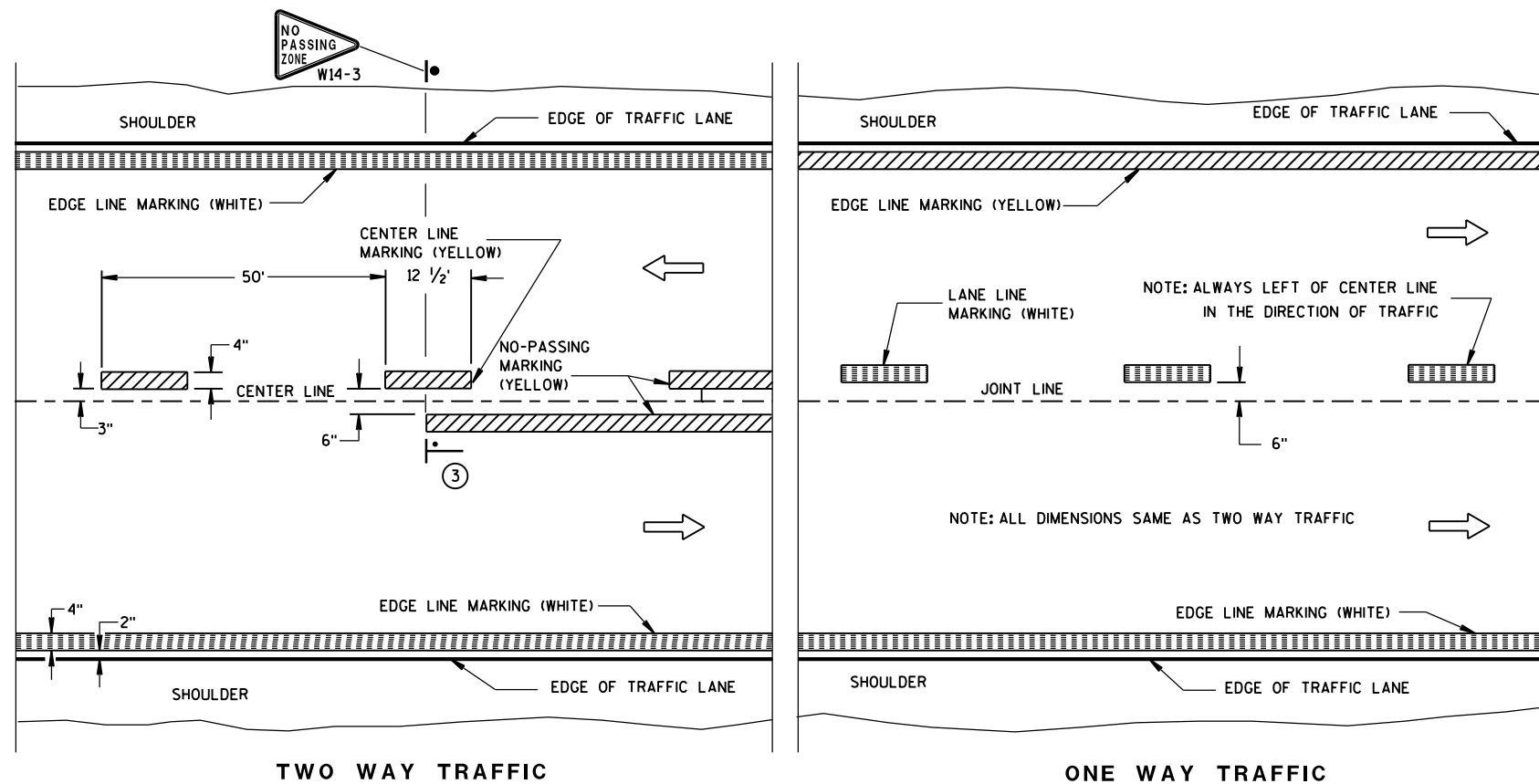
**STEEL PLATE BEAM GUARD  
ENERGY ABSORBING TERMINAL**

**STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION**

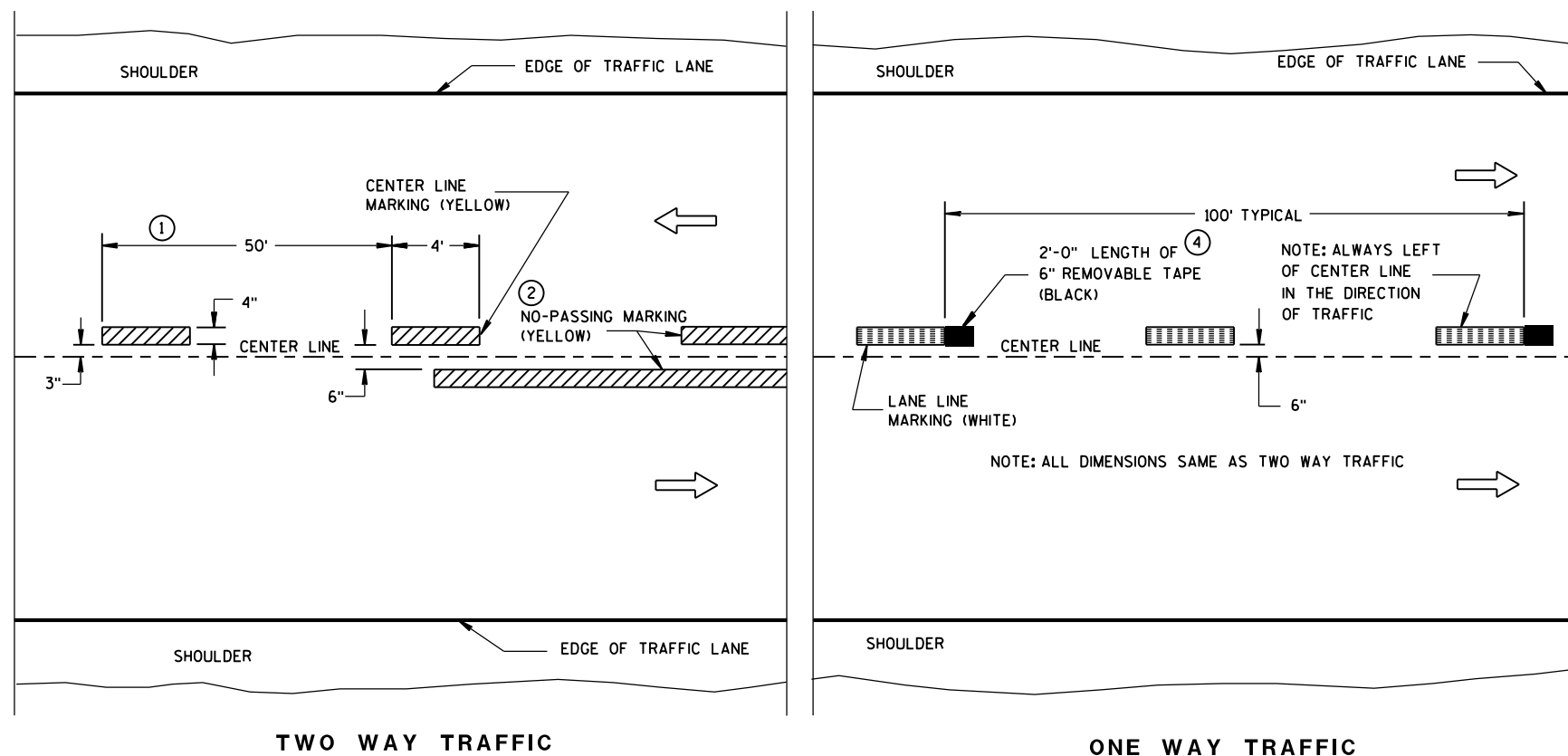
APPROVED  
June 2014  
DATE  
FHWA

/S/ Jerry H. Zogg  
ROADWAY STANDARDS DEVELOPMENT  
ENGINEER





## PERMANENT PAVEMENT MARKING



**TEMPORARY (INTERMEDIATE) PAVEMENT MARKING**  
(SHOWS CYCLE FOR TEMPORARY CENTER LINE OR TEMPORARY LANE LINE MARKING)

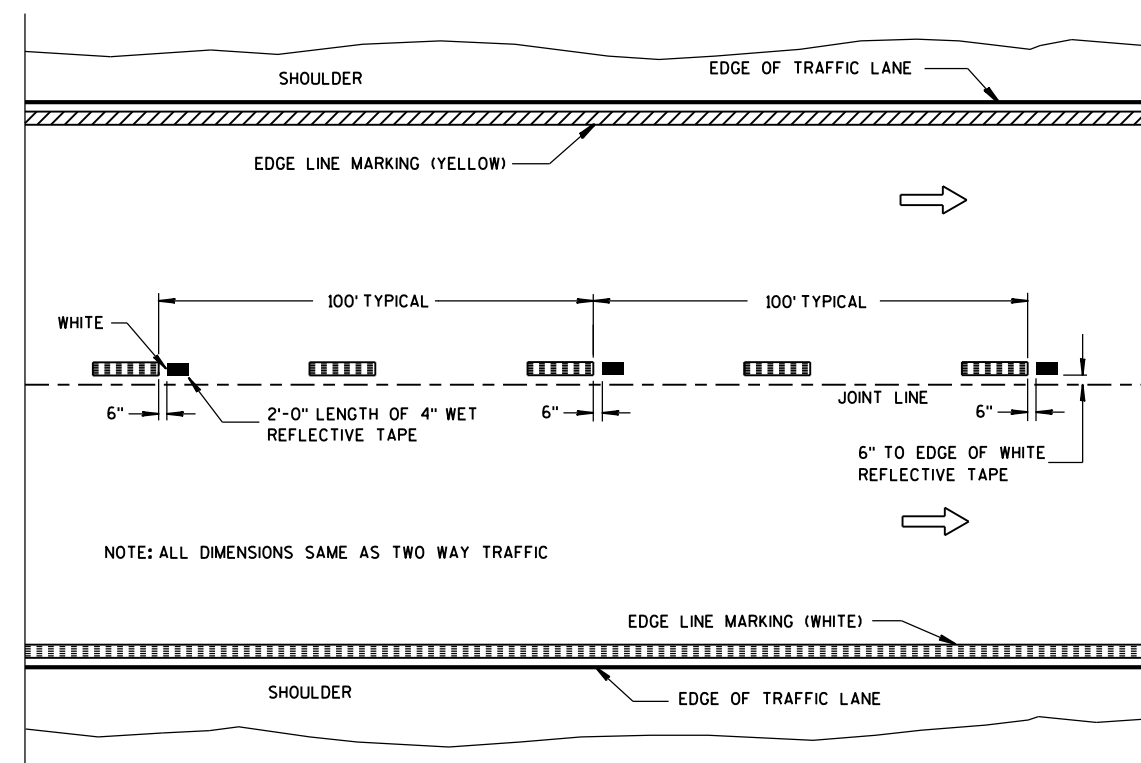
## GENERAL NOTES

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

- ① HALF CYCLE LENGTHS (25'±) WITH 2' MINIMUM STRIPE LENGTHS SHALL BE PROVIDED ON ROADWAYS (INCLUDING TEMPORARY TRAVELED WAYS) WITH REVERSE CURVATURE, CURVATURE OF OVER 5 DEGREES OR WHEN DIRECTED BY THE ENGINEER TO MARK UNUSUAL ALIGNMENT OF THE TRAVELED WAY.
- ② NO PASSING ZONE TEMPORARY PAVEMENT MARKING IS REQUIRED TO BE PLACED, WHERE APPROPRIATE, ALONG WITH CENTERLINE TEMPORARY PAVEMENT MARKING WHEN A SAME DAY PERMANENT PAVEMENT MARKING ITEM IS INCLUDED IN THE CONTRACT.
- ③ NO PASSING ZONE MARKINGS ARE PLACED ACCORDING TO "T" MARKINGS. IF EXISTING NO PASSING ZONE W14-3 SIGNS ARE BEYOND 50 FEET IN EITHER DIRECTION, THE SIGNS SHALL BE MOVED TO THE "T" MARKINGS.
- ④ CONCRETE ONLY.



## NOTE

ARROW SYMBOL (  ) SHOWS DIRECTION OF TRAVEL



WET REFLECTIVE TAPE SUPPLEMENT TO  
SPRAYED OR NON WET REFLECTIVE TAPE LANE LINE

### LEGEND

-  "T" MARKING
-  POST MOUNTED SIGN

### PAVEMENT MARKING (MAINLINE)

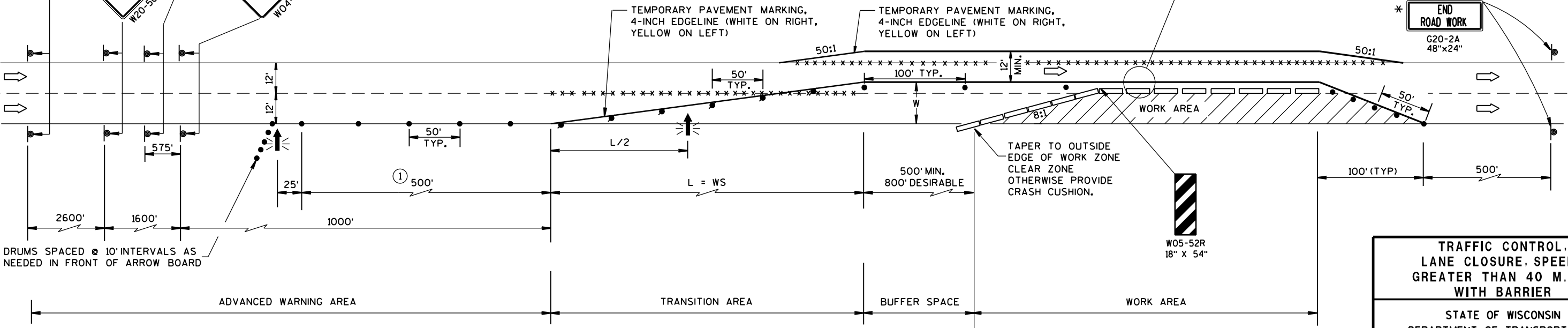
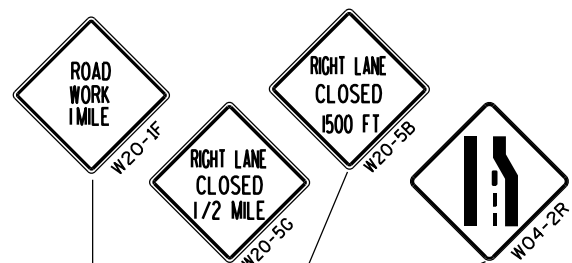
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
5-13-2013 /S/ Travis Feltes  
DATE STATE TRAFFIC ENGINEER  
FHWA

LEGEND

- SIGN ON PERMANENT SUPPORT
- TRAFFIC CONTROL DRUM WITH TYPE "C" STEADY BURN LIGHT
- TRAFFIC CONTROL DRUM
- FLASHING ARROW BOARD
- REMOVING PAVEMENT MARKING
- CONCRETE BARRIER TEMPORARY PRECAST
- DIRECTION OF TRAFFIC
- WORK AREA

L. TAPER LENGTH (MPH)									
SPEED (MPH)	W. LATERAL OFFSET (FT)								
	10	11	12	13	14	15	16	17	18
45	450	495	540	585	630	675	720	765	810
50	500	550	600	650	700	750	800	850	900
55	550	605	660	715	770	825	880	935	990
60	600	660	720	780	840	900	960	1020	1080
65	650	715	780	845	910	975	1040	1105	1170
70	700	770	840	910	980	1050	1120	1190	1260



DRUMS SPACED @ 10' INTERVALS AS NEEDED IN FRONT OF ARROW BOARD

ADVANCED WARNING AREA

TRANSITION AREA

BUFFER SPACE

WORK AREA

W12-52P 42"x36"

EACH LANE

OR



W057-52 48"x36"

INSTALL ON EACH APPROACH AT THE CLOSEST INTERSECTION WITH A STATE OR COUNTY TRUNK HIGHWAY, OR AS DIRECTED BY THE ENGINEER. WIDTH ON SIGN TO BE APPROX. 1 FOOT LESS THAN AVAILABLE WIDTH (OMIT IF AVAILABLE WIDTH IS MORE THAN 16 FEET).



OR



LOCATED 2600 FEET IN ADVANCE OF R2-1 SIGN AND 500 FEET BEYOND THE "ROAD WORK 1 MILE" SIGN.



OR



R2-1 48"x60" (BLACK AND WHITE) LOCATED 500 FEET BEYOND W20-5G SIGN.

IF THE REGULATORY SPEED HAS BEEN REDUCED, A SPEED LIMIT SIGN SHALL BE LOCATED 1500 FEET BEYOND THE END OF THE ACCELERATION LANE OF EACH ENTRANCE RAMP. THERE SHOULD BE A SPEED LIMIT SIGN INCORPORATED A MINIMUM OF EVERY 2 OR 3 MILES.

\* INCLUDE RESUME SPEED LIMIT SIGN A MINIMUM OF 200 FEET (500 FEET DESIRABLE) AFTER END ROAD WORK SIGNS.

GENERAL NOTES

THIS LANE CLOSURE IS TYPICAL FOR CLOSING RIGHT LANE - REVERSE FOR CLOSING LEFT LANE.

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

THE SPACING BETWEEN SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 200 FEET (500 FEET DESIRABLE) CLEARANCE TO EXISTING SIGNS.

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED.

"W0" IS THE SAME AS "W" EXCEPT THE BACKGROUND IS ORANGE.

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

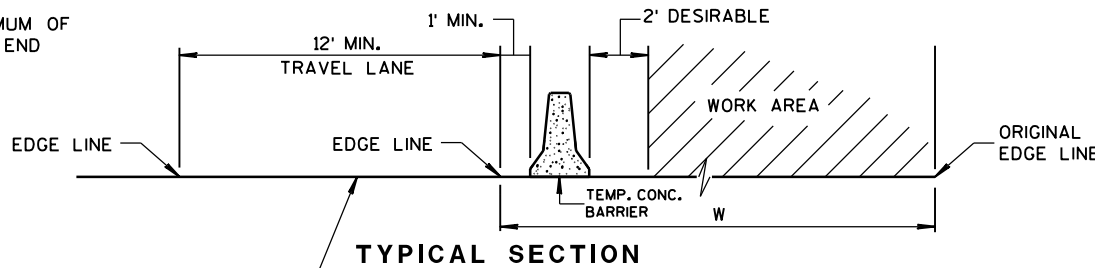
① CONSIDER ROADWAY GEOMETRICS WHEN LOCATING SIGNS AND ARROW BOARD SO THE DRIVER HAS A CLEAR VIEW OF THE ARROW BOARD AND LANE CLOSURE DRUMS FOR A MINIMUM 1500 FEET IN FRONT OF DRUM TAPER.

FOR A LANE CLOSURE THAT IS IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS, THE ADVANCED WARNING SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS.

REMOVE PAVEMENT MARKINGS IF LANE CLOSURE IS TO BE IN PLACE FOR 4 OR MORE CONTINUOUS DAYS AND NIGHTS.

IF THE HORIZONTAL ALIGNMENT IS SUCH THAT A CURVE MAY REQUIRE ADDITIONAL DELINEATION, THE DEVICE SPACING MAY BE DECREASED TO 50 FEET.

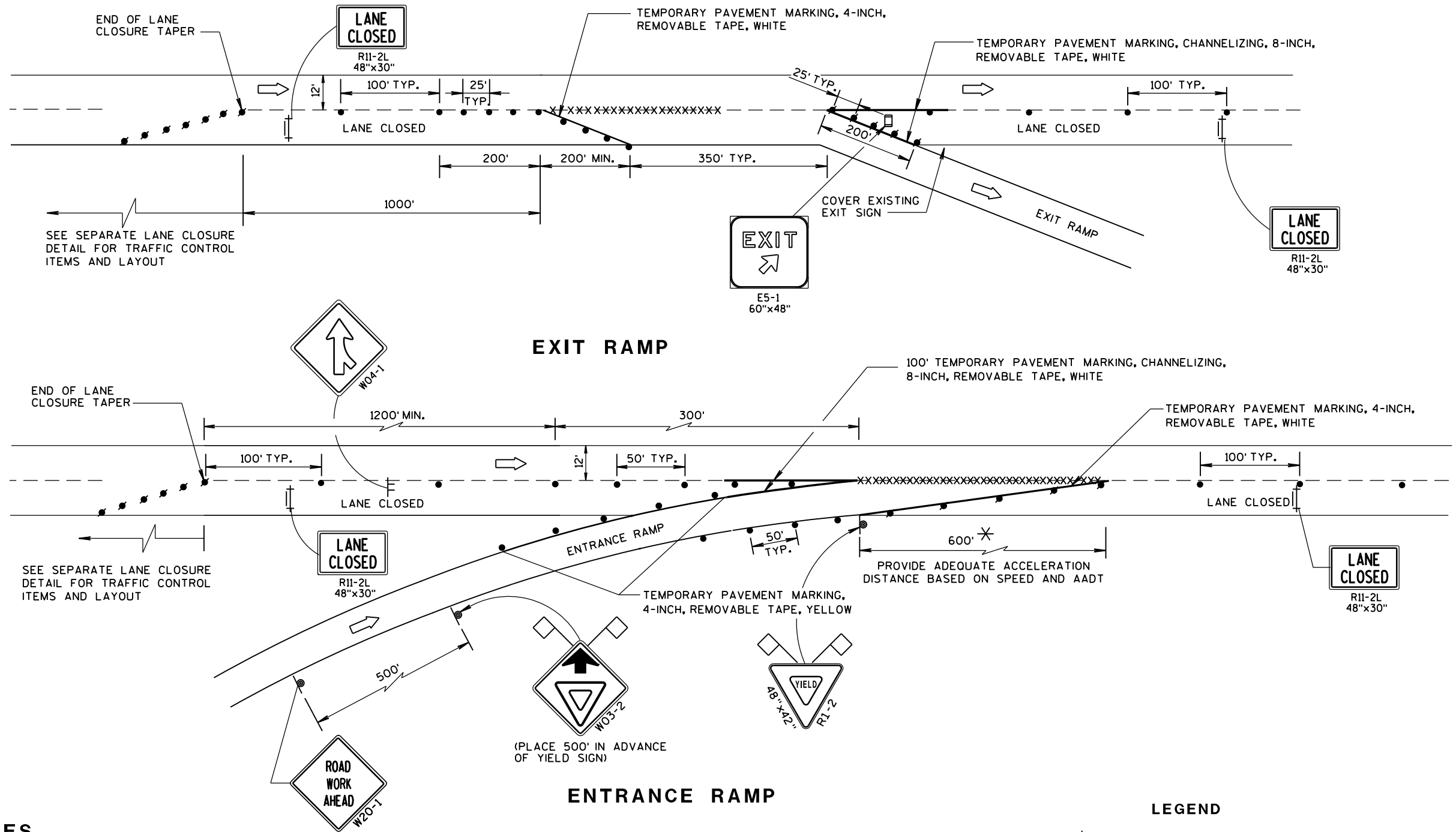
ADJUSTMENTS IN BUFFER SPACE NEED TO BE INCORPORATED WHEN THE LANE CLOSURE OCCURS NEAR AN INTERCHANGE EXIT OR ENTRANCE RAMP OR INTERSECTION. THE LANE CLOSURE MUST TAKE PLACE FAR ENOUGH IN ADVANCE OF AN EXIT OR ENTRANCE RAMP TO STILL ALLOW FOR ADEQUATE BUFFER SPACE. THE MINIMUM LENGTH OF THE BUFFER SPACE BEFORE AN EXIT RAMP SHOULD BE 1/2 THE LENGTH OF THE TRANSITION AREA. THE ENTRANCE RAMP SHOULD BE FOLLOWED BY THE ORIGINAL BUFFER SPACE LENGTH OF 800 FEET DESIRABLE PRIOR TO ANOTHER TRAFFIC CONTROL CHANGE SUCH AS A CROSSOVER MANEUVER.



TRAFFIC CONTROL,  
LANE CLOSURE, SPEEDS  
GREATER THAN 40 M.P.H.  
WITH BARRIER

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
March 2016 /S/ Peter Amakobe Atepe  
DATE STATEWIDE WORK ZONE TRAFFIC  
FHWA SAFETY ENGINEER



GENERAL NOTES

THE INSTALLATIONS SHOWN ON THIS SHEET ARE TYPICAL EXAMPLES AND ARE NOT INTENDED TO REPRESENT ANY PARTICULAR RAMP. AT SPECIFIC FIELD LOCATIONS, SIMILAR INSTALLATIONS SHALL BE USED AND ADJUSTED TO THE GEOMETRICS OF THE RAMP AS COORDINATED WITH THE ENGINEER.

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

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A MINIMUM OF 200 FEET, (500 FEET DESIRABLE) CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED.

"WO" IS THE SAME AS "W" EXCEPT THE BACKGROUND IS ORANGE.

SEE SEPARATE LANE CLOSURE DETAIL FOR TYPICAL SPACING OF TYPE III BARRICADES AND R11-2L "LANE CLOSED" SIGNS.

YIELD SIGN AND WARNING SIGNS ON ENTRANCE RAMP ARE ALSO APPROPRIATE FOR CLOSURE OF THE MAINLINE LEFT LANE. OMIT THE YIELD SIGN IF MORE THAN ONE LANE REMAINS OPEN ON THE MAINLINE AND THE RAMP TAPER IS AT LEAST AS LONG AS THE NORMAL ENTRANCE RAMP TAPER AT THE SITE.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS, OR THAT WILL BE PLACED IN A CLOSED LANE, MAY BE MOUNTED ON PORTABLE SUPPORTS.

IF INDICATED IN MISCELLANEOUS QUANTITIES, SUBSTITUTE FLEXIBLE TUBULAR MARKERS FOR DRUMS IN THE GORE BETWEEN THE ENTRANCE RAMP AND MAINLINE TRAFFIC.

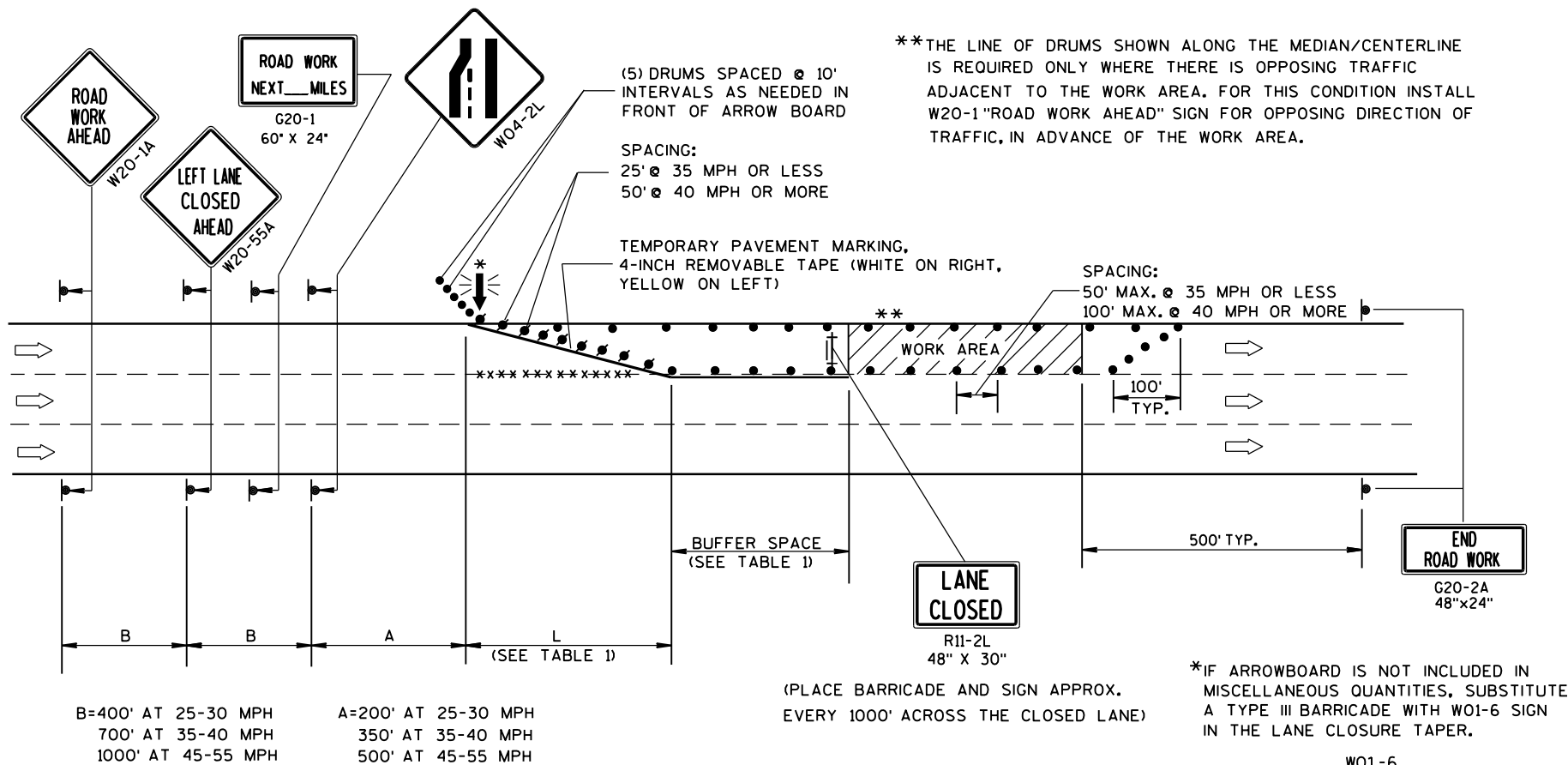
ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

REMOVE PAVEMENT MARKINGS AND PLACE TEMPORARY PAVEMENT MARKING, REMOVABLE TAPE IF LANE CLOSURE IS TO BE IN PLACE FOR 7 OR MORE CONTINUOUS DAYS AND NIGHTS.

WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.

\* LENGTH OF OPENING MAY BE REDUCED TO 150 FEET DURING STAGING OF WORK IN IMMEDIATE AREA OF RAMP TAPER.

TRAFFIC CONTROL, EXIT AND ENTRANCE RAMP WITHIN LANE CLOSURE	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED Sept. 2015 DATE	/S/ Peter Amokobe Atepe STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER
FHWA	



GENERAL NOTES

THIS LANE CLOSURE DETAIL IS TYPICAL FOR CLOSING THE LEFT LANE. FOR A RIGHT LANE CLOSURE, REVERSE THE TRAFFIC CONTROL.

THIS DETAIL MAY BE USED FOR ROADWAYS WITH EITHER TWO OR THREE LANES IN EACH DIRECTION.

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND DEVICES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS 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.

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY DISTRICT TRAFFIC UNIT.

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

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS, OR THAT WILL BE PLACED IN A CLOSED LANE, MAY BE MOUNTED ON PORTABLE SUPPORTS.

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.

REMOVE PAVEMENT MARKINGS AND PLACE TEMPORARY PAVEMENT MARKING, REMOVABLE TAPE IF LANE CLOSURE IS TO BE IN PLACE FOR 4 OR MORE CONTINUOUS DAYS AND NIGHTS.

ON UNDIVIDED ROADWAYS, OMIT THE SIGNS SHOWN ON LEFT SIDE OF ROAD.

W20-1A, G20-1 AND G20-2A SIGNS ARE NOT REQUIRED IF THE LANE CLOSURE IS WITHIN A LARGER WORK ZONE WHERE THESE SIGNS ARE ALREADY PRESENT.

OMIT G20-1 SIGNS IF LENGTH OF WORK AREA IS 2 MILES OR LESS.

CONSIDER GEOMETRICS WHEN LOCATING SIGNS AND ARROWBOARDS SO THE APPROACHING DRIVER HAS A CLEAR VIEW OF THE ARROWBOARDS AND LANE CLOSURE DRUMS.

PLACE THE ARROWBOARD AS CLOSE AS POSSIBLE TO THE BEGINNING OF THE LANE CLOSURE TAPER, PREFERABLY ON THE SHOULDER OR TERRACE.

CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

BARRICADES IN A CLOSED LANE 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.

WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.

TABLE 1  
TAPER AND BUFFER SPACE  
FOR 12' LANE WIDTH

S	L	BUFFER SPACE
25	125'	55'
30	180'	85'
35	245'	120'
40	320'	170'
45	540'	220'
50	600'	280'
55	660'	335'

FOR LANE WIDTH OTHER THAN 12':

L = WS AT 45 MPH OR GREATER

$L = \frac{WS^2}{60}$  AT 40 MPH OR LESS

L = TAPER LENGTH IN FEET

S = NON-CONSTRUCTION SPEED LIMIT (MPH)

W = WIDTH OF LANE CLOSURE

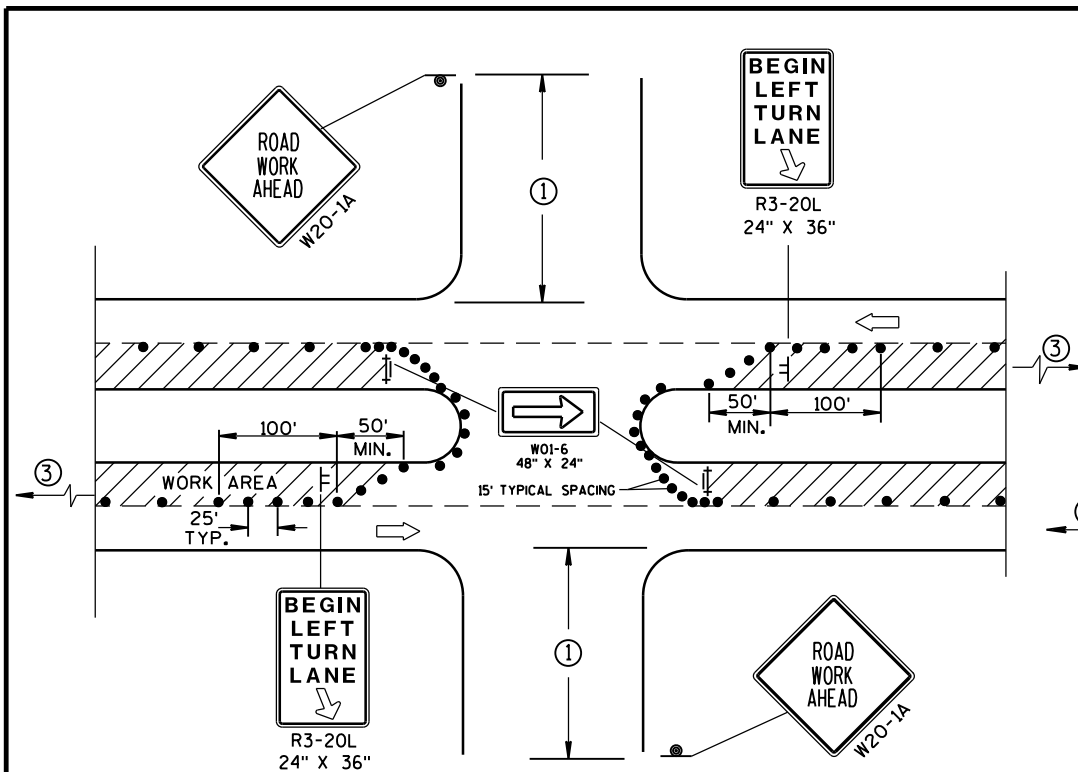
LEGEND

- TYPE III BARRICADE WITH ATTACHED SIGN
- SIGN ON PERMANENT SUPPORT
- TRAFFIC CONTROL DRUM WITH TYPE "C" STEADY BURN LIGHT
- TRAFFIC CONTROL DRUM
- FLASHING ARROW BOARD
- DIRECTION OF TRAFFIC
- REMOVING PAVEMENT MARKING (SEE GENERAL NOTES)
- WORK AREA

TRAFFIC CONTROL,  
SINGLE LANE CLOSURE,  
NON-FREEWAY/EXPRESSWAY

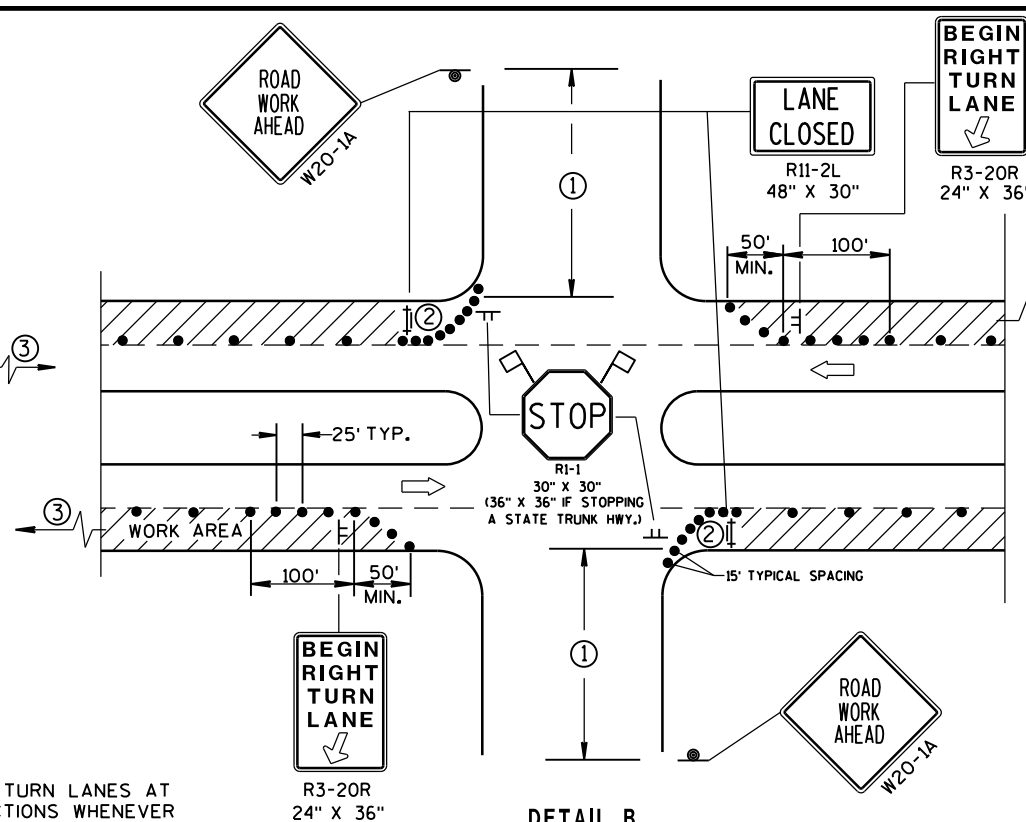
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
June 2016 /S/ Peter Amakobe Atepe  
DATE STATEWIDE WORK ZONE TRAFFIC  
FHWA SAFETY ENGINEER



DETAIL A  
FOR LEFT LANE CLOSURE AT  
INTERSECTION OR MEDIAN OPENING

PROVIDE TURN LANES AT  
INTERSECTIONS WHENEVER  
STAGING OF WORK ALLOWS.  
TAPER AND TURN LANE  
LENGTHS BASED ON FIELD  
CONDITIONS AS APPROVED  
BY THE ENGINEER.



DETAIL B  
FOR RIGHT LANE CLOSURE  
AT INTERSECTION

## GENERAL NOTES

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

THE SPACING BETWEEN 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.

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY DISTRICT TRAFFIC UNIT.

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

SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE FHWA'S MANUAL OF STANDARD HIGHWAY SIGNS OR THE WISCONSIN STANDARD SIGN PLATES.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS, OR THAT WILL BE PLACED IN A CLOSED LANE, MAY BE MOUNTED ON PORTABLE SUPPORTS.

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.

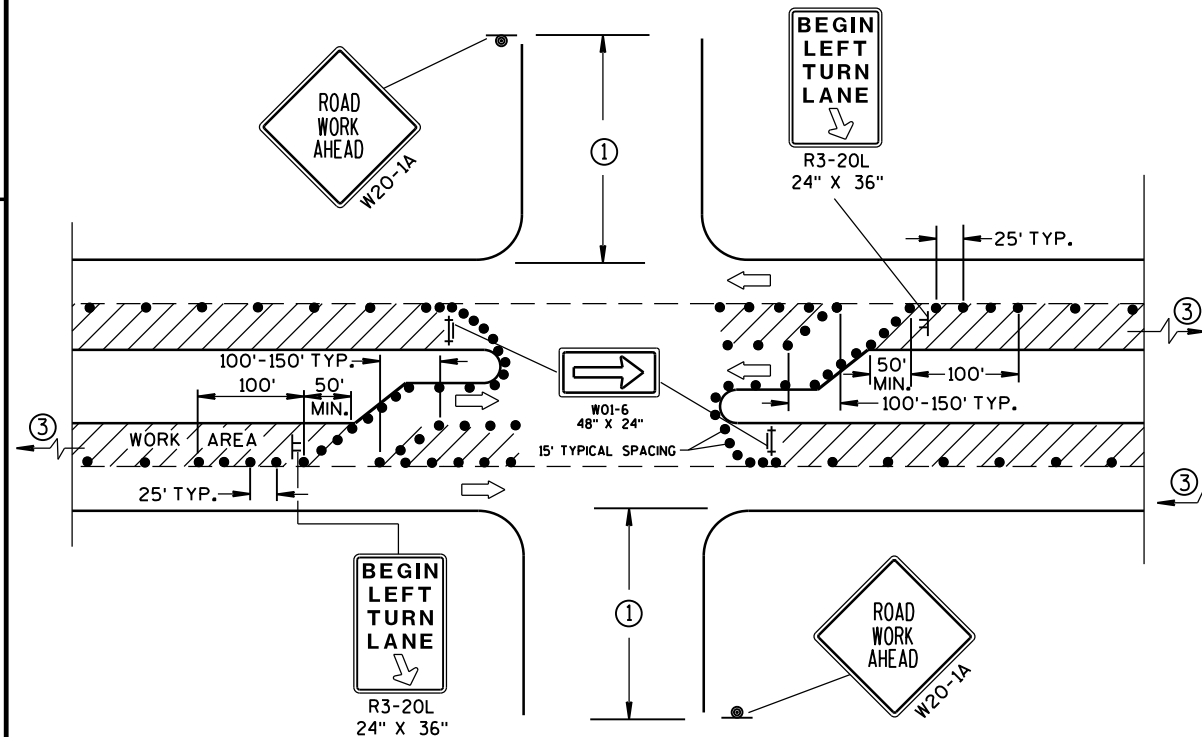
CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

BARRICADES IN A CLOSED LANE 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.

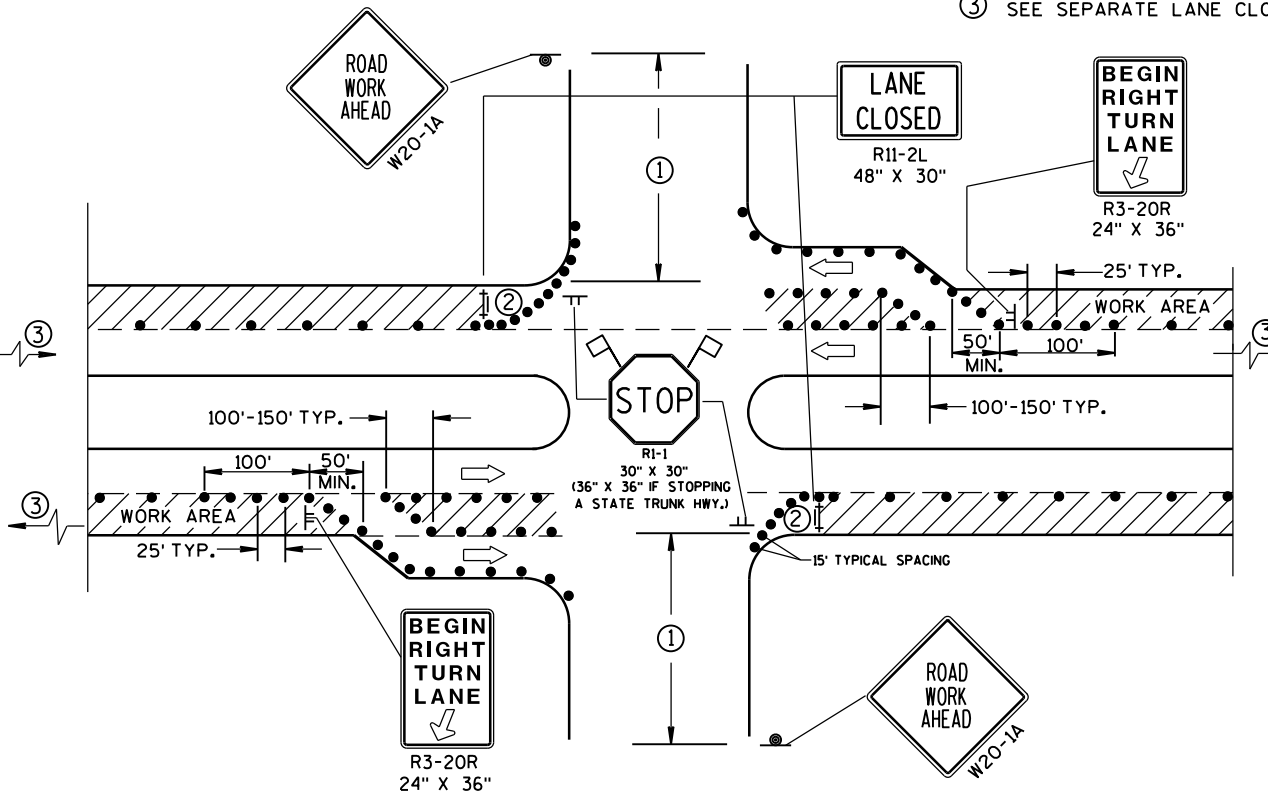
- ① 500' TYPICAL OR AT LAST INTERSECTION, WHICHEVER IS CLOSER.  
350' IF 35-40 MPH.  
200' IF 25-30 MPH.
- ② ALSO USE BARRICADE AND 15-FOOT TYPICAL DRUM SPACING AT COMMERCIAL DRIVEWAYS.
- ③ SEE SEPARATE LANE CLOSURE DETAIL FOR ADDITIONAL TRAFFIC CONTROL.

## LEGEND

- TRAFFIC CONTROL DRUM
- ⊙ SIGN ON PERMANENT SUPPORT
- ⊢ SIGN ON TEMPORARY SUPPORT (5' MIN. MOUNTING HEIGHT)
- ⊢ TYPE III BARRICADE WITH ATTACHED SIGN AND TYPE "A" WARNING LIGHT (FLASHING)
- ➡ DIRECTION OF TRAFFIC
- ⚑ FLAGS, 16" X 16" MIN., (ORANGE)
- ▨ WORK AREA



DETAIL C  
FOR LEFT LANE CLOSURE AT INTERSECTION OR  
MEDIAN OPENING (WITH LEFT TURN BAY OPEN)



DETAIL D  
FOR RIGHT LANE CLOSURE AT INTERSECTION  
(WITH RIGHT TURN BAY OPEN)

## TRAFFIC CONTROL, INTERSECTION WITHIN SINGLE LANE CLOSURE

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
June 2016 /S/ Peter Anakobe Atepe  
DATE STATEWIDE WORK ZONE TRAFFIC  
FHWA SAFETY ENGINEER

LEGEND

- TRAFFIC CONTROL DRUM
- ⦿ SIGN ON PERMANENT SUPPORT
- ➡ DIRECTION OF TRAFFIC
- ⚡➡ FLASHING ARROW BOARD
- ▨ WORK AREA

GENERAL NOTES

THIS DETAIL IS TYPICAL FOR CLOSING THE RIGHT SHOULDER. FOR CLOSING THE LEFT SHOULDER, REVERSE THE TRAFFIC CONTROL.

THIS DETAIL MAY BE USED FOR DIVIDED ROADWAYS WITH ANY NUMBER OF TRAVEL LANES.

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

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE FHWA'S MANUAL OF STANDARD HIGHWAY SIGNS OR THE WISCONSIN STANDARD SIGN PLATES.

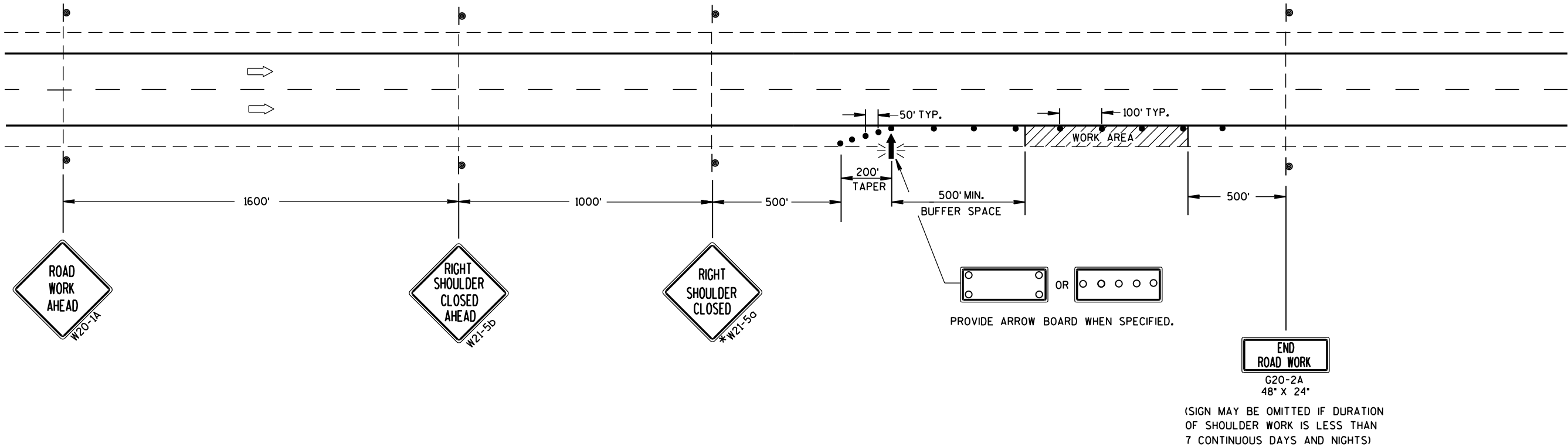
SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

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.

CHANNELIZING DEVICES PLACED ADJACENT TO THE WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

WHEN A RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROLS SHALL BE PROVIDED AS SPECIFIED IN THE PLANS AND/OR THE SPECIAL PROVISIONS OR AS APPROVED BY THE ENGINEER.

\*FOR SHORT DURATION SHOULDER WORK OF LESS THAN ONE HOUR, THE W21-5a SIGN MAY BE OMITTED.

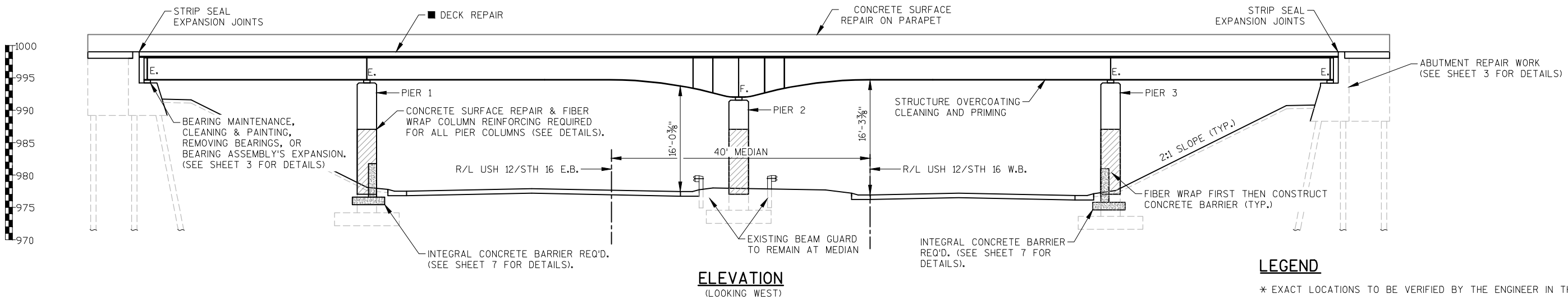


TRAFFIC CONTROL  
SHOULDER CLOSURE ON DIVIDED  
ROADWAY, SPEEDS GREATER  
THAN 40 MPH

STATE OF WISCONSIN  
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FHWA SAFETY ENGINEER





DESIGN DATA

LIVE LOAD:

DESIGN RATING \_\_\_\_\_ HS-20  
INVENTORY RATING \_\_\_\_\_ HS-14  
OPERATING RATING \_\_\_\_\_ HS-24  
WISCONSIN STANDARD PERMIT VEHICLE \_\_\_\_\_ 170 KIPS

MATERIAL PROPERTIES:

CONCRETE MASONRY, \_\_\_\_\_  
OVERLAY DECKS \_\_\_\_\_ f'c = 4,000 P.S.I.  
INTEGRAL BARRIER \_\_\_\_\_ f'c = 4,000 P.S.I.  
HIGH-STRENGTH BAR STEEL \_\_\_\_\_ fy = 60,000 P.S.I.  
REINFORCEMENT, GRADE 60

TRAFFIC DATA

USH 12/STH 16  
A.D.T. (2017) \_\_\_\_\_ 4,990  
A.D.T. (2037) \_\_\_\_\_ 7,410  
DESIGN SPEED \_\_\_\_\_ 60 M.P.H.

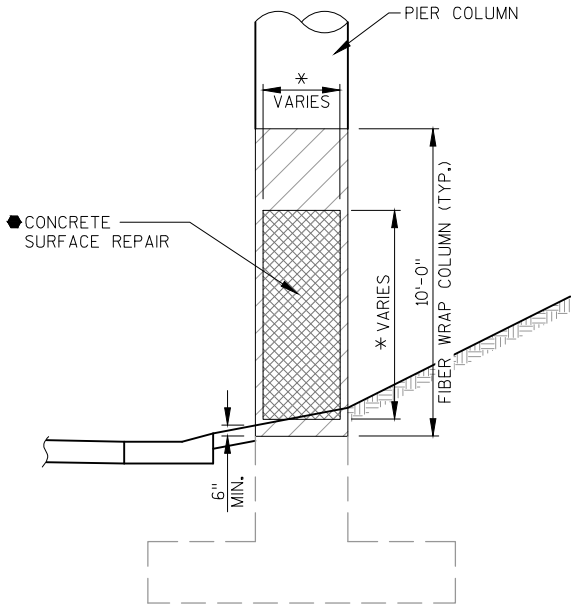
I.H. 90  
A.D.T. (2017) \_\_\_\_\_ 8,390  
A.D.T. (2037) \_\_\_\_\_ 12,460  
DESIGN SPEED \_\_\_\_\_ 75 M.P.H.

LEGEND

- \* EXACT LOCATIONS TO BE VERIFIED BY THE ENGINEER IN THE FIELD.
- ◆ CONCRETE SURFACE REPAIR ON COLUMNS, GALVANIC ANODES ON EACH PIER COLUMN, FIBER WRAP EACH COLUMN AS SHOWN, STAIN/PAINT FIBER WRAP GRAY IN COLOR TO MATCH CONCRETE
- DECK REPAIR WORK INCLUDES CLEANING DECKS, PREPARATION DECKS TYPE 1 & TYPE 2, FULL DEPTH DECK REPAIR, AND CONCRETE MASONRY OVERLAY DECKS. REPAIR AREAS TO BE DETERMINED BY ENGINEER IN THE FIELD.
- \*\* QUANTITY INCLUDES CONCRETE OVERLAY, PREPARATION DECKS TYPE 1, PREPARATION DECKS TYPE 2, JOINT REPAIR, AND FULL DEPTH DECK REPAIR VOLUMES.
- ◆ THE SUPERSTRUCTURE QUANTITIES INCLUDE QUANTITIES FOR THE PARAPETS.
- ▲ EXCAVATION FOR STRUCTURES B-41-30 FOR EXCAVATION AND BACKFILL FOR INTEGRAL BARRIER WALL.

TOTAL ESTIMATED QUANTITIES

ITEM NUMBER	ITEM DESCRIPTION	UNIT	W. ABUT.	PIER 1	PIER 2	PIER 3	E. ABUT.	SUPER.◆	BARRIER	TOTALS
▲ 206.1000	EXCAVATION FOR STRUCTURES BRIDGES B-41-30	LS	--	--	--	--	--	--	--	1
305.0120	BASE AGGREGATE DENSE 1¼-INCH	TON	--	--	--	--	--	--	140	140
312.0110	SELECT CRUSHED MATERIAL	TON	--	--	--	--	--	--	140	140
502.0100	CONCRETE MASONRY BRIDGES	CY	--	--	--	--	--	4	122	126
502.0717.S	CRACK SEALING EPOXY	LF	--	--	--	--	--	450	--	450
502.3100	EXPANSION DEVICE B-41-30	LS	--	--	--	--	--	--	--	1
502.3200	PROTECTIVE SURFACE TREATMENT	SY	--	--	--	--	--	1,520	--	1,520
502.4205	ADHESIVE ANCHORS NO. 5 BAR	EACH	--	--	--	--	--	40	--	40
502.4206	ADHESIVE ANCHORS NO. 6 BAR	EACH	--	--	--	--	--	--	120	120
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	--	--	--	--	--	3,390	16,490	19,880
506.6000	BEARING ASSEMBLIES EXPANSION B-41-30	EACH	3	--	--	--	--	--	--	3
506.7050.S	REMOVING BEARINGS B-41-30	EACH	3	--	--	--	--	--	--	3
509.0301	PREPARATION DECKS TYPE 1	SY	--	--	--	--	--	24	--	24
509.0302	PREPARATION DECKS TYPE 2	SY	--	--	--	--	--	17	--	17
509.0500	CLEANING DECKS	SY	--	--	--	--	--	1,456	--	1,456
509.1000	JOINT REPAIR	SY	--	--	--	--	--	69	--	69
509.1500	CONCRETE SURFACE REPAIR	SF	13	120	90	70	1	55	--	349
509.2000	FULL DEPTH DECK REPAIR	SY	--	--	--	--	--	1	--	1
509.2500	CONCRETE MASONRY OVERLAY DECKS **	CY	14	--	--	--	14	104	--	132
509.9020.S	EPOXY CRACK SEALING	LF	50	--	--	--	70	--	--	120
517.3000.S	STRUCTURE OVERCOATING CLEANING AND PRIMING B-41-30	LS	--	--	--	--	--	--	--	1
517.4000.S	CONTAINMENT AND COLLECTION OF WASTE MATERIALS B-41-30	LS	--	--	--	--	--	--	--	1
604.0500	SLOPE PAVING CRUSHED AGGREGATE	SY	--	--	--	--	--	--	280	280
614.0150	ANCHOR ASSEMBLIES FOR STEEL PLATE BEAM GUARD	EACH	--	--	--	--	--	--	4	4
SPV.0060.01	BEARING MAINTENANCE B-41-30	EACH	2	--	--	--	2	--	--	4
SPV.0060.03	EMBEDDED GALVANIC ANODES	EACH	4	30	23	18	1	--	--	76
SPV.0165.01	FIBER WRAP COLUMN REINFORCING	SF	--	470	470	470	--	--	--	1,410
SPV.0180.01	PIGMENTED SURFACE RESEAL	SY	--	--	--	--	--	275	--	275
	NON-BID ITEMS									
	BRIDGE SEAT PROTECTION	SY	24	--	--	--	24	--	--	48
	FILLER	SIZE								½"



PIER COLUMN REPAIR DETAIL (TYP.)

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-41-30			
DRAWN By		DJT	PLANS CKD. PTB
ELEVATION, DETAILS & QUANTITIES			SHEET 2 OF 8



BEARING NOTES

ALL BEARINGS ARE SYMMETRICAL ABOUT C/L OF GIRDER AND C/L OF BEARING.

ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153, CLASS C.

ROCKER PLATE AND MASONRY PLATE SHALL BE GALVANIZED. TOP PLATE AND STEEL PLATE SHALL BE SHOP PAINTED. USE A WELDABLE PRIMER ON TOP PLATE. DO NOT PAINT STAINLESS STEEL OR TEFLON SURFACES.

ALL MATERIAL IN BEARINGS, INCLUDING SHIM PLATES, BUT EXCLUDING STAINLESS STEEL SHEET, TEFLON SURFACE, PINTLES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 50W.

IN LIEU OF USING SHIM PLATES, FABRICATOR MAY INCREASE THICKNESS OF TOP PLATE OR MASONRY PLATE BY THE SHIM PLATE THICKNESS.

ALL MATERIALS IN TYPE "A-T" BEARINGS, INCLUDING SHIM PLATES AND BEARING PADS, SHALL BE PAID OF AT THE UNIT PRICE BID FOR "BEARING ASSEMBLIES EXPANSION B-41-30", EACH.

CHAMFER ANCHOR BOLTS PRIOR TO THREADING.

ALL FINISHED SURFACES SHALL BE MACHINE FINISHED BY AN AUTOMATIC PROCESS.

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.

ALL STRUCTURAL STEEL BEARING PLATES SHALL BE FLAT ROLLED STEEL PLATES WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL.

PROVIDE A 3/8" THICK BEARING PAD THE SAME SIZE AS MASONRY PLATE FOR EACH BEARING.

ANCHOR BOLTS SHALL BE THREADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT. PROJECT ANCHOR BOLTS 4 5/16" ABOVE TOP OF CONCRETE.

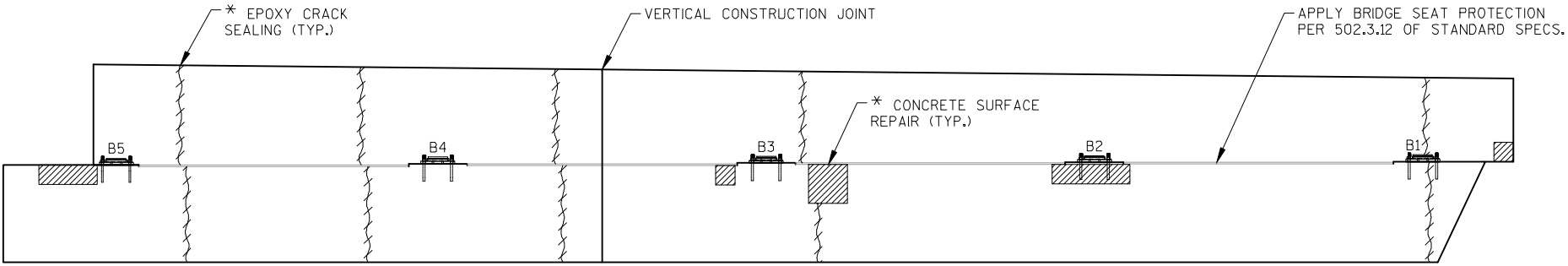
CHAMFER TOP OF PINTLES 3/8". DRILL HOLES FOR ALL PINTLES IN MASONRY PLATE FOR A DRIVING FIT.

STEEL PINTLES SHALL CONFORM TO ASTM A449 OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

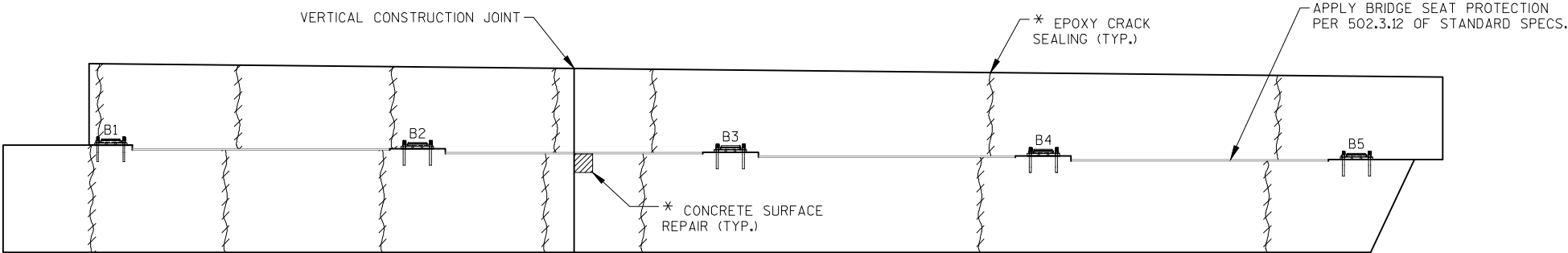
ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 36, OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

PLACE SHIM PLATES BETWEEN BEARING PAD AND MASONRY PLATE. PLATES SHALL BE THE SAME SIZE AS MASONRY PLATE AND 1 3/16" THICK.

AT INSTALLATION, ENSURE STAINLESS STEEL SLIDING FACE OF UPPER ELEMENT AND THE TFE SLIDING FACE OF THE LOWER ELEMENT HAVE THE SURFACE FINISH SPECIFIED AND ARE CLEAN AND FREE OF ALL DUST, MOISTURE, OR ANY OTHER FOREIGN MATTER.



WEST ABUTMENT  
(LOOKING WEST)



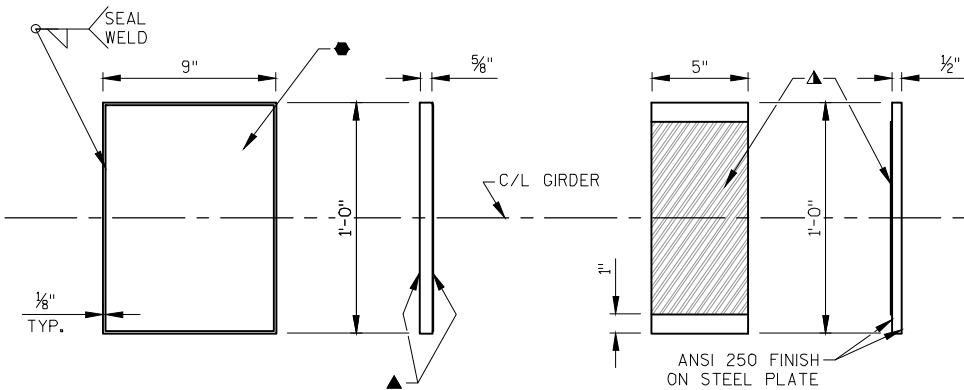
EAST ABUTMENT  
(LOOKING EAST)

BEARING REPAIR

BEARING NUMBER	LOCATION	REPLACE BEARING	** BEARING MAINTENANCE	ANCHOR BOLT FAILED	● CLEAN & PAINT
B1	WEST ABUTMENT	X			X
B2	WEST ABUTMENT		X		X
B3	WEST ABUTMENT		X		X
B4	WEST ABUTMENT	X		X	X
B5	WEST ABUTMENT	X			X
B1	EAST ABUTMENT				X
B2	EAST ABUTMENT				X
B3	EAST ABUTMENT		X	X	X
B4	EAST ABUTMENT		X	X	X
B5	EAST ABUTMENT				X

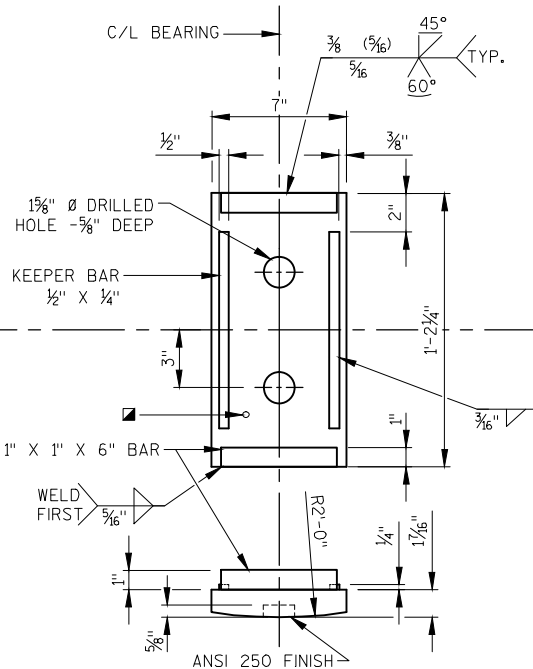
LEGEND

- \* EXACT LOCATIONS TO BE VERIFIED BY ENGINEER IN THE FIELD
- STAINLESS STEEL ASTM A240, TYPE 304, 2B FINISH, 16 GAUGE SHEET
- ▲ ANSI 250 FINISH ON STRUCTURAL STEEL PLATE TO ENSURE FLATNESS IN TOP PLATE UPON ASSEMBLY
- ▲ TEFLON SURFACE, USE UNFILLED WITH MIN. 1/8" THICK. PLACE WITH SCRIVE MARKS IN DIRECTION OF MOVEMENT. BOND STEEL PLATE AND TEFLON WITH ADHESIVE MATERIAL MEETING FEDERAL SPECIFICATION MMM-A-134, FEP FILM OR EQUAL
- PROVIDE A METHOD FOR HANDLING ROCKER PLATE DURING GALVANIZING
- WORK PAID UNDER BID ITEM 517.3000.S STRUCTURE OVERCOATING CLEANING AND PRIMING B-41-30.
- \*\* BEARING MAINTENANCE INCLUDES REPLACING MISSING OR BROKEN KEEPER BARS, RESETTNG BRONZE PLATE, AND/OR REPLACING POPPED ANCHOR BOLTS.

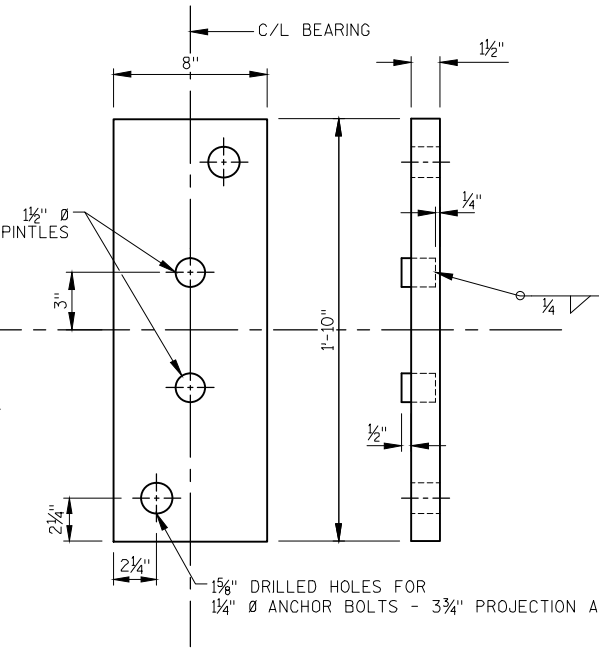


TOP PLATE

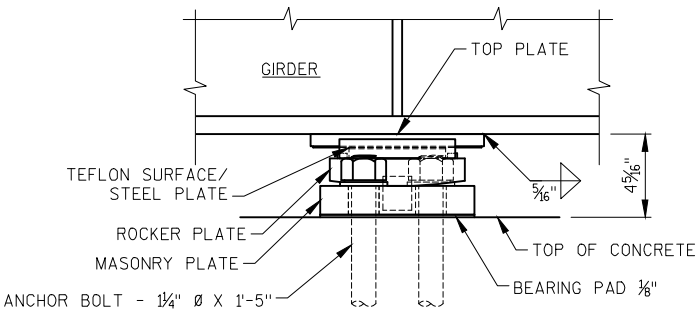
TEFLON SURFACE PLATE



ROCKER PLATE



MASONRY PLATE



EXPANSION BEARING ASSEMBLY

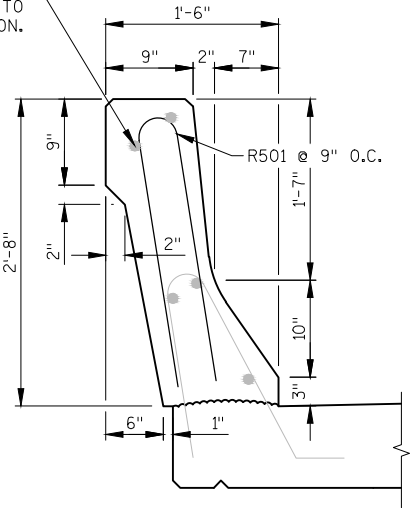
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-41-30			
DRAWN BY		DJT	PLANS CKD. PTB
ABUTMENT & BEARING REPAIR DETAILS		SHEET 3 OF 8	

LEGEND

- REMOVAL LIMITS: SLAB & DIAPHRAGMS
- REMOVAL LIMITS: SLAB, DIAPHRAGMS, PARAPET

NOTE: PAINT BACKSIDE OF STEEL DIAPHRAGM AT ABUTMENT AFTER JOINT REMOVAL.

EXIST. PARAPET BAR STEEL - CLEAN, STRAIGHTEN AND INCORPORATE INTO NEW PARAPET CONSTRUCTION.



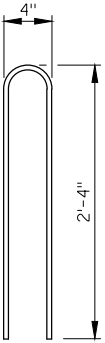
CROSS SECTION

(SECTION OVER DECK SHOWN, SECTION OVER WING SIMILAR)

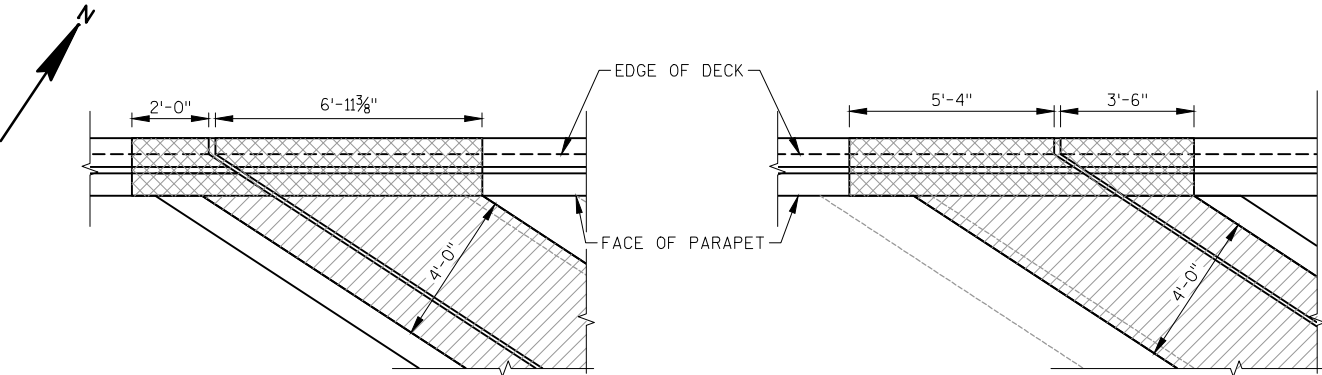
BILL OF BARS  
PARAPETS 260 LB (COATED)

BAR MARK	NO. REQ'D.	LENGTH	BENT	COAT	LOCATION
R501	50	4-10	X	X	PARAPETS - VERT.

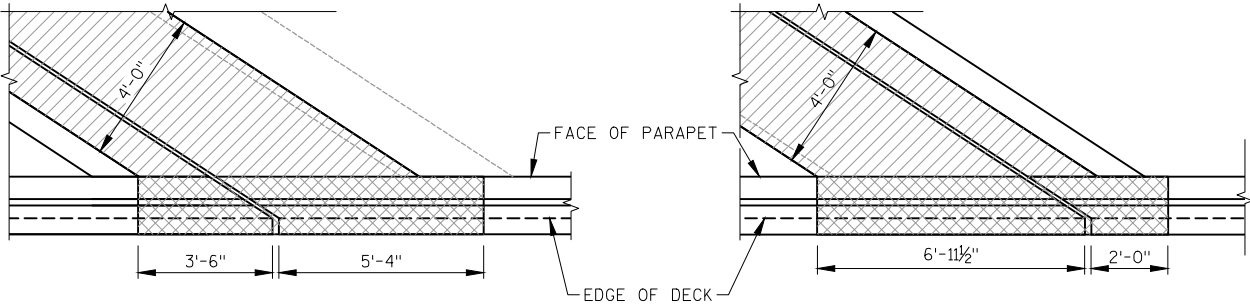
NOTES: THE FIRST DIGIT OF A BAR MARK SIGNIFIES THE BAR SIZE.  
DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.



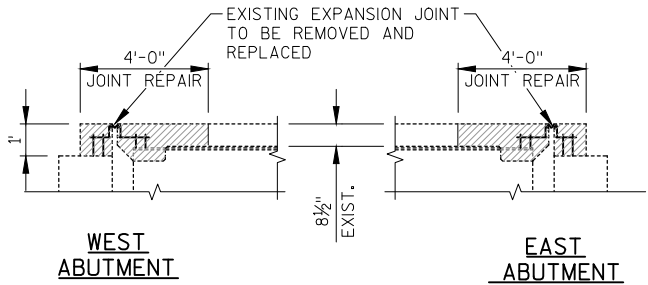
R501



WEST  
ABUTMENT



EAST  
ABUTMENT



NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-41-30			
DRAWN BY		DJT	PLANS CK'D. PTB
REMOVAL DETAILS			SHEET 4 OF 8

LEGEND

- ① NEOPRENE STRIP SEAL (4-INCH) & STEEL EXTRUSIONS. SET JOINT OPENING AT 1 3/4".
- ② STUDS 5/8" DIA. X 6 3/8" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS & BEND AS SHOWN AFTER WELDING.
- 2A 1/2" THICK STRIP SEAL ANCHOR PLATE WITH 5/8" DIA. ROD (OR ALTERNATE STRIP SEAL ANCHOR). WELD ROD TO ANCHOR PLATE, WELD ANCHOR PLATE TO NO. 1 AT 1'-6" CENTERS BETWEEN GIRDERS.
- ③ 3/4" DIA. THREADED ROD WITH 2 NUTS AND WASHERS. FOR STEEL GIRDERS, WELD THREADED ROD TO TOP FLANGE OR ATTACH BY BOLTING THRU FLANGE, ON ABUTMENT SIDE, GROUT THREADED ROD INTO FIELD DRILLED HOLES IN ABUTMENT BACKWALL AS SHOWN
- ④ 3/4" DIA. THREADED ROD WITH NUT. TACK WELD NUT TO NO. 5.
- ⑤ FABRICATE SUPPORT FROM 3" X 1 1/2" BAR AS SHOWN OR EQUIVALENT, ONE PER GIRDER PER SIDE. FIELD OR SHOP WELD TO NO. 1. IF FIELD WELDED, COVER WELDED AREAS WITH EPOXY-COATING MATERIAL. PROVIDE 1 1/2" HOLE FOR NO. 3 & 1" DIA. HOLE FOR NO. 4.
- EXISTING BARS ARE LIKELY TO BE CORRODED AND/OR DAMAGED DURING CONCRETE REMOVAL. PRESERVE AND INCORPORATE AS MUCH REBAR AS PRACTICAL. SUPPLEMENT WITH THE BARS INDICATED BY ▣.
- ADHESIVE ANCHORS NO. 5 BAR. EMBED 1'-6" INTO CONCRETE. SPACE AT 1'-0". ESTIMATED AT 25% REPLACEMENT RATE.
- SET BARS SAME LENGTH AS HORIZONTAL DIAPHRAGM BARS AT BOTTOM OF DIAPHRAGM.

NOTES

ONE FIELD SPLICE PERMITTED IN STEEL EXTRUSIONS. IF USED, DETAILS SHALL BE SUBMITTED FOR APPROVAL. NO SPLICING PERMITTED IN NEOPRENE STRIP SEAL.

AFTER FABRICATION, BUT BEFORE SHIPMENT, STRAIGHTEN STEEL EXTRUSIONS SUCH THAT THEY SHALL BE FREE FROM WARP, TWIST & SWEEP.

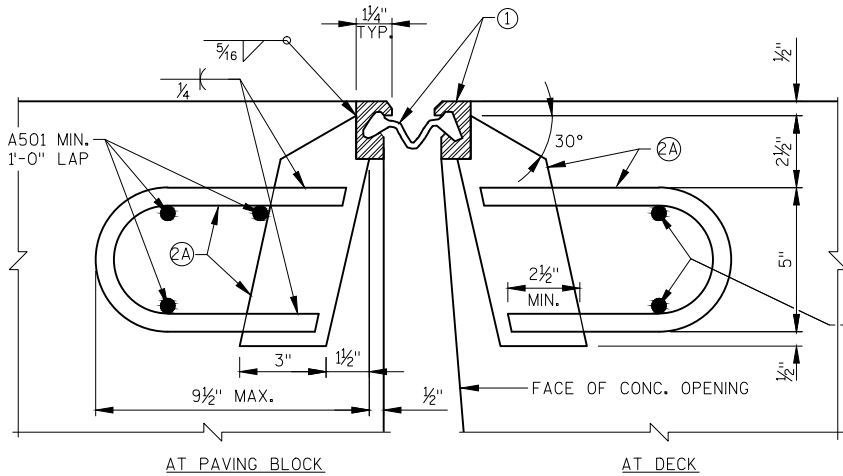
FABRICATOR SHALL PROVIDE MEANS OF KEEPING GALVANIZED EXTRUSIONS CLEAN & SMOOTH DURING SHIPMENT AND PRIOR TO APPLYING LUBRICANT ADHESIVE FOR NEOPRENE GLAND INSTALLATION.

SANDBLAST PLATES, SUPPORTS, & EXTRUSIONS AFTER FABRICATION IN ACCORDANCE WITH SSPC SP. #6 "COMMERCIAL BLAST CLEANING". AFTER BLAST CLEANING THE PLATES, SUPPORTS & EXTRUSIONS SHALL BE HOT DIPPED GALVANIZED.

ANCHOR SYSTEM NO. 8 & NO. 9 SHALL CONFORM TO ASTM A307 & SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C & D.

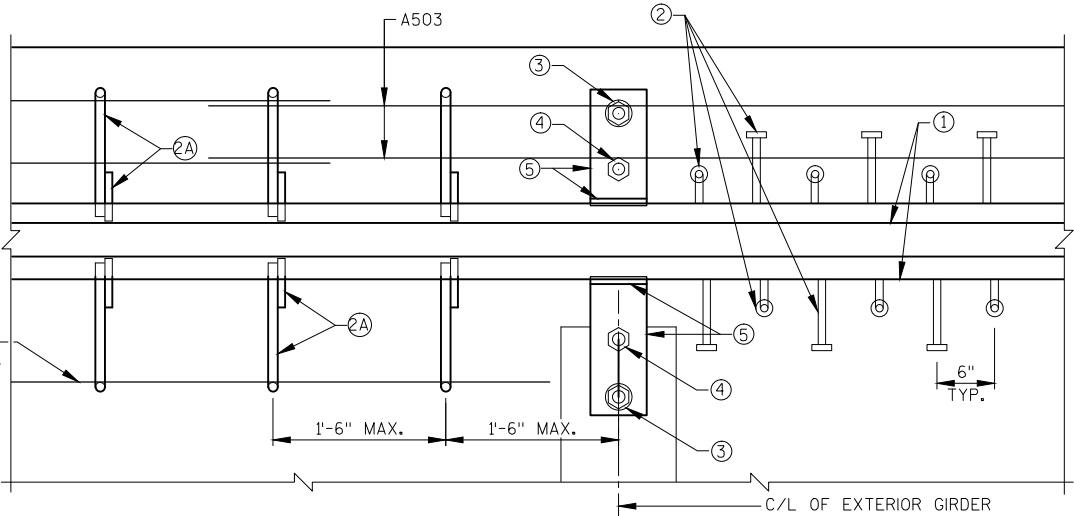
STRIP SEAL EXPANSION JOINT ASSEMBLY, INCLUDING ANCHOR STUDS & HARDWARE WILL BE PAID FOR AT THE LUMP SUM PRICE BID FOR "EXPANSION DEVICE B-41-30".

USE A 1'-9" MIN. LAP FOR ALL TRANSVERSE STEEL (A501).

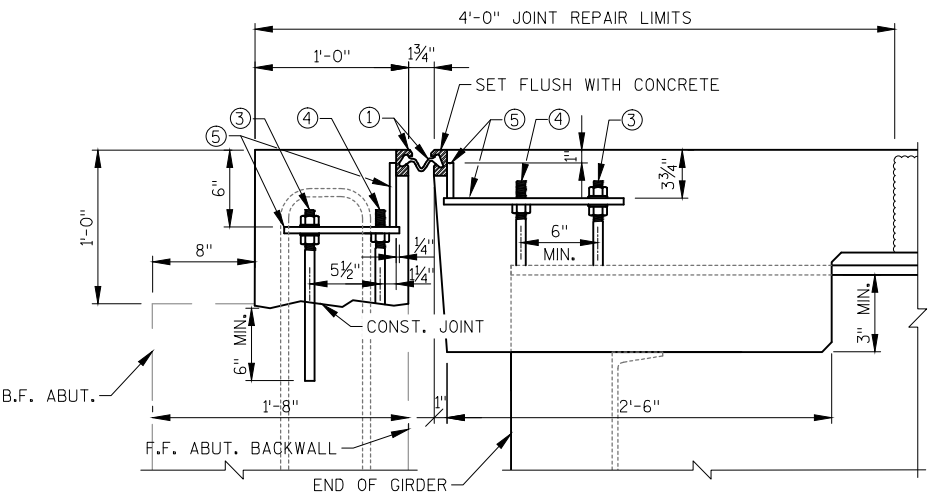


SECTION THRU JOINT

ROADWAY TRAFFIC AREA BETWEEN EXTERIOR GIRDERS

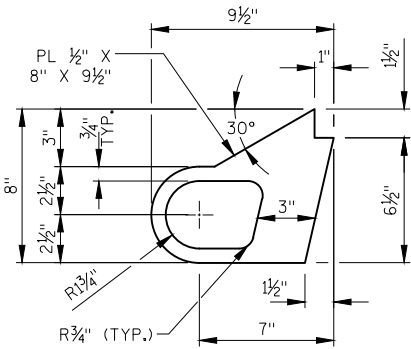


PART PLAN

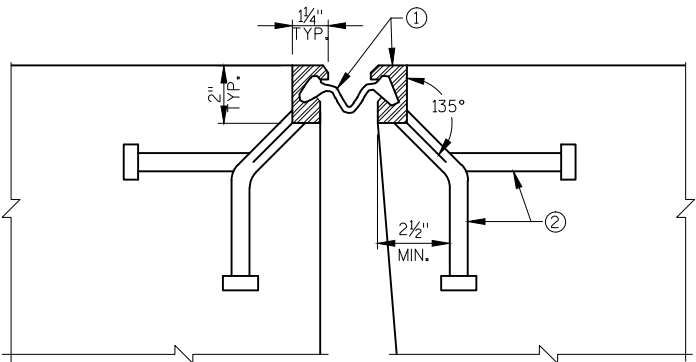


TYPICAL SECTION THRU JOINT AT WEST ABUT.

(WEST ABUT. JOINT SHOWN)  
(EXPANSION JOINT ASSEMBLY SHOWN)

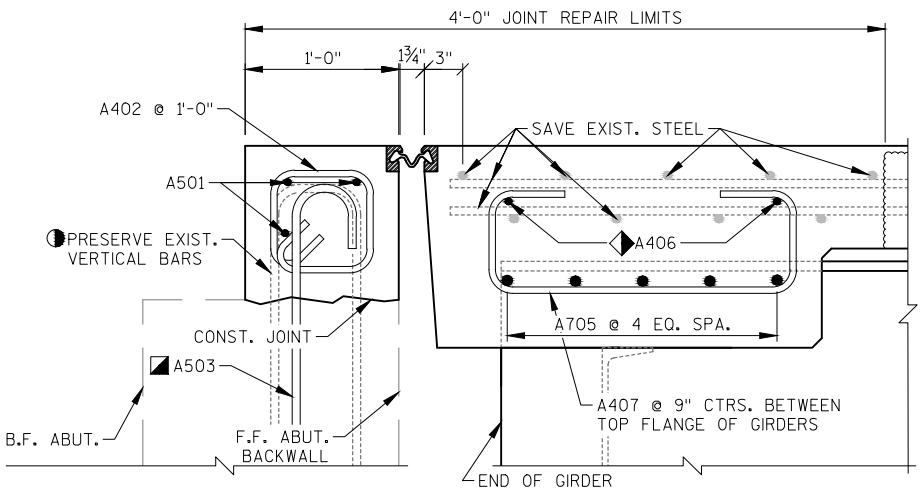


ALTERNATE STRIP SEAL ANCHOR



SECTION THRU JOINT

EXTERIOR GIRDER TO EDGE OF DECK, AND  
AT PARAPETS.



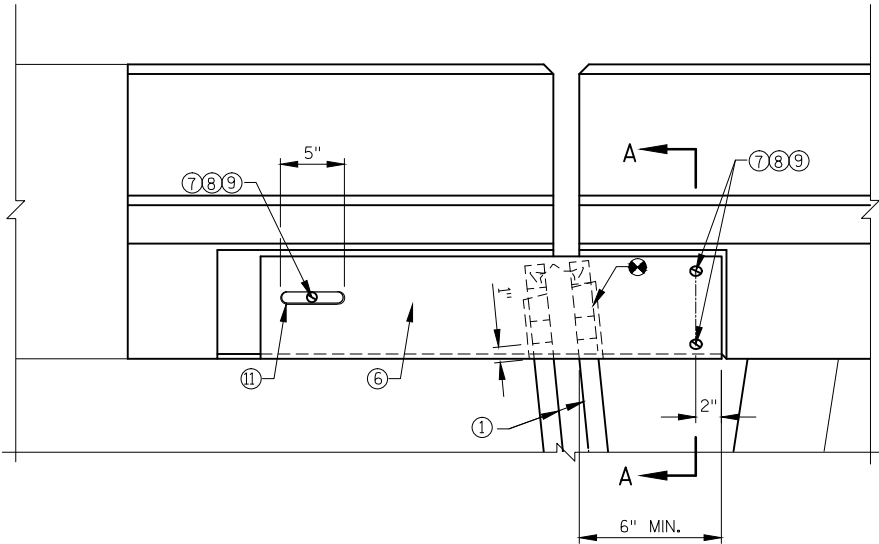
TYPICAL SECTION THRU JOINT AT WEST ABUT.

(WEST ABUT. JOINT SHOWN)  
(BAR STEEL REINFORCEMENT SHOWN)

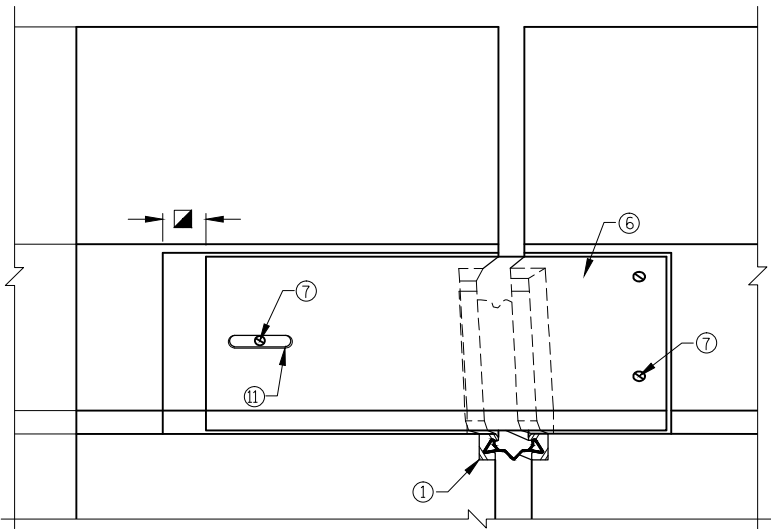
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-41-30			
DRAWN BY		DJT	PLANS CKD. PTB
EXPANSION DEVICE			SHEET 5 OF 8

LEGEND

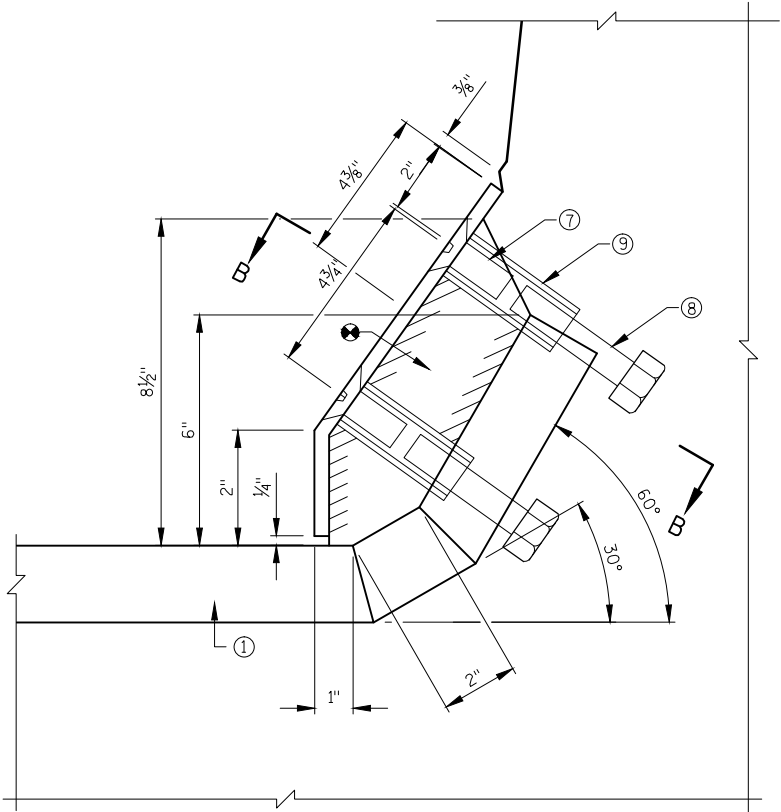
- ① NEOPRENE STRIP SEAL (4-INCH) & STEEL EXTRUSIONS. SET JOINT OPENING AT 1¾".
- ② STUDS ⅝" DIA. X 6⅜" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS & BEND AS SHOWN AFTER WELDING.
- ⑥ GALVANIZED PLATE ⅜" x 10½" x 3'-0" LONG WITH HOLES FOR NO. 7. BEND AS SHOWN.
- ⑦ ¾" DIA. X 1½" STAINLESS STEEL SOCKET FLAT HEAD SCREWS WITH ANTI-SEIZE LUBRICANT. RECESS ⅙" BELOW PLATE SURFACE.
- ⑧ ¾" DIA. X 4" GALVANIZED HEX HEAD BOLT, BEND 45°.
- ⑨ ¾" DIA. X 2¼" GALVANIZED THREADED COUPLING.
- ⑪ 1" X 5" SLOTTED CSK. HOLE FOR NO. 7. SLOT PARALLEL TO DIRECTION OF MOVEMENT.
- ⊗ BLOCK OUT CONCRETE 2" EACH SIDE OF JOINT OPENING.
- ▣ JOINT OPENING DIM. PLUS ½".



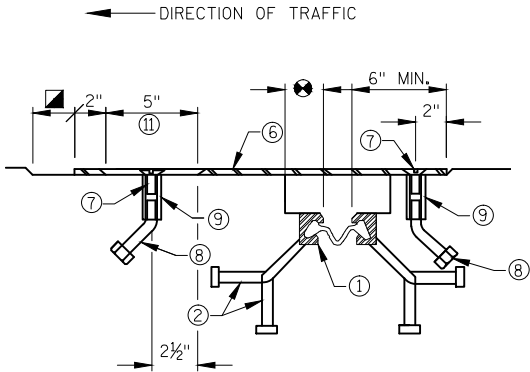
PART PLAN - WEST ABUT.



PART ELEVATION - WEST ABUT.



SECTION A-A

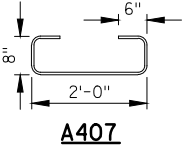
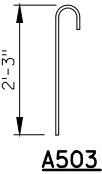
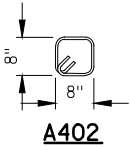


SECTION B-B

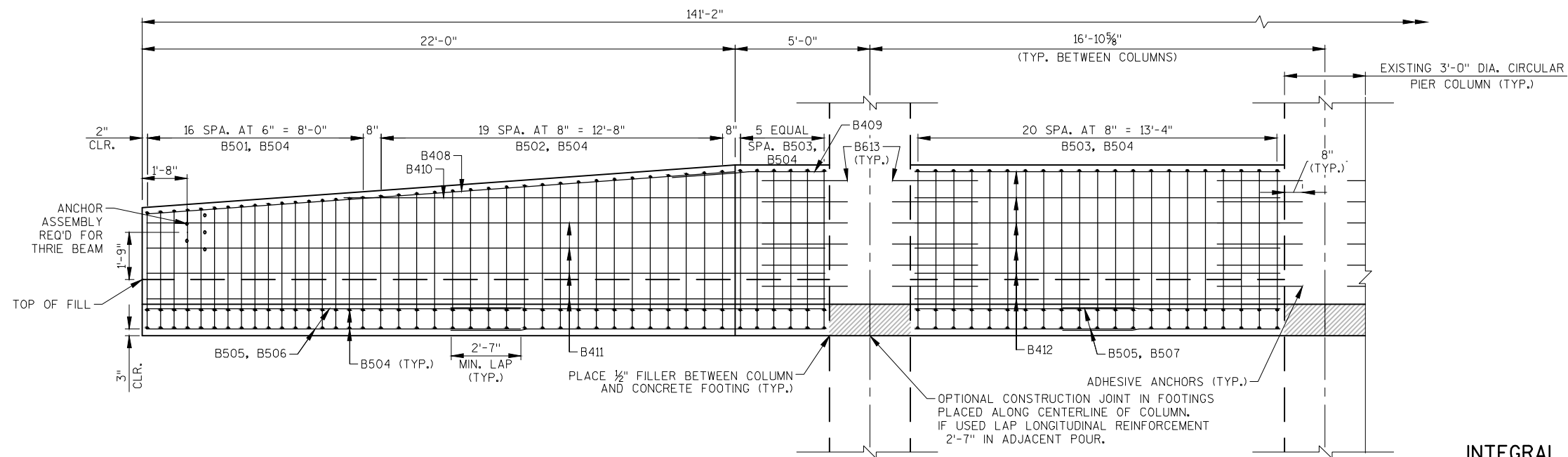
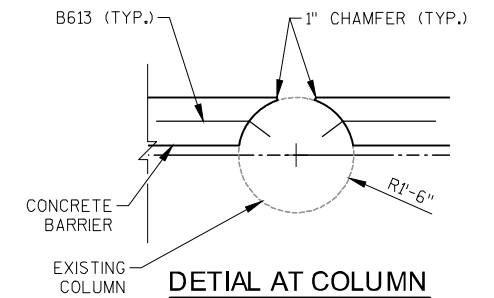
BILL OF BARS 3,130 LB (COATED)

BAR MARK	NO. REQ'D.	LENGTH	BENT	COAT	LOCATION
A501	66	8'-0"		X	PAVING BLOCK - HORIZ.
A402	156	3'-0"	X	X	PAVING BLOCK - STIRRUP
A503	39	2'-10"	X	X	PAVING BLOCK - VERT.
A404	16	16'-6"		X	SLAB - ANCHOR REINF.
A705	40	16'-6"		X	DIAPHRAGM - HORIZ. - BOTTOM
A406	16	16'-6"		X	DIAPHRAGM - HORIZ. - TOP
A407	168	4'-0"	X	X	WEST & EAST GIRDER - STIRRUP

NOTES: THE FIRST DIGIT OF A BAR MARK SIGNIFIES THE BAR SIZE.  
DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.



NO.	DATE	REVISION	BY
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STRUCTURE B-41-30			
DRAWN BY		DJT	PLANS CK'D. PTB
EXPANSION DEVICE DETAILS		SHEET 6 OF 8	

ELEVATION VIEW**INTEGRAL BARRIER NOTES**

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

BARRIER AND FOOTING SHALL CONSIST OF CAST IN PLACE CONSTRUCTION. NO JOINTS SHALL BE ALLOWED IN THE BARRIER. CONSTRUCTION JOINTS WILL ONLY BE ALLOWED IN THE FOOTING AT LOCATIONS SHOWN.

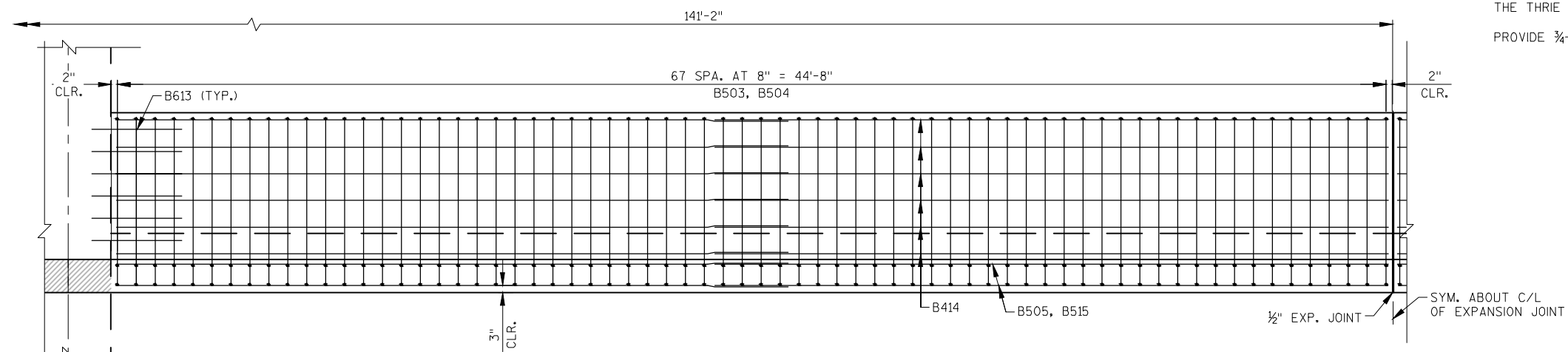
DO NOT CUT OR DRILL INTO EXISTING COLUMN BAR STEEL.

ALL REINFORCEMENT SHALL BE EPOXY-COATED.

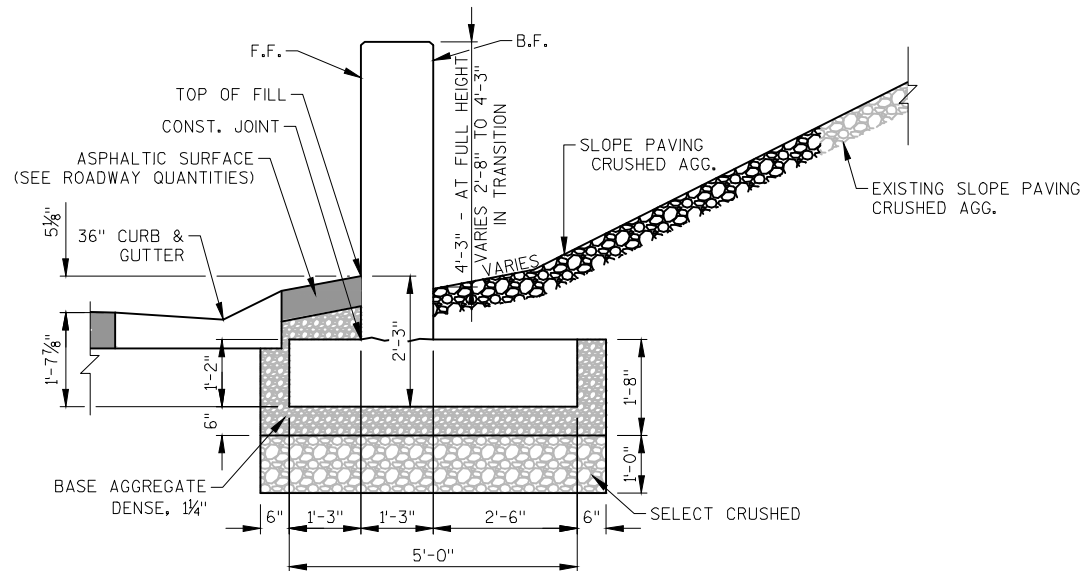
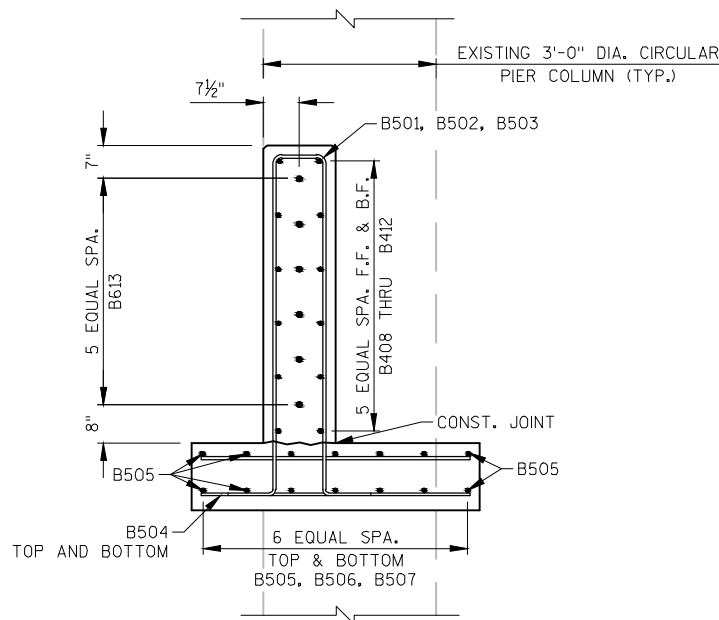
USE 2-INCH MINIMUM BAR CLEARANCE, EXCEPT AT FOOTINGS PROVIDE 3-INCH BAR CLEARANCE FROM BOTTOM OF FOOTING TO BOTTOM OF TRANSVERSE REINFORCEMENT.

PLACE REINFORCEMENT SUCH THAT IT WILL NOT CONFLICT WITH THE ANCHOR ASSEMBLY FOR THE THRIE BEAM ATTACHMENT.

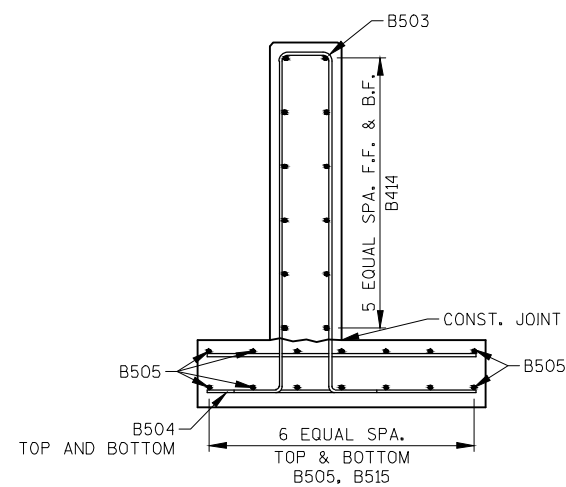
PROVIDE  $\frac{3}{4}$ -INCH BEVEL OR 1-INCH RADIUS ON BARRIER EDGES, TOP AND ENDS.

ELEVATION VIEW

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-41-30			
DRAWN BY RBH		PLANS CKD. T.JR.	
INTEGRAL BARRIER			SHEET 7 OF 8

**CROSS SECTION****CROSS SECTION**

(IN TRANSITION AND BETWEEN PIER COLUMNS)

**CROSS SECTION**

(BETWEEN STRUCTURES B-41-30 &amp; B-41-31)

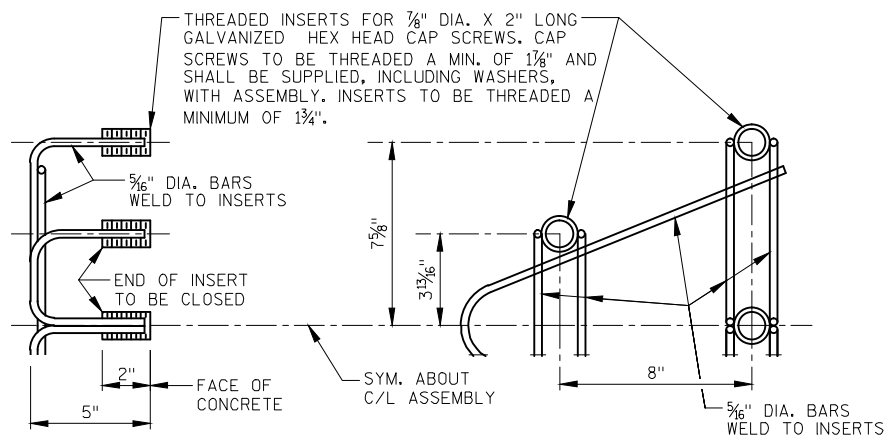
**BILL OF BARS****CONCRETE BARRIER****16,490 LB (COATED)**

BAR MARK	NO. REQ'D.	LENGTH	BENT	COAT	BAR SERIES	LOCATION
B501	34	11-3	X	X	*	TRANSITION AREA - VERT.
B502	40	12-10	X	X	*	TRANSITION AREA - VERT.
B503	316	13-11	X	X		BARRIER WALL - VERT.
B504	780	4-8		X		FOOTING - TRANSVERSE
B505	48	41-11		X		FOOTING - LONGITUDINAL
B506	32	14-3		X		TRANSITION AREA-FOOTING-LONGIT.
B507	128	8-10		X		BETWEEN COLUMNS-FOOTING-LONGIT.
B408	4	21-10		X		TRANSITION AREA - HORIZ.
B409	4	5-11	X	X		TRANSITION AREA - HORIZ.
B410	4	17-10		X		TRANSITION AREA - HORIZ.
B411	16	25-2		X		TRANSITION AREA - HORIZ.
B412	96	13-6		X		BETWEEN COLUMNS - HORIZ.
B613	120	3-2		X		PIER ANCHORS
B414	48	24-3		X		BETWEEN STRUCTURES - HORIZ.
B515	32	24-3		X		BETWEEN STRUCTURES-FOOTING-LONGIT.

**BAR SERIES TABLE**

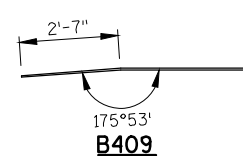
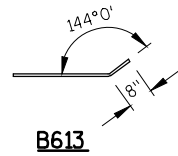
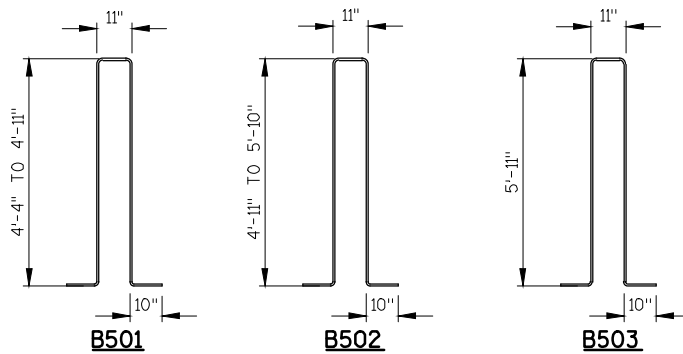
BAR MARK	NO. REQ'D.	LENGTH
B501	2 SERIES OF 17	10-7 TO 11-11
B502	2 SERIES OF 20	11-3 TO 13-9

BUNDLE AND TAG EACH SERIES SEPARATELY.

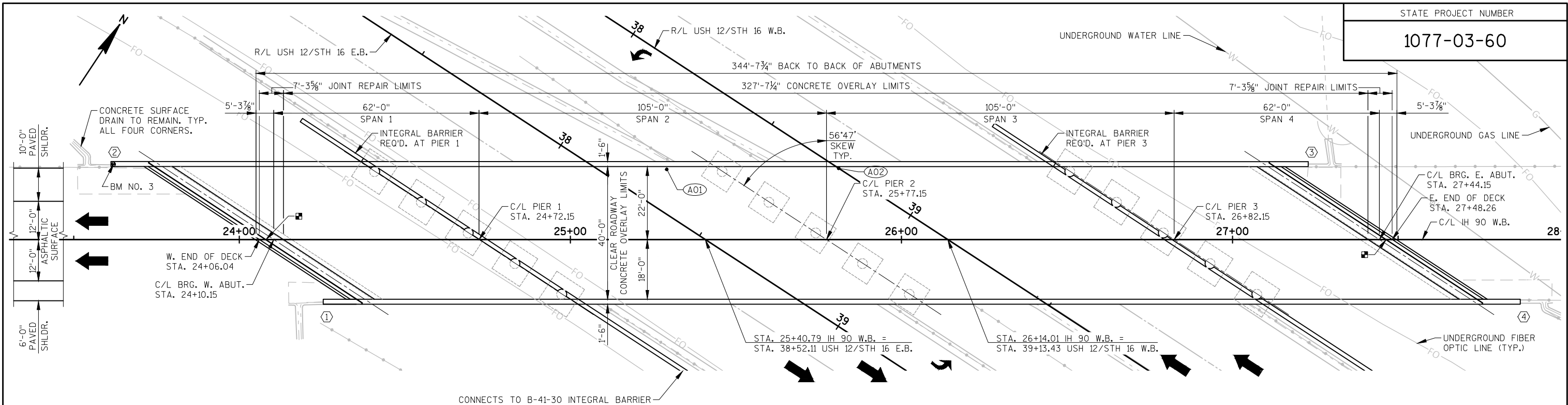
**DETAIL OF ANCHOR ASSEMBLY**

NOTE: HEX HEAD CAP SCREWS AND WASHERS TO BE GALVANIZED IN ACCORDANCE WITH AASHTO M232, CLASS C.

ASSEMBLY SHALL BE BID ITEM "ANCHOR ASSEMBLIES FOR STEEL PLATE BEAM GUARD".



NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-41-30			
DRAWN BY		RBH	PLANS CKD. TJR
INTEGRAL BARRIER DETAILS		SHEET 8 OF 8	



### GENERAL NOTES

- DRAWINGS SHALL NOT BE SCALED.
- DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS, INSPECTION REPORTS & FIELD SURVEY.
- APPLY PROTECTIVE SURFACE TREATMENT TO THE ENTIRE TOP SURFACE OF THE NEW CONCRETE OVERLAY.
- A MIN OF 1" OF CONCRETE SHALL BE REMOVED FROM THE ENTIRE BRIDGE DECK UNDER THE BID ITEM "CLEANING DECKS".
- PREPARATION DECKS TYPE 1 & 2 AND FULL-DEPTH DECK REPAIR AREAS SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD. FILL DECK PREPARATION AND FULL-DEPTH DECK REPAIR AREAS WITH "CONCRETE MASONRY OVERLAY DECKS".
- PROFILE GRADE LINE SHALL BE DETERMINED IN THE FIELD BASED ON A MINIMUM OVERLAY THICKNESS OF 1½" PLACED ABOVE THE DECK SURFACE AFTER CLEANING. EXPECTED AVERAGE OVERLAY THICKNESS IS 2". IF EXPECTED AVERAGE OVERLAY THICKNESS IS EXCEEDED BY MORE THAN ½", CONTACT THE BUREAU OF STRUCTURES.

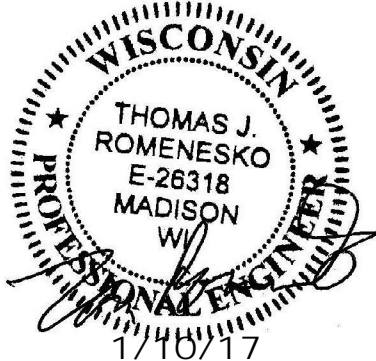
- ANY EXCAVATION REQ'D TO COMPLETE THE OVERLAY OR THE PAVING BLOCK AT ABUTMENTS IS INCIDENTAL TO THE BID ITEM, "CONCRETE MASONRY OVERLAY DECKS".
- ALL CONCRETE REMOVAL NOT COVERED WITH A CONCRETE OVERLAY SHALL BE DEFINED BY A 1" SAW CUT.
- CONCRETE SURFACE REPAIR & FIBER WRAP COLUMN REINFORCING REQ'D. AT ALL COLUMNS OF PIERS 1, 2 & 3. EXACT LOCATION & LIMITS OF CONCRETE SURFACE REPAIR TO BE DETERMINED BY THE ENGINEER IN THE FIELD.

- ALL GIRDERS SHALL BE RAISED SIMULTANEOUSLY TO PREVENT TWISTING AND DISTORTION. RAISE GIRDERS A MAXIMUM OF ⅛".
- UTILIZE EXISTING BAR STEEL REINFORCEMENT WHERE SHOWN AND EXTEND 24 BAR DIAMETERS INTO NEW WORK, UNLESS SPECIFIED OTHERWISE.
- EMBED BAR STEEL REINFORCEMENT 2" CLEAR UNLESS OTHERWISE SHOWN OR NOTED.
- THE FIRST DIGIT OF A BAR MARK SIGNIFIES THE BAR SIZE.

- EXPANSION JOINT ASSEMBLY, INCLUDING ANCHOR STUDS AND HARDWARE IS PAID FOR IN THE LUMP SUM PRICE BID AS "EXPANSION DEVICE B-41-31".
- THE BID ITEM STRUCTURE OVERCOATING CLEANING AND PRIMING B-41-31, INCLUDES CLEANING AND PAINTING BEARINGS.

### BENCH MARKS

NO.	STA.	DESCRIPTION	ELEV.
1	24+38	0.75" IRS IN USH 12 MEDIAN, 78.2' LT.	979.68
2	28+31	0.75" IRS IN USH 12 MEDIAN, 155.3' RT.	977.95
3	23+62	WISDOT ALUM. DISK WING 2, 22.7' LT.	1001.76

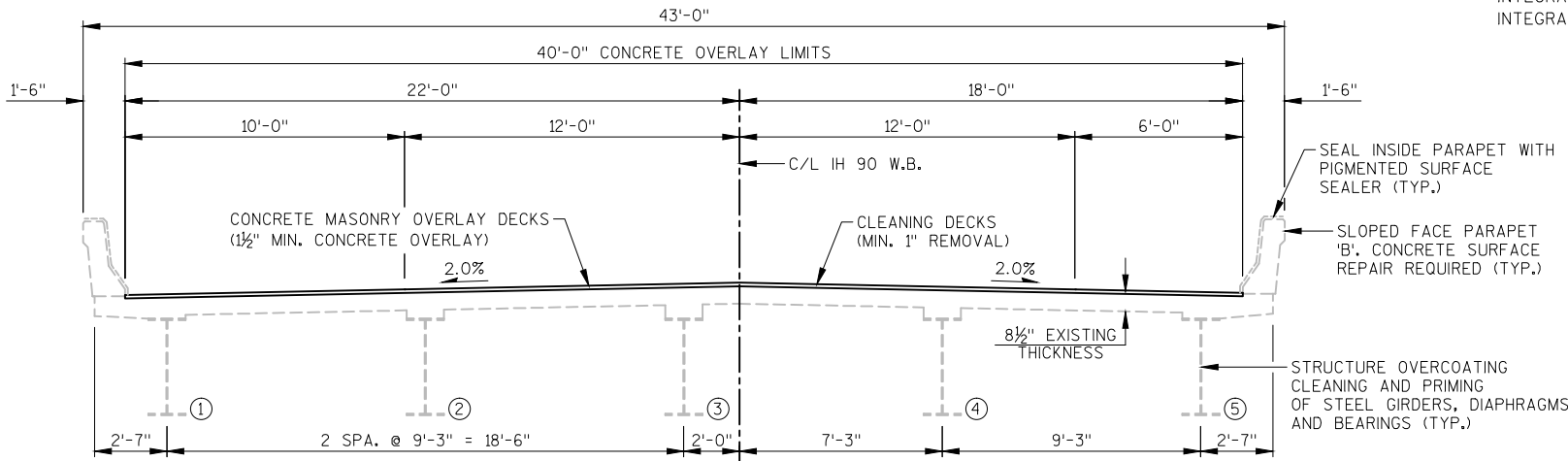


### LEGEND

- ◻ INDICATES WING NUMBER
- JOINT REPAIR AND STRIP SEAL EXPANSION JOINT REQUIRED - SEE SHEETS 4-6 FOR DETAILS.
- Ⓐ01 POINT OF MINIMUM VERTICAL CLEARANCE = 16.01'
- Ⓐ02 POINT OF MINIMUM VERTICAL CLEARANCE = 16.45'

### LIST OF DRAWINGS

- GENERAL PLAN \_\_\_\_\_ 1.
- ELEVATION, DETAILS & QUANTITIES \_\_\_\_\_ 2.
- ABUTMENT & BEARING REPAIR DETAILS \_\_\_\_\_ 3.
- REMOVAL DETAILS \_\_\_\_\_ 4.
- EXPANSION DEVICE \_\_\_\_\_ 5.
- EXPANSION DEVICE DETAILS \_\_\_\_\_ 6.
- INTEGRAL BARRIER \_\_\_\_\_ 7.
- INTEGRAL BARRIER DETAILS \_\_\_\_\_ 8.

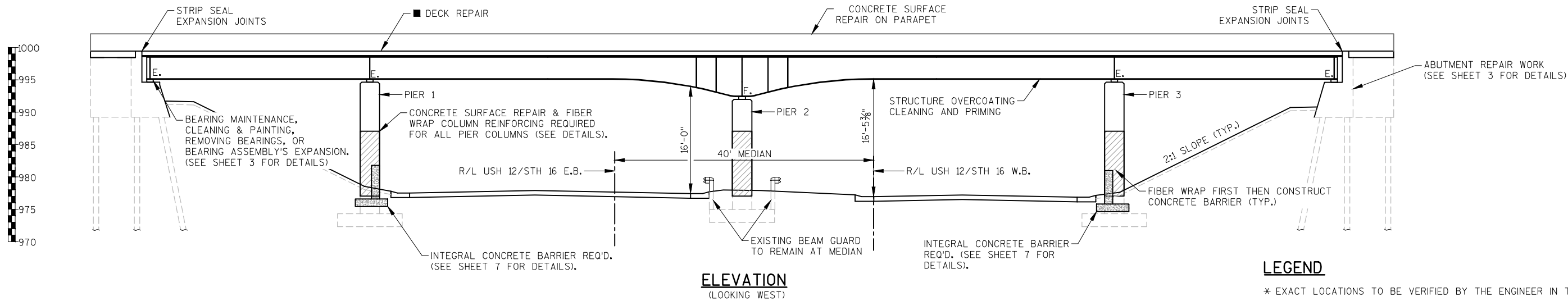


### CROSS SECTION THROUGH ROADWAY LOOKING EAST

DESIGN CONSULTANT  
PATRICK BOLAND, PE  
(608) 588-7484

BRIDGE OFFICE CONTACT  
WILLIAM DREHER, PE  
(608) 266-8489

NO.	DATE	REVISION	BY
<b>JEWELL</b> associates engineers, inc. <i>Engineers - Surveyors - Architects</i>		560 SUNRISE DRIVE SPRING GREEN, WI 53588 PHONE: (608) 588-7484 FAX: (608) 588-9322	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
ACCEPTED <i>William C. Dreher</i> SDR CHIEF STRUCTURES DESIGN ENGINEER		01/17/17 DATE	
STRUCTURE B-41-31			
IH 90 W.B. OVER USH 12/STH 16			
COUNTY	MONROE	TOWN/CITY/VILLAGE	TOMAH
DESIGN SPEC. REHABILITATION N/A			
DESIGNED BY	RBH	DESIGN CK'D	TJR
DRAWN BY	DJT	PLANS CK'D	PTB
GENERAL PLAN			SHEET 1 OF 8



DESIGN DATA

LIVE LOAD:

DESIGN RATING \_\_\_\_\_ HS-20  
INVENTORY RATING \_\_\_\_\_ HS-14  
OPERATING RATING \_\_\_\_\_ HS-24  
WISCONSIN STANDARD PERMIT VEHICLE \_\_\_\_\_ 170 KIPS

MATERIAL PROPERTIES:

CONCRETE MASONRY, OVERLAY DECKS \_\_\_\_\_ f'c = 4,000 P.S.I.  
INTEGRAL BARRIER \_\_\_\_\_ f'c = 4,000 P.S.I.  
HIGH-STRENGTH BAR STEEL \_\_\_\_\_ f\_y = 60,000 P.S.I.  
REINFORCEMENT, GRADE 60

TRAFFIC DATA

USH 12/STH 16  
A.D.T. (2017) \_\_\_\_\_ 4,990  
A.D.T. (2037) \_\_\_\_\_ 7,410  
DESIGN SPEED \_\_\_\_\_ 60 M.P.H.

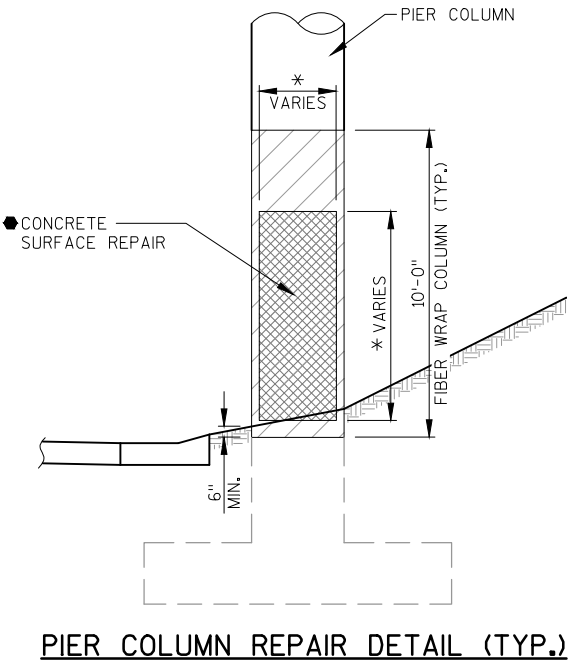
LH. 90  
A.D.T. (2017) \_\_\_\_\_ 8,390  
A.D.T. (2037) \_\_\_\_\_ 12,460  
DESIGN SPEED \_\_\_\_\_ 75 M.P.H.

LEGEND

- \* EXACT LOCATIONS TO BE VERIFIED BY THE ENGINEER IN THE FIELD.
- CONCRETE SURFACE REPAIR ON COLUMNS, GALVANIC ANODES ON EACH PIER COLUMN, FIBER WRAP EACH COLUMN AS SHOWN, STAIN/PAINT FIBER WRAP GRAY IN COLOR TO MATCH CONCRETE
- DECK REPAIR WORK INCLUDES CLEANING DECKS, PREPARATION DECKS TYPE 1 & TYPE 2, FULL DEPTH DECK REPAIR, AND CONCRETE MASONRY OVERLAY DECKS. REPAIR AREAS TO BE DETERMINED BY ENGINEER IN THE FIELD.
- \*\* QUANTITY INCLUDES CONCRETE OVERLAY, PREPARATION DECKS TYPE 1, PREPARATION DECKS TYPE 2, JOINT REPAIR, AND FULL DEPTH DECK REPAIR VOLUMES.
- ◆ THE SUPERSTRUCTURE QUANTITIES INCLUDE QUANTITIES FOR THE PARAPETS.
- ▲ EXCAVATION FOR STRUCTURES B-41-31 FOR EXCAVATION AND BACKFILL FOR INTEGRAL BARRIER WALL.

TOTAL ESTIMATED QUANTITIES

ITEM NUMBER	ITEM DESCRIPTION	UNIT	W. ABUT.	PIER 1	PIER 2	PIER 3	E. ABUT.	SUPER.◆	BARRIER	TOTALS
▲ 206.1000	EXCAVATION FOR STRUCTURES BRIDGES B-41-31	LS	--	--	--	--	--	--	--	1
305.0120	BASE AGGREGATE DENSE 1 1/4-INCH	TON	--	--	--	--	--	--	140	140
312.0110	SELECT CRUSHED MATERIAL	TON	--	--	--	--	--	--	140	140
502.0100	CONCRETE MASONRY BRIDGES	CY	--	--	--	--	--	4	122	126
502.0717.S	CRACK SEALING EPOXY	LF	--	--	--	--	--	450	--	450
502.3100	EXPANSION DEVICE B-41-31	LS	--	--	--	--	--	--	--	1
502.3200	PROTECTIVE SURFACE TREATMENT	SY	--	--	--	--	--	1,520	--	1,520
502.4205	ADHESIVE ANCHORS NO. 5 BAR	EACH	20	--	--	--	20	--	--	40
502.4206	ADHESIVE ANCHORS NO. 6 BAR	EACH	--	--	--	--	--	--	120	120
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	--	--	--	--	--	3,390	16,490	19,880
506.6000	BEARING ASSEMBLIES EXPANSION B-41-31	EACH	1	--	--	--	3	--	--	4
506.7050.S	REMOVING BEARINGS B-41-31	EACH	1	--	--	--	3	--	--	4
509.0301	PREPARATION DECKS TYPE 1	SY	--	--	--	--	--	49	--	49
509.0302	PREPARATION DECKS TYPE 2	SY	--	--	--	--	--	18	--	18
509.0500	CLEANING DECKS	SY	--	--	--	--	--	1,456	--	1,456
509.1000	JOINT REPAIR	SY	--	--	--	--	--	69	--	69
509.1500	CONCRETE SURFACE REPAIR	SF	8	93	18	54	37	55	--	265
509.2000	FULL DEPTH DECK REPAIR	SY	--	--	--	--	--	1	--	1
509.2500	CONCRETE MASONRY OVERLAY DECKS **	CY	14	--	--	--	14	106	--	134
509.9020.S	EPOXY CRACK SEALING	LF	53	--	--	--	53	--	--	106
517.3000.S	STRUCTURE OVERCOATING CLEANING AND PRIMING B-41-31	LS	--	--	--	--	--	--	--	1
517.4000.S	CONTAINMENT AND COLLECTION OF WASTE MATERIALS B-41-31	LS	--	--	--	--	--	--	--	1
604.0500	SLOPE PAVING CRUSHED AGGREGATE	SY	--	--	--	--	--	--	280	280
614.0150	ANCHOR ASSEMBLIES FOR STEEL PLATE BEAM GUARD	EACH	--	--	--	--	--	--	4	4
SPV.0060.02	BEARING MAINTENANCE B-41-31	EACH	1	--	--	--	2	--	--	3
SPV.0060.03	EMBEDDED GALVANIC ANODES	EACH	2	24	5	14	10	--	--	55
SPV.0165.01	FIBER WRAP COLUMN REINFORCING	SF	--	470	470	470	--	--	--	1,410
SPV.0180.01	PIGMENTED SURFACE RESEAL	SY	--	--	--	--	--	275	--	275
NON-BID ITEMS										
	BRIDGE SEAT PROTECTION	SY	24	--	--	--	24	--	--	48
	FILLER	SIZE								1/2"



NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-41-31			
DRAWN BY		DJT	PLANS CKD. PTB
ELEVATION, DETAILS & QUANTITIES			SHEET 2 OF 8



BEARING NOTES

ALL BEARINGS ARE SYMMETRICAL ABOUT C/L OF GIRDER AND C/L OF BEARING.

ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153, CLASS C.

ROCKER PLATE AND MASONRY PLATE SHALL BE GALVANIZED. TOP PLATE AND STEEL PLATE SHALL BE SHOP PAINTED. USE A WELDABLE PRIMER ON TOP PLATE. DO NOT PAINT STAINLESS STEEL OR TEFLON SURFACES.

ALL MATERIAL IN BEARINGS, INCLUDING SHIM PLATES, BUT EXCLUDING STAINLESS STEEL SHEET, TEFLON SURFACE, PINTLES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 50W.

IN LIEU OF USING SHIM PLATES, FABRICATOR MAY INCREASE THICKNESS OF TOP PLATE OR MASONRY PLATE BY THE SHIM PLATE THICKNESS.

ALL MATERIALS IN TYPE "A-T" BEARINGS, INCLUDING SHIM PLATES AND BEARING PADS, SHALL BE PAID OF AT THE UNIT PRICE BID FOR "BEARING ASSEMBLIES EXPANSION B-41-31", EACH.

CHAMFER ANCHOR BOLTS PRIOR TO THREADING.

ALL FINISHED SURFACES SHALL BE MACHINE FINISHED BY AN AUTOMATIC PROCESS.

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.

ALL STRUCTURAL STEEL BEARING PLATES SHALL BE FLAT ROLLED STEEL PLATES WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL.

PROVIDE A 1/8" THICK BEARING PAD THE SAME SIZE AS MASONRY PLATE FOR EACH BEARING.

ANCHOR BOLTS SHALL BE THREADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT. PROJECT ANCHOR BOLTS 4 5/16" ABOVE TOP OF CONCRETE.

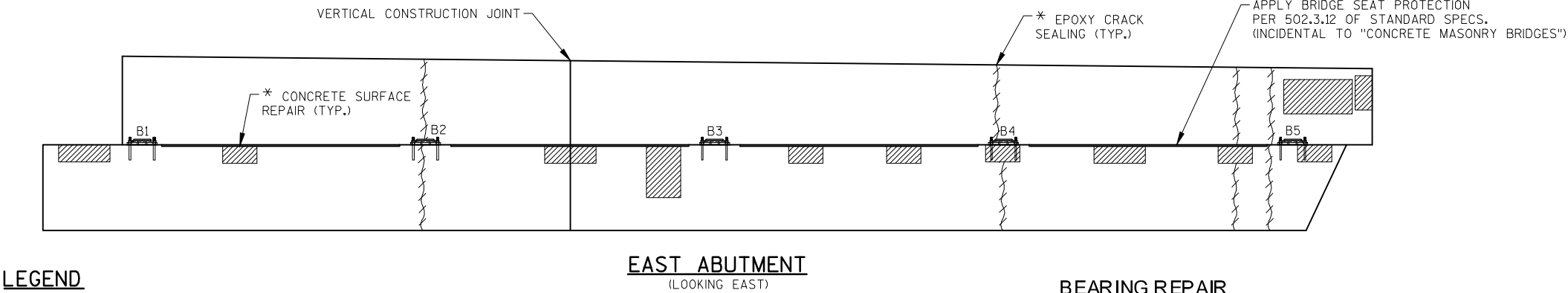
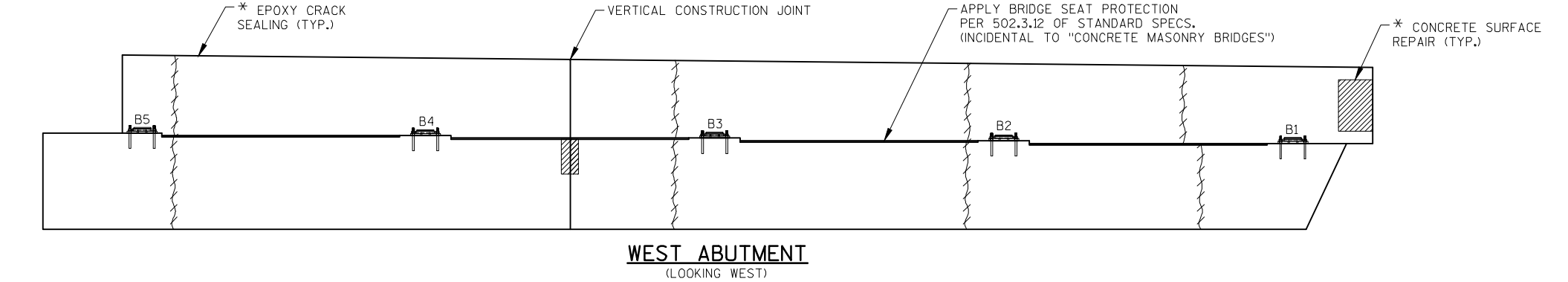
CHAMFER TOP OF PINTLES 1/8". DRILL HOLES FOR ALL PINTLES IN MASONRY PLATE FOR A DRIVING FIT.

STEEL PINTLES SHALL CONFORM TO ASTM A449 OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 36, OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

PLACE SHIM PLATES BETWEEN BEARING PAD AND MASONRY PLATE. PLATES SHALL BE THE SAME SIZE AS MASONRY PLATE AND 1 3/16" THICK.

AT INSTALLATION, ENSURE STAINLESS STEEL SLIDING FACE OF UPPER ELEMENT AND THE TFE SLIDING FACE OF THE LOWER ELEMENT HAVE THE SURFACE FINISH SPECIFIED AND ARE CLEAN AND FREE OF ALL DUST, MOISTURE, OR ANY OTHER FOREIGN MATTER.

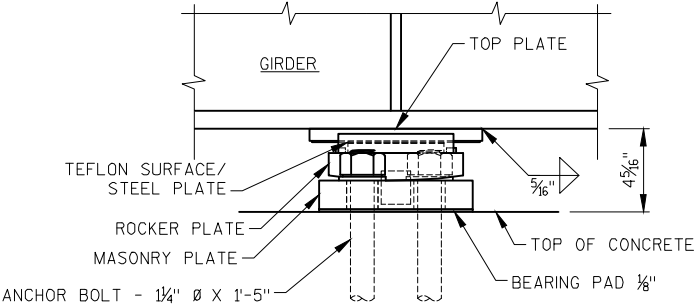
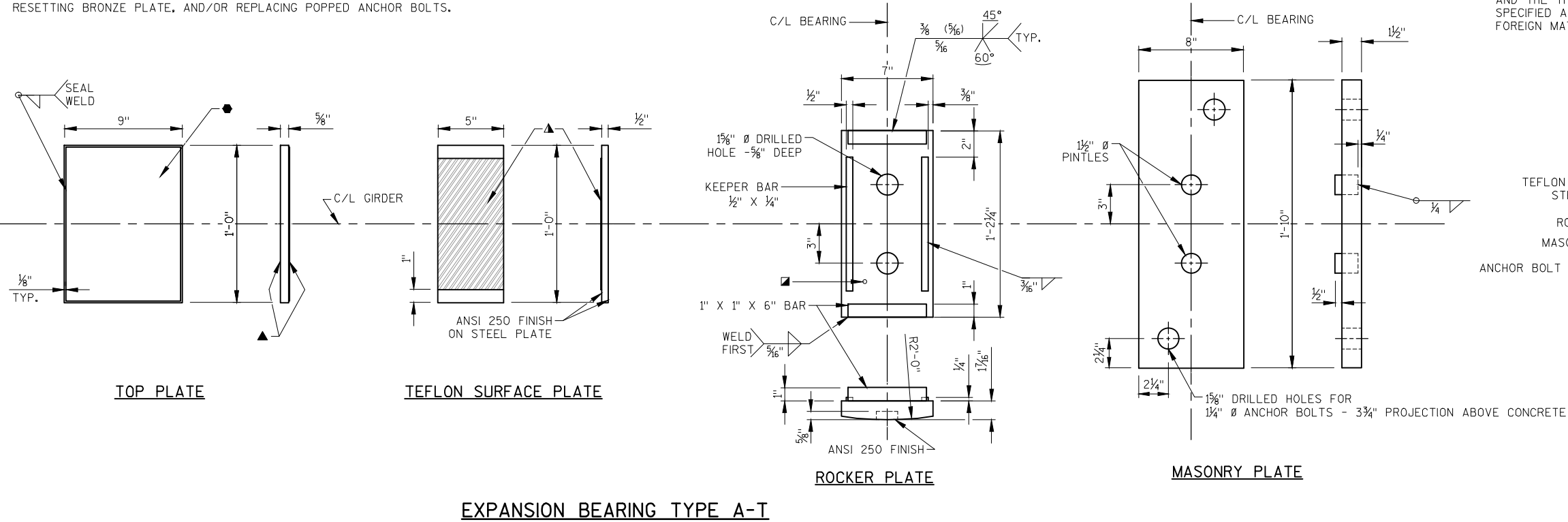


LEGEND

- \* EXACT LOCATIONS TO BE VERIFIED BY ENGINEER IN THE FIELD
- STAINLESS STEEL ASTM A240, TYPE 304, 2B FINISH, 16 GAUGE SHEET
- ▲ ANSI 250 FINISH ON STRUCTURAL STEEL PLATE TO ENSURE FLATNESS IN TOP PLATE UPON ASSEMBLY
- ▲ TEFLON SURFACE, USE UNFILLED WITH MIN. 1/8" THICK. PLACE WITH SCRIVE MARKS IN DIRECTION OF MOVEMENT. BOND STEEL PLATE AND TEFLON WITH ADHESIVE MATERIAL MEETING FEDERAL SPECIFICATION MMM-A-134, FEP FILM OR EQUAL
- ▣ PROVIDE A METHOD FOR HANDLING ROCKER PLATE DURING GALVANIZING
- WORK PAID UNDER BID ITEM 517.3000.S STRUCTURE OVERCOATING CLEANING AND PRIMING B-41-31.
- \*\* BEARING MAINTENANCE INCLUDES REPLACING MISSING OR BROKEN KEEPER BARS, RESETTING BRONZE PLATE, AND/OR REPLACING POPPED ANCHOR BOLTS.

BEARING REPAIR

BEARING NUMBER	LOCATION	REPLACE BEARING	** BEARING MAINTENANCE	ANCHOR BOLT FAILED	● CLEAN & PAINT
B1	WEST ABUTMENT		X		X
B2	WEST ABUTMENT				X
B3	WEST ABUTMENT				X
B4	WEST ABUTMENT				X
B5	WEST ABUTMENT	X			X
B1	EAST ABUTMENT	X		X	X
B2	EAST ABUTMENT		X		X
B3	EAST ABUTMENT		X		X
B4	EAST ABUTMENT	X		X	X
B5	EAST ABUTMENT	X		X	X



EXPANSION BEARING ASSEMBLY

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-41-31			
DRAWN BY		DJT	PLANS CKD. PTB
ABUTMENT REPAIR			SHEET 3 OF 8

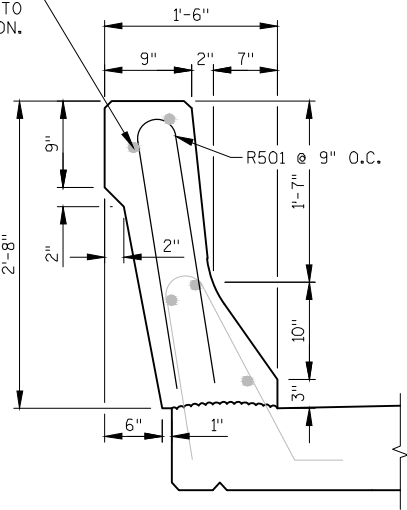
LEGEND

REMOVAL LIMITS: SLAB  
& DIAPHRAGMS

REMOVAL LIMITS: SLAB,  
DIAPHRAGMS, PARAPET

NOTE: PAINT BACKSIDE OF STEEL DIAPHRAGM  
AT ABUTMENT AFTER JOINT REMOVAL.

EXIST. PARAPET BAR STEEL - CLEAN,  
STRAIGHTEN AND INCORPORATE INTO  
NEW PARAPET CONSTRUCTION.



CROSS SECTION

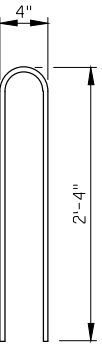
(SECTION OVER DECK SHOWN, SECTION OVER WING SIMILAR)

BILL OF BARS  
PARAPETS

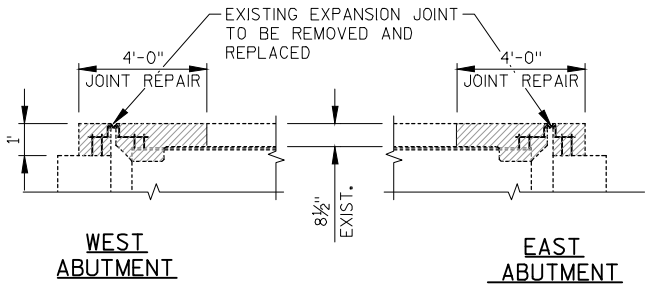
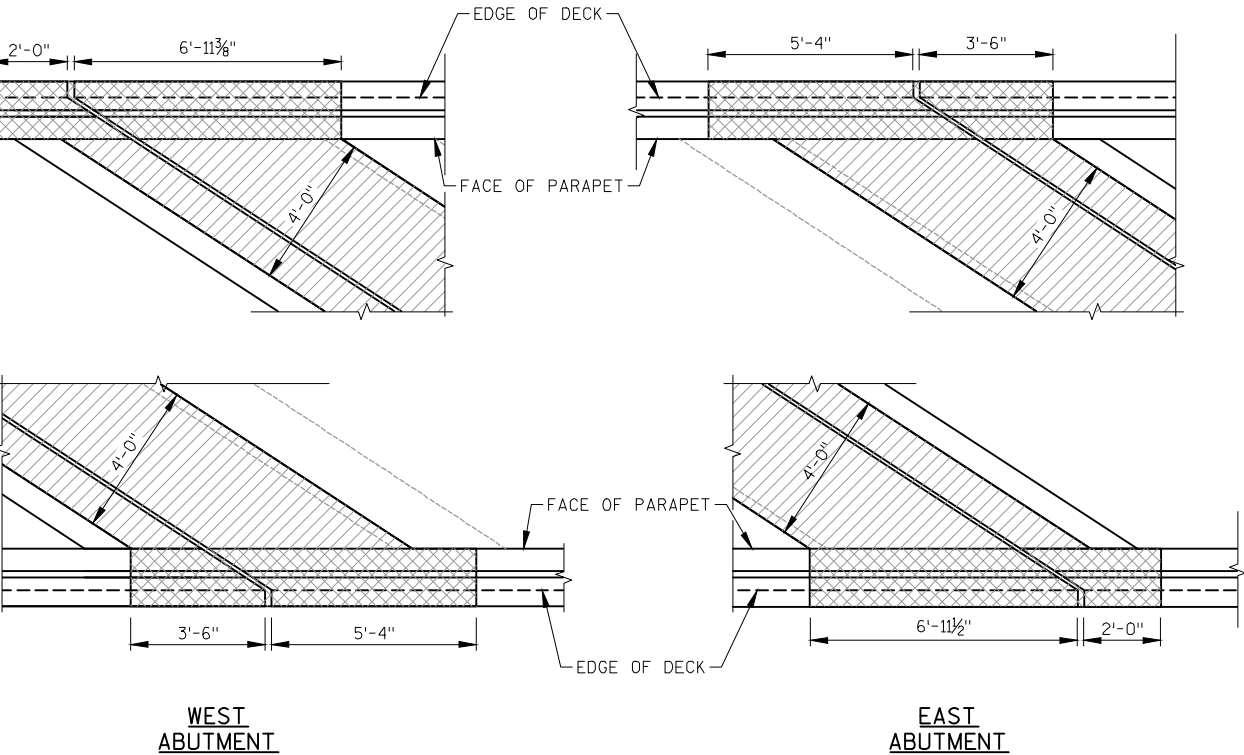
260 LB (COATED)

BAR MARK	NO. REQ'D.	LENGTH	BENT	COAT	LOCATION
R501	50	4-10	X	X	PARAPETS - VERT.

NOTES: THE FIRST DIGIT OF A BAR MARK SIGNIFIES THE BAR SIZE.  
DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.



R501



NO.	DATE	REVISION	BY
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STRUCTURE B-41-31			
DRAWN BY		DJT	PLANS CKD. PTB
REMOVAL DETAILS			SHEET 4 OF 8

LEGEND

- ① NEOPRENE STRIP SEAL (4-INCH) & STEEL EXTRUSIONS. SET JOINT OPENING AT 1¾".
- ② STUDS ⅝" DIA. X 6⅜" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS & BEND AS SHOWN AFTER WELDING.
- 2A ½" THICK STRIP SEAL ANCHOR PLATE WITH ⅝" DIA. ROD (OR ALTERNATE STRIP SEAL ANCHOR). WELD ROD TO ANCHOR PLATE, WELD ANCHOR PLATE TO NO. 1 AT 1'-6" CENTERS BETWEEN GIRDERS.
- ③ ¾" DIA. THREADED ROD WITH 2 NUTS AND WASHERS. FOR STEEL GIRDERS, WELD THREADED ROD TO TOP FLANGE OR ATTACH BY BOLTING THRU FLANGE. ON ABUTMENT SIDE, GROUT THREADED ROD INTO FIELD DRILLED HOLES IN ABUTMENT BACKWALL AS SHOWN
- ④ ¾" DIA. THREADED ROD WITH NUT. TACK WELD NUT TO NO. 5.
- ⑤ FABRICATE SUPPORT FROM 3" X ½" BAR AS SHOWN OR EQUIVALENT, ONE PER GIRDER PER SIDE. FIELD OR SHOP WELD TO NO. 1. IF FIELD WELDED, COVER WELDED AREAS WITH EPOXY-COATING MATERIAL. PROVIDE 1½" HOLE FOR NO. 3 & 1" DIA. HOLE FOR NO. 4.
- EXISTING BARS ARE LIKELY TO BE CORRODED AND/OR DAMAGED DURING CONCRETE REMOVAL. PRESERVE AND INCORPORATE AS MUCH REBAR AS PRACTICAL. SUPPLEMENT WITH THE BARS INDICATED BY ■.
- ADHESIVE ANCHORS NO. 5 BAR. EMBED 1'-6" INTO CONCRETE. SPACE AT 1'-0". ESTIMATED AT 25% REPLACEMENT RATE.
- SET BARS SAME LENGTH AS HORIZONTAL DIAPHRAGM BARS AT BOTTOM OF DIAPHRAGM.

NOTES

ONE FIELD SPLICE PERMITTED IN STEEL EXTRUSIONS. IF USED, DETAILS SHALL BE SUBMITTED FOR APPROVAL. NO SPLICING PERMITTED IN NEOPRENE STRIP SEAL.

AFTER FABRICATION, BUT BEFORE SHIPMENT, STRAIGHTEN STEEL EXTRUSIONS SUCH THAT THEY SHALL BE FREE FROM WARP, TWIST & SWEEP.

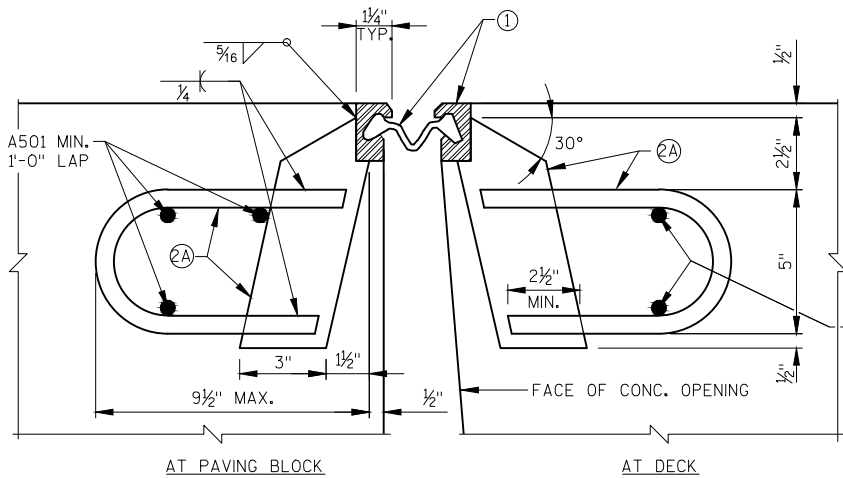
FABRICATOR SHALL PROVIDE MEANS OF KEEPING GALVANIZED EXTRUSIONS CLEAN & SMOOTH DURING SHIPMENT AND PRIOR TO APPLYING LUBRICANT ADHESIVE FOR NEOPRENE GLAND INSTALLATION.

SANDBLAST PLATES, SUPPORTS, & EXTRUSIONS AFTER FABRICATION IN ACCORDANCE WITH SSPC SP. #6 "COMMERCIAL BLAST CLEANING". AFTER BLAST CLEANING THE PLATES, SUPPORTS & EXTRUSIONS SHALL BE HOT DIPPED GALVANIZED.

ANCHOR SYSTEM NO. 8 & NO. 9 SHALL CONFORM TO ASTM A307 & SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C & D.

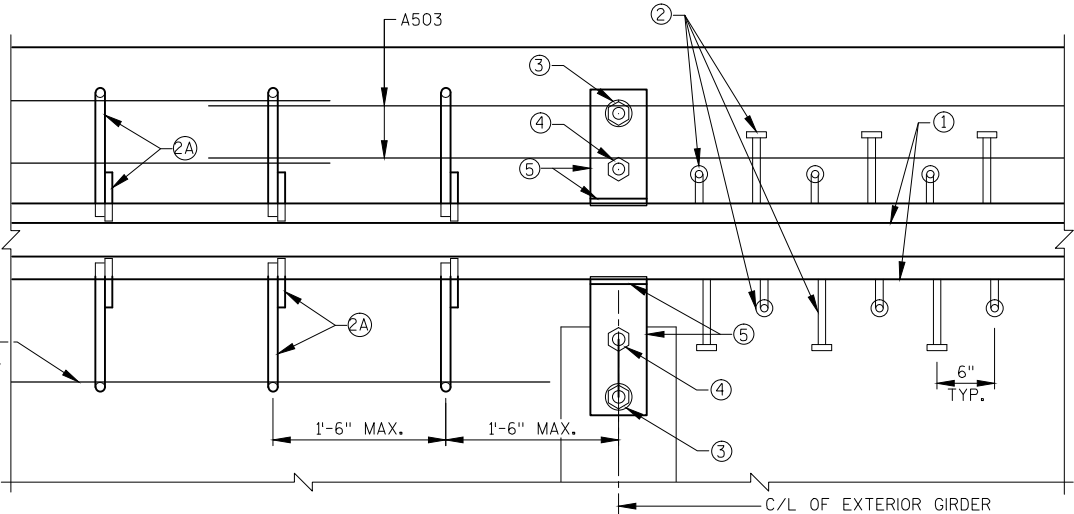
STRIP SEAL EXPANSION JOINT ASSEMBLY, INCLUDING ANCHOR STUDS & HARDWARE WILL BE PAID FOR AT THE LUMP SUM PRICE BID FOR "EXPANSION DEVICE B-41-31".

USE A 1'-9" MIN. LAP FOR ALL TRANSVERSE STEEL (A501).

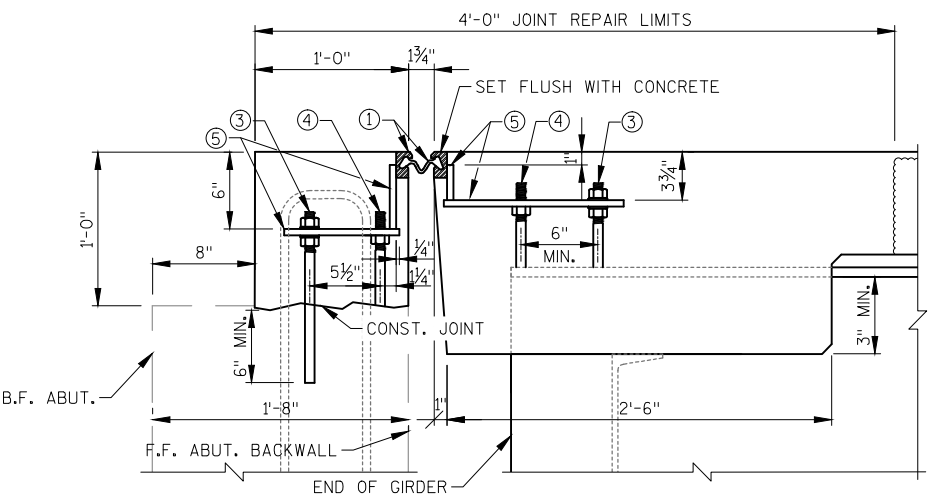


SECTION THRU JOINT

ROADWAY TRAFFIC AREA BETWEEN EXTERIOR GIRDERS

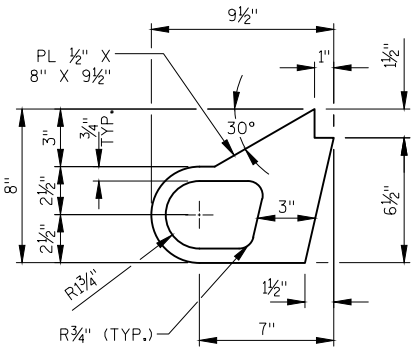


PART PLAN

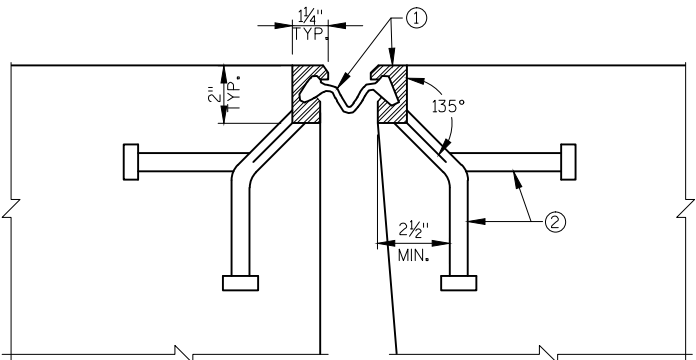


TYPICAL SECTION THRU JOINT AT WEST ABUT.

(WEST ABUT. JOINT SHOWN)  
(EXPANSION JOINT ASSEMBLY SHOWN)

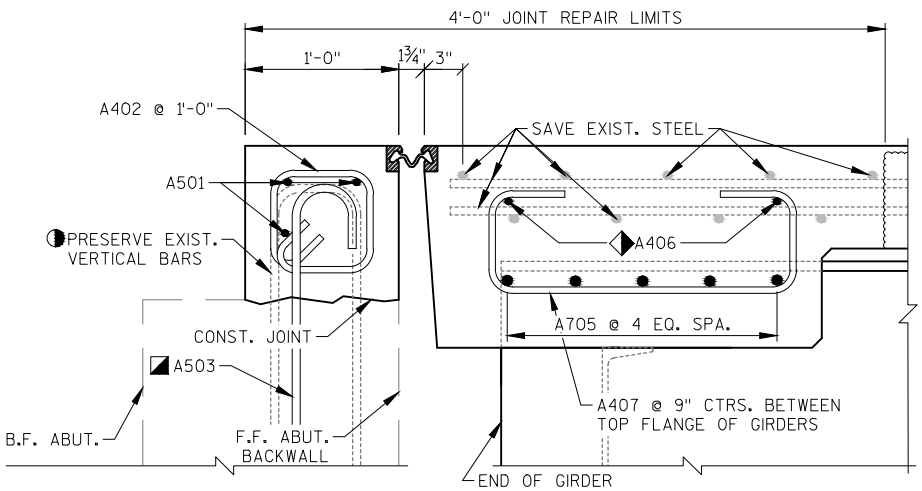


ALTERNATE STRIP SEAL ANCHOR



SECTION THRU JOINT

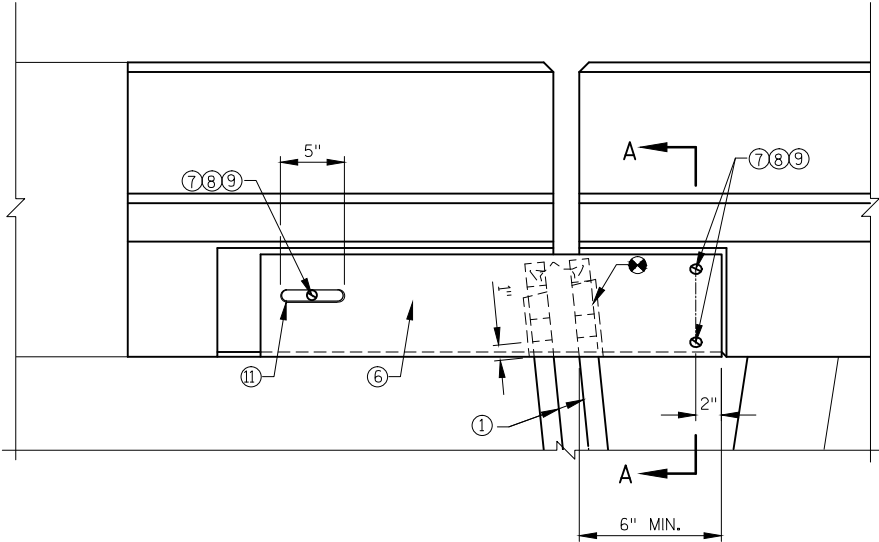
EXTERIOR GIRDER TO EDGE OF DECK, AND  
AT PARAPETS.



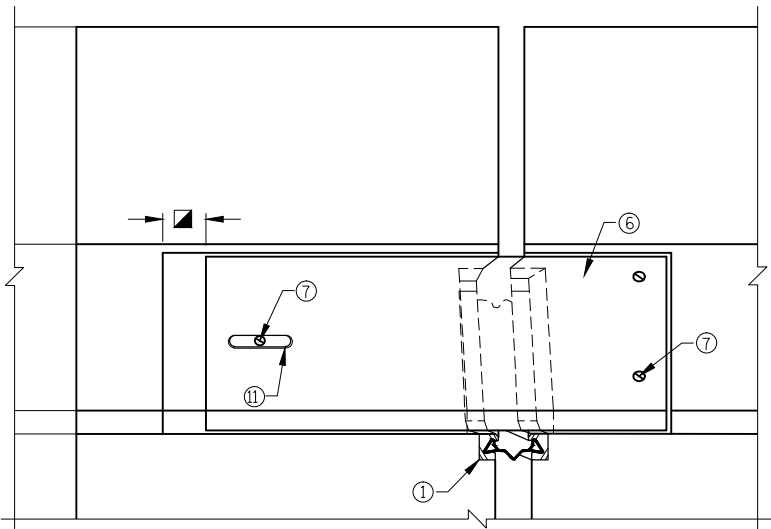
TYPICAL SECTION THRU JOINT AT WEST ABUT.

(WEST ABUT. JOINT SHOWN)  
(BAR STEEL REINFORCEMENT SHOWN)

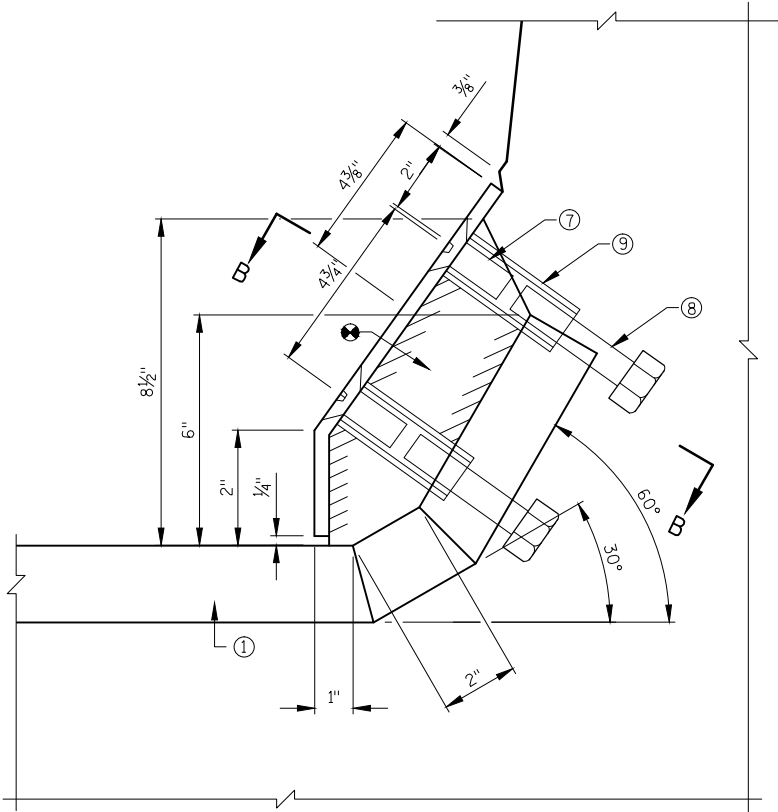
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-41-31			
DRAWN BY		DJT	PLANS CKD. PTB
EXPANSION DEVICE			SHEET 5 OF 8



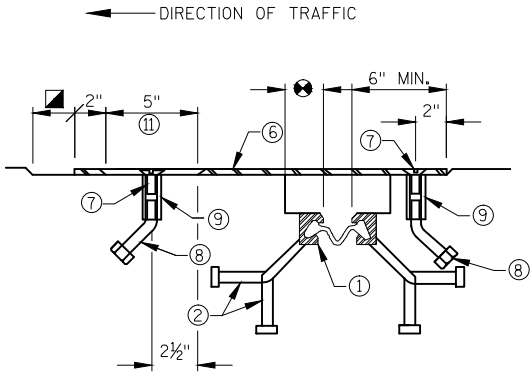
PART PLAN - WEST ABUT.



PART ELEVATION - WEST ABUT.



SECTION A-A



SECTION B-B

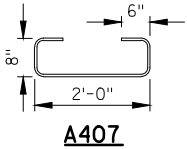
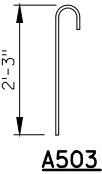
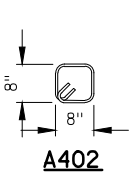
LEGEND

- ① NEOPRENE STRIP SEAL (4-INCH) & STEEL EXTRUSIONS. SET JOINT OPENING AT 1 3/4".
- ② STUDS 3/8" DIA. X 6 3/8" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS & BEND AS SHOWN AFTER WELDING.
- ⑥ GALVANIZED PLATE 3/8" X 10 1/2" X 3'-0" LONG WITH HOLES FOR NO. 7. BEND AS SHOWN.
- ⑦ 3/4" DIA. X 1 1/2" STAINLESS STEEL SOCKET FLAT HEAD SCREWS WITH ANTI-SEIZE LUBRICANT. RECESS 1/8" BELOW PLATE SURFACE.
- ⑧ 3/4" DIA. X 4" GALVANIZED HEX HEAD BOLT, BEND 45°.
- ⑨ 3/4" DIA. X 2 1/4" GALVANIZED THREADED COUPLING.
- ⑪ 1" X 5" SLOTTED CSK. HOLE FOR NO. 7. SLOT PARALLEL TO DIRECTION OF MOVEMENT.
- ⊗ BLOCK OUT CONCRETE 2" EACH SIDE OF JOINT OPENING.
- ▣ JOINT OPENING DIM. PLUS 1/2".

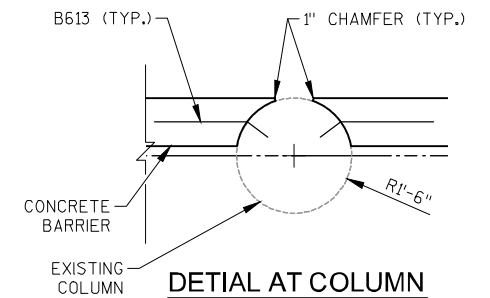
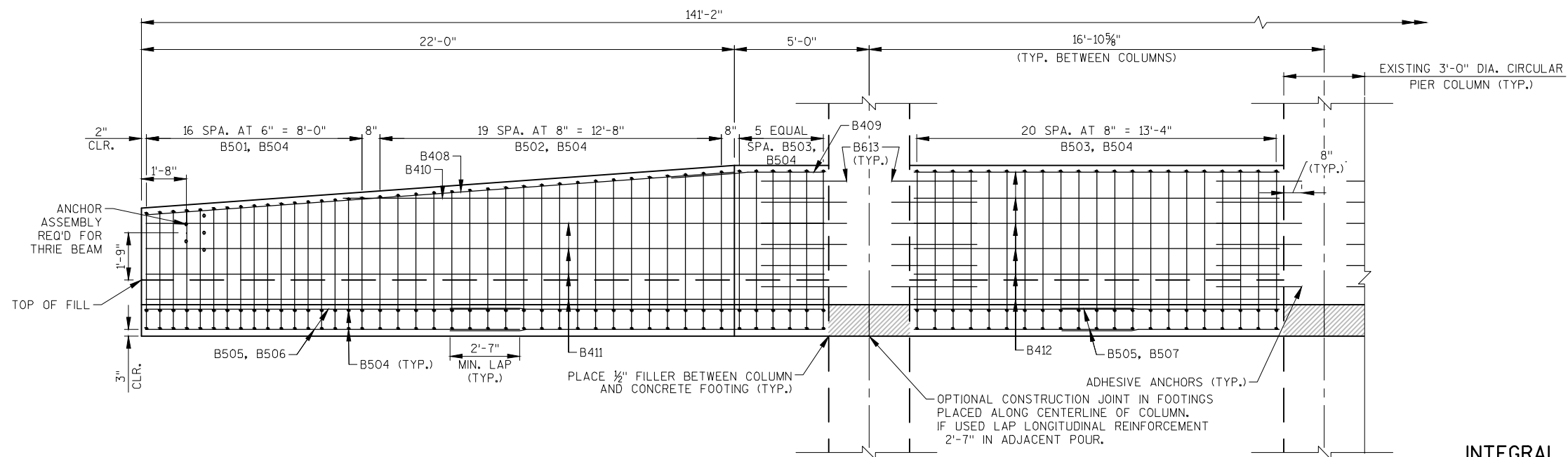
BILL OF BARS 3,130 LB (COATED)

BAR MARK	NO. REQ'D.	LENGTH	BENT	COAT	LOCATION
A501	66	8-0		X	PAVING BLOCK - HORIZ.
A402	156	3-0	X	X	PAVING BLOCK - STIRRUP
A503	39	2-10	X	X	PAVING BLOCK - VERT.
A404	16	16-6		X	SLAB - ANCHOR REINF.
A705	40	16-6		X	DIAPHRAGM - HORIZ. - BOTTOM
A406	16	16-6		X	DIAPHRAGM - HORIZ. - TOP
A407	168	4-0	X	X	WEST & EAST GIRDER - STIRRUP

NOTES: THE FIRST DIGIT OF A BAR MARK SIGNIFIES THE BAR SIZE.  
DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.



NO.	DATE	REVISION	BY
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STRUCTURE B-41-31			
DRAWN BY		DJT	PLANS CK'D. PTB
EXPANSION DEVICE DETAILS		SHEET 6 OF 8	

**INTEGRAL BARRIER NOTES**

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

BARRIER AND FOOTING SHALL CONSIST OF CAST IN PLACE CONSTRUCTION. NO JOINTS SHALL BE ALLOWED IN THE BARRIER. CONSTRUCTION JOINTS WILL ONLY BE ALLOWED IN THE FOOTING AT LOCATIONS SHOWN.

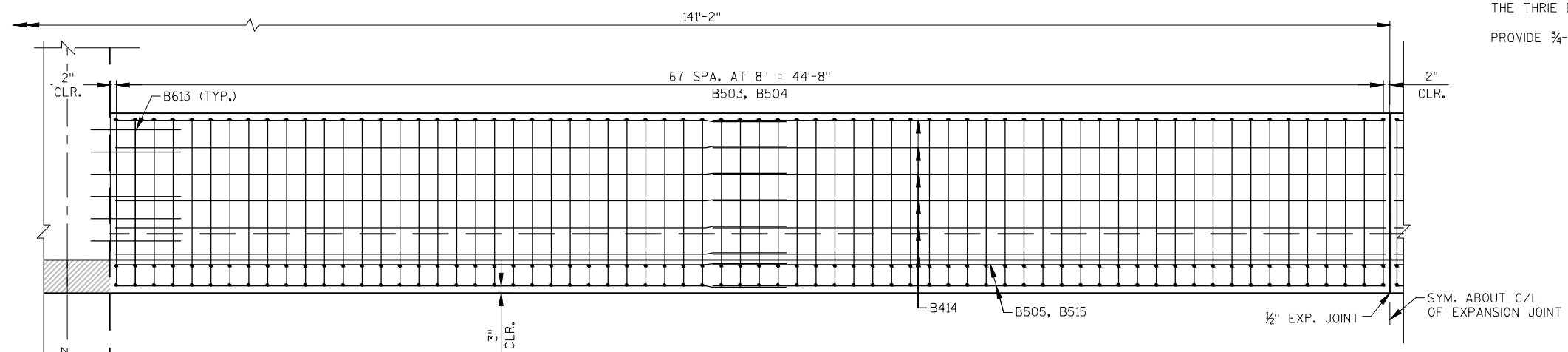
DO NOT CUT OR DRILL INTO EXISTING COLUMN BAR STEEL.

ALL REINFORCEMENT SHALL BE EPOXY-COATED.

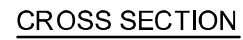
USE 2-INCH MINIMUM BAR CLEARANCE, EXCEPT AT FOOTINGS PROVIDE 3-INCH BAR CLEARANCE FROM BOTTOM OF FOOTING TO BOTTOM OF TRANSVERSE REINFORCEMENT.

PLACE REINFORCEMENT SUCH THAT IT WILL NOT CONFLICT WITH THE ANCHOR ASSEMBLY FOR THE THRIE BEAM ATTACHMENT.

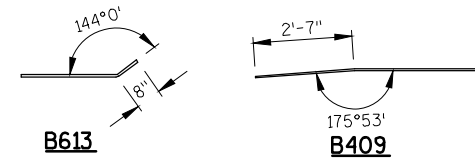
PROVIDE  $\frac{3}{4}$ -INCH BEVEL OR 1-INCH RADIUS ON BARRIER EDGES, TOP AND ENDS.

**ELEVATION VIEW**

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-41-31			
DRAWN BY RBH		PLANS CK'D. TJR	
INTEGRAL BARRIER			SHEET 7 OF 8



ASSEMBLY SHALL BE BID ITEM "ANCHOR ASSEMBLIES  
FOR STEEL PLATE BEAM GUARD".



BAR MARK	NO. REQ'D.	LENGTH	BENT	COAT	BAR SERIES	LOCATION
B501	34	11-3	X	X	*	TRANSITION AREA - VERT.
B502	40	12-10	X	X	*	TRANSITION AREA - VERT.
B503	316	13-11	X	X		BARRIER WALL - VERT.
B504	780	4-8		X		FOOTING - TRANSVERSE
B505	48	41-11		X		FOOTING - LONGITUDINAL
B506	32	14-3		X		TRANSITION AREA-FOOTING-LONGIT.
B507	128	8-10		X		BETWEEN COLUMNS-FOOTING-LONGIT.
B408	4	21-10		X		TRANSITION AREA - HORIZ.
B409	4	5-11	X	X		TRANSITION AREA - HORIZ.
B410	4	17-10		X		TRANSITION AREA - HORIZ.
B411	16	25-2		X		TRANSITION AREA - HORIZ.
B412	96	13-6		X		BETWEEN COLUMNS - HORIZ.
B613	120	3-2		X		PIER ANCHORS
B414	48	24-3		X		BETWEEN STRUCTURES - HORIZ.
B515	32	24-3		X		BETWEEN STRUCTURES-FOOTING-LONGIT.

BUNDLE AND TAG EACH SERIES SEPARATELY.

NO.	DATE	REVISION	BY
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STRUCTURE B-41-31			
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INTEGRAL BARRIER DETAILS		SHEET 8 OF 8	

## Notes



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