STOUGHTON - EDGERTON

YAHARA RIVER BRIDGE B-13-0681

CTH N

FOR

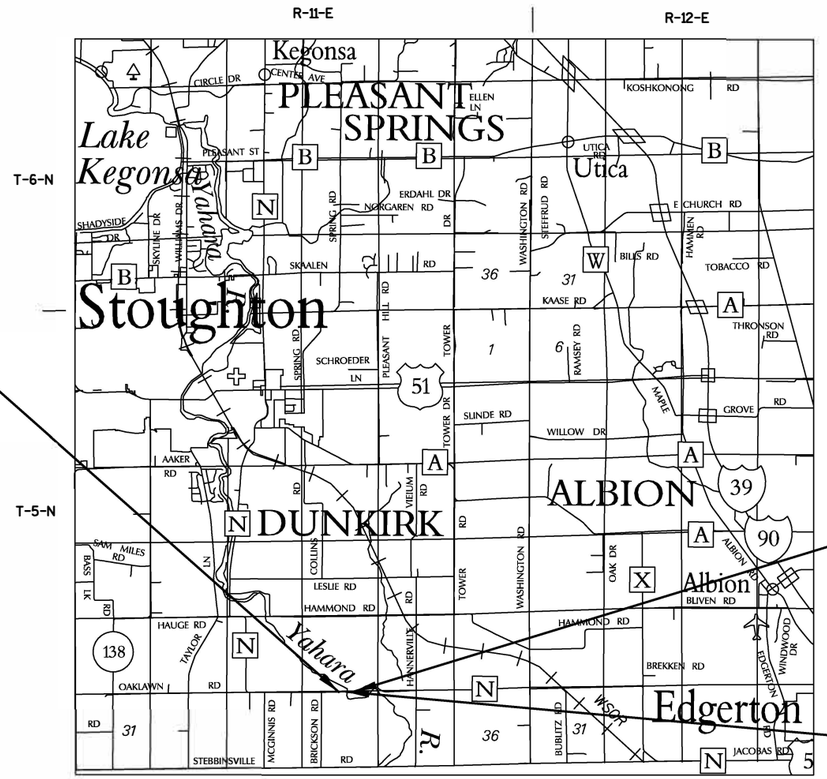
DANE COUNTY

JANUARY 17, 2017

PUBLIC WORKS PROJECT NUMBER 316046

ORDER OF SHEETS

TOTAL SHEETS = 88



BEGIN PROJECT
STA. 98+50.00
X=875,930.23
Y=404,973.68

END PROJECT
STA. 101+50.00

STRUCTURE
B-13-0681

LAYOUT
SCALE 0 1.0 MI.

TOTAL NET LENGTH OF CENTERLINE = 0.057 MI.

Coordinates on this plan are referenced to the Wisconsin County Coordinate System (WCCS), Dane County Zone, NAD 83 (2011)

Elevations shown on this plan are referenced to the North American Vertical Datum of 1988 NAVD 88 (2011).

ACCEPTED FOR DANE COUNTY

Date: 11/30/16 _____ SIGNATURE AND TITLE OF OFFICAL

ORIGINAL PLANS PREPARED BY:

STRAND ASSOCIATES®
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MADISON, WISCONSIN 53715
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WISCONSIN
SARA J. GRIMME
E-36643
VERONA
WI
PROFESSIONAL ENGINEER
11-29-16

CONTRACT NO. 69191-1591

2

GENERAL NOTES

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

THERE ARE NO KNOWN UTILITY FACILITIES WITHIN THE PROJECT AREA.

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

THE LOCATION OF PROPOSED SIGNS AS SHOWN ON THE PLANS ARE APPROXIMATE. THE EXACT NUMBER OF SIGNS AND SIGN LOCATIONS ARE TO BE APPROVED BY THE ENGINEER IN THE FIELD.

DISTURBED AREAS WITHIN THE RIGHT-OF-WAY SHALL BE RESTORED AS DIRECTED BY THE ENGINEER.

MISCELLANEOUS REMOVAL ITEMS SHALL BE REMOVED TO AN EXISTING JOINT, SAWCUT WHERE SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.

A SAWED JOINT SHALL BE REQUIRED WHERE NEW PAVEMENT IS TO MEET AN EXISTING PAVED SURFACE.

SILT FENCE SHALL BE PLACED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER AND IN PLACE PRIOR TO CONSTRUCTION.

WETLANDS EXIST IN THE PROJECT AREA. DO NOT DISTURB AREAS OUTSIDE THE SLOPE INTERCEPTS.

ALL BARE, EXPOSED SOIL SHALL BE TEMPORARILY OR PERMANENTLY STABILIZED WITH SEED AND MULCH WITHIN 30 DAYS.

TRACKING PAD(S) SHALL BE LOCATED BY THE CONTRACTOR AND APPROVED BY THE FIELD ENGINEER.

PER DNR 1071, SLOPE INTERRUPTION DEVICE SHALL BE INSTALLED FOLLOWING SOIL DISTURBANCE.

2

DESIGN CONSULTANT

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WISDNR

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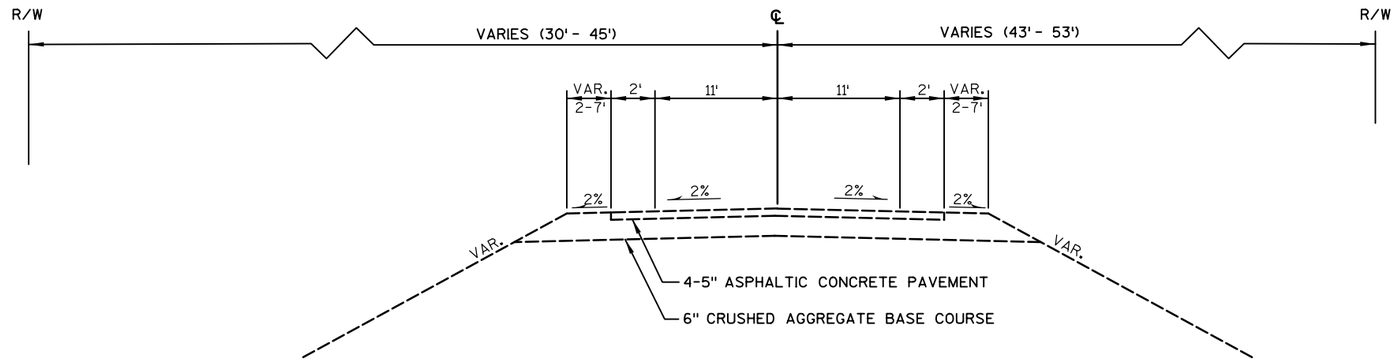
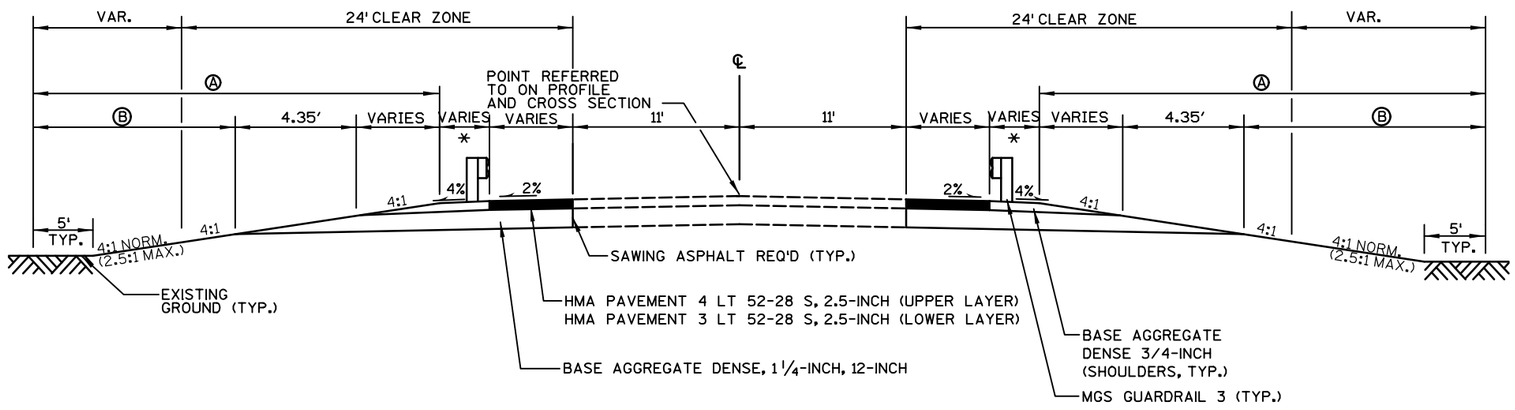
PH: (608) 275-3301
eric.heggelund@wisconsin.gov

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	GENERAL NOTES	SHEET 2	E



EXISTING TYPICAL SECTION
CTH N



* TAPER SHOULDER TO MATCH EXISTING BEYOND GUARDRAIL LIMITS.

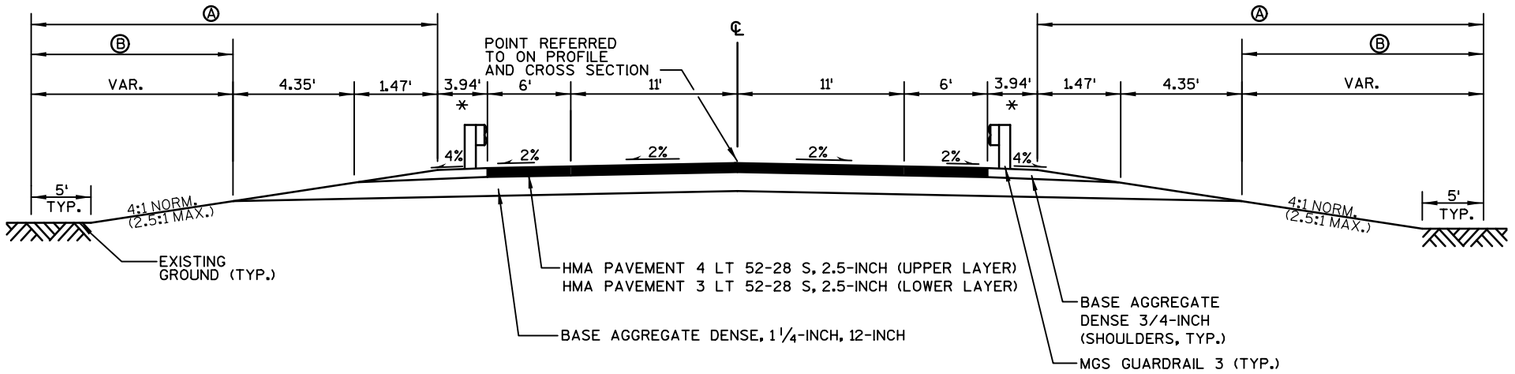
ADDITIONAL 2' OFFSET AT FACE OF RAIL AT EAT POST #1.

Ⓐ SEEDING TEMPORARY; SEEDING MIXTURE NO. 20; AND FERTILIZER TYPE B.

Ⓑ SALVAGED TOPSOIL; AND MULCHING

PROPOSED TYPICAL SECTION
CTH N
97+28.36 - 98+50
101+50 - 102+88.88

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	TYPICAL SECTIONS	SHEET 3	E



* TAPER SHOULDER TO MATCH EXISTING BEYOND GUARDRAIL LIMITS.

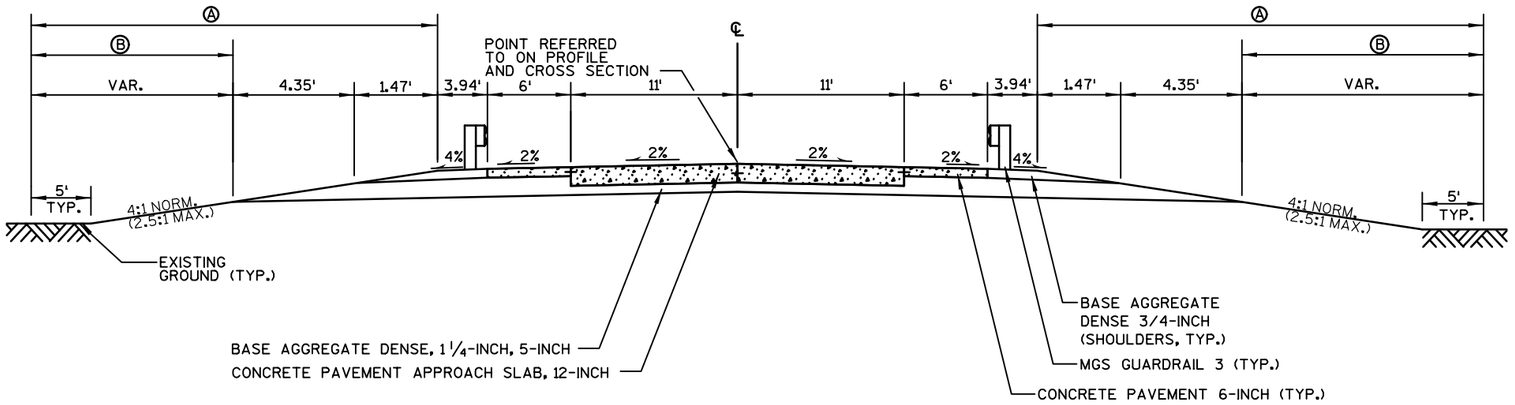
ADDITIONAL 2' OFFSET AT FACE OF RAIL AT EAT POST #1.

Ⓐ SEEDING TEMPORARY;
SEEDING MIXTURE NO. 20;
AND FERTILIZER TYPE B.

Ⓑ SALVAGED TOPSOIL;
AND MULCHING

PROPOSED TYPICAL SECTION

CTH N
STA. 98+50.00 - STA. 99+28.75
STA. 100+71.25 - STA. 101+50.00



Ⓐ SEEDING TEMPORARY;
SEEDING MIXTURE NO. 20;
AND FERTILIZER TYPE B.

Ⓑ SALVAGED TOPSOIL;
AND MULCHING

PROPOSED TYPICAL SECTION

CTH N
STA. 99+28.75 - STA. 99+43.75
STA. 100+56.25 - STA. 100+71.25

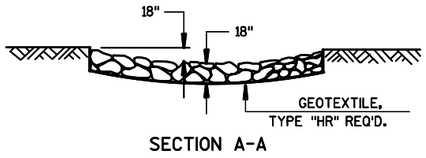
PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	TYPICAL SECTIONS	SHEET 4	E

2

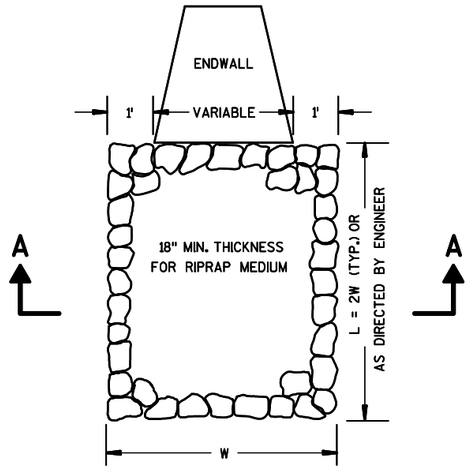
RUNOFF COEFFICIENT TABLE

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

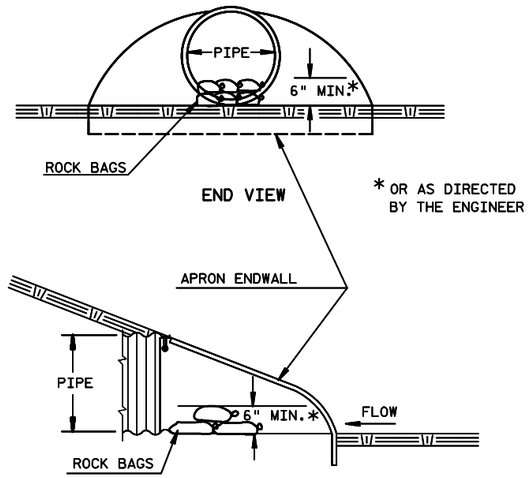
TOTAL PROJECT AREA = 1.0 ACRES
TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 0.8 ACRES



SECTION A-A



RIPRAP MEDIUM TREATMENT AT CULVERTS



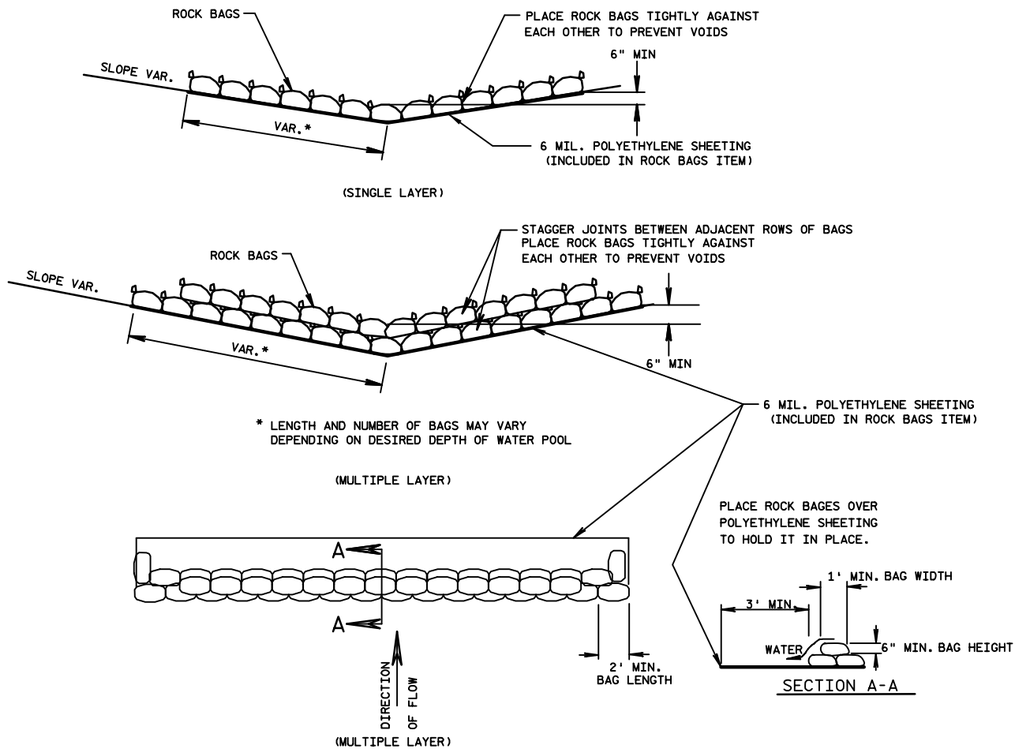
SIDE VIEW

CULVERT PIPE CHECKS

STA. 102+10 RT
STA. 102+60 LT

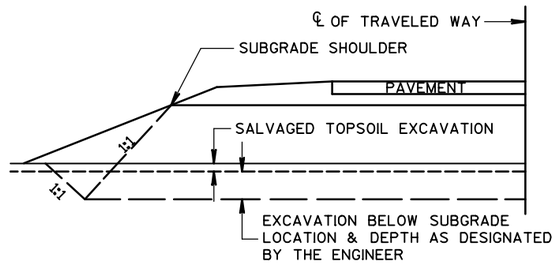
2

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	CONSTRUCTION DETAILS	SHEET 5	E

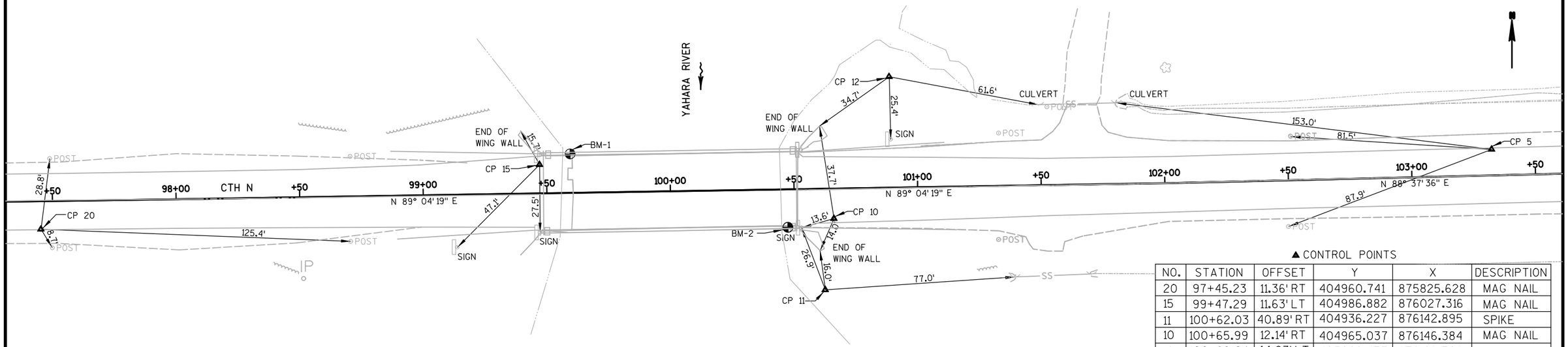


ROCK BAGS (DITCH CHECK)

STA. 101+00 LT
STA. 101+30 RT



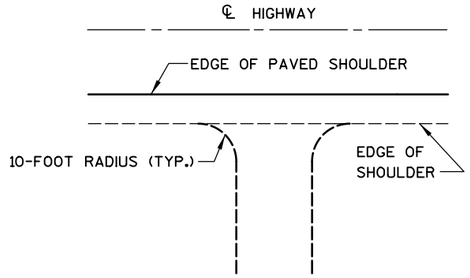
DETAIL FOR EXCAVATION BELOW SUBGRADE



▲ CONTROL POINTS

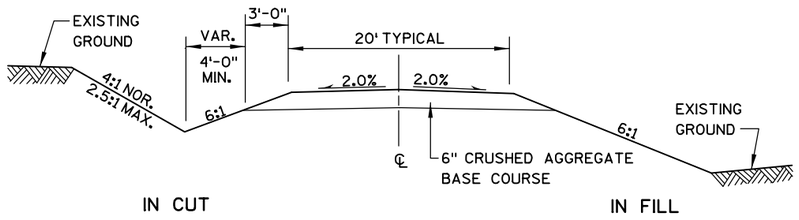
NO.	STATION	OFFSET	Y	X	DESCRIPTION
20	97+45.23	11.36' RT	404960.741	875825.628	MAG NAIL
15	99+47.29	11.63' LT	404986.882	876027.316	MAG NAIL
11	100+62.03	40.89' RT	404936.227	876142.895	SPIKE
10	100+65.99	12.14' RT	404965.037	876146.384	MAG NAIL
12	100+89.24	44.93' LT	405022.477	876168.708	SPIKE
5	103+32.54	10.55' LT	404993.068	876412.429	MAG NAIL

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	CONSTRUCTION DETAILS	SHEET 6	E



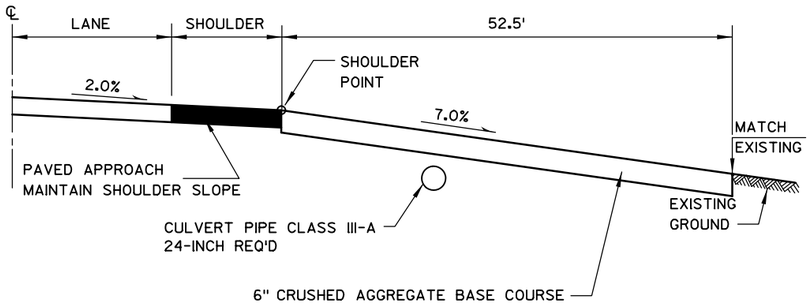
PLAN VIEW

RURAL DRIVEWAY INTERSECTION DETAIL



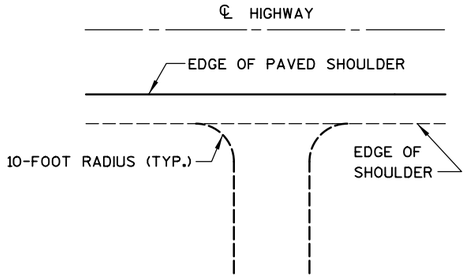
IN CUT IN FILL

TYPICAL CROSS SECTION FIELD ENTRANCE



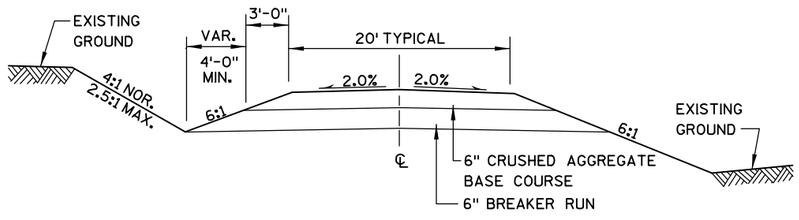
TYPICAL DRIVEWAY PROFILE
STA. 101+96 RT

2



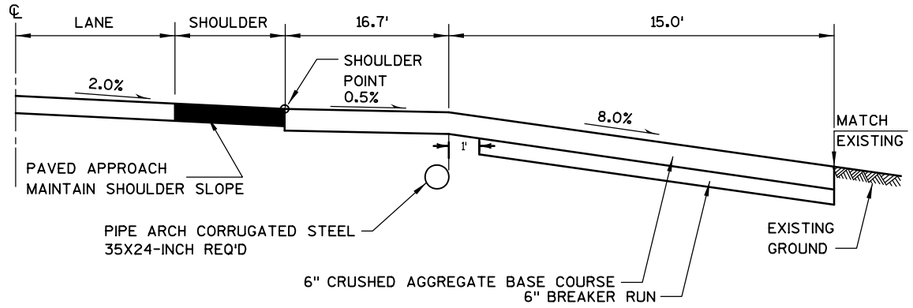
PLAN VIEW

RURAL DRIVEWAY INTERSECTION DETAIL



IN CUT IN FILL

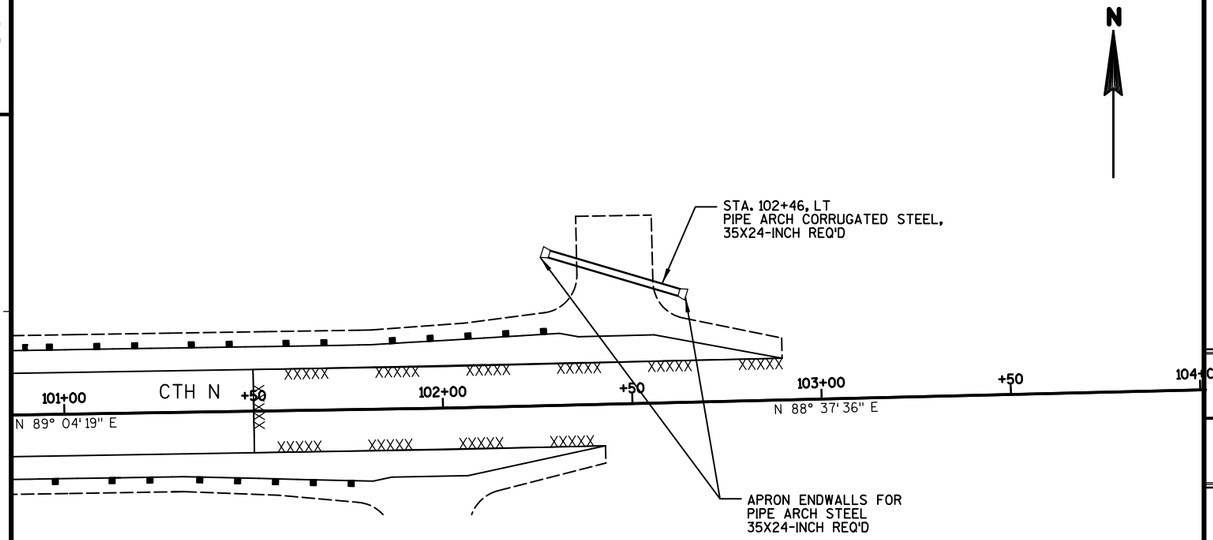
TYPICAL CROSS SECTION FIELD ENTRANCE

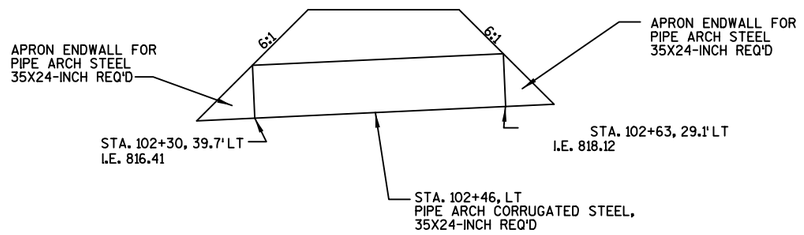


TYPICAL DRIVEWAY PROFILE
STA. 102+46 LT

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	CONSTRUCTION DETAILS	SHEET 7	E

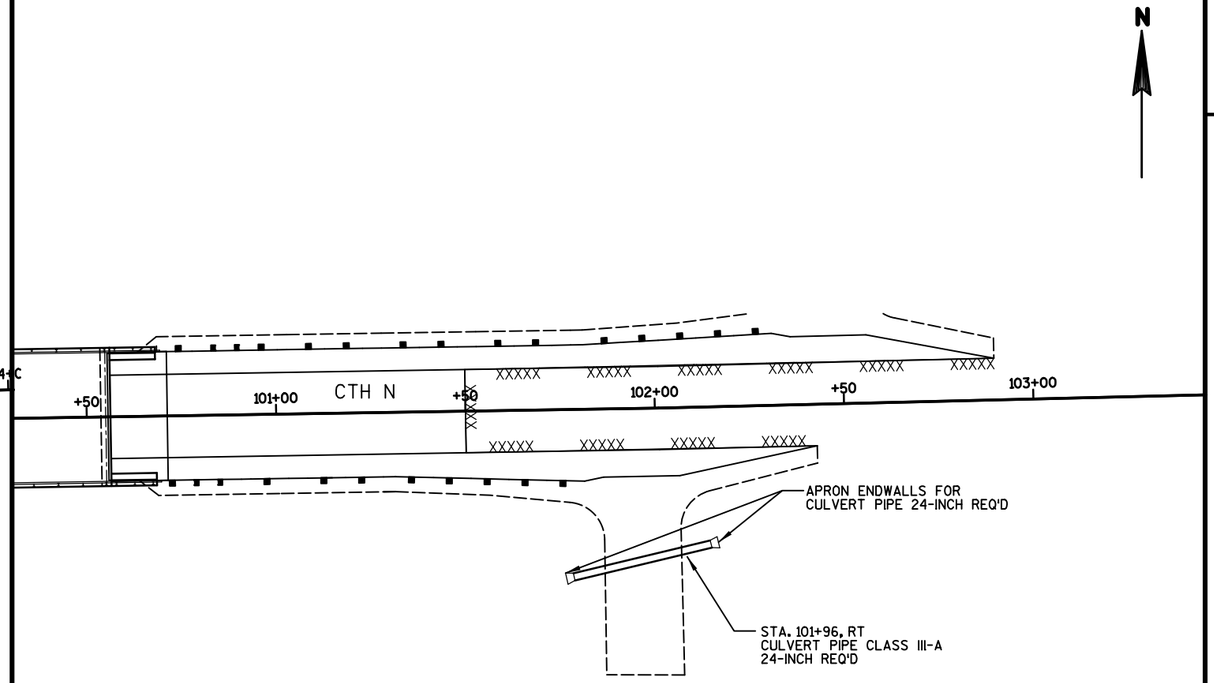
2

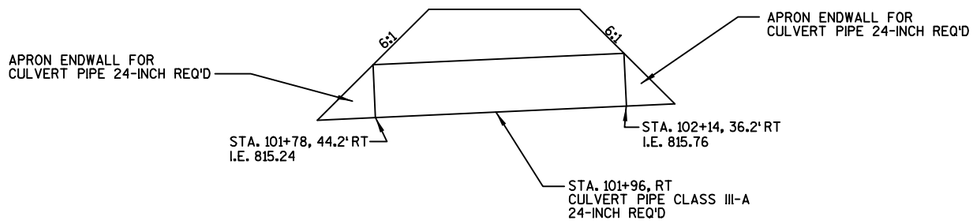




DRIVEWAY CULVERT

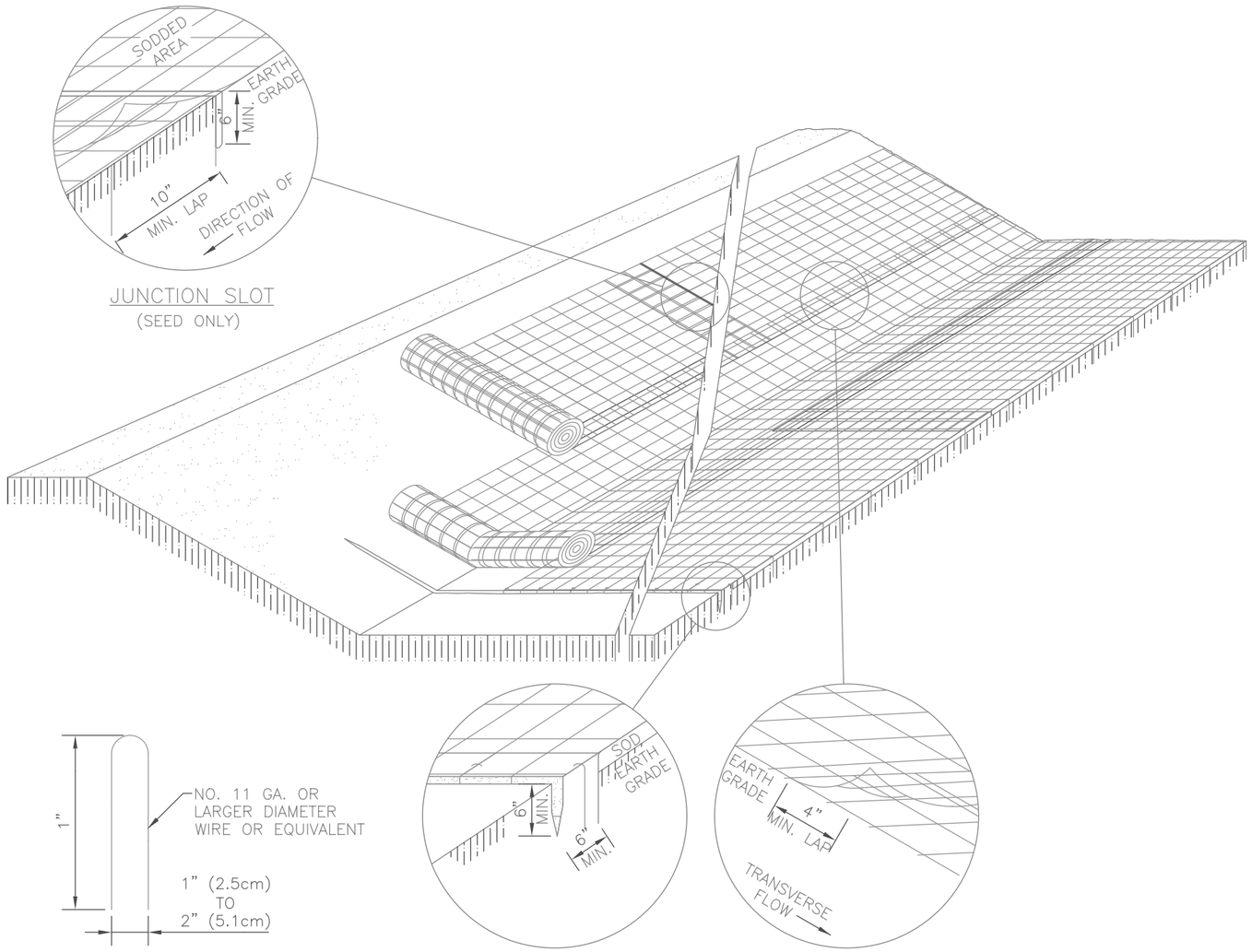
STA. 102+46 LT





DRIVEWAY CULVERT

STA. 101+96 RT



JUNCTION SLOT
(SEED ONLY)

DETAIL OF TYPICAL STAPLE

–*6" MIN FOR FIRM SOILS
–8" MIN WHERE MATS ARE BEING USED
–12" MIN FOR LOOSE SOILS

ANCHOR SLOT
AT BEGINNING AND END OF EROSION MAT
(SEED)

LAP JOINT
(SEED)

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

2. VARIATIONS IN THE DIMENSIONS OR MATERIALS SHOWN HEREON SHALL BE PERMITTED IF THEY PROVIDE EQUIVALENT PROTECTION AND MATERIAL STRENGTH.

3. LAP JOINTS SHALL NOT BE PLACED IN THE BOTTOM OF V–SHAPED DITCHES.

4. JUNCTION SLOTS ON ADJACENT STRIPS OF MATTING SHALL BE STAGGERED A MINIMUM OF 4 FEET APART.

5. EDGES OF THE EROSION MAT SHALL BE IMPRESSED IN THE SOIL.

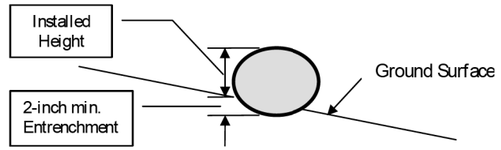
6. EROSION MAT SHALL BE MEASURED AND PAID FOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

EROSOIN MAT OVER SEEDING

– JUNCTION OR ANCHOR SLOTS WHALL BE AT MINIMUM INTERVALS OF 100 FEET ON GRADES UP TO AND INCLUDING 3 PERCENT, AND 50 FEET ON GRADES EXCEEDING 3 PERCENT.

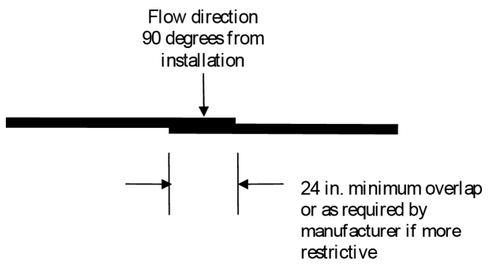
EROSION CONTROL MAT INSTALLATION

MINIMUM DIAMETER OF THE SLOPE INTERRUPTION DEVICE IS 12-INCHES

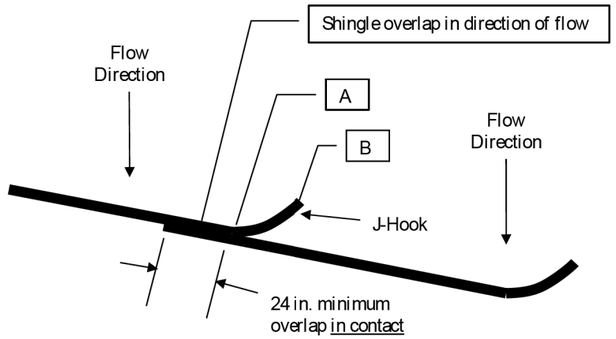


Note:
Installed height is measured from the upslope ground surface to the top of the product. Due to settlement and/or deformation, the installed height may not be equivalent to the nominal diameter of the product.

CROSS SECTION



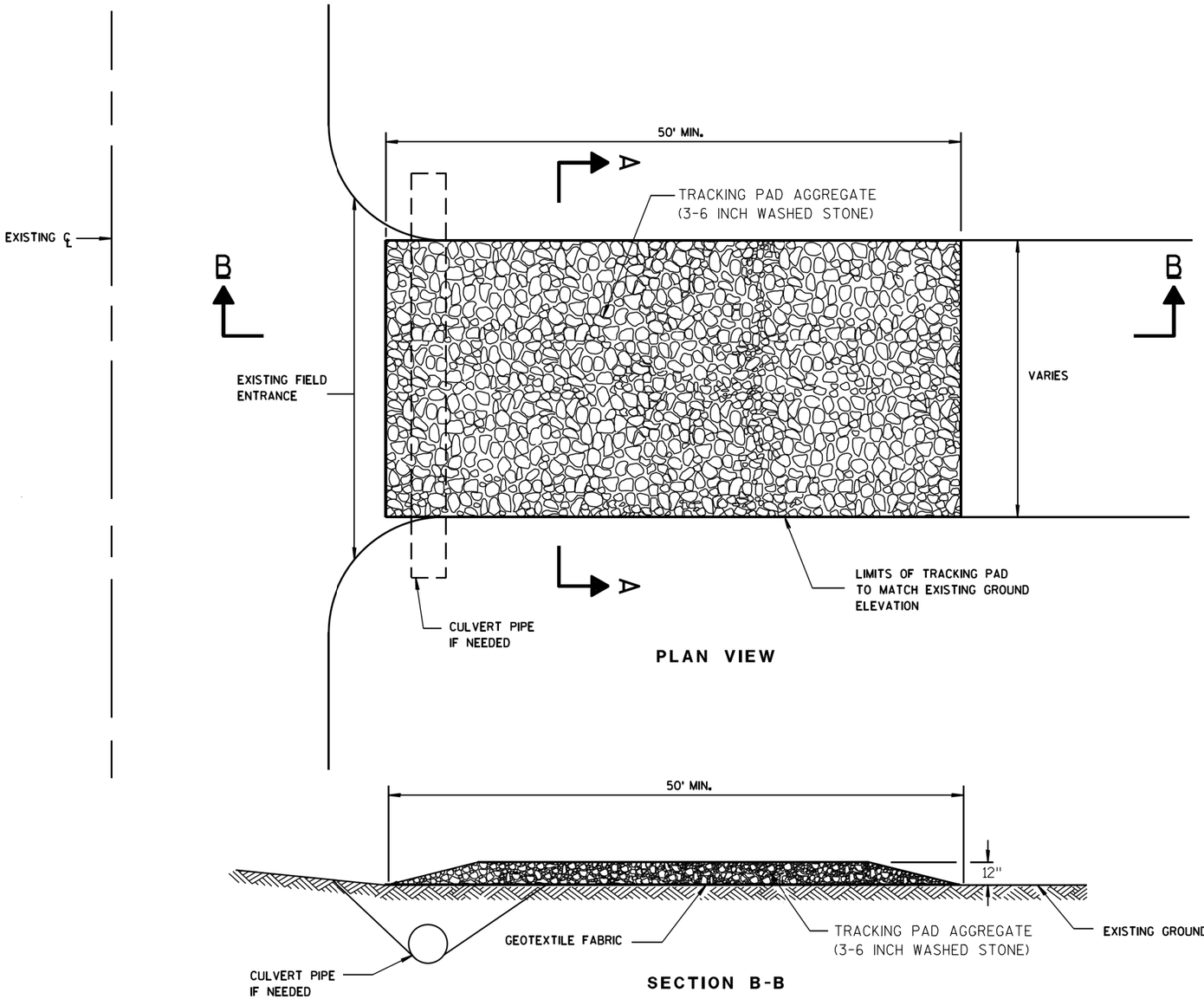
TYPICAL INSTALLATION
(Plan View)



Notes:
1. J-hooks shall be installed so that the ground-product interface elevation at location B is higher than the top of product elevation at location A to create a weir at point A.
2. J-hooks shall be installed every 2 vertical feet of drop along the length of the installation.
3. Stake overlap as required by manufacturer.

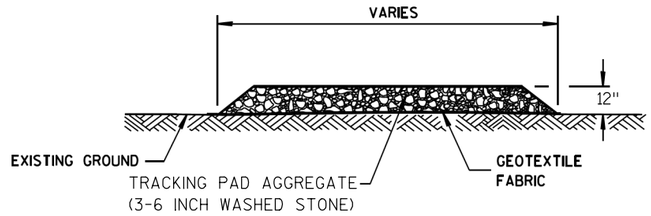
SLOPING INSTALLATION
(Plan View)

SLOPE INTERRUPTION DEVICE



PLAN VIEW

SECTION B-B



SECTION A-A

GENERAL 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.

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

TRACKING PAD TO BE REMOVED AFTER CONSTRUCTION IS COMPLETED.

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

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

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

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

TRACKING PAD

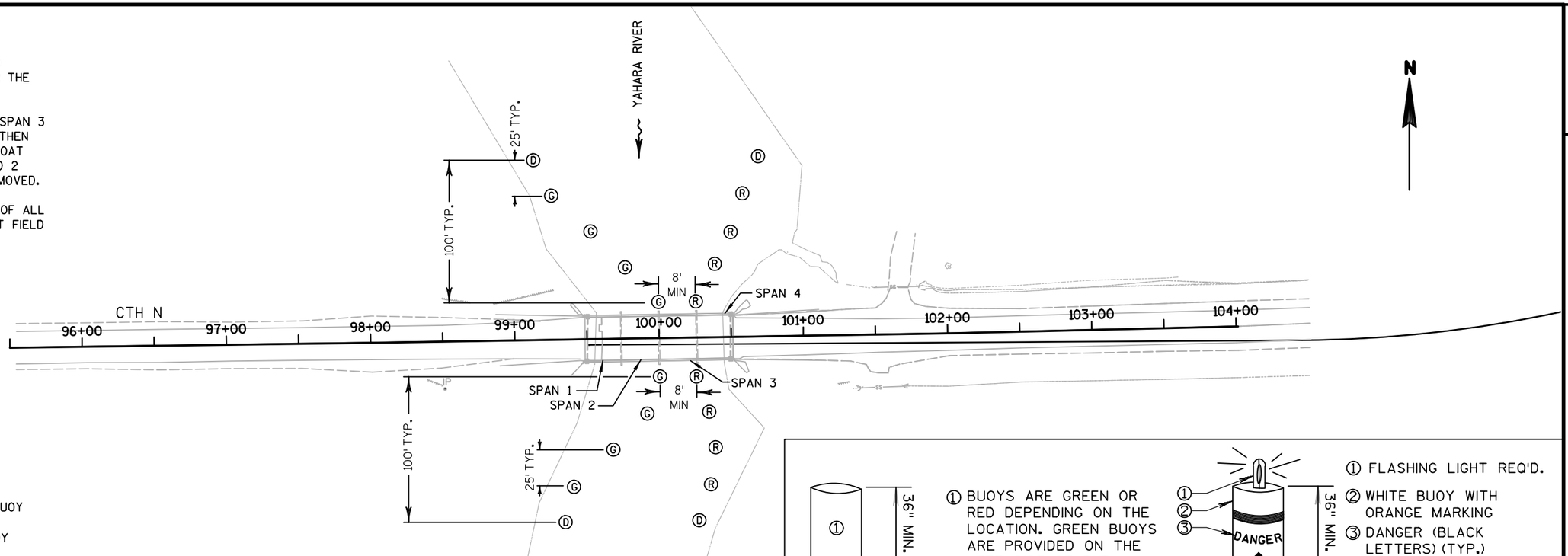
2

LAYOUT DURING BRIDGE REMOVAL

REMOVE BRIDGE HALF AT A TIME TO ACCOMMODATE BOAT TRAFFIC UNDER THE SPANS NOT BEING WORKED ON.

BOAT TRAFFIC WILL TRAVEL UNDER SPAN 3 WHEN SPAN 1 AND 2 ARE REMOVED. THEN BUOYS WILL BE MOVED TO ALLOW BOAT TRAFFIC UNDER THE OLD SPAN 1 AND 2 WHILE SPAN 3 AND 4 ARE BEING REMOVED.

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

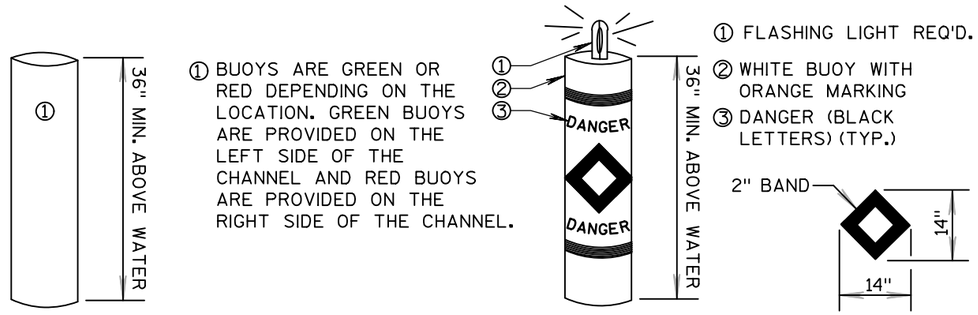


LEGEND

Ⓓ DANGER BUOY

Ⓖ GREEN DIRECTIONAL BUOY

Ⓡ RED DIRECTIONAL BUOY



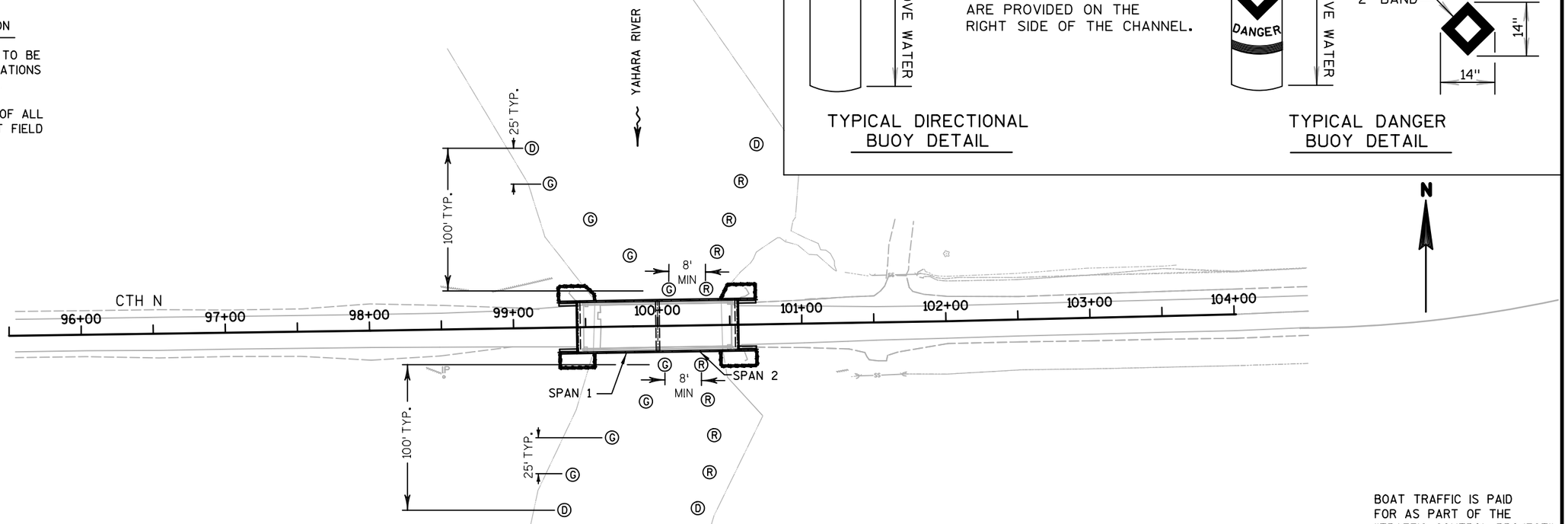
TYPICAL DIRECTIONAL BUOY DETAIL

TYPICAL DANGER BUOY DETAIL

LAYOUT DURING BRIDGE CONSTRUCTION

ACCESS UNDER EITHER SPAN 1 OR 2 TO BE DETERMINED BY CONTRACTOR'S OPERATIONS AND AS DIRECTED BY THE ENGINEER.

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



LEGEND

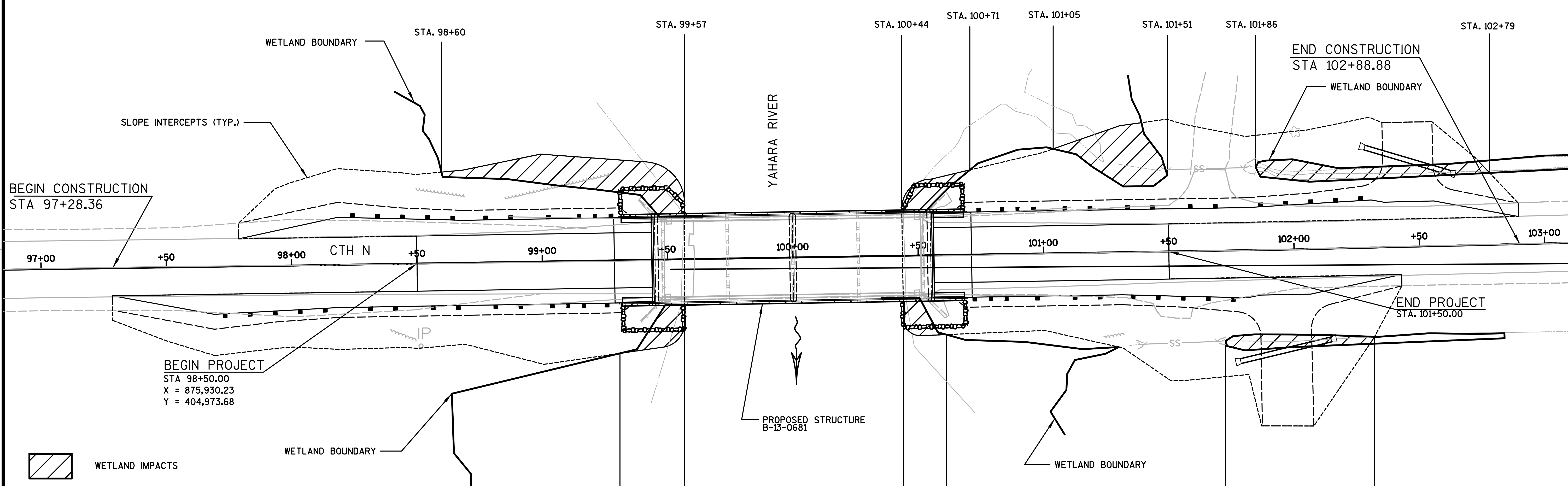
Ⓓ DANGER BUOY

Ⓖ GREEN DIRECTIONAL BUOY

Ⓡ RED DIRECTIONAL BUOY

BOAT TRAFFIC IS PAID FOR AS PART OF THE "TRAFFIC CONTROL PROJECT"

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	BOAT TRAFFIC CONTROL DETAIL	SHEET 12	E



WETLAND IMPACTS

IMPACT LOCATION STATION	IMPACT TYPE	AREA ACRES
98+60 - 99+57 LT	RPE/RPF	0.024
99+30 - 99+56 RT	RPE	0.005
100+44 - 100+60 RT	RPE	0.003
100+44 - 100+71 LT	RPE	0.005
101+05 - 101+51 LT	RPF	0.015
101+72 - 102+31 RT	M(D)	0.006
101+86 - 102+79 LT	M(D)	0.011

2

N

YAHARA RIVER

BEGIN CONSTRUCTION
STA 97+28.36

END CONSTRUCTION
STA 102+88.88

CTH N

97+00 +50 98+00 +50 99+00 +50 100+00 +50 101+00 +50 102+00 +50

STA. 97+79.02
17.21' LT

STA. 97+79.02
11.00' LT

STA. 98+18.81
24.94' LT

STA. 98+18.81
19.00' LT
POST #1

STA. 98+43.83
22.33' LT

STA. 98+68.81
17.00' LT

STA. 99+28.75
17.00' LT

CONCRETE PAVEMENT 6-IN

STA. 99+36.33
17.00' LT

CONCRETE PAVEMENT
APPROACH SLAB

STA. 100+63.67
17.00' LT

CONCRETE PAVEMENT 6-IN

STA. 100+71.25
17.00' LT

STA. 101+81.19
17.00' LT

STA. 102+06.34
22.33' LT

STA. 102+31.19
19.00' LT
POST #1

STA. 102+36.18
18.00' LT

STA. 102+36.18
49.77' LT

STA. 102+56.18
18.00' LT

STA. 102+56.18
49.77' LT

STA. 102+89.82
11.00' LT

STA. 102+89.82
16.36' LT

F.E.

5:1

STA. 97+28.36
11.00' RT

STA. 97+28.36
16.81' RT

STA. 97+68.81
19.00' RT
POST #1

STA. 97+68.81
24.94' RT

STA. 97+93.88
22.33' RT

STA. 98+18.81
17.00' RT

BEGIN PROJECT
STA 98+50.00
X = 875,930.23
Y = 404,973.68

STA. 99+28.75
17.00' RT

CONCRETE PAVEMENT 6-IN

STA. 99+43.75

PROPOSED STRUCTURE
B-13-0681

STA. 99+36.33
17.00' RT

STA. 100+56.25

STA. 100+63.67
17.00' RT

CONCRETE PAVEMENT 6-IN

STA. 100+71.25
17.00' RT

STA. 101+31.19
17.00' RT

END PROJECT
STA. 101+50.00

STA. 101+56.17
22.33' RT

STA. 101+81.19
19.00' RT
POST #1

STA. 101+86.19
70.22' RT

STA. 102+63.97
22.23' LT

STA. 102+42.73
11.00' RT

STA. 102+42.73
15.55' RT

STA. 102+13.93
22.21' RT

STA. 102+06.19
18.00' RT

STA. 101+86.19
18.00' RT

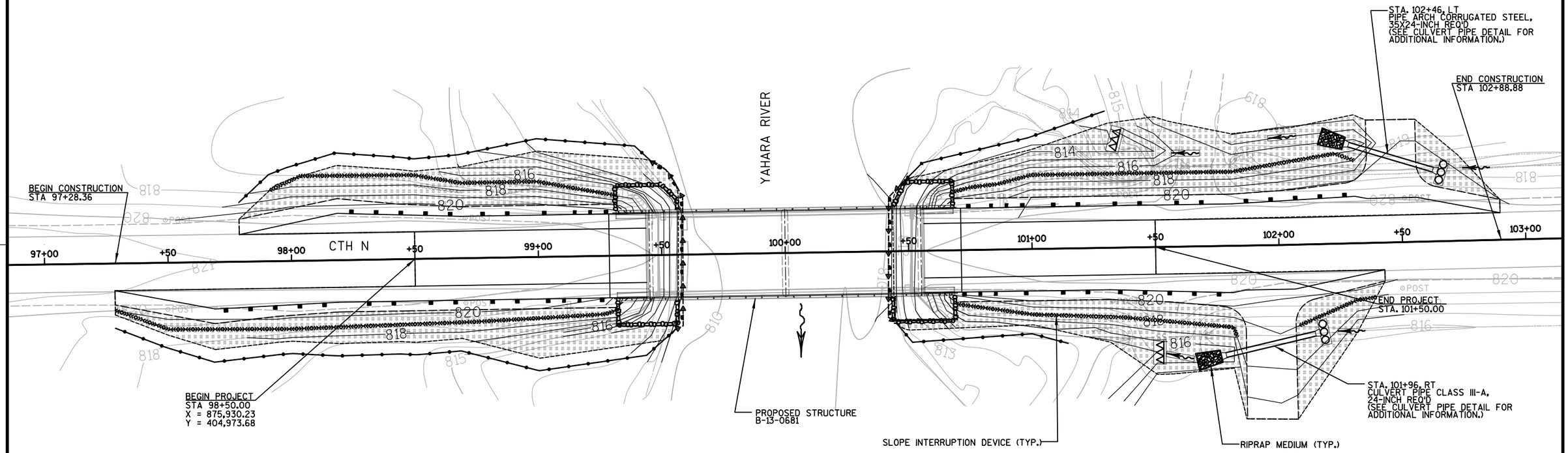
STA. 102+06.19
70.65' RT

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	LAYOUT DETAIL	SHEET 14	E

2

SCALE, FEET 0 20 40

N



LEGEND

- EROSION MAT CLASS II, TYPE C (SEE CONSTRUCTION DETAIL - EROSION CONTROL MAT INSTALLATION FOR MORE INFORMATION)
- SILT FENCE (SEE S.D.D SILT FENCE FOR MORE INFORMATION)
- RIPRAP MEDIUM (SEE CONSTRUCTION DETAIL - RIPRAP MEDIUM TREATMENT AT CULVERTS FOR MORE INFORMATION)
- TURBIDITY BARRIER (SEE S.D.D TURBIDITY BARRIER FOR MORE INFORMATION)
- CULVERT PIPE CHECKS (SEE CONSTRUCTION DETAIL - CULVERT PIPE CHECKS FOR MORE INFORMATION)
- ROCK BAGS (DITCH CHECK) (SEE CONSTRUCTION DETAIL - ROCK BAGS (DITCH CHECK) FOR MORE INFORMATION)
- SLOPE INTERRUPTION DEVICE (SEE CONSTRUCTION DETAIL - SLOPE INTERRUPTION DEVICE FOR MORE INFORMATION)
- SLOPE INTERCEPT
- SURFACE WATER FLOW

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

DISTURBED AREAS WITHIN THE RIGHT-OF-WAY SHALL BE RESTORED AS DIRECTED BY THE ENGINEER.

SILT FENCE SHALL BE PLACED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER AND IN PLACE PRIOR TO CONSTRUCTION.

WETLANDS EXIST IN THE PROJECT AREA. DO NOT DISTURB AREAS OUTSIDE THE SLOPE INTERCEPTS.

ALL BARE, EXPOSED SOIL SHALL BE TEMPORARILY OR PERMANENTLY STABILIZED WITH SEED AND MULCH WITHIN 30 DAYS.

TRACKING PAD(S) SHALL BE LOCATED BY THE CONTRACTOR AND APPROVED BY THE FIELD ENGINEER.

PER DNR 1071, SLOPE INTERRUPTION DEVICE SHALL BE INSTALLED FOLLOWING SOIL DISTURBANCE.

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	EROSION CONTROL DETAIL	SHEET 15	E

2

GENERAL NOTES

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

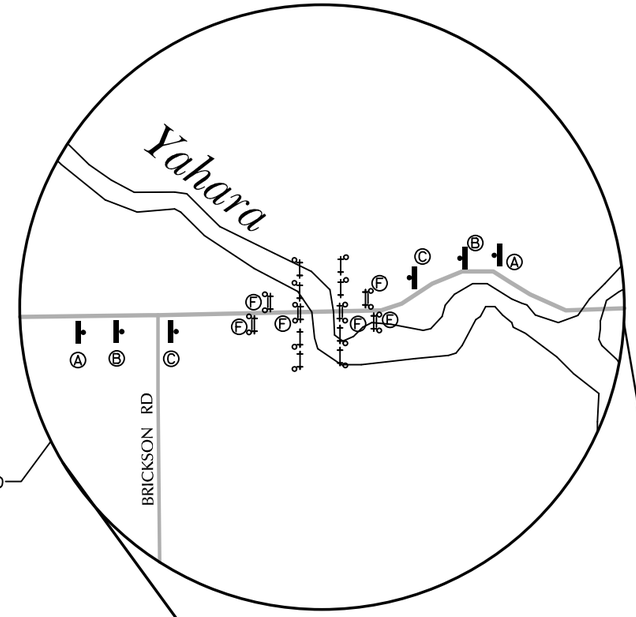
REMOVE OR COVER ANY SIGN, TEMPORARY OR EXISTING, WHICH CONFLICTS WITH TRAFFIC CONTROL "IN USE," OR AS APPROVED BY THE ENGINEER.

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

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

ALL "WO" AND "W" SIGNS SHALL BE 48"X48" UNLESS OTHERWISE NOTED.

IMMEDIATELY RE-ESTABLISH "STOP" SIGNS THAT ARE REMOVED FOR A CONSTRUCTION OPERATION.



SEE S.D.D "BARRICADES AND SIGNS FOR MAINLINE CLOSURES" DETAIL C AND D

LEGEND

- DETOUR ROUTE
- BARRICADES TYPE III WITH ATTACHED SIGN TYPE 2 (TWO WARNING LIGHTS TYPE A REQ'D.)
- BARRICADES TYPE III WITHOUT SIGN (ONE WARNING LIGHT TYPE A REQ'D.)
- SIGN MOUNTED ON POST
- SIGN MOUNTED ON EXISTING SIGN

ROAD CLOSED AHEAD W20-3 — (A)

ROAD CLOSED 1000 FT W20-3 — (B)

ROAD CLOSED 500 FT W20-3 — (C)

M3-1 24" X 12" NORTH COUNTY N
M1-5A 24" X 24"
DETOUR AHEAD W20-2 — (D)

M4-8 24" X 12" DETOUR
M3-1 24" X 12" NORTH COUNTY N
M1-5A 24" X 24"
M06-1 21" X 21" — (E)

BRIDGE OUT R11-2B 48" X 30" — (F)

BRIDGE OUT XX MILES AHEAD LOCAL TRAFFIC ONLY R11-3B 60" X 30" — (G)

M4-8 24" X 12" DETOUR
M3-1 24" X 12" NORTH COUNTY N
M1-5A 24" X 24" — (H)

M4-8 24" X 12" DETOUR
M3-3 24" X 12" SOUTH COUNTY N
M1-5A 24" X 24"
M05-1L 21" X 21" — (J)

M4-8 24" X 12" DETOUR
M3-3 24" X 12" SOUTH COUNTY N
M1-5A 24" X 24"
M06-1 21" X 21" — (K)

M4-8 24" X 12" DETOUR
M3-1 24" X 12" NORTH COUNTY N
M1-5A 24" X 24"
M06-1 21" X 21" — (L)

M4-8 24" X 12" DETOUR
M3-3 24" X 12" SOUTH COUNTY N
M1-5A 24" X 24"
M06-1 21" X 21" — (M)

END DETOUR M4-8A 24" X 18" — (N)

M4-8 24" X 12" DETOUR
M3-1 24" X 12" NORTH COUNTY N
M1-5A 24" X 24"
M05-1L 21" X 21" — (P)

M4-8 24" X 12" DETOUR
M3-1 24" X 12" NORTH COUNTY N
M1-5A 24" X 24"
M06-1 21" X 21" — (R)

M3-3 24" X 12" SOUTH COUNTY N
M1-5A 24" X 24"
DETOUR AHEAD W20-2 — (S)

M4-8 24" X 12" DETOUR
M3-3 24" X 12" SOUTH COUNTY N
M1-5A 24" X 24" — (T)

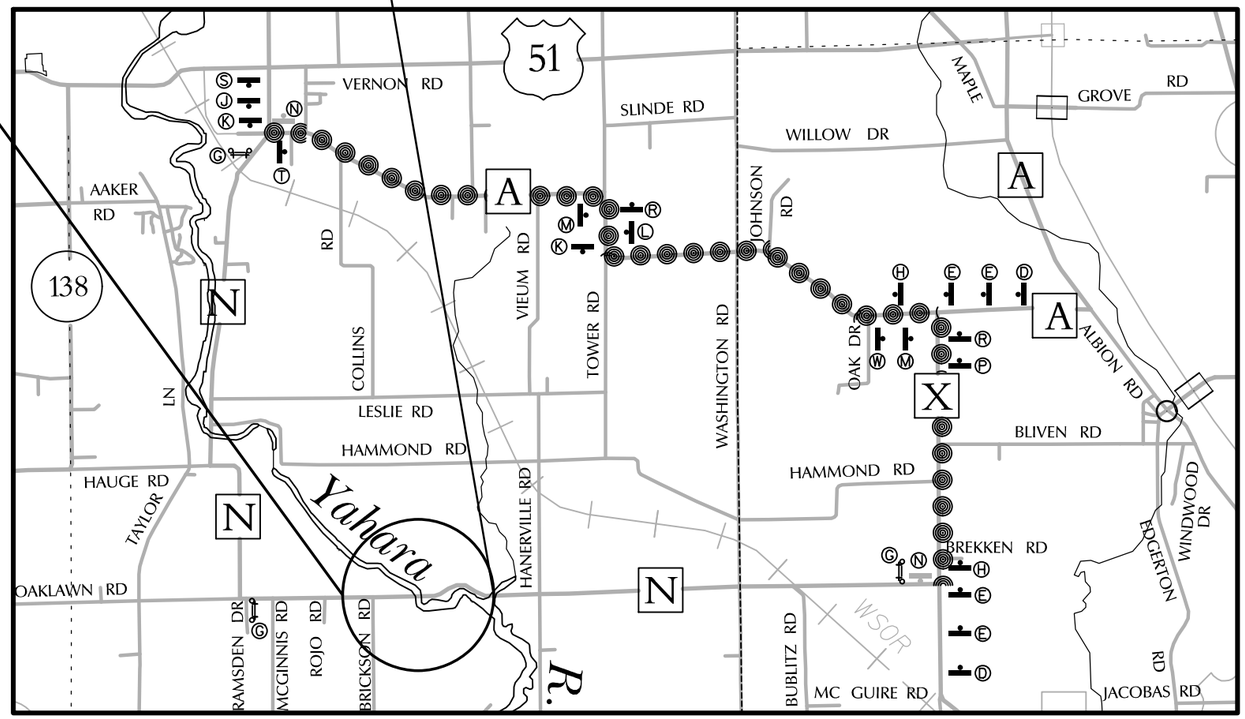
M4-8 24" X 12" DETOUR
M3-3 24" X 12" SOUTH COUNTY N
M1-5A 24" X 24"
M05-1R 21" X 21" — (W)

TRAFFIC CONTROL SUMMARY (FOR INFORMATION ONLY)

CATEGORY	LOCATION	DESCRIPTION	SIGN CODE	SIZE INCH X INCH	EACH
0010	DETOUR	TRAFFIC CONTROL BARRICADES TYPE III	---	---	3
		TRAFFIC CONTROL WARNING LIGHTS TYPE A	---	---	6
		NORTH	M3-1	24X12	12
		SOUTH	M3-3	24X12	8
		BRIDGE OUT XX MILES AHEAD	R11-3 (MOD.)	60X30	3
		CTH N	M1-5A	24X24	20
		ARROW AHEAD/LT/RT	M6-1	21X21	11
		DETOUR	M4-8	24X12	17
		END DETOUR	M4-8A	24X18	2
		ADVANCE TURN ARROW	M05-1L	21X21	3
		DETOUR AHEAD	W20-2	48X48	3
		SUBTOTAL SIGNS			79*
	ROAD CLOSURE	TRAFFIC CONTROL BARRICADES TYPE III	---	---	14
		TRAFFIC CONTROL WARNING LIGHTS TYPE A	---	---	20
		ROAD CLOSED AHEAD	W20-3	48X48	2
		ROAD CLOSED 1000 FT	W20-3	48X48	2
		ROAD CLOSED 500 FT	W20-3	48X48	2
		BRIDGE OUT	R11-2M	48X30	6
		SUBTOTAL SIGNS			12**

* PAID FOR AS TRAFFIC CONTROL DETOUR (PROJECT)

** PAID FOR AS TRAFFIC CONTROL (PROJECT)



PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	DETOUR ROUTE	SHEET 16	E

EARTHWORK SUMMARY

CATEGORY	STATION - STATION	LOCATION	EXCAVATION COMMON	(1) SALVAGED/ UNUSABLE PAVEMENT MATERIAL REMOVAL	(2) AVAILABLE MATERIAL	(3) EBS EXCAVATION 5% OV AVAILABLE MATERIAL	(4) 311.0110 BREAKER RUN*	(5) 205.0100 TOTAL EXCAVATION COMMON	(6) EBS EXCAVATION REDUCED FACTOR 0.8	UNEXPANDED FILL	(7) EXPANDED FILL FACTOR 1.25	(8) MASS ORDINATE	(9) 208.0100 -BORROW +WASTE	624.0100 WATER*
			CY	CY	CY	CY	TON	CY	CY	CY	CY		CY	MGAL
0010	97+28.36 - 99+43.75	LT & RT	212	34	178	9	16	221	7	168	210	-32	-32	0.42
	100+56.25 - 102+89.82	LT & RT	403	34	369	18	32	421	15	276	345	24	24	0.81
	TOTALS		615	68	547	27	48	642	22	444	555	-8	-8	1.23
	PAY QUANTITIES		---	---	---	---	50	640	---	---	---	---	8	1.20

1) SALVAGED/UNUSABLE MATERIALS ARE INCLUDED IN EXCAVATION COMMON COLUMN
2) AVAILABLE MATERIAL = EXCAVATION COMMON - SALGVAGED MATERIALS
3) EBS EXCAVATION TO BE BACKFILLED WITH BREAKER RUN.
4) BREAKER RUN = EBS EXCAVATION*1.75 TONS/CY.
5) TOTAL EXCAVATION COMMON = EXCAVATION COMMON + EBS EXCAVATION.
6) REDUCED EBS IN FILL: EXCAVATED EBS MATERIAL IS USEABLE IN FILLS OUTSIDE THE 1:1 SLOPE. EBS IN FILL REDUCTION FACTOR = 0.8.
7) EXPANDED FILL FACTOR = 1.25
8) THE MASS ORDINATE + OR - QTY CALCULATED FOR THE CATEGORY.
   PLUS QTY INDICATES AN EXCESS OF MATERIAL WITHIN THE CATEGORY,
   MINUS QTY INDICATES A SHORTAGE OF MATERIAL WITHIN THE CATEGORY
9) WASTE = POSITIVE MASS ORDINATE, BORROW = NEGATIVE MASS ORDINATE

* ADDITIONAL QUANTITIES LISTED ELSEWHERE

GRUBBING

CATEGORY	STATION - STATION	LOCATION	201.0205 STA
0010	98+00 - 99+00	RT	1
	98+00 - 99+00	LT	1
	101+00 - 102+00	RT	1
	101+00 - 102+00	LT	1
		TOTAL	4

REMOVING GUARDRAIL

CATEGORY	STATION - STATION	LOCATION	204.0165 LF
0010	98+87.15 - 99+58.20	LT & RT	131
	100+51.41 - 101+15.61	LT & RT	123
		TOTAL	254

REMOVING DELINEATORS AND MARKERS

CATEGORY	STATION	OFFSET	LOCATION	204.0180 EACH
0010	97+49.16	17.2'	LT	1
	97+49.74	18.9'	RT	1
	98+70.43	18.2'	RT	1
	98+70.71	16.2'	LT	1
	101+32.58	21.7'	RT	1
	101+33.16	21.4'	LT	1
	102+49.69	18.7'	RT	1
	102+51.38	17.7'	LT	1
			TOTAL	8

FINISHING ROADWAY

CATEGORY	PROJECT I.D.	213.0100 EACH
0010	69191-1591	1

BASE AGGREGATE SUMMARY

CATEGORY	STATION - STATION	LOCATION	305.0110 BASE AGGREGATE DENSE 3/4-INCH TON	305.0120 BASE AGGREGATE DENSE 1 1/4-INCH TON	311.0110 BREAKER RUN TON*	624.0100 WATER MGAL*
0010	97+28.36 - 99+43.75	LT & RT	56	553	---	1.2
	100+56.25 - 102+89.82	LT & RT	49	548	---	1.2
	FIELD ENTRANCE	RT	---	35	---	0.1
	FIELD ENTRANCE	LT	---	19	9	0.1
		TOTALS	105	1,155	9	2.6

*ADDITIONAL QUANTITIES LISTED ELSEWHERE

CONCRETE PAVEMENT

CATEGORY	STATION - STATION	LOCATION	415.0060 CONCRETE PAVEMENT (6-INCH) SY	415.0410 CONCRETE PAVEMENT APPROACH SLAB SY
0010	99+28.75 - 99+43.75	LT & RT	20	37
	100+56.25 - 100+71.25	LT & RT	20	37
		TOTALS	40	74

ASPHALTIC ITEMS

CATEGORY	STATION - STATION	LOCATION	455.0605 TACK COAT GAL	460.5223 HMA PAVEMENT 3 LT 58-28 S TON	460.5224 HMA PAVEMENT 4 LT 58-28 S TON	460.2000 INCENTIVE DENSITY HMA PAVEMENT DOL
0010	97+28.36 - 99+28.25	LT & RT	21	58	58	80
	100+71.25 - 102+89.8	LT & RT	22	62	62	80
		TOTALS	43	120	120	160

CULVERT PIPE
MINOR SIDE ROAD, PRIVATE ENTRANCE AND SLOPE DRAINS

CATEGORY	STATION	LOCATION	CULVERT PIPE CLASS III-A 520.3324 24-INCH LF	APRON ENDWALLS FOR CULVERT PIPE 520.1024 24-INCH EACH	PIPE ARCH CORRUGATED STEEL 521.0735 35X24-INCH LF	APRON ENDWALLS FOR PIPE ARCH STEEL 521.1235 35X24-INCH EACH	C.P.R.C. CLASS	THICKNESS (INCHES) STEEL
0010	101+96	F.E. RT	37	2	---	---	III	0.064
	102+46	F.E. LT	---	---	36	2	---	0.079
		TOTALS	37	2	36	2		

RIPRAP MEDIUM

CATEGORY	STATION	LOCATION	606.0200 CY
0010	101+76	RT	4
	102+27	LT	7
		TOTAL	11

MGS THRIE BEAM TRANSITION

CATEGORY	STATION - STATION	LOCATION	614.2500 LF
0010	98+96.94 - 99+36.33	LT	39.4
	98+96.94 - 99+36.33	RT	39.4
	100+63.67 - 101+03.0	LT	39.4
	100+63.67 - 101+03.0	RT	39.4
		TOTAL	157.6

MGS GUARDRAIL 3

CATEGORY	STATION - STATION	LOCATION	614.2300 LF
0010	98+21.94 - 98+96.94	RT	75.0
	98+71.94 - 98+96.94	LT	25.0
	101+03.06 - 101+28.06	RT	25.0
	101+03.06 - 101+78.06	LT	75.0
		TOTAL	200.0

MGS GUARDRAIL TERMINAL EAT

CATEGORY	STATION - STATION	LOCATION	614.2610 EACH
0010	97+68.81 - 98+21.94	RT	1
	98+18.81 - 98+71.94	LT	1
	101+28.06 - 101+81.1	RT	1
	101+78.06 - 102+31.1	LT	1
		TOTAL	4

MOBILIZATION

CATEGORY	PROJECT I.D.	619.1000 EACH
0010	69191-1591	1

FINISHING ITEMS

CATEGORY	STATION - STATION	LOCATION	625.0500 SALVAGED TOPSOIL SY	627.0200 MULCHING SY	629.0210 FERTILIZER TYPE B CWT	630.0120 SEEDING MIXTURE NO. 20 LB	630.0200 SEEDING TEMPORARY LB
0010	97+28.36 - 99+43.75	LT & RT	635	635	0.5	23	23
	100+56.25 - 102+89.82	LT & RT	801	801	0.6	26	26
	UNDISTRIBUTED		---	359	0.3	12	12
		TOTALS	1,436	1,795	1.4	61	61

SILT FENCE

CATEGORY	STATION - STATION	LOCATION	628.1504 SILT FENCE LF	628.1520 SLIT FENCE MAINTENANCE LF
0010	97+28 - 99+56	RT	234	468
	97+79 - 99+56	LT	178	356
	100+45 - 101+14	RT	74	148
	100+47 - 101+25	LT	90	180
	UNDISTRIBUTED	---	144	288
		TOTALS	720	1,440

MOBILIZATIONS EROSION CONTROL

CATEGORY	628.1905 EACH
0010	2

MOBILIZATIONS EMERGENCY EROSION CONTROL

CATEGORY	628.1910 EACH
0010	2

EROSION MAT SUMMARY

CATEGORY	STATION - STATION	LOCATION	628.2027 CLASS II TYPE C SY
0010	97+28 - 99+56	RT	300
	97+79 - 99+56	LT	290
	100+44 - 101+86	RT	250
	100+49 - 102+36	LT	460
	102+06 - 102+43	RT	100
	102+56 - 102+90	LT	50
	UNDISTRIBUTED	---	360
		TOTAL	1,810

TURBIDITY BARRIERS

CATEGORY	STATION	LOCATION	628.6005 SY
0010	99+58	LT & RT	60
	100+42	LT & RT	50
		TOTALS	110

TRACKING PADS SUMMARY

CATEGORY	LOCATION	628.7560 TRACKING PADS EACH	645.0130 GEOTEXTILE FABRIC TYPE R SY
0010	UNDISTRIBUTED	2	270
	TOTALS	2	270

ROCK BAGS

CATEGORY	STATION	LOCATION	628.7570 EACH
0010	101+35	LT	14
	101+52	RT	14
	UNDISTRIBUTED		7
		TOTALS	35

CULVERT PIPE CHECKS

CATEGORY	STATION	LOCATION	628.7555 EACH
0010	102+10	RT	3
	102+60	LT	5
		TOTALS	8

PERMANENT SIGNING QUANTITIES

CATEGORY	STATION	LOCATION	SIGN CODE	SIGN MESSAGE	SIGN SIZE (W X H) IN X IN	637.2230 SIGNS TYPE II RELECTIVE F SF	634.0612 POSTS WOOD 4X6-INCH X12-FT EACH	638.2102 MOVING SIGNS TYPE II EACH	638.4000 MOVING SMALL SIGN SUPPORTS EACH	REMARKS
0010	99+33	LT	W5-52L	CLEARANCE STRIPE	12X36	3.00	1	---	---	INSTALL AT END OF BRIDGE
	99+33	RT	W5-52R	CLEARANCE STRIPE	12X36	3.00	1	---	---	INSTALL AT END OF BRIDGE
	100+66	LT	W5-52L	CLEARANCE STRIPE	12X36	3.00	1	---	---	INSTALL AT END OF BRIDGE
	100+66	RT	W5-52R	CLEARANCE STRIPE	12X36	3.00	1	---	---	INSTALL AT END OF BRIDGE
	99+11	RT	D3-1	YAHARA RIVER	---	---	---	1	2	RE-INSTALL IN SAME LOCATION
	100+89	LT	D3-1	YAHARA RIVER	---	---	---	1	2	RE-INSTALL IN SAME LOCATION
					TOTALS	12.00	4	2	4	

REMOVING SIGNS SUMMARY

CATEGORY	LOCATION	SIGN MESSAGE	638.2602 REMOVING SIGNS TYPE II EACH	638.3000 REMOVING SMALL SIGN SUPPORTS EACH
0010	BRIDGE CORNERS	CLEARANCE STRIPE	4	4

FIELD OFFICE TYPE C

CATEGORY	PROJECT I.D.	642.5201 EACH
0010	69191-1591	1

TRAFFIC CONTROL

CATEGORY	PROJECT I.D.	643.0100 EACH
0010	69191-1591	1

3

3

TRAFFIC CONTROL DETOUR

CATEGORY	PROJECT I.D.	643.2000 EACH
0010	69191-1591	1

PAVEMENT MARKING

CATEGORY	STATION - STATION	LOCATION	646.0106 EPOXY 4-INCH (WHITE) LF	646.0106 EPOXY 4-INCH (YELLOW) LF	REMARKS
0010	97+28 - 102+43	RT	515	---	EDGELINE
	97+79 - 102+90	LT	510	---	
	98+50 - 101+50	CL	---	600	CENTERLINE DOUBLE YELLOW
		TOTALS	1025	600	
		ITEM TOTAL	1,625		

CONSTRUCTION STAKING SUMMARY

CATEGORY	STATION - STATION	LOCATION	650.4500 SUBGRADE LF	650.5000 BASE LF	650.9920 SLOPE STAKES LF
0010	97+28.36 - 99+43.75	LT & RT	215	215	215
	100+56.25 - 102+89.82	LT & RT	235	235	235
		TOTALS	450	450	450

CONSTRUCTION STAKING STRUCTURE LAYOUT

CATEGORY	STRUCTURE	650.6500 LS
0010	B-13-0681	1

CONSTRUCTION STAKING SUPPLEMENTAL CONTROL

CATEGORY	PROJECT	650.9910 LS
0010	69191-1591	1

SAWING ASPHALT

CATEGORY	STATION	LOCATION	690.0150 LF
0010	97+28 - 98+50	RT	122
	97+79 - 98+50	LT	71
	98+50	LT & RT	22
	101+50	LT & RT	22
	101+50 - 102+43	RT	93
	101+50 - 102+90	LT	140
		TOTALS	470

SLOPE INTERRUPTION DEVICE

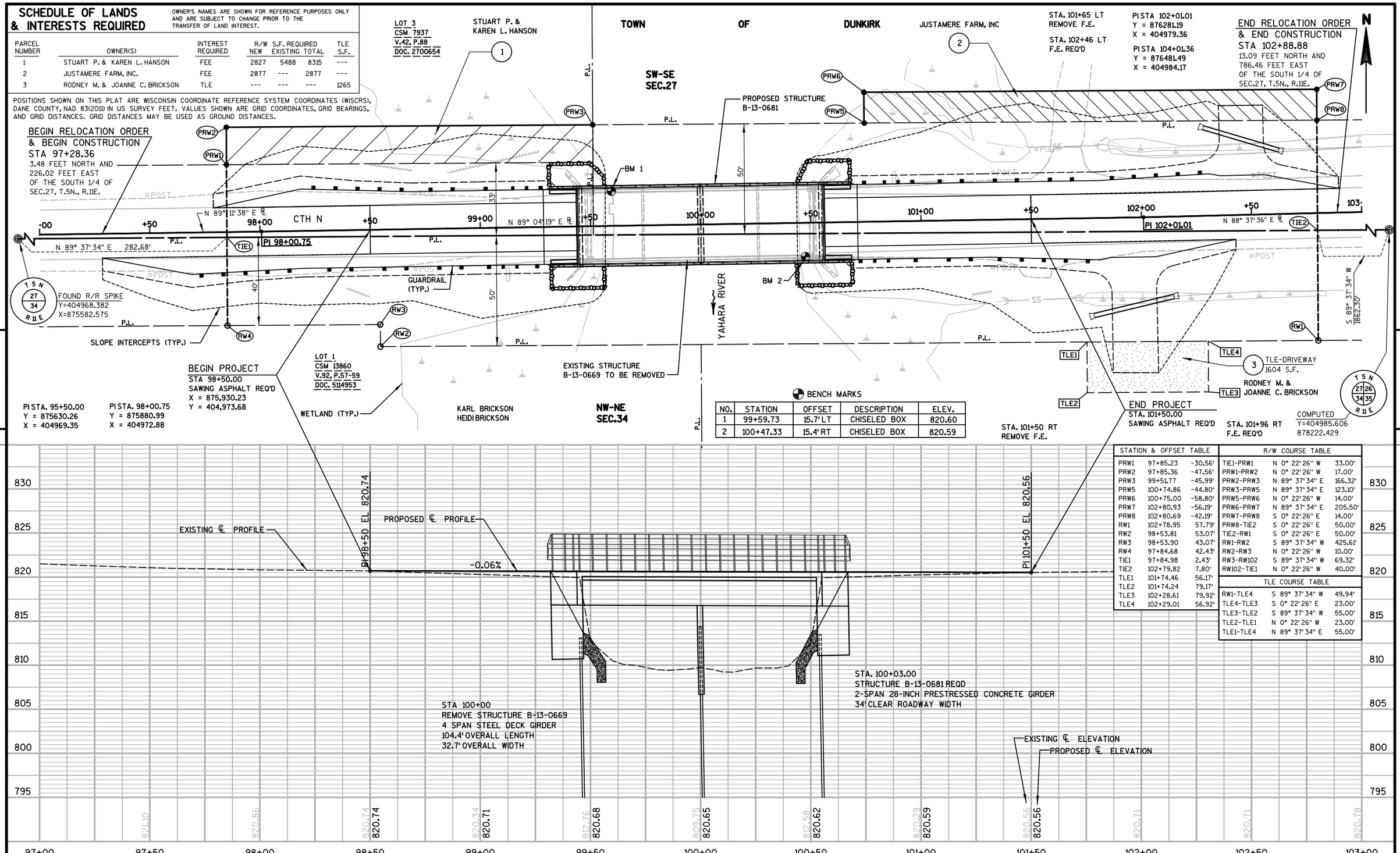
CATEGORY	STATION	LOCATION	SPV.0090.01 LF
0010	97+28 - 99+32	RT	205
	97+82 - 99+32	LT	130
	100+68 - 101+82	RT	115
	100+68 - 102+31	LT	165
	102+08 - 102+39	RT	35
	UNDISTRIBUTED		160
		TOTALS	810

SCHEDULE OF LANDS & INTERESTS REQUIRED

OWNER'S NAMES ARE SHOWN FOR REFERENCE PURPOSES ONLY AND ARE SUBJECT TO CHANGE PRIOR TO THE TRANSFER OF LAND INTEREST.

PARCEL NUMBER	OWNER(S)	INTEREST REQUIRED	R/W S.F. REQUIRED NEW	EXISTING	TOTAL	TLE S.F.
1	STUART P. & KAREN L. HANSON	FEE	2827	5488	8315	---
2	JUSTAMERE FARM, INC.	FEE	2877	---	2877	---
3	RODNEY M. & JOANNE C. BRICKSON	TLE	---	---	---	1265

POSITIONS SHOWN ON THIS PLAT ARE WISCONSIN COORDINATE REFERENCE SYSTEM COORDINATES (WISCRS), DANE COUNTY, NAD 83(2011) IN US SURVEY FEET. VALUES SHOWN ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES MAY BE USED AS GROUND DISTANCES.



BENCH MARKS

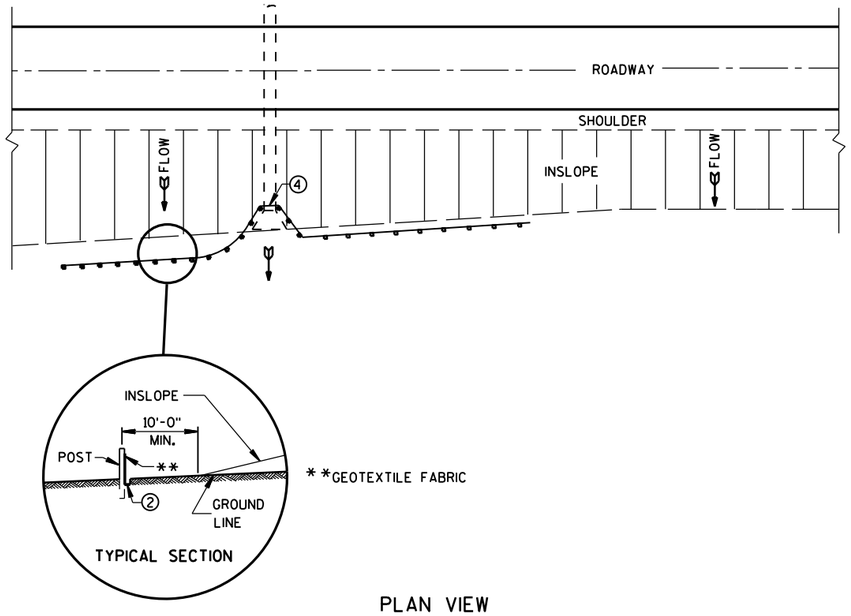
NO.	STATION	OFFSET	DESCRIPTION	ELEV.
1	99+59.73	15.7' LT	CHISELED BOX	820.60
2	100+47.33	15.4' RT	CHISELED BOX	820.59

STATION & OFFSET TABLE		
PRW1	97+85.23	-30.56'
PRW2	97+85.36	-47.56'
PRW3	99+51.77	-45.99'
PRW5	100+74.86	-44.80'
PRW6	100+75.00	-58.80'
PRW7	102+80.93	-56.19'
PRW8	102+80.69	-42.19'
RW1	102+78.95	57.79'
RW2	98+53.81	53.07'
RW3	98+53.90	43.07'
RW4	97+84.68	42.43'
TIE1	97+84.98	2.43'
TIE2	102+79.82	7.80'
TLE1	101+74.46	56.17'
TLE2	101+74.24	79.17'
TLE3	102+28.61	79.92'
TLE4	102+29.01	56.92'

R/W COURSE TABLE		
TIE1-PRW1	N 0° 22' 26" W	33.00'
PRW1-PRW2	N 0° 22' 26" W	17.00'
PRW2-PRW3	N 89° 37' 34" E	166.32'
PRW3-PRW5	N 89° 37' 34" E	123.10'
PRW5-PRW6	N 0° 22' 26" W	14.00'
PRW6-PRW7	N 89° 37' 34" E	205.50'
PRW7-PRW8	S 0° 22' 26" E	14.00'
PRW8-TIE2	S 0° 22' 26" E	50.00'
TIE2-RW1	S 0° 22' 26" E	50.00'
RW1-RW2	S 89° 37' 34" W	425.61'
RW2-RW3	N 0° 22' 26" W	10.00'
RW3-RW102	S 89° 37' 34" W	69.32'
RW102-TIE1	N 0° 22' 26" W	40.00'

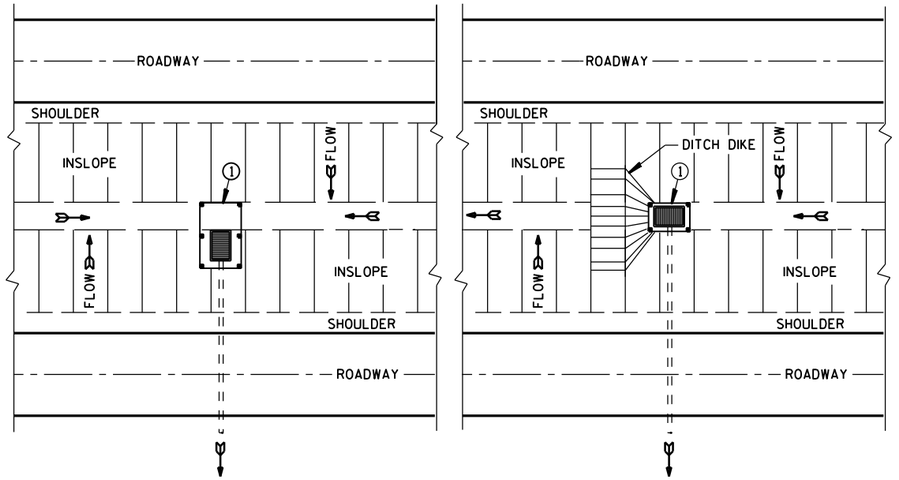
TLE COURSE TABLE		
RW1-TLE4	S 89° 37' 34" W	49.94'
TLE4-TLE3	S 0° 22' 26" E	23.00'
TLE3-TLE2	S 89° 37' 34" W	55.00'
TLE2-TLE1	N 0° 22' 26" W	23.00'
TLE1-TLE4	N 89° 37' 34" E	55.00'

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	PLAN & PROFILE	SHEET 21	E



PLAN VIEW

TYPICAL APPLICATION OF SILT FENCE



PLAN VIEW

SILT FENCE AT MEDIAN SURFACE DRAINS

GENERAL NOTES

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

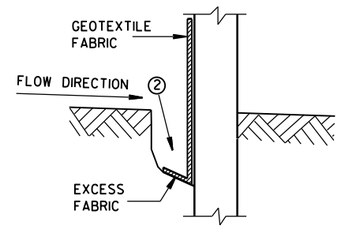
① HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.

② FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.

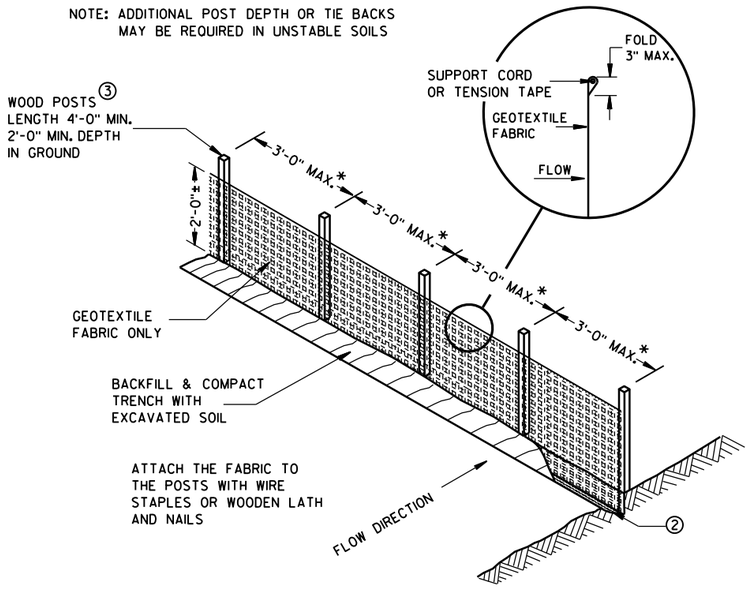
③ WOOD POSTS SHALL BE A MINIMUM SIZE OF 1⅛" X 1⅛" OF OAK OR HICKORY.

④ SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.

⑤ CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.

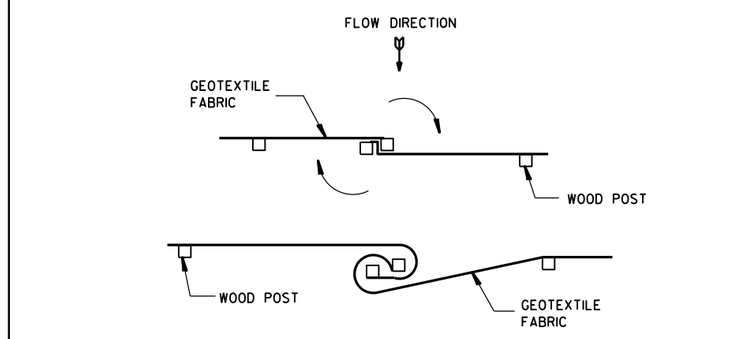


TRENCH DETAIL

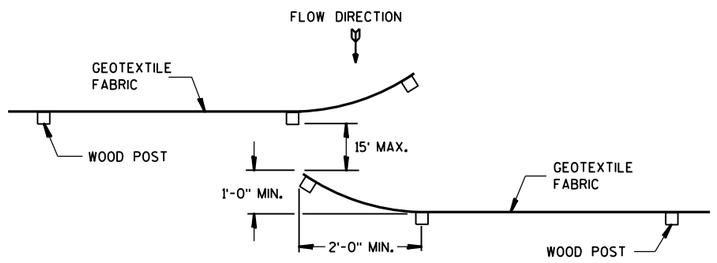


*NOTE: 8'-0" POST SPACING ALLOWED IF A WOVEN GEOTEXTILE FABRIC IS USED.

SILT FENCE

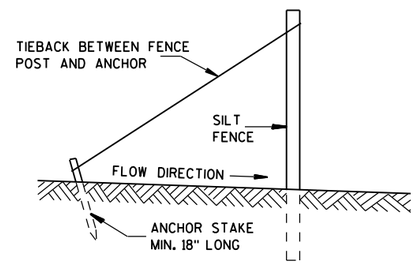


TWIST METHOD



HOOK METHOD

JOINING TWO LENGTHS OF SILT FENCE ⑤



SILT FENCE TIE BACK

(WHEN REQUIRED BY THE ENGINEER)

Sheet 22

SILT FENCE	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED	
4-29-05 DATE	/S/ Beth Cannestra CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA	

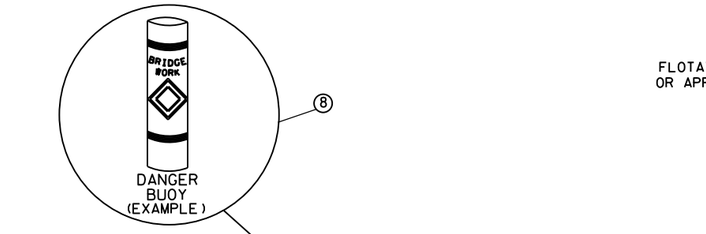
6

S.D.D. 8 E 9-6

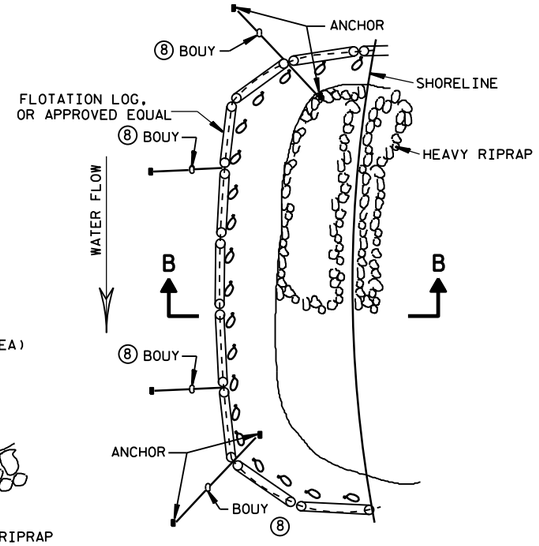
6

S.D.D. 8 E 9-6

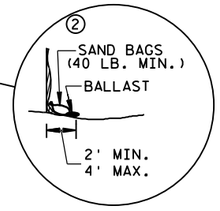
8E11: Turbidity Barrier

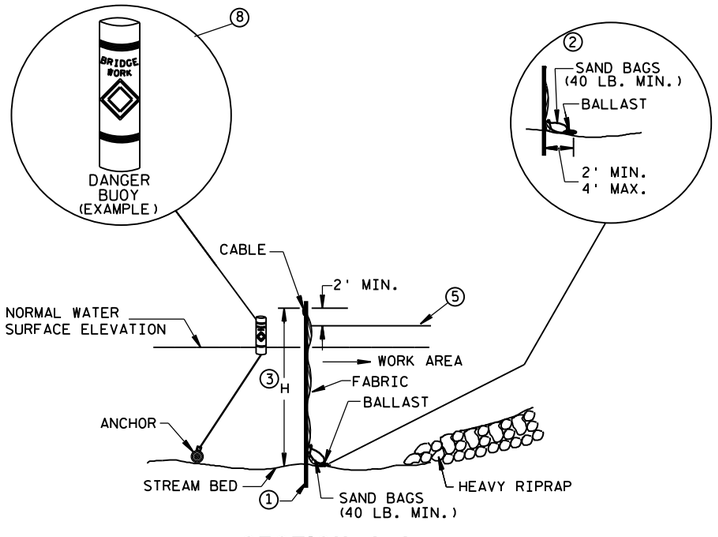


SECTION B-B

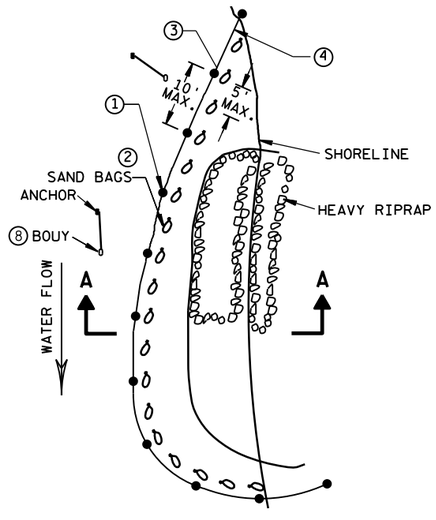


TURBIDITY BARRIER FLOAT ALTERNATIVE
CAUTION - SEE NOTE 6





SECTION A-A



PLAN VIEW

TURBIDITY BARRIER STANDARD POST INSTALLATION

TURBIDITY BARRIER PLACEMENT DETAILS

GENERAL NOTES

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

TURBIDITY BARRIER MAY BE REMOVED AT THE ENGINEERS DISCRETION, WHEN PERMANENT EROSION CONTROL MEASURES HAVE BEEN ESTABLISHED.

① DRIVEN STEEL POSTS, PIPES, OR CHANNELS. LENGTH SHALL BE SUFFICIENT TO SECURELY SUPPORT BARRIER AT HIGH WATER ELEVATIONS.

② SANDBAGS TO BE USED AS ADDITIONAL BALLAST WHEN ORDERED BY THE ENGINEER TO MEET ADVERSE FIELD CONDITIONS. SPACE AS APPROPRIATE FOR SITE CONDITIONS.

③ WHEN BARRIER HEIGHT, H, EXCEEDS 8 FT., POST SPACING MAY NEED TO BE DECREASED.

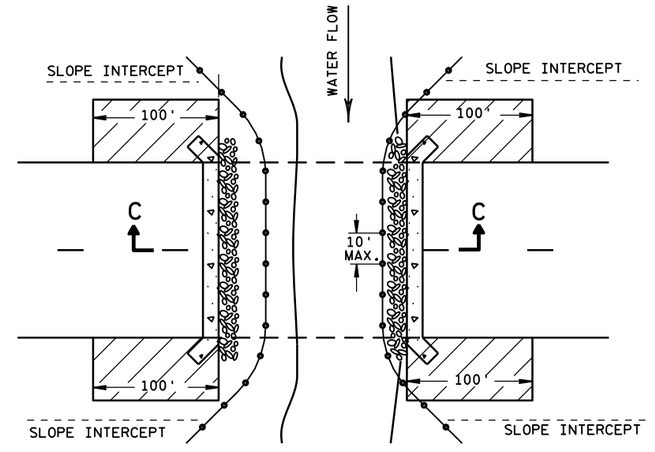
④ IN WATERWAYS SUBJECT TO FLUCTUATING WATER ELEVATIONS, PROVISIONS SHOULD BE MADE TO ALLOW THE WATER TO EQUALIZE ON EACH SIDE OF THE BARRIER. THIS MAY BE ACCOMPLISHED BY LEAVING A PORTION OF THE BARRIER OPEN ON THE UPSTREAM END.

⑤ ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION PERIOD. MIMIMUM BARRIER HEIGHT SHALL BE 2'GREATER THAN EITHER THE O2 ELEVATION OR THE ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION, WICHEVER IS GREATER.

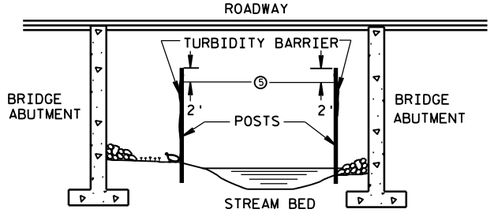
⑥ FLOAT ALTERNATIVE WILL ONLY BE ALLOWED WITH WRITTEN APPROVAL OF THE ENGINEER, AND IS MEANT FOR LOCATIONS WHERE BED ROCK PREVENTS THE INSTALLATION OF POSTS.

⑦ ALLOW SUFFICIENT SLACK VERTICALLY AND HORIZONTALLY SO THAT SEDIMENT BUILD UP WILL NOT SEPARATE OR LOWER THE TURBIDITY BARRIER.

⑧ USE AS DIRECTED BY COAST GUARD OR DNR PERMIT WHEN WORKING IN NAVIGABLE WATERWAYS.



PLAN VIEW



SECTION C-C

TURBIDITY BARRIER DETAIL SHOWING TYPICAL PLACEMENT AT STRUCTURES

Sheet 23

TURBIDITY BARRIER

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
6-04-02 DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

6

S.D.D. 8 E 11-2

6

S.D.D. 8 E 11-2

8F1: Apron Endwalls for Culvert Pipe

METAL APRON ENDWALLS

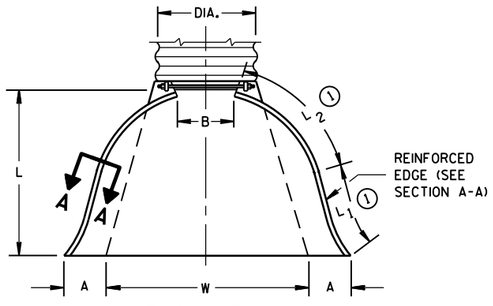
PIPE DIA. (IN.)	MIN. THICK. (inches)		DIMENSIONS (inches)							APPROX. SLOPE	BODY
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 ①	L2 ①	W (±2")		
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	36	2 1/2 to 1	1 Pc.
21	.064	.060	9	12	6	36	18	29 5/8	42	2 1/2 to 1	1 Pc.
24	.064	.075	10	13	6	41	18	37 1/4	48	2 1/2 to 1	1 Pc.
30	.079	.075	12	16	8	51	18	52 1/4	60	2 1/2 to 1	1 Pc.
36	.079	.105	14	19	9	60	24	59 3/4	72	2 1/2 to 1	2 Pc.
42	.109	.105	16	22	11	69	24	75 5/8	84	2 1/2 to 1	2 Pc.
48	.109	.105	18	27	12	78	24	81	90	2 1/4 to 1	3 Pc.
54	.109	.105	18	30	12	84	30	85 1/2	102	2 1/4 to 1	3 Pc.
60	.109×	.105×	18	33	12	87	—	—	114	2 to 1	3 Pc.
66	.109×	.105×	18	36	12	87	—	—	120	2 to 1	3 Pc.
72	.109×	.105×	18	39	12	87	—	—	126	2 to 1	3 Pc.
78	.109×	.105×	18	42	12	87	—	—	132	1 1/2 to 1	3 Pc.
84	.109×	.105×	18	45	12	87	—	—	138	1 1/2 to 1	3 Pc.
90	.109×	.105×	18	37	12	87	—	—	144	1 1/2 to 1	3 Pc.
96	.109×	.105×	18	35	12	87	—	—	150	1 1/2 to 1	3 Pc.

× EXCEPT CENTER PANEL SEE GENERAL NOTES

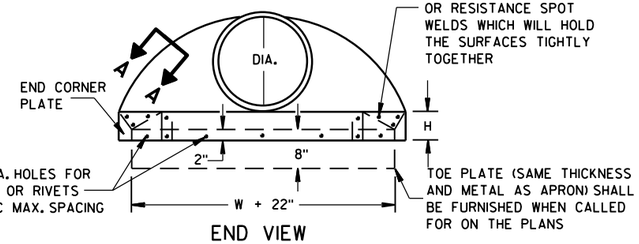
REINFORCED CONCRETE APRON ENDWALLS

PIPE DIA. (IN.)	DIMENSIONS (inches)							APPROX. SLOPE
	T	A	B	C	D	E	G	
12	2	4	24	48 7/8	72 7/8	24	2	3 to 1
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1
18	2 1/2	9	27	46	73	36	2 1/2	3 to 1
21	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	3 to 1
24	3	9 1/2	43 1/2	30	73 1/2	48	3	3 to 1
27	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	3 to 1
30	3 1/2	12	54	19 3/4	73 1/2	60	3 1/2	3 to 1
36	4	15	63	34 3/4	97 3/4	72	4	3 to 1
42	4 1/2	21	63	35	98	78	4 1/2	3 to 1
48	5	24	72	26	98	84	5	3 to 1
54	5 1/2	27	65	* 33 1/4 - ** 35	* 98 1/4 - ** 100	90	5 1/2	2 2/5 to 1
60	6	* 30 - ** 35	60	39	99	96	5	2 to 1
66	6 1/2	* 24 - ** 30	* 72 - ** 78	* 21 - ** 27	99	102	5 1/2	2 to 1
72	7	* 24 - ** 36	78	21	99	108	6	2 to 1
78	7 1/2	* 24 - ** 36	78	21	99	114	6 1/2	2 to 1
84	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1
90	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	1 1/2 to 1

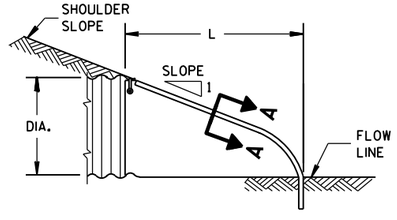
*MINIMUM
**MAXIMUM



PLAN VIEW

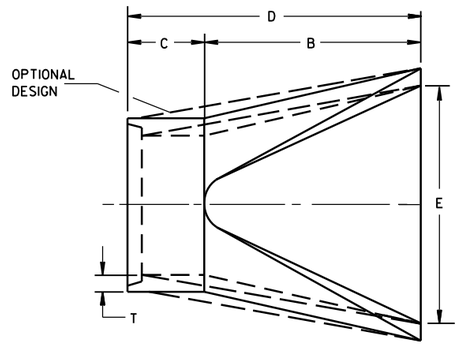


END VIEW

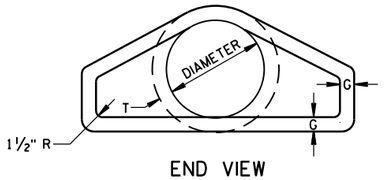


SIDE ELEVATION

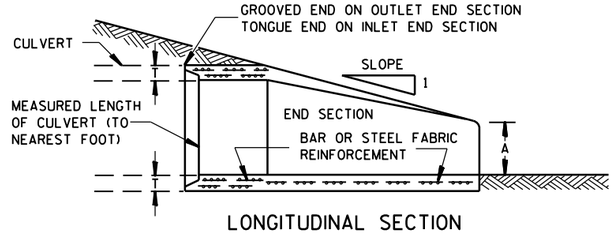
METAL ENDWALLS



PLAN

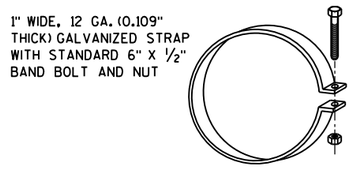


END VIEW



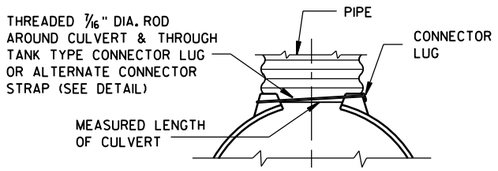
LONGITUDINAL SECTION

CONCRETE ENDWALLS

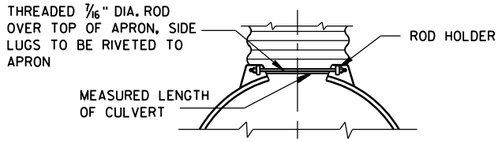


ALTERNATE FOR TYPE 1 CONNECTION

END SECTION CONNECTOR STRAP

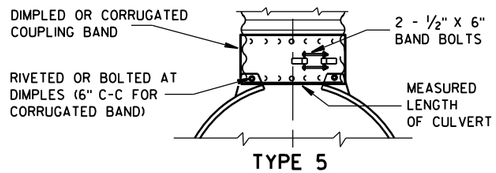


TYPE 1
FOR 12" THRU 24" CORR. PIPE



TYPE 2
FOR 30" THRU 96" CORR. PIPE

TYPE 3
FOR 42" THRU 96" CORR. PIPE



TYPE 5
ALTERNATE FOR:
ALL SIZES CORRUGATED CIRCULAR PIPE

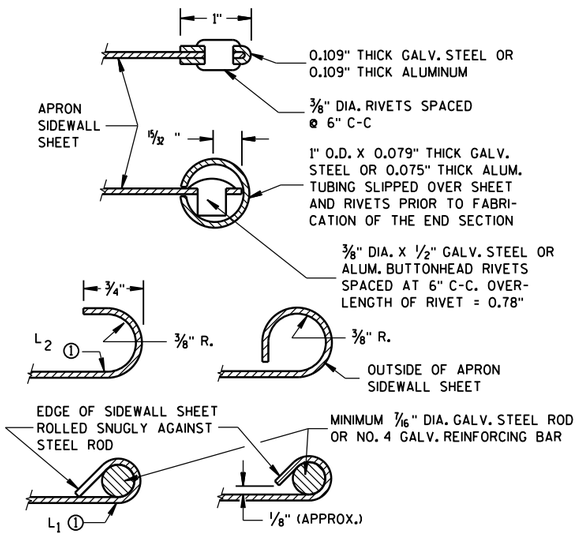
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

FOR CIRCUMFERENTIALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2, 3 OR 5 AS APPLICABLE.

FOR HELICALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2 OR 5.

FOR HELICALLY CORRUGATED PIPES WITH TWO CIRCUMFERENTIAL CORRUGATIONS AT EACH END USE ENDWALL CONNECTION DETAILS 1, 2 OR 3.

CONNECTION DETAILS



SECTION A-A

GENERAL NOTES

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

CONCRETE CULVERT ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VISE VERSA. GALVANIZED STEEL OR ALUMINUM ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL.

ALL THREE PIECE STEEL APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.105" SIDES AND 0.134" CENTER PANELS. THE WIDTH OF CENTER PANELS SHALL BE GREATER THAN 20 PERCENT OF THE PIPE PERIMETER.

LAP SEAMS SHALL BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM RIVETS AND BOLTS FOR ALUMINUM UNITS. FOR THE 60" THROUGH 96" DIAMETER APRON ENDWALL SIZES, THE REINFORCED EDGES AND CENTER PANEL SEAMS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER ANGLES. THE ANGLES SHALL BE ATTACHED BY GALVANIZED NUTS AND BOLTS FOR STEEL UNITS AND ALUMINUM NUTS AND BOLTS FOR ALUMINUM UNITS.

WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

① FOR PIPE SIZES UP TO 60" DIAMETER, A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.

Sheet 24

APRON ENDWALLS FOR CULVERT PIPE

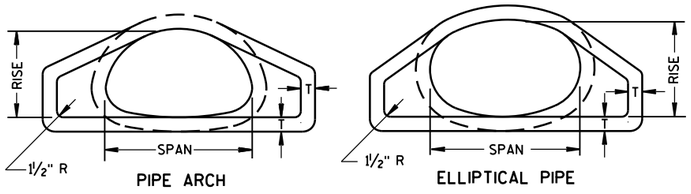
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8-30-94
DATE
/S/ Rory L. Rhinesmith
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

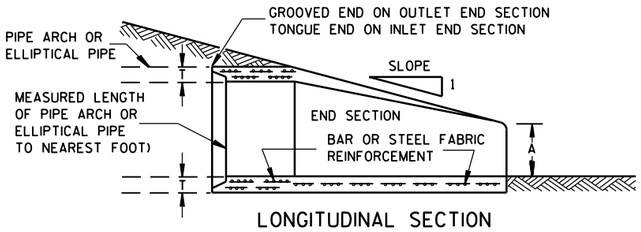
6

S.D.D. 8 F 1-11

8F2: Apron Endwalls for Pipe Arch and Elliptical Pipe



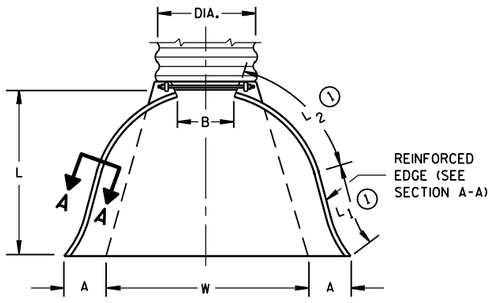
END VIEW



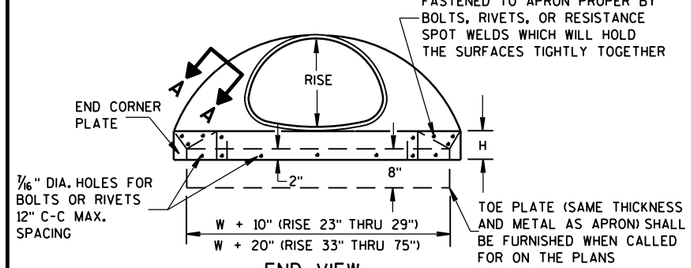
LONGITUDINAL SECTION

PLAN VIEW

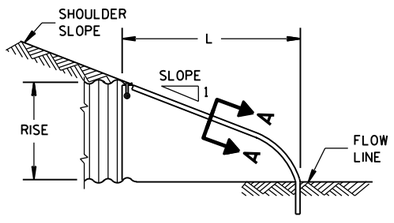
CONCRETE ENDWALLS



PLAN VIEW

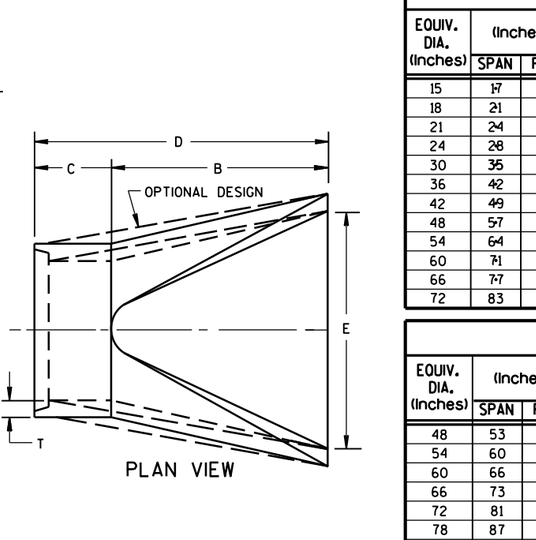


END VIEW



SIDE ELEVATION

METAL ENDWALLS



SECTION A-A

2- 2/3" X 1/2" CORRUGATIONS

EQUIV. DIA. (Inches)	(Inches) SPAN	(Inches) RISE	MIN. THICK. (Inches) STEEL	MIN. THICK. (Inches) ALUM.	DIMENSIONS (Inches) A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 ①	L2 ①	W (±2")	APPROX. SLOPE	BODY
15	17	13	.064	.060	7	9	6	19	14	16	30	2½ to 1	1 Pc.
18	21	15	.064	.060	7	10	6	23	14	19 3/8	36	2½ to 1	1 Pc.
21	24	18	.064	.060	8	12	6	28	18	21¾	42	2½ to 1	1 Pc.
24	28	20	.064	.060	9	14	6	32	18	27½	48	2½ to 1	1 Pc.
30	35	24	.079	.075	10	16	6	39	18	37 5/8	60	2½ to 1	1 Pc.
36	42	29	.079	.075	12	18	8	46	24	45 3/8	75	2½ to 1	1 Pc.
42	49	33	.109	.105	13	21	9	53	24	54¾	85	2½ to 1	2 Pc.
48	57	38	.109	.105	18	26	12	63	24	68	90	2½ to 1	3 Pc.
54	64	43	.109	.105	18	30	12	70	24	72¾	102	2¼ to 1	3 Pc.
60	71	47	.109*	.105*	18	33	12	77	30	82¼	114	2¼ to 1	3 Pc.
66	77	52	.109*	.105*	18	36	12	77	—	—	126	2 to 1	3 Pc.
72	83	57	.109*	.105*	18	39	12	77	—	—	138	2 to 1	3 Pc.

3" X 1" CORRUGATIONS

EQUIV. DIA. (Inches)	(Inches) SPAN	(Inches) RISE	MIN. THICK. (Inches) STEEL	MIN. THICK. (Inches) ALUM.	DIMENSIONS (Inches) A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 ①	L2 ①	W (±2")	APPROX. SLOPE	BODY
48	53	41	.109	.105	18	26	12	63	24	72¾	90	2½ to 1	2 Pc.
54	60	46	.109	.105	18	30	12	70	30	82¼	102	2 to 1	2 Pc.
60	66	51	.109*	.105*	18	33	12	77	—	—	114	1½ to 1	3 Pc.
66	73	55	.109*	.105*	18	36	12	77	—	—	126	1½ to 1	3 Pc.
72	81	59	.109*	.105*	18	39	12	77	—	—	138	2 to 1	3 Pc.
78	87	63	.109*	.105*	22	38	12	77	—	—	148	1½ to 1	3 Pc.
84	95	67	.109*	.105*	22	34	12	77	—	—	162	1½ to 1	3 Pc.
90	103	71	.109*	.105*	22	38	12	77	—	—	174	1½ to 1	3 Pc.
96	112	75	.109*	.105*	24	40	12	77	—	—	174	1½ to 1	3 Pc.

NOTE: ALL SPLICES TO BE LAP RIVETED OR BOLTED.

* EXCEPT CENTER PANEL SEE GENERAL NOTES

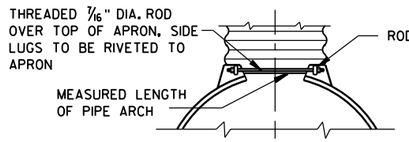
REINFORCED CONCRETE PIPE ARCH

EQUIV. DIA. (Inches)	DIMENSIONS (Inches) ** SPAN	** RISE	T	A	B	C	D	E	APPROX. SLOPE
24	29	18	3	8½	39	33	72	48	3 to 1
30	36	22	3½	9½	50	46	96	60	3 to 1
36	44	27	4	11⅛	60	36	96	72	3 to 1
42	51	31	4½	15 1/16	60	36	96	78	3 to 1
48	58	36	5	21	60	36	96	84	3 to 1
54	65	40	5½	25½	60	36	96	90	3 to 1
60	73	45	6	31	60	36	96	96	3 to 1
72	88	54	7	31	60	39	99	120	2 to 1
84	102	62	8	28½	83	19	102	144	2 to 1

REINFORCED CONCRETE ELLIPTICAL PIPE

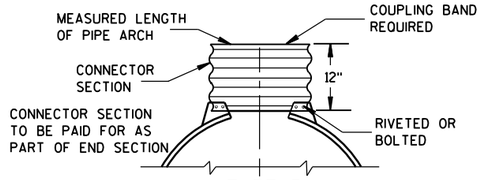
EQUIV. DIA. (Inches)	DIMENSIONS (Inches) ** SPAN	** RISE	T	A	B	C	D	E	APPROX. SLOPE
24	30	19	3¼	8½	39	33	72	48	3 to 1
30	38	24	3¾	9½	54	18	72	60	3 to 1
36	45	29	4½	11⅛	60	24	84	72	2½ to 1
42	53	34	5	15¾	60	36	96	78	2½ to 1
48	60	38	5½	21	60	36	96	84	2½ to 1
54	68	43	6	25½	60	36	96	90	2½ to 1
60	76	48	6½	30	60	36	96	96	2½ to 1

**NOMINAL SIZE



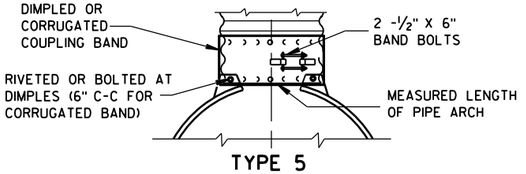
TYPE 2

FOR 17" X 13" THRU 112" X 75" PIPE ARCH



TYPE 3

FOR 64" X 43" THRU 112" X 75" PIPE ARCH



TYPE 5

ALTERNATE FOR:

ALL SIZES CORRUGATED PIPE ARCHES

NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL.

CONNECTION DETAILS

GENERAL NOTES

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

CONCRETE APRON ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VISE VERSA. GALVANIZED STEEL OR ALUMINUM APRON ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL.

ALL THREE PIECE STEEL APRON ENDWALLS FOR 66" X 51" PIPE ARCH AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 66" X 51" PIPE ARCH AND LARGER SHALL HAVE 0.105" SIDES AND 0.134" CENTER PANELS. THE WIDTH OF CENTER PANELS SHALL BE GREATER THAN 20 PERCENT OF THE PIPE ARCH PERIMETER.

LAP SEAMS SHALL BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM RIVETS AND BOLTS FOR ALUMINUM UNITS. FOR THE 77" X 52" THROUGH 112" X 75" APRON ENDWALL SIZES, THE REINFORCED EDGES AND CENTER PANEL SEAMS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER ANGLES. THE ANGLES SHALL BE ATTACHED BY GALVANIZED NUTS AND BOLTS FOR STEEL UNITS AND ALUMINUM NUTS AND BOLTS FOR ALUMINUM UNITS.

WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

① FOR PIPE ARCH SIZES UP TO 73" X 55" A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.

Sheet 25

APRON ENDWALLS FOR PIPE ARCH AND ELLIPTICAL PIPE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

11-30-94 — DATE

/S/ Rory L. Rhinesmith — CHIEF ROADWAY DEVELOPMENT ENGINEER

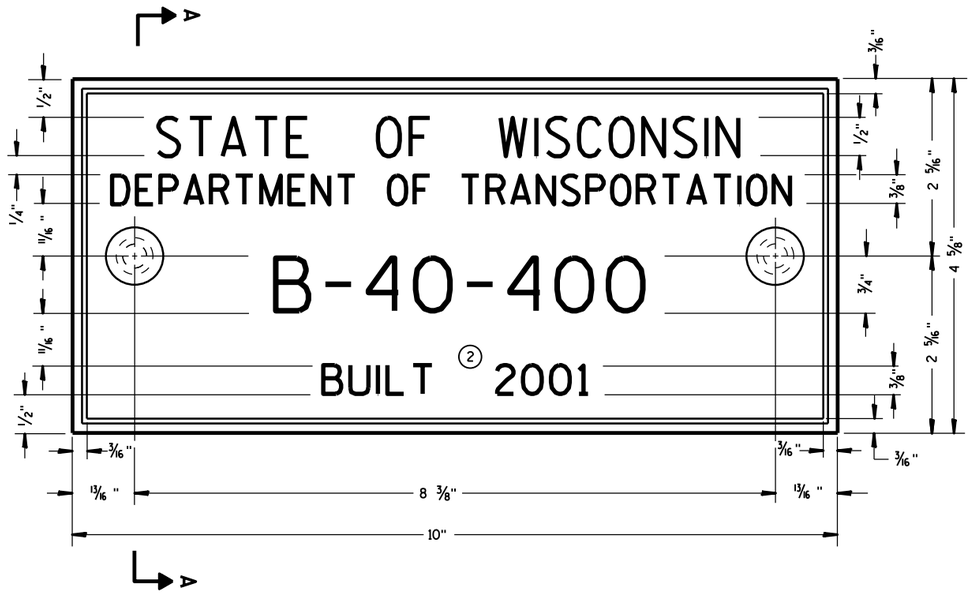
FHWA

6

S.D.D. 8 F 2-1

6

S.D.D. 8 F 2-1



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

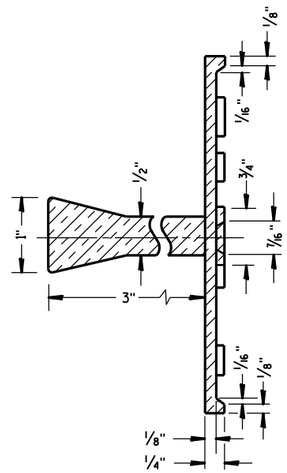
GENERAL NOTES

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

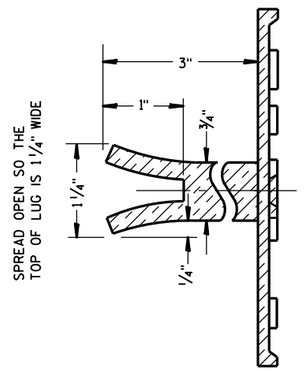
THE BRIDGE NUMBER AND YEAR BUILT SHOWN ON THIS DRAWING ARE EXAMPLES ONLY. SEE CONSTRUCTION PLANS FOR INDIVIDUAL NUMBERING AND YEAR BUILT.

① EPOXY RESIN SHALL BE FROM AN APPROVED MANUFACTURER AND USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

② REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.



SECTION A-A



ALTERNATE LUG

FOR MULTI-UNIT STRUCTURES
LINE 3 ABOVE SHALL READ

B = BRIDGE
C = CULVERT
R = RETAINING WALL

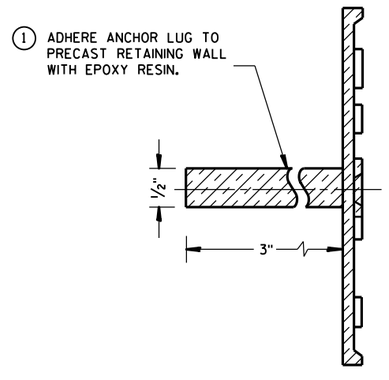
COUNTY NO.

BRIDGE NO.

UNIT NO. FOR MULTIPLE UNIT BRIDGE

B-40-400-1A

NUMBERING DESIGNATION
MULTI-UNIT STRUCTURES



ALTERNATE LUG
(FOR ATTACHMENT TO PRECAST STRUCTURES)

Sheet 26

NAME PLATE (STRUCTURES)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

3/26/10
DATE

/S/ Scot Becker
CHIEF STRUCTURAL DEVELOPMENT ENGINEER

FHWA

6

S.D.D. 12 A 3-10

6

S.D.D. 12 A 3-10

14B42 sheet a: Midwest Guardrail System (MGS) Installation Cross Sections, Post and Block Details

GENERAL NOTES

1. WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.

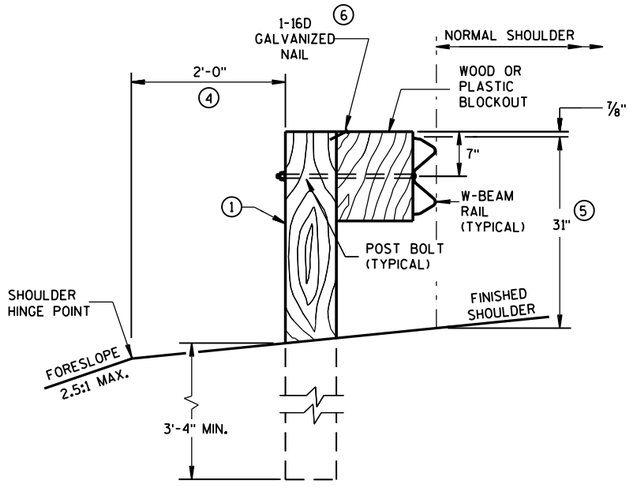
2. USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.

3. IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2½ INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AMD INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.

4. WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).

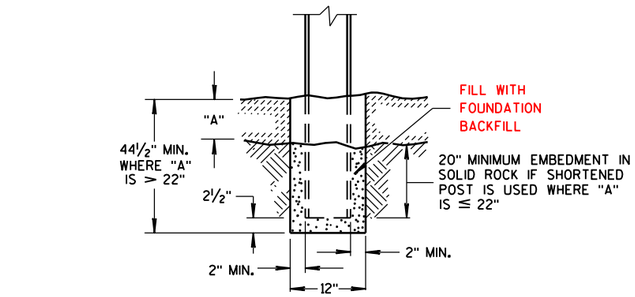
5. FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS ± 1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27¾" TO 32".

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



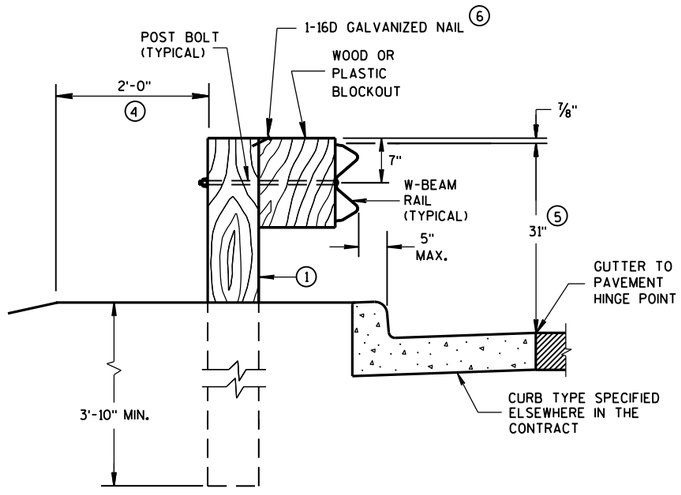
END VIEW

LOCATED ALONG A ROADWAY SHOULDER
STANDARD INSTALLATION



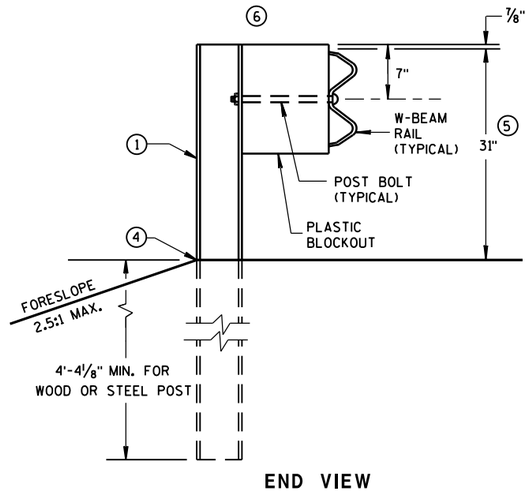
END VIEW

SETTING STEEL OR WOOD POST IN ROCK ③



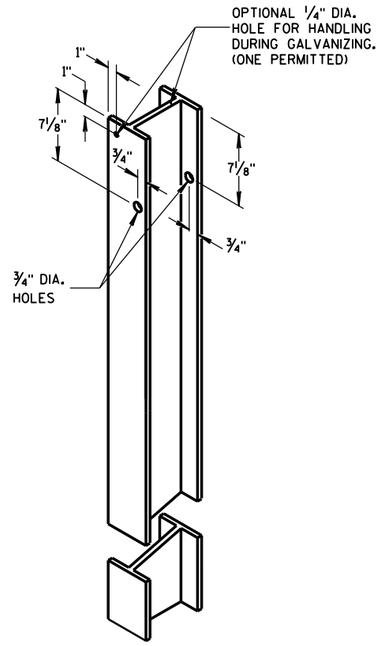
END VIEW

LOCATED ALONG A CURBED ROADWAY

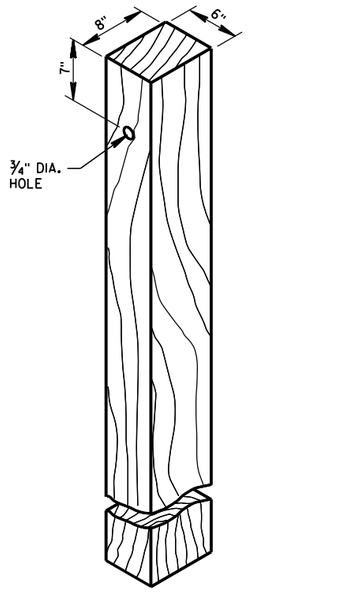


END VIEW

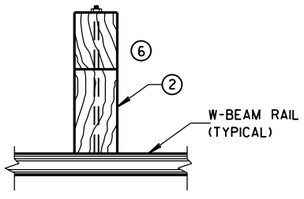
MGS LONGER POST AT HALFPOST SPACING W BEAM (K)



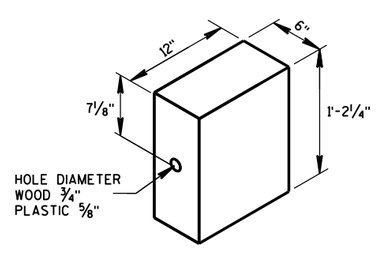
STEEL POST &
HOLE PUNCHING DETAIL
(w6X9) ①



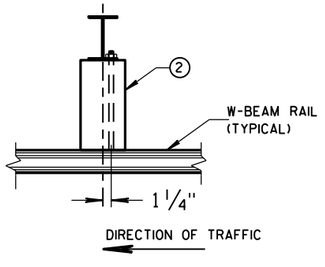
WOOD POST
(6" X 8") NOMINAL ①



PLAN VIEW
WOOD POST,
BLOCKOUT & BEAM



WOOD OR
PLASTIC BLOCKOUT ②



PLAN VIEW
STEEL POST,
PLASTIC BLOCKOUT & BEAM

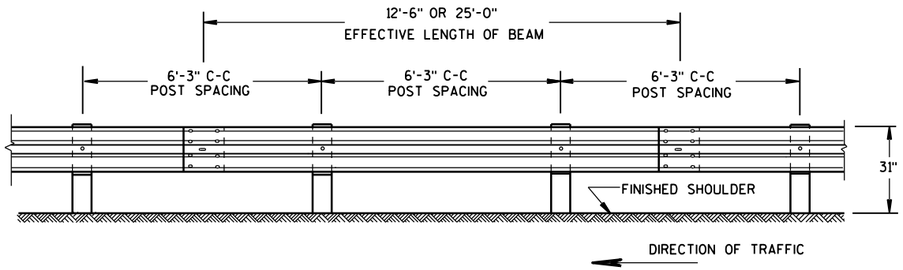
Sheet 27

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

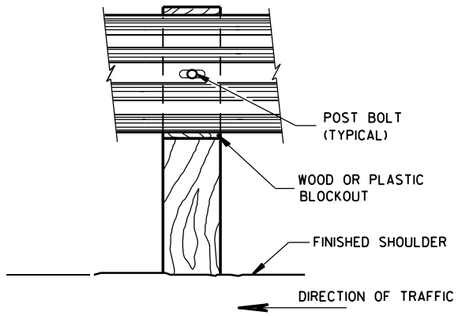
S.D.D. 14 B 42-4a

S.D.D. 14 B 42-4a



FRONT VIEW

POST SPACING STANDARD INSTALLATION



FRONT VIEW AT WOOD POST

GENERAL NOTES

(7) 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.

(8) DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPLICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.

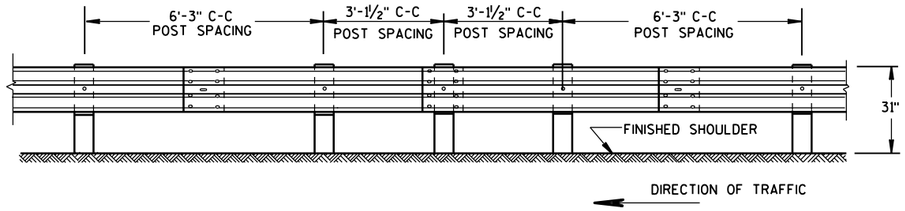
(9) REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.

(10) PROVIDE AN ANGLE OF BEND OF 90° ± 1° FOR TWO-SIDED REFLECTORS.

(11) 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.

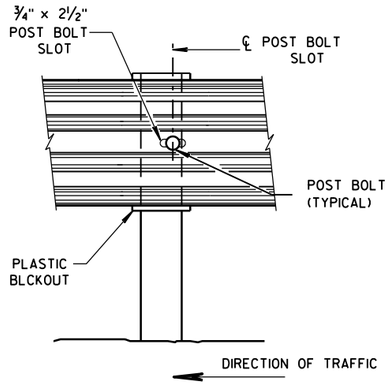
POST BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 5/8" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.

GUARD RAIL SPLICE BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.

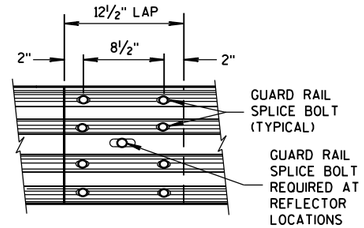


FRONT VIEW

HALF POST SPACING (HS) AND HALF POST SPACING WITH LONGER POSTS (K)

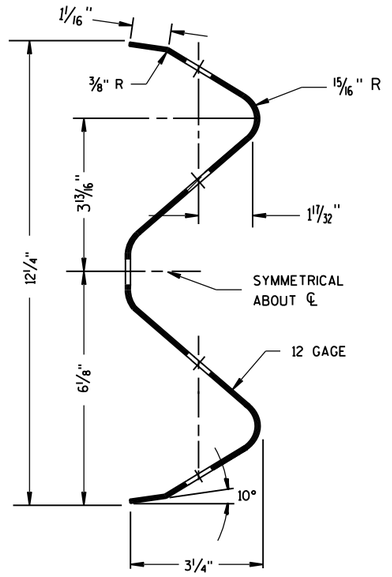


FRONT VIEW AT STEEL POST

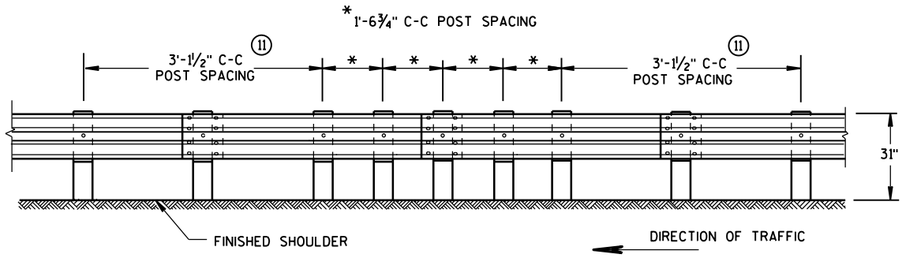


FRONT VIEW

MID-SPAN BEAM SPLICE

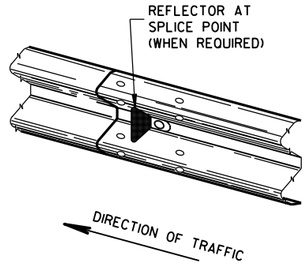


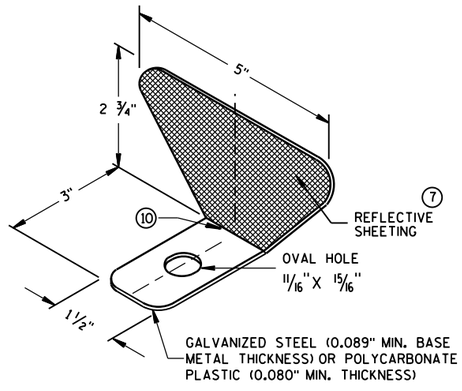
SECTION THRU W-BEAM RAIL



FRONT VIEW

QUARTER POST SPACING (QS)





ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION (7)

REFLECTOR SPACING (8)

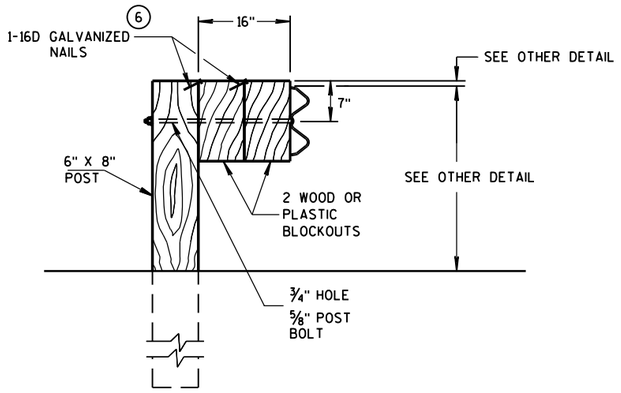
	BEAM GUARD LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200' > 200'	50' C-C 100' C-C	1 1	3
TWO WAY TRAFFIC	< 200' > 200'	25' C-C 50' C-C	1 (9) 1	6
TWO WAY TRAFFIC	< 200' > 200'	50' C-C 100' C-C	2 2 (10)	3

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

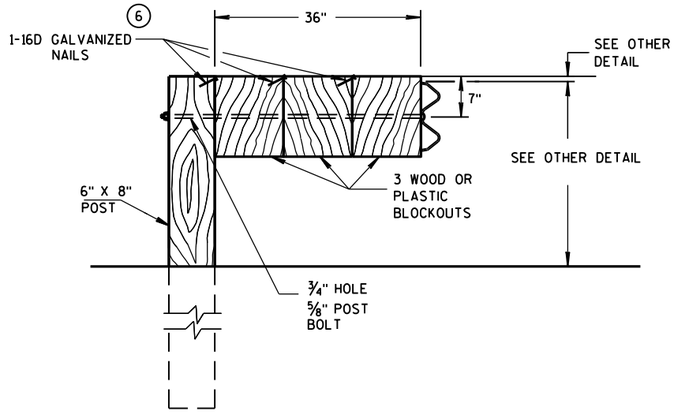
S.D.D. 14 B 42-4b

S.D.D. 14 B 42-4b



DETAIL FOR 16" BLOCKOUT DEPTH

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

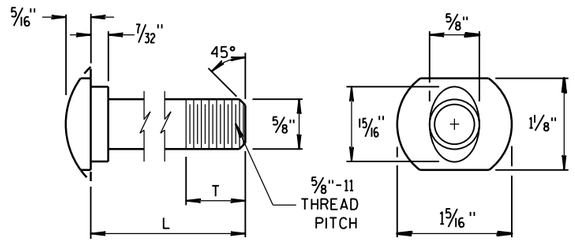


DETAIL FOR 36" BLOCKOUT DEPTH

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

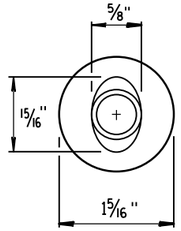
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.

NOTE: 1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 1/16".
2. IF THE BOLT EXTENDS MORE THAN 1/4" FROM THE NUT THE BOLT SHOULD BE TRIMMED BACK.

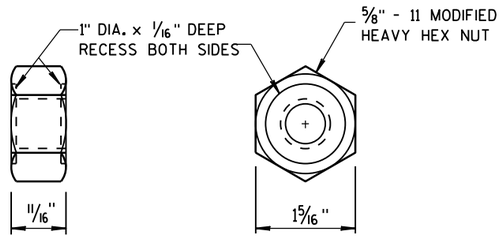


POST BOLT TABLE

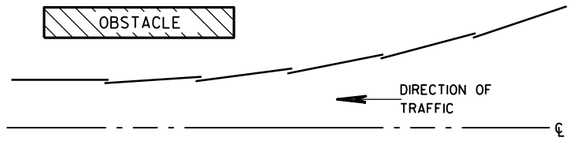
L	T (MIN.)
1¼"	1⅛"
2"	1¾"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



ALTERNATE BOLT HEAD

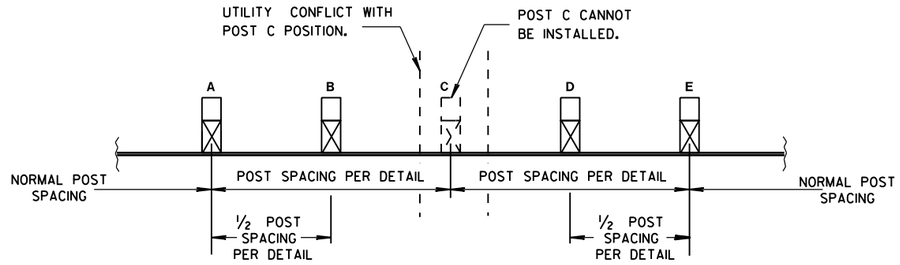


POST BOLT, SPLICE BOLT AND RECESS NUT

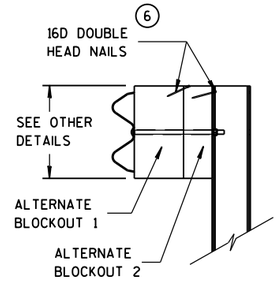


PLAN VIEW

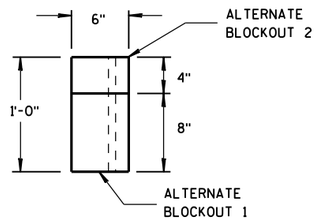
BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION



SIDE VIEW



TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2016
DATE
FHWA

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER

6

S.D.D. 14 B 42-4c

6

S.D.D. 14 B 42-4c

14B44 sheet a: Midwest Guardrail System (MGS) EAT

GENERAL NOTES

(A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL), AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.

(B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED.

(C) DIFFERENT MANUFACTURES REQUIRE DIFFERENT PERFORATED W-BEAM RAIL END PANELS. SEE MANUFACTURES INFORMATION.

(D) THE TOP OF THE STEEL TUBE ON POST 1 AND POST 2 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.

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

(G) ½" DIAMETER X 3" LONG LAG BOLT AND WASHER.

(H) HARDWARE VARIES BETWEEN DIFFERENT MANUFACTURES. SEE MANUFACTURE'S DRAWING FOR INFORMATION.

(I) DIMENSIONS MAY VARY. SEE MANUFACTURE'S INFORMATION.

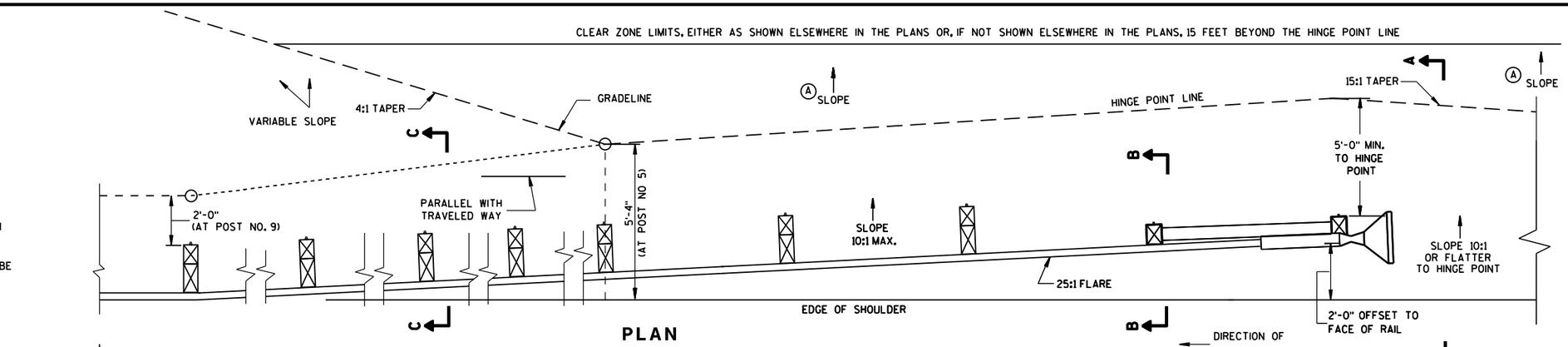
SEE SDD 14B42 FOR MORE INFORMATION.

* DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.

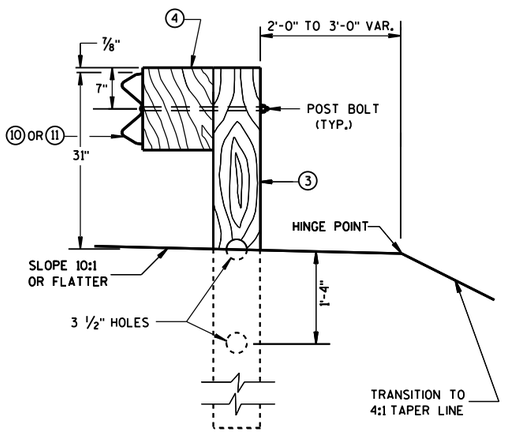
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

W-BEAM RAIL SPLICES ARE LOCATED AT POST NUMBER 3, AND BETWEEN POST 5 AND 6, BETWEEN POSTS 7 AND 8, AND MIDDLE OF THE SPAN AFTER POST 9.

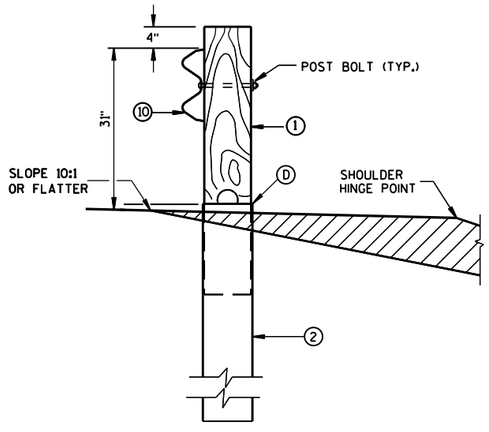
THE CENTER OF THE UPPER 3½" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE.



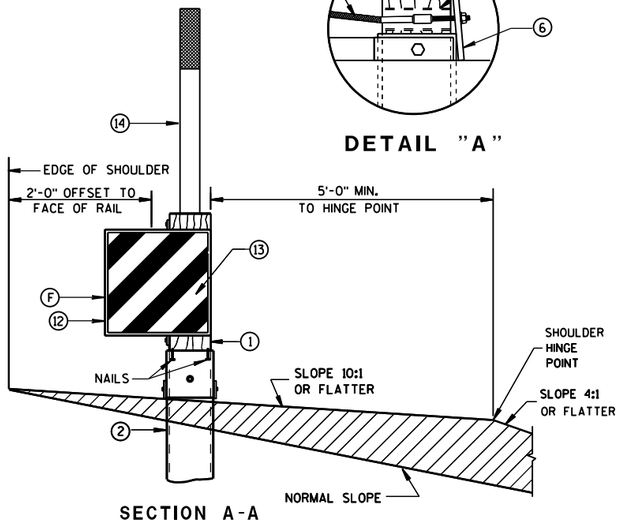
ELEVATION



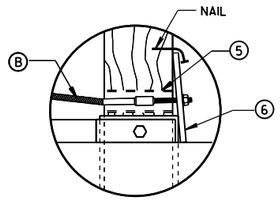
SECTION C-C
TYPICAL AT POST NOS. 3-9



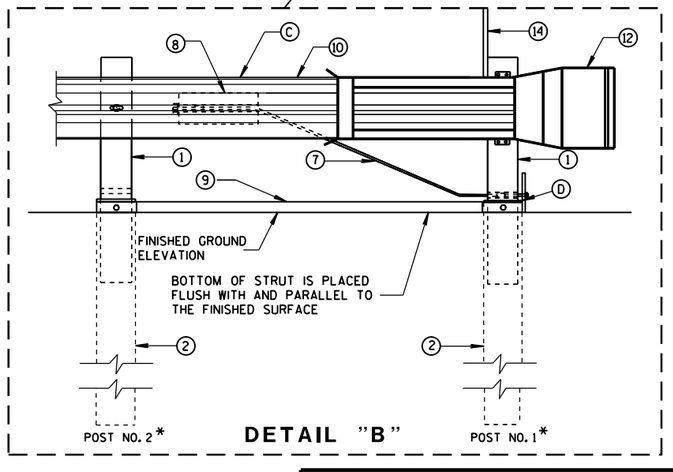
SECTION B-B
TYPICAL AT POST NO. 2*



SECTION A-A
TYPICAL AT POST NO. 1*



DETAIL "A"



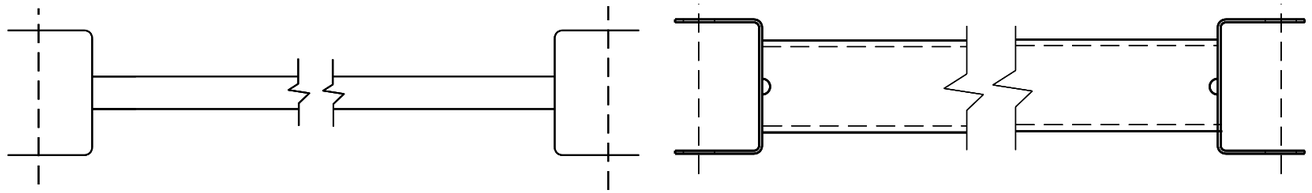
DETAIL "B"

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

S.D.D. 14 B 44-2a

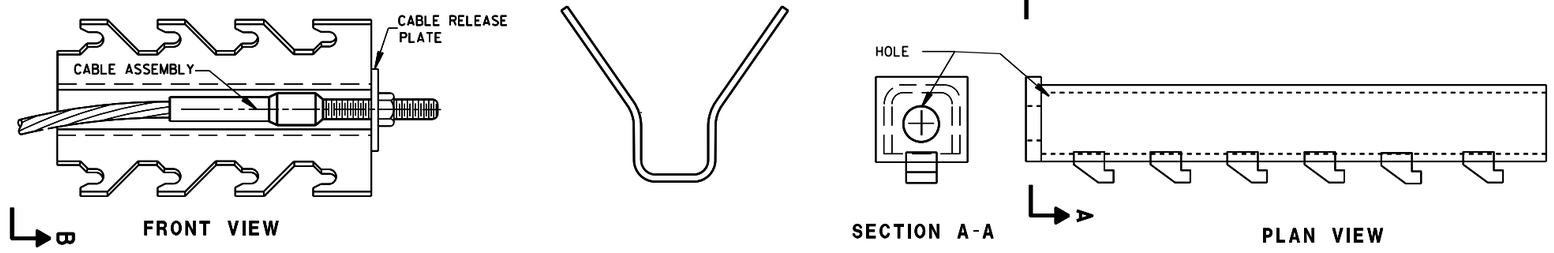
14B44 sheet b: Midwest Guardrail System (MGS) EAT Ground Strut, Anchor Cable Box



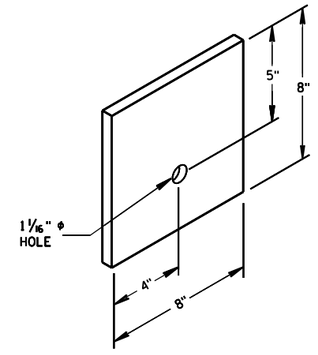
GENERIC GROUND STRUT (9) (H)

BILL OF MATERIALS

PART NO.	DESCRIPTION MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
(1)	WOOD BREAKAWAY POST
(2)	6" X 8" X 0.188", 6'-0" LONG FOUNDATION TUBE AT POSTS 1 AND 2
(3)	WOOD CRT
(4)	WOOD BLOCKOUT
(5)	PIPE SLEEVE
(6)	BEARING PLATE
(7)	BCT CABLE ASSEMBLY
(8)	ANCHOR CABLE BOX
(9)	GROUND STRUT
(10)	PERFORATED W-BEAM RAIL END PANEL, 12'-6" LONG.
(11)	STANDARD W-BEAM RAIL. MULTIPLE SECTIONS REQUIRED. SECTIONS VARY IN LENGTH.
(12)	END SECTION EAT
(13)	0.040" ALUMINUM SHEET WITH REFLECTIVE SHEETING TYPE F PER SECTION 637 OF THE STANDARD SPECIFICATIONS
(14)	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)



GENERIC ANCHOR CABLE BOX (8) (H)



BEARING PLATE (6)

Sheet 31

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

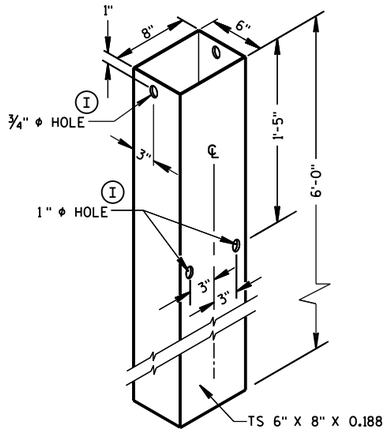
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

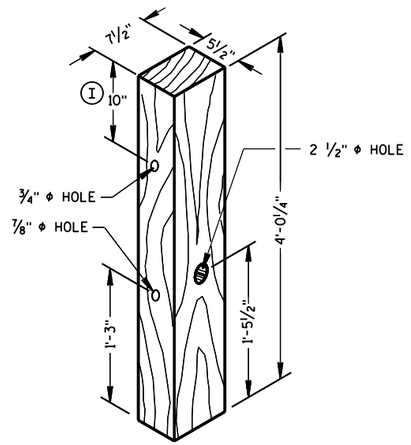
S.D.D. 14 B 44-2b

6

S.D.D. 14 B 44-2b

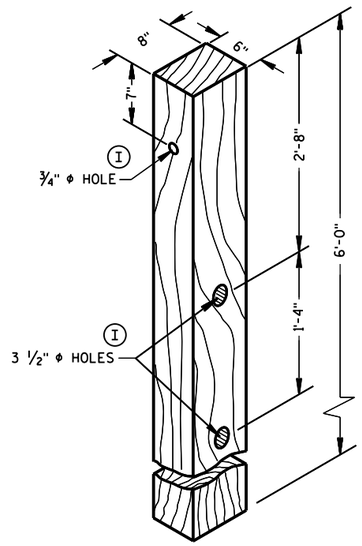


FOUNDATION TUBE (2)



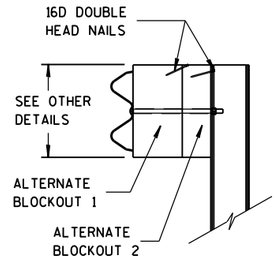
POSTS NUMBER 1 AND 2

WOOD BREAKAWAY POST (1)

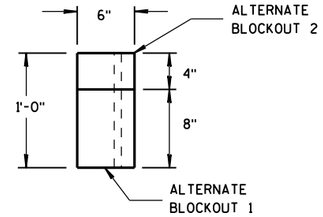


POSTS NUMBER 3-9

WOOD CRT POST (3)

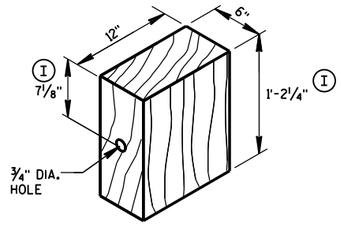


SIDE VIEW



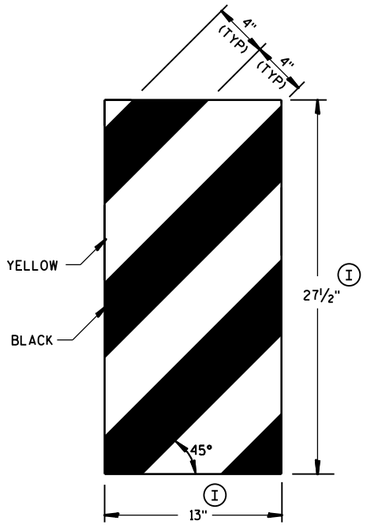
TOP VIEW

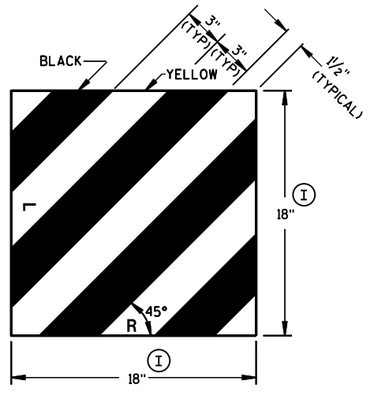
ALTERNATE WOOD BLOCKOUT DETAIL



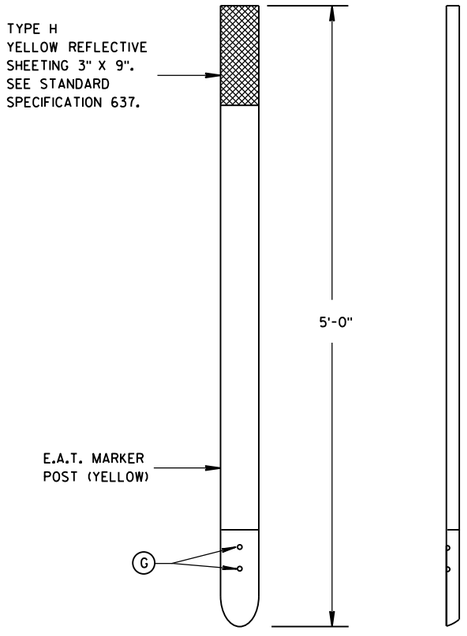
WOOD BLOCKOUT (4)

REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2





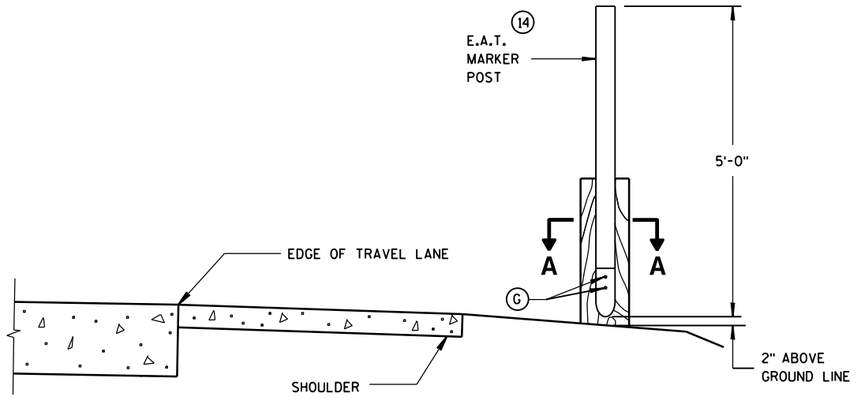
GENERIC REFLECTIVE SHEETING (13) (H)



FRONT VIEW

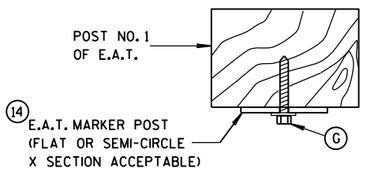
SIDE VIEW

E.A.T. MARKER POST (14)



TYPICAL INSTALLATION OF E.A.T. MARKER POST BACKSIDE OF POST NO. 1

(E.A.T. AND RAIL REMOVED FOR CLARITY)



SECTION A-A

Sheet 32

MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2014 — DATE
/S/ Jerry H. Zogg — ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

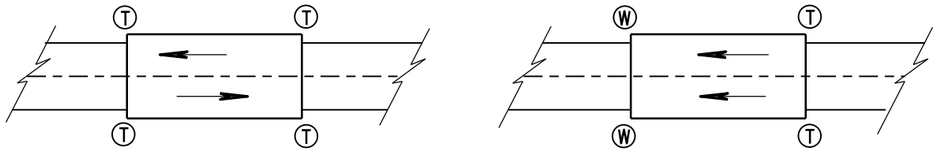
6

S.D.D. 14 B 44-2c

6

S.D.D. 14 B 44-2c

14B45 sheet a: Midwest Guardrail System (MGS) Thrie Beam Transition: Layout



TWO WAY TRAFFIC

ONE WAY TRAFFIC

Ⓣ THRIE BEAM CONNECTION

Ⓦ W-BEAM CONNECTION WHEN REQUIRED

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

GENERAL NOTES

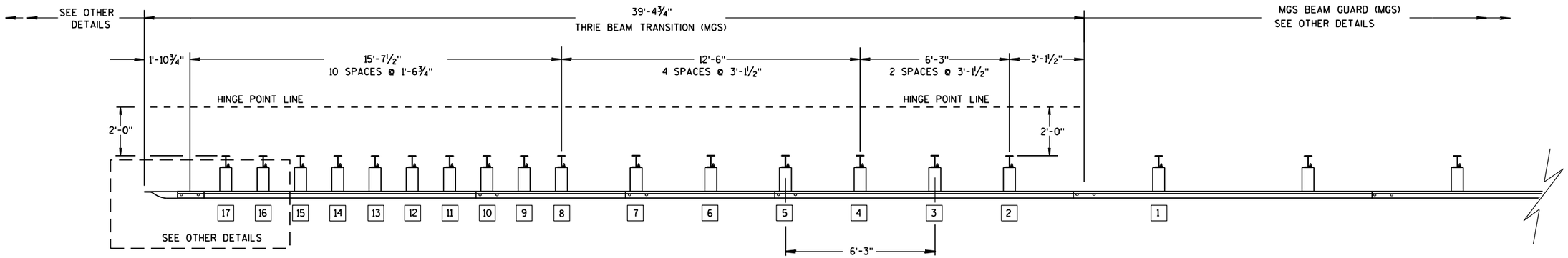
IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2½", AND 12" DIAMETER AROUND POST. SEE 14B42 FOR MORE DETAILS.

TRANSITION USES STEEL POSTS ONLY.

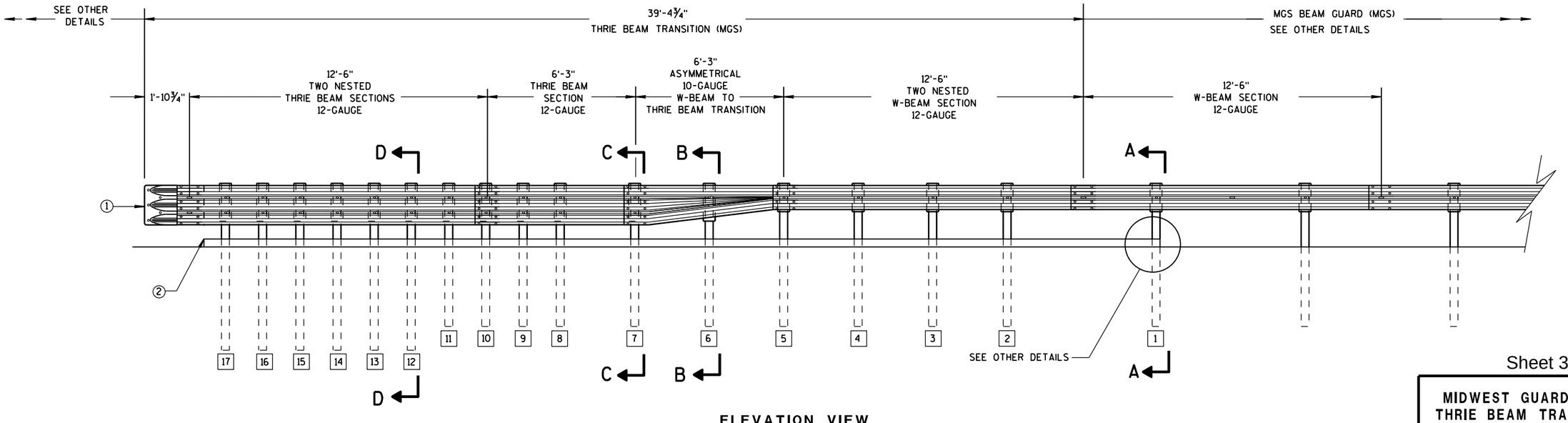
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.

② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.



PLAN VIEW



ELEVATION VIEW

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

Sheet 33

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

S.D.D. 14 B 45-4a

6

S.D.D. 14 B 45-4a

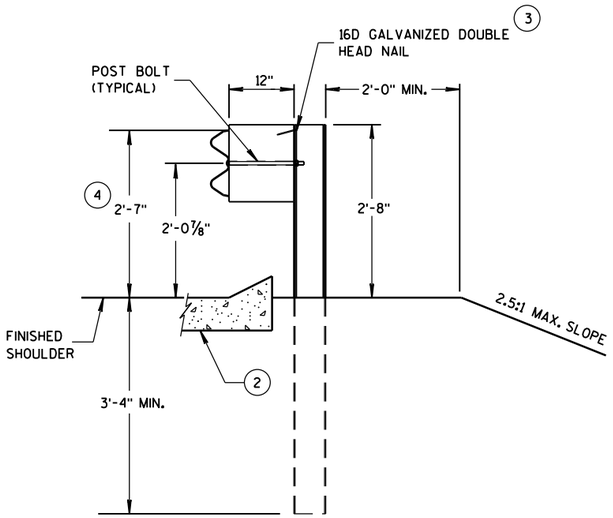
14B45 sheet b: Midwest Guardrail System (MGS) Thrie Beam Transition: Cross Sections, Thrie Beam Details, Splice Detail

GENERAL NOTES

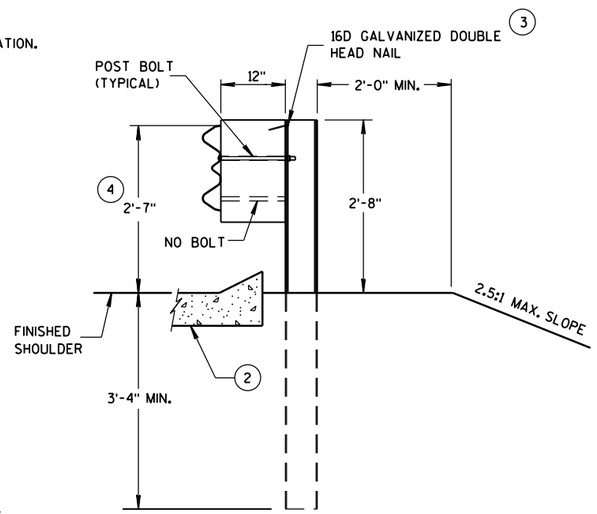
(2) OPTIONAL CURB AND GUTTER OR DRAINAGE_FEATURE SEE PLAN FOR INFORMATION.

(3) WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 10D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

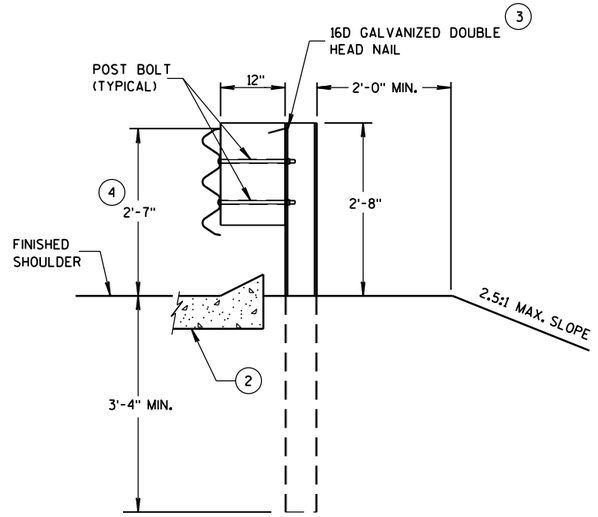
(4) TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".



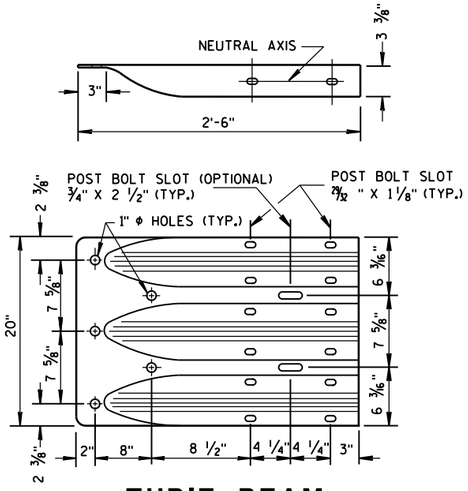
SECTION A-A
POSTS 1-5



SECTION B-B
POST 6



SECTION C-C
POSTS 7-11



THRIE BEAM
TERMINAL CONNECTOR

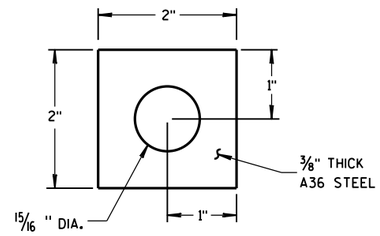
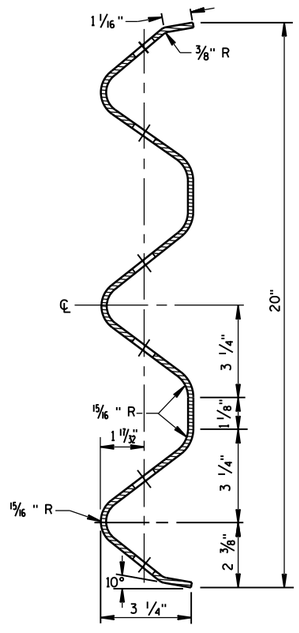
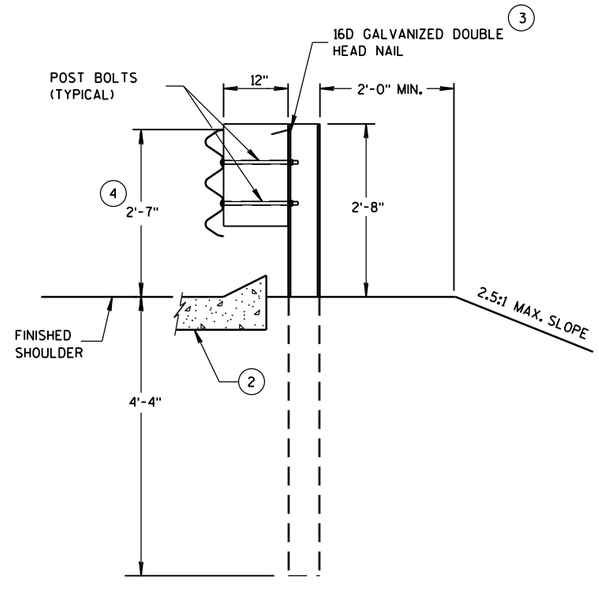


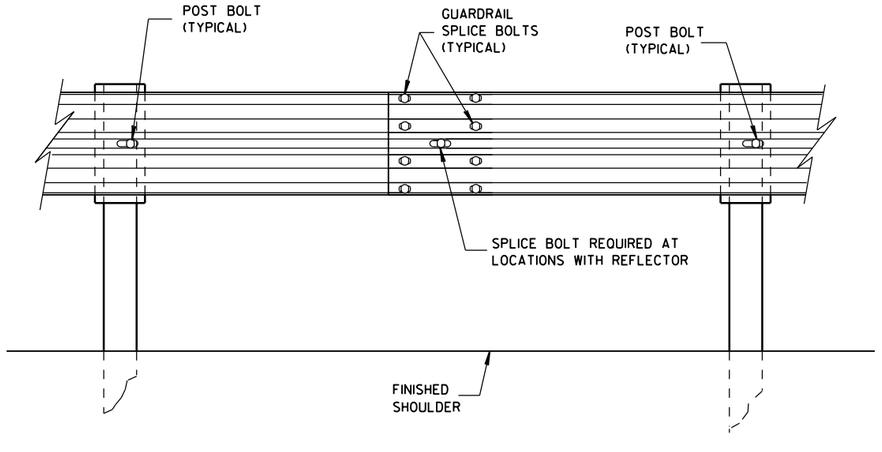
PLATE WASHER DETAIL



SECTION THRU THRIE
BEAM RAIL ELEMENT



SECTION D-D
POSTS 12-17



SPLICE DETAIL

6

6

S.D.D. 14 B 45-4b

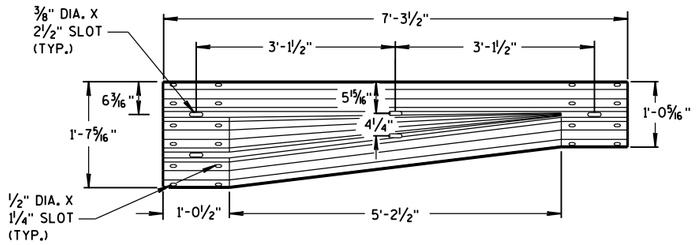
S.D.D. 14 B 45-4b

Sheet 34

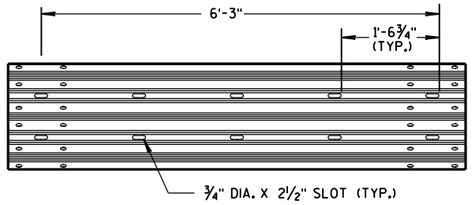
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

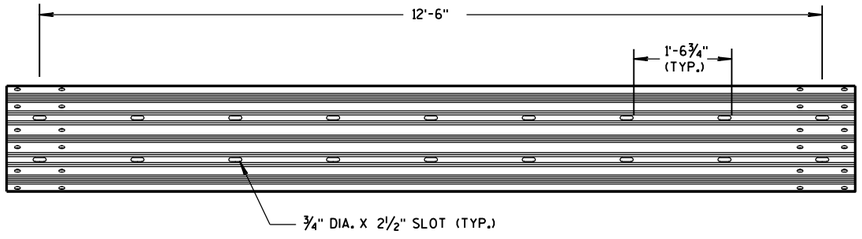
14B45 sheet c: Midwest Guardrail System (MGS) Thrie Beam Transition: Thrie Beam Details, Post Details, Block Details



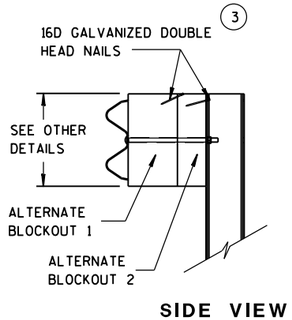
W-BEAM TO THRIE BEAM TRANSITION SECTION



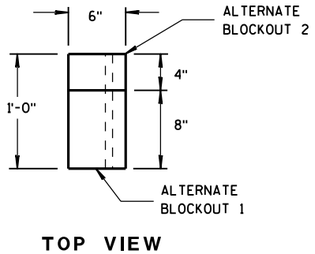
6'-3" THRIE BEAM SECTION



12'-6" THRIE BEAM SECTION

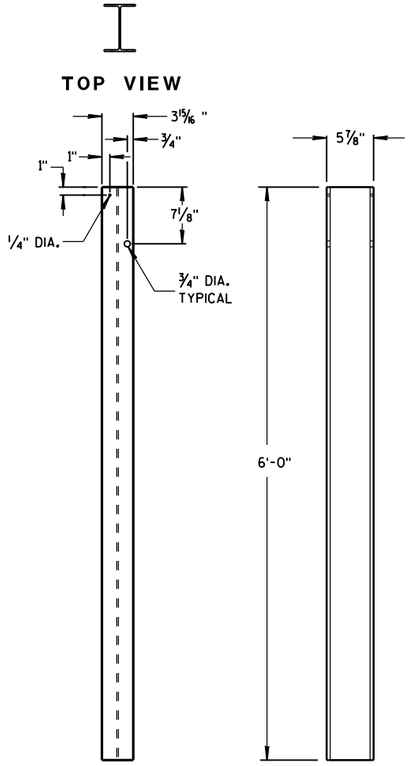


SIDE VIEW

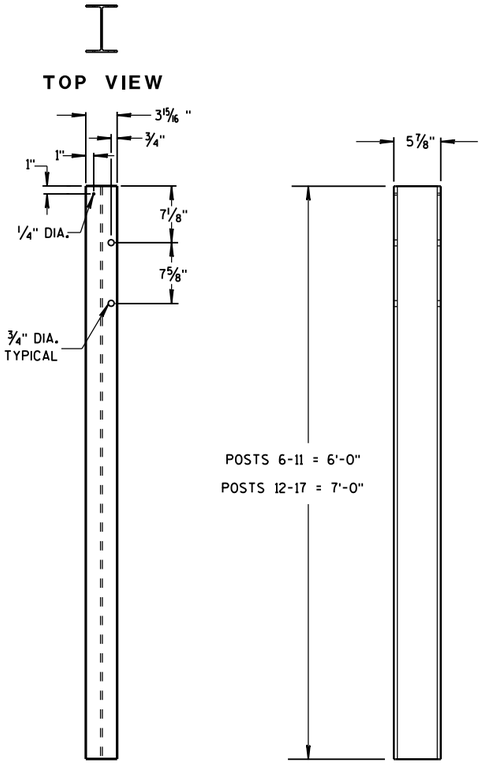


TOP VIEW

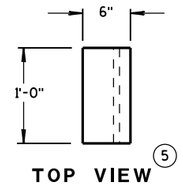
ALTERNATE WOOD BLOCKOUT DETAIL



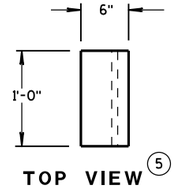
STEEL POSTS 1-5



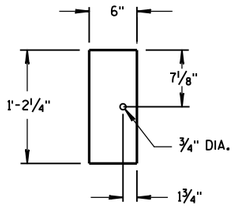
STEEL POSTS 6-17



TOP VIEW

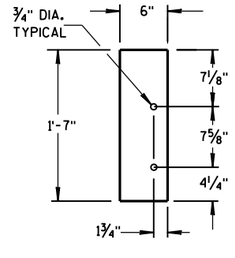


TOP VIEW



FRONT VIEW

BLOCKOUT POSTS 1-5



FRONT VIEW

BLOCKOUT POSTS 6-17

GENERAL NOTES

STEEL POSTS ARE W6X9 OR W6X8.5.

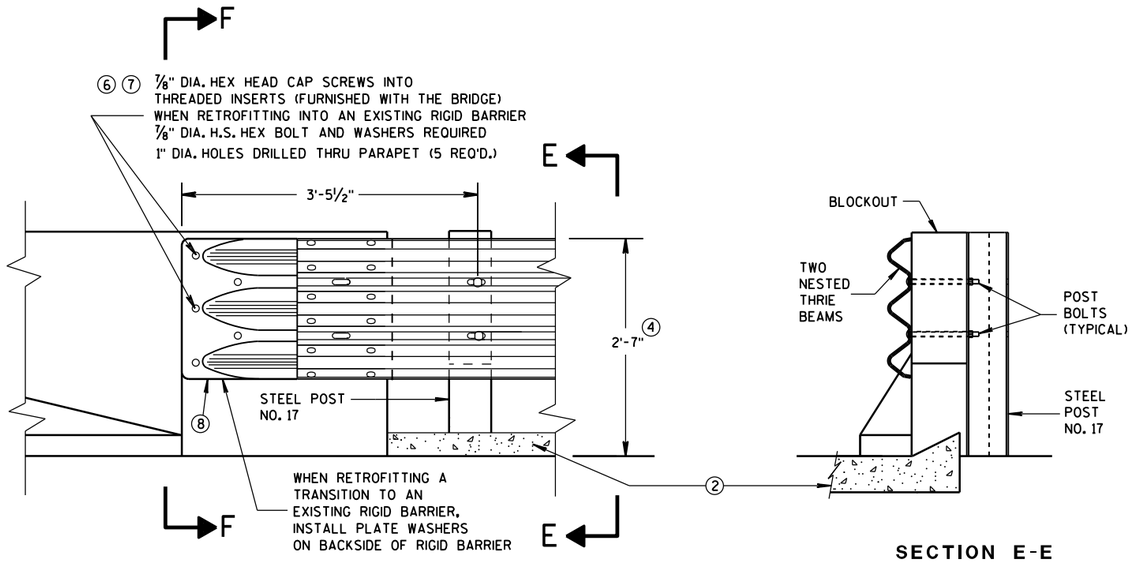
BOLT HOLES FOR POST ARE ON FRONT AND OF SIDE OF POST.

(3) WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

(5) WOOD BLOCKS MAY BE CONSTRUCTED OUT OF 2 WOOD BLOCKS. SEE ALTERNATE WOOD BLOCK DETAIL.

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



FRONT VIEW

SECTION E-E

THRIE BEAM CONNECTION TO BRIDGE PARAPET WITH SQUARE ENDS

GENERAL NOTES

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

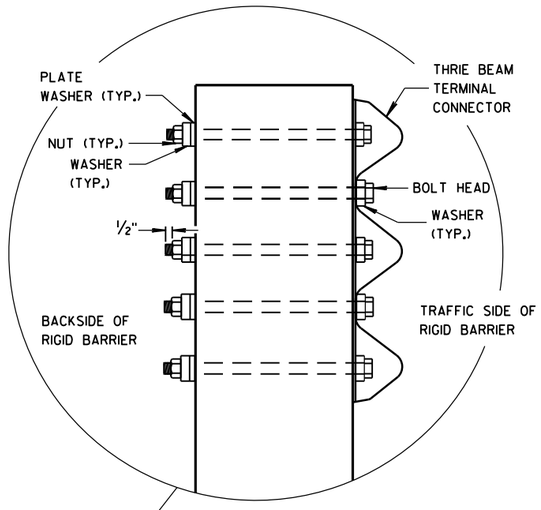
② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.

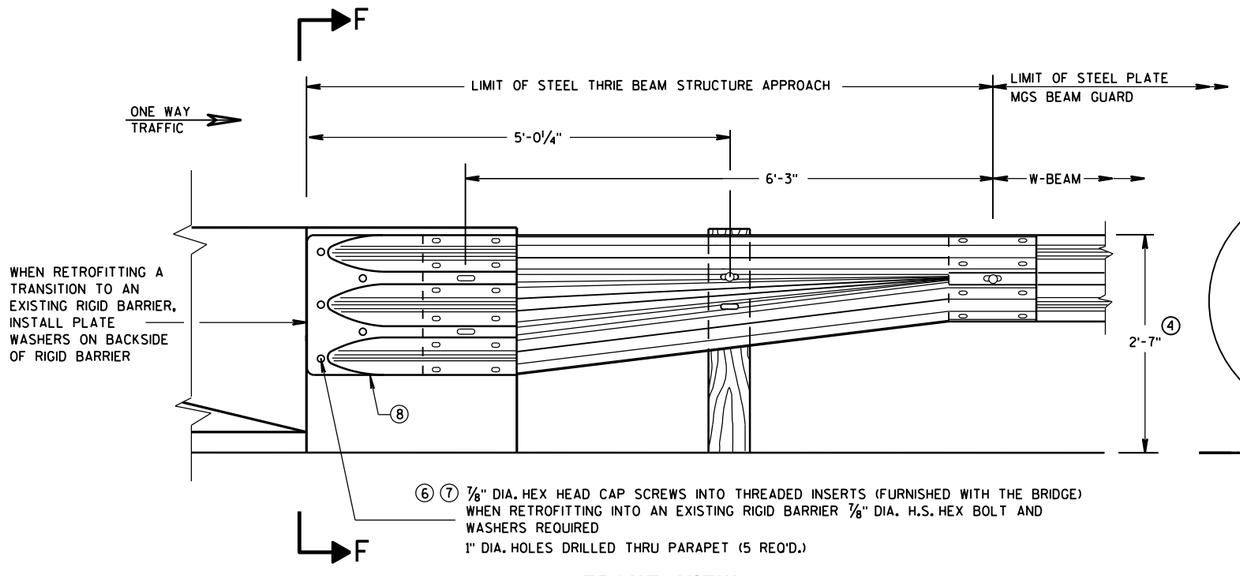
④ TOLERANCE FOR TOP OF BEAM IS ± 1".

⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

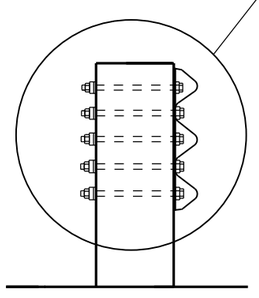
⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. 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.

⑧ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".

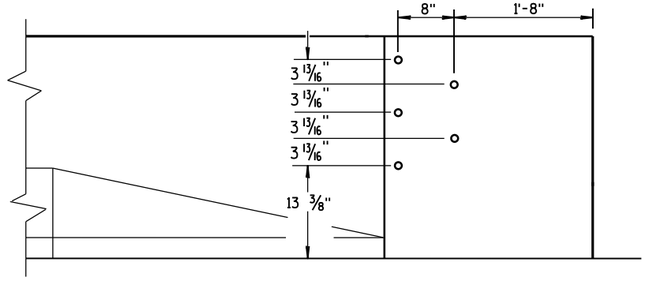




FRONT VIEW



SECTION F-F



DRILL HOLE LOCATION

W BEAM TRANSITION AND CONNECTION TO BRIDGE PARAPETS WITH SQUARE ENDS

(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

Sheet 36

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June, 2015
DATE
FHWA

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER

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GENERAL NOTES

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

(2) OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.

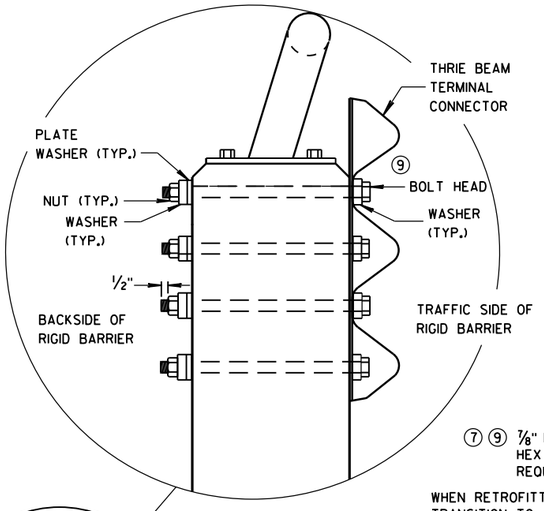
(4) TOLERANCE FOR TOP OF BEAM IS ± 1".

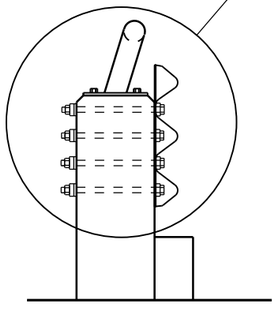
(6) DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

(7) 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 CONNECTOR PLATE. 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.

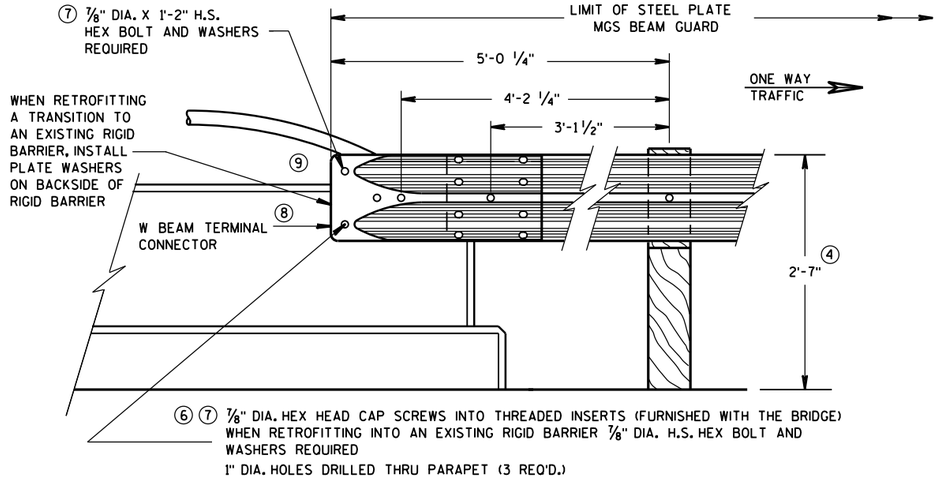
(8) THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".

(9) BOLT, NUT AND WASHERS NOT REQUIRED FOR THIS LOCATION WHEN RETROFITTING AN EXISTING PAPAPET AND THE HOLE IS EITHER ABOVE PARAPET OR WITHIN 4 INCHES OF THE EDGE OF PARAPET.





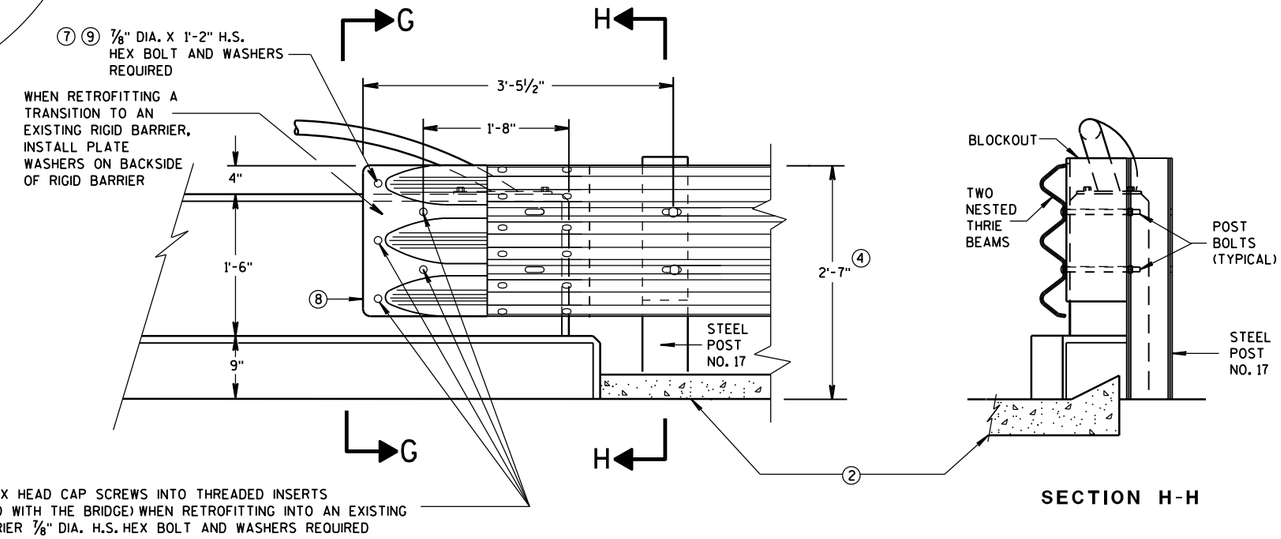
SECTION G-G



FRONT VIEW

W BEAM CONNECTION TO VERTICAL FACE PARAPET

(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)



FRONT VIEW

SECTION H-H

THRIE BEAM CONNECTION TO VERTICAL FACED PARAPETS

Sheet 37

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
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June, 2015 — DATE
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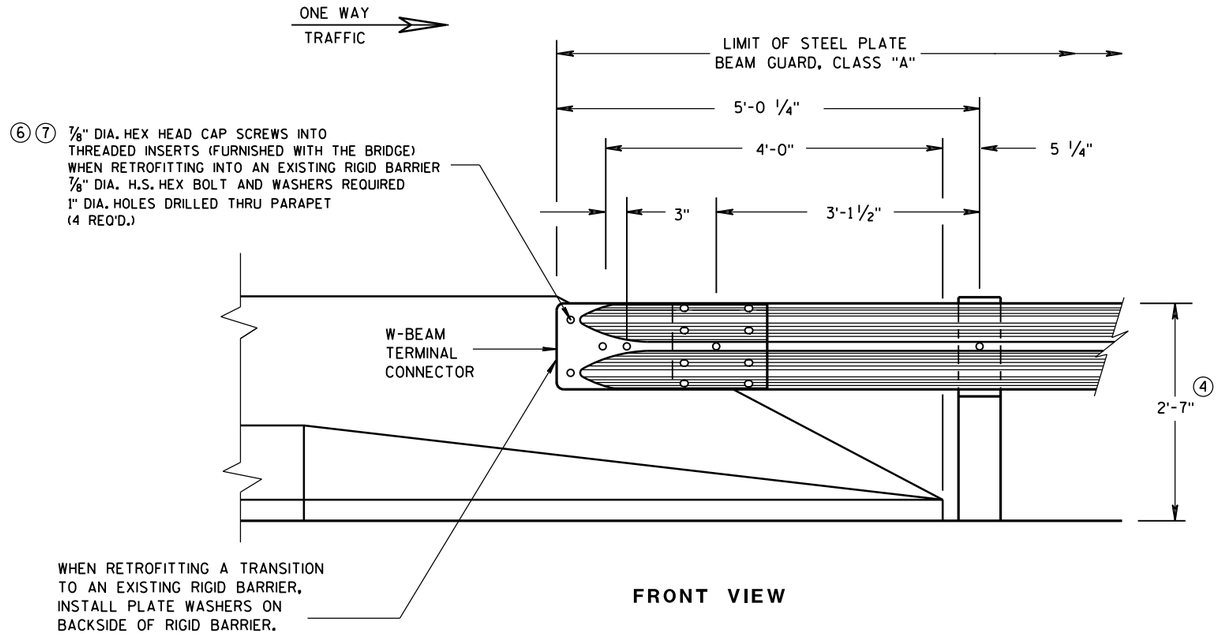


FRONT VIEW

W BEAM CONNECTION TO PARAPETS WITH SLOPED ENDS

(USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)

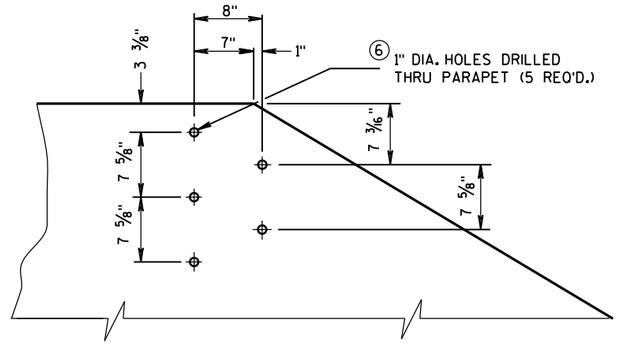
GENERAL NOTES

② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.

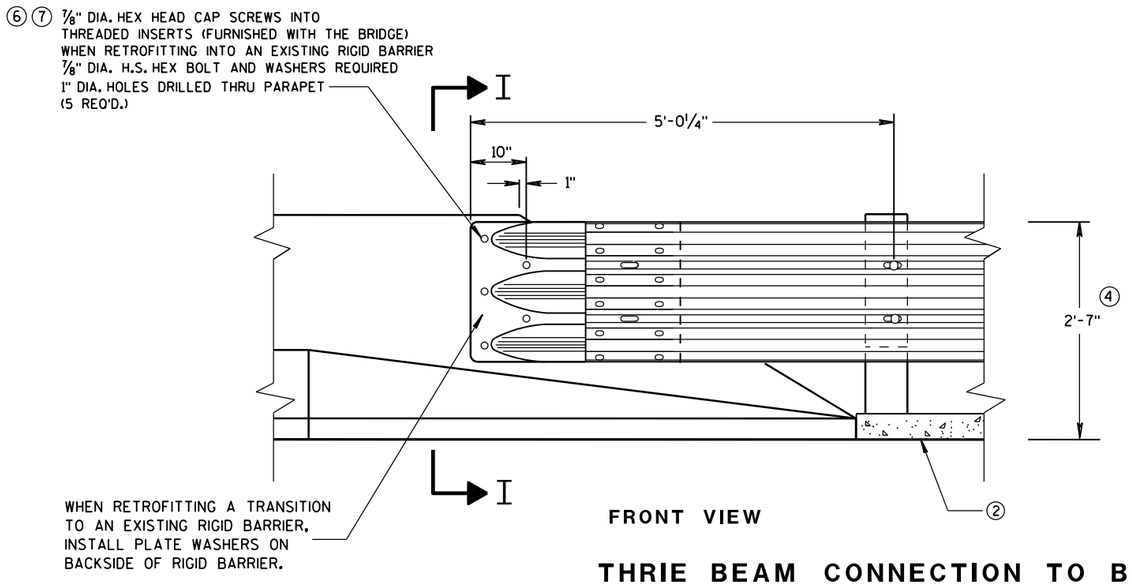
④ TOLERANCE FOR TOP OF BEAM IS ± 1".

⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

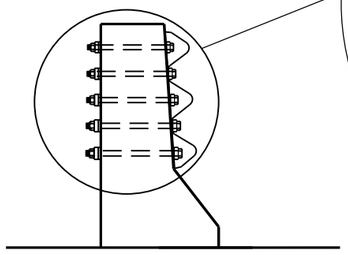
⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. 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.



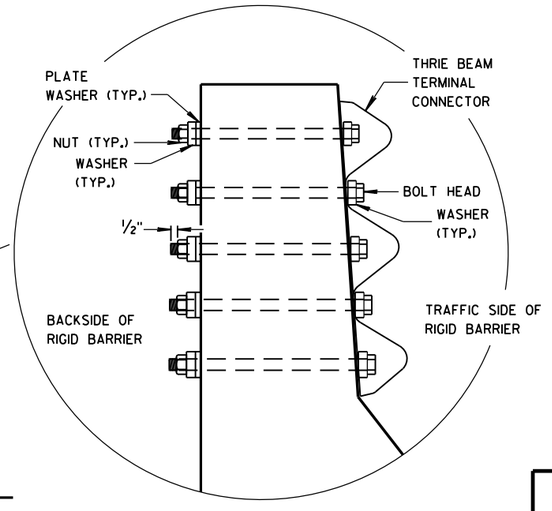
DRILL HOLE LOCATION AND PATTERN
FOR THRIE BEAM CONNECTION



FRONT VIEW



SECTION I-I



THRIE BEAM CONNECTION TO BRIDGE PARAPETS WITH SLOPED ENDS

Sheet 38

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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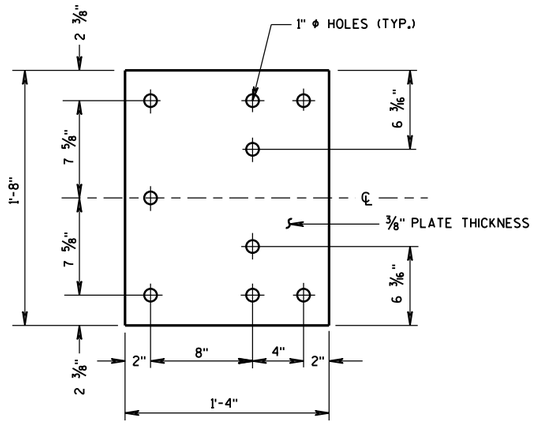
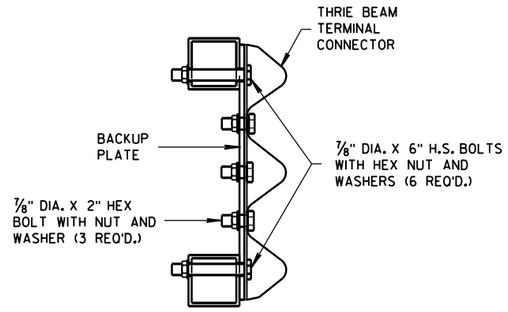
14B45 sheet g: Midwest Guardrail System (MGS) Thrie Beam Transition: Connection to W and F Bridge Parapet



BACK-UP PLATE DETAIL

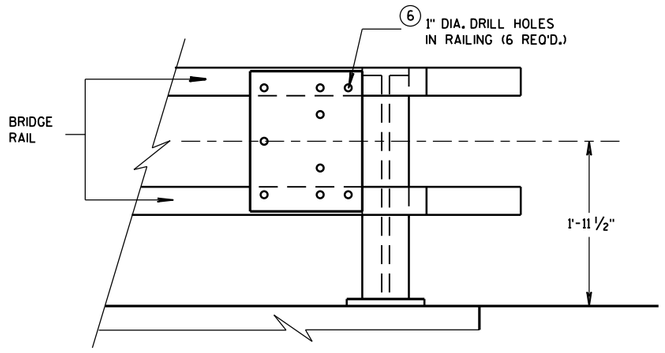


SECTION J-J

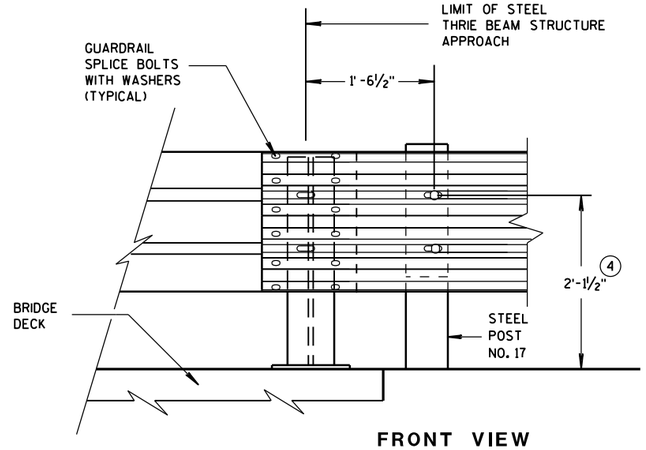
GENERAL NOTES

(4) TOLERANCE FOR TOP OF BEAM IS ± 1".

(6) DRILLING HOLES THROUGH THE PAPRPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

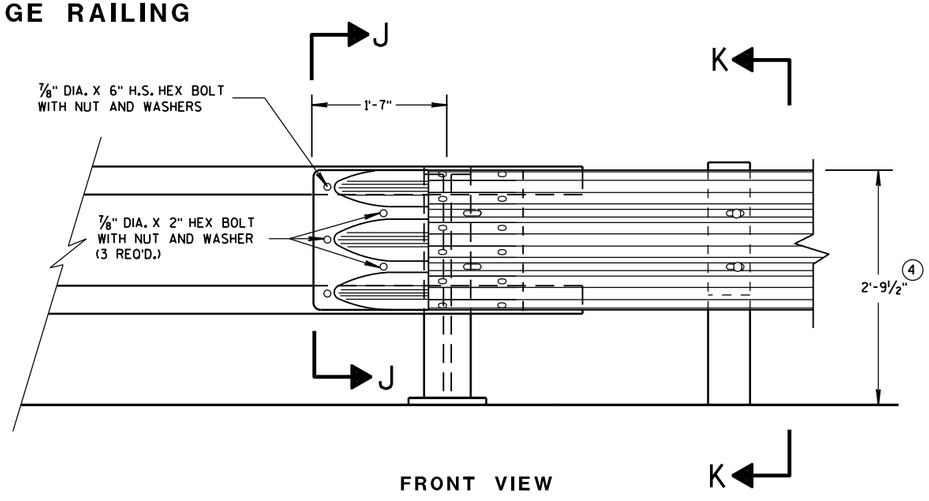


BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING

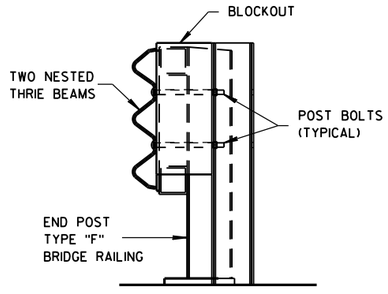


FRONT VIEW

THRIE BEAM CONNECTION TO STEEL RAILING TYPE "W"



FRONT VIEW



SECTION K-K

THRIE BEAM CONNECTION TO TUBULAR RAILING TYPE "F"

Sheet 39

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
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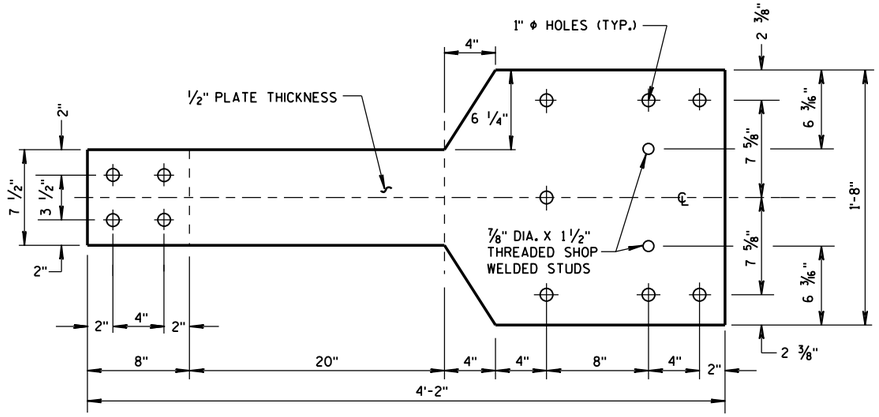
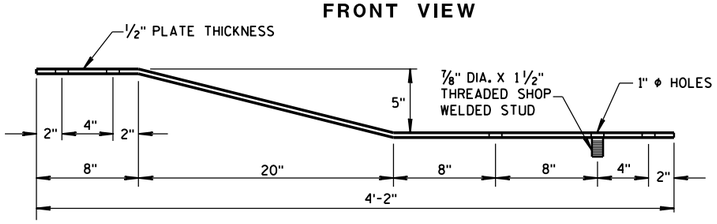
14B45 sheet h: Midwest Guardrail System (MGS) Thrie Beam Transition: Connection to M Bridge Parapet

GENERAL NOTES

(4) TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".

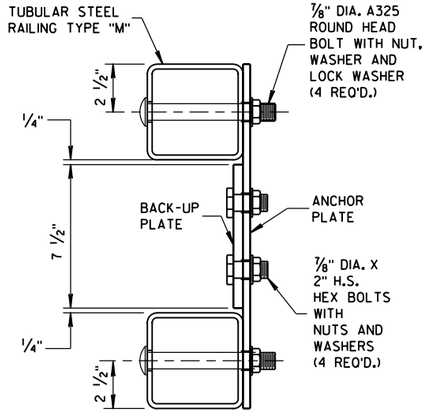


FRONT VIEW

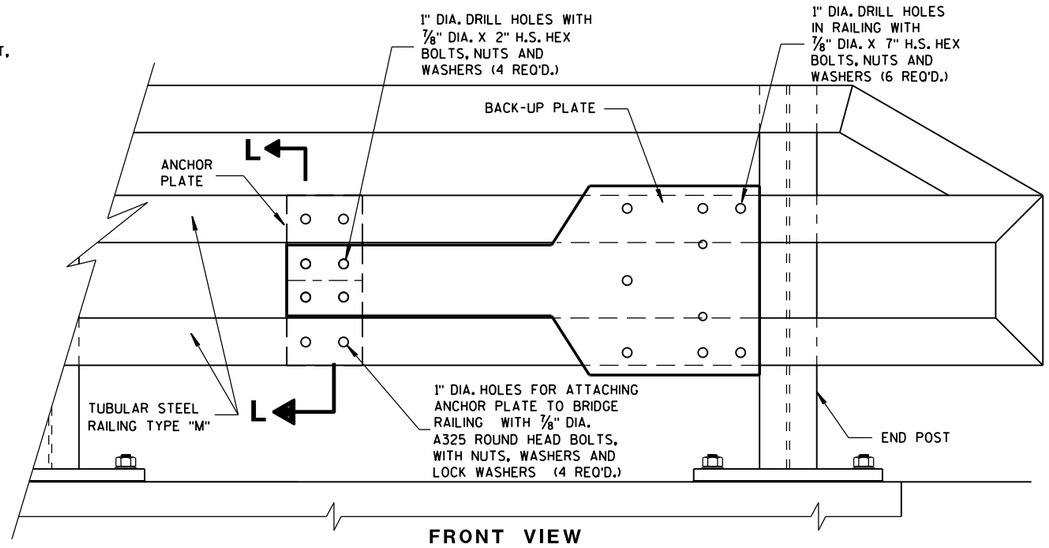


PLAN VIEW

BACK-UP PLATE DETAIL, TYPE "M"

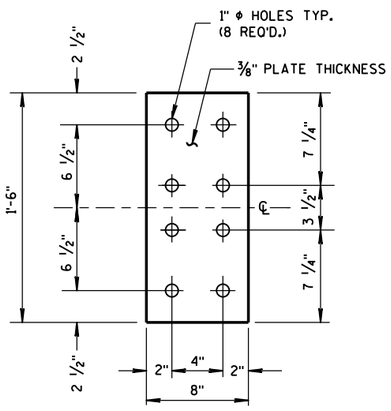


SECTION L-L



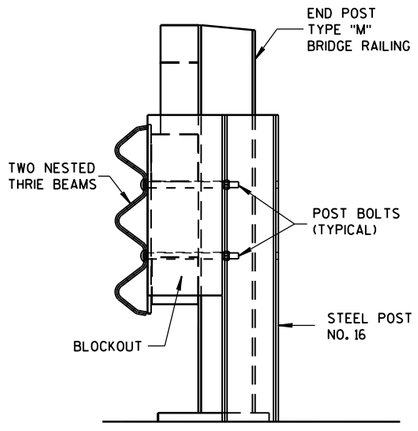
FRONT VIEW

ANCHOR AND BACK-UP PLATE MOUNTING TO BRIDGE RAILING, TYPE "M"

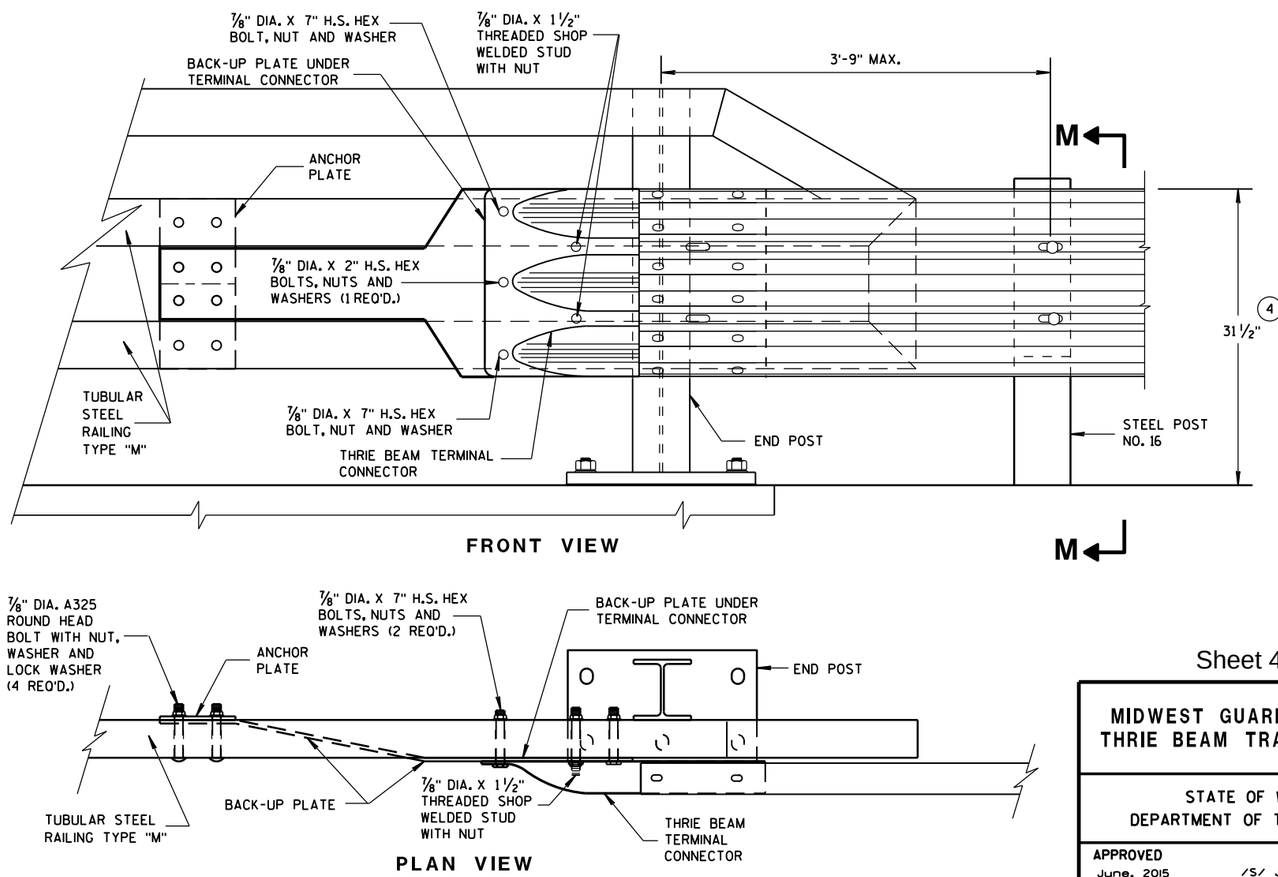


FRONT VIEW

ANCHOR PLATE DETAIL, TYPE "M"



SECTION M-M



FRONT VIEW

PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

Sheet 40

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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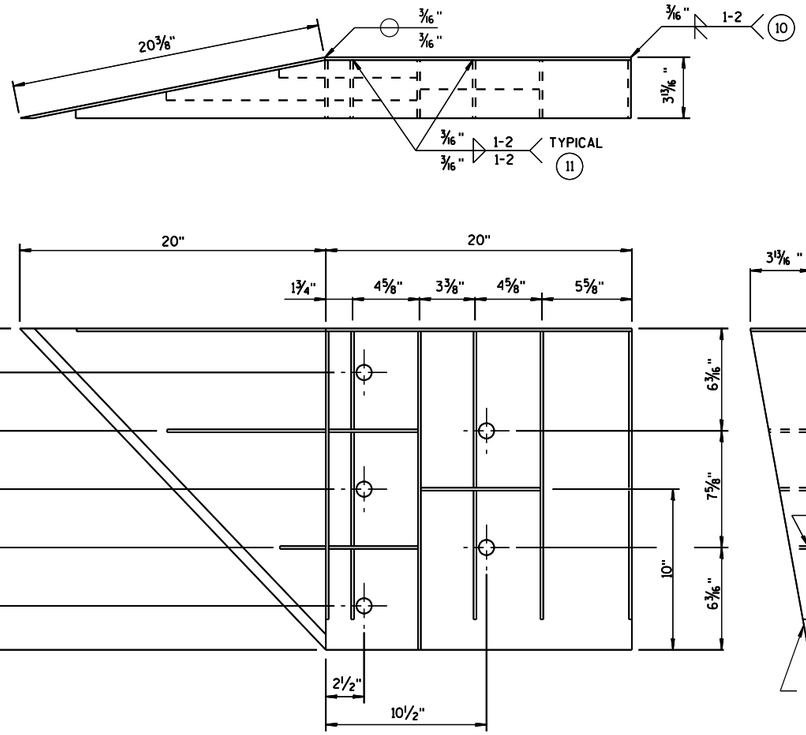
S.D.D. 14 B 45-4h



WELDING INSTRUCTION

(VIEWED FROM BACK SIDE OF PLATE)

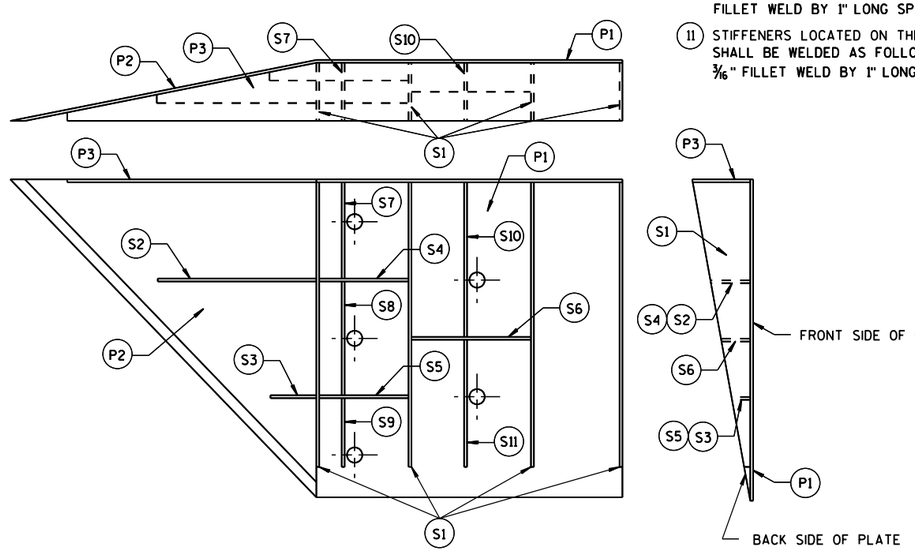


PLATE AND STIFFENER IDENTIFICATION

(VIEWED FROM BACK SIDE OF PLATE)

GENERAL NOTES

COVER PLATE PANELS ARE 3/16" THICK.

ALL STIFFENERS ARE 1/4" THICK.

CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.

FOR GALVANIZED REQUIREMENTS, SEE SECTION 614 OF THE STANDARD SPECIFICATIONS.

ALL HOLE DIAMETERS SHALL BE 1".

FOR OPPOSITE SIDE INSTALLATION MIRROR DRAWINGS.

(10) STIFFENERS LOCATED AT THE OUTSIDE EDGES OF THE COVER PLATES SHALL BE WELDED AS FOLLOWS:
SINGLE BEVEL GROOVE WELD ON EXTERNAL SIDES AND 3/16" FILLET WELD BY 1" LONG SPACED AT 2" ON INTERNAL SIDES.

(11) STIFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:
3/16" FILLET WELD BY 1" LONG SPACED AT 2".

CONNECTOR PLATE DIMENSION (PER ASSEMBLY)

PLATE	QUANTITY	SHAPE	SIZE (A x B x C x D)	THICKNESS
P1	1		20" x 20"	3/16"
P2	1		20" x 20" x 28 9/16"	3/16"
P3	1		39" x 3 5/8" x 20" x 19 5/16"	3/16"
S1	4		18 7/16" x 3 3/8" x 18 3/4"	1/4"
S2	1		10 1/4" x 2 7/16" x 10 3/8" x 1/2"	1/4"
S3	1		3" x 1 1/16" x 3 1/8" x 1/2"	1/4"
S4	1		6 1/8" x 2 7/16"	1/4"
S5	1		6 1/8" x 1 1/16"	1/4"
S6	1		7 3/4" x 1 3/4"	1/4"
S7	1		2 9/16" x 6" x 3 5/8" x 5 7/8"	1/4"
S8	1		1 5/32" x 7 1/2" x 2 1/2" x 7 3/8"	1/4"
S9	1		6 1/16" x 6 3/16" x 1 3/32"	1/4"
S10	1		1 7/8" x 9 7/8" x 3 5/8" x 9 11/16"	1/4"
S11	1		8 1/2" x 8 3/4" x 1 13/16"	1/4"

SINGLE SLOPE CONNECTION PLATE

Sheet 41

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
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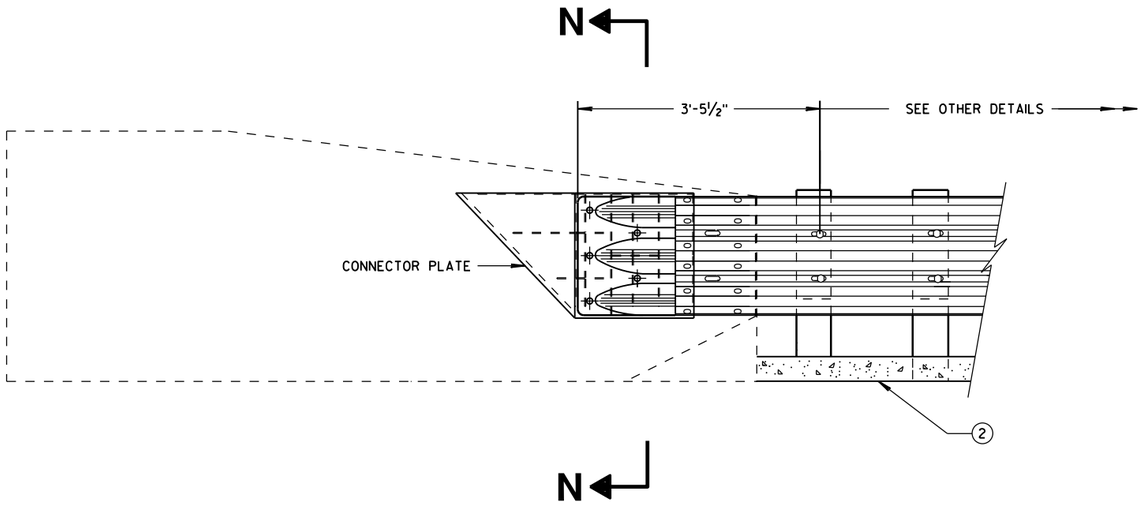
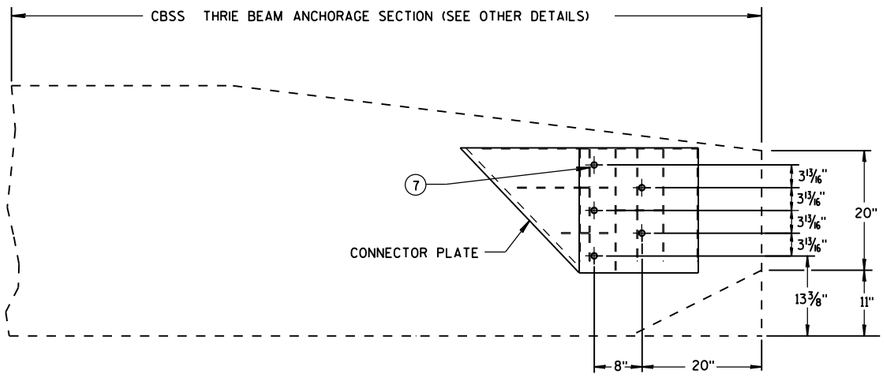
S.D.D. 14 B 45-4i



THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER



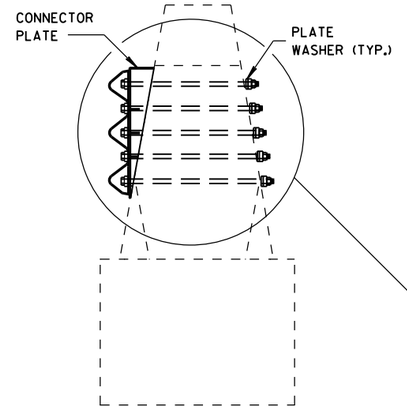
SINGLE SLOPE CONNECTION PLATE PLACEMENT

GENERAL NOTES

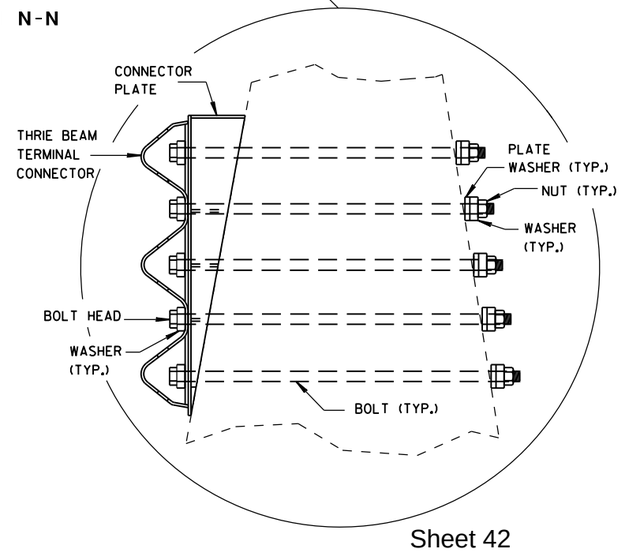
CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

(2) OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.

(7) 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 CONNECTOR PLATE. 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.



SECTION N-N



MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

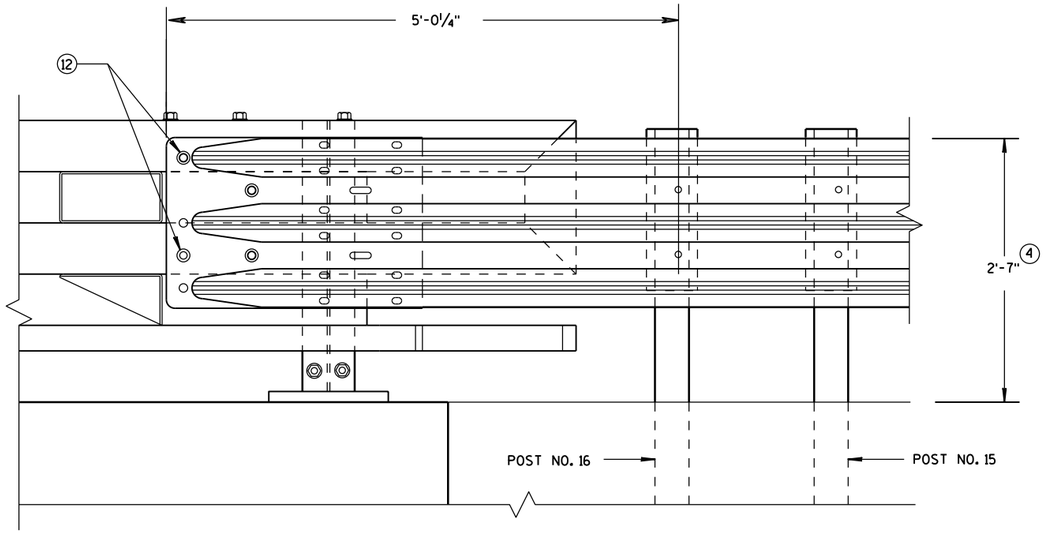
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June, 2015
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

6

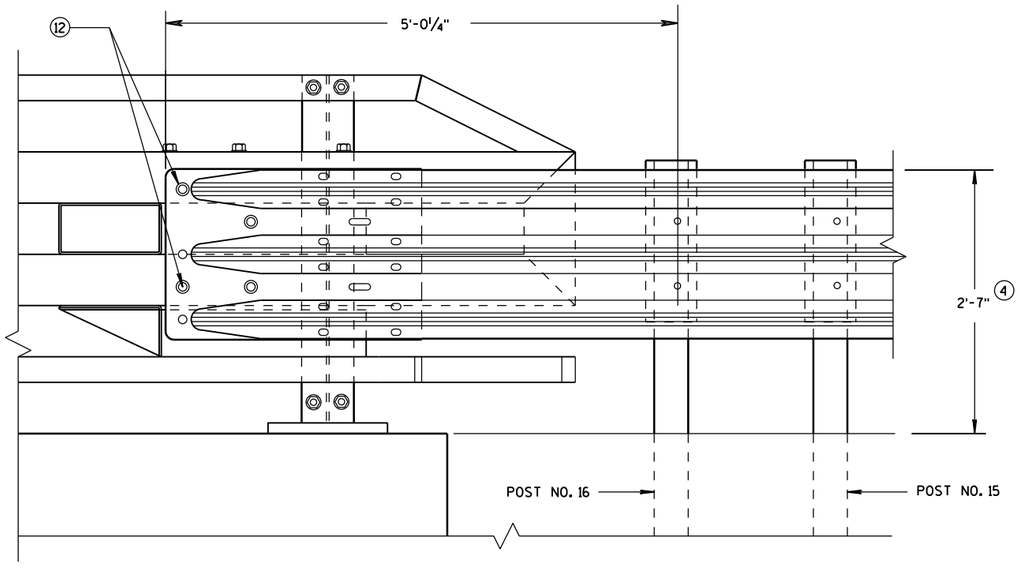
S.D.D. 14 B 45-4j

14B45 sheet k: Midwest Guardrail System (MGS) Thrie Beam Transition: Approach Connection to NY Bridge Parapets



ELEVATION OF DETAIL AT NY3 END POST

THRIE BEAM RAIL ATTACHMENT



ELEVATION OF DETAIL AT NY4 END POST

THRIE BEAM RAIL ATTACHMENT

GENERAL NOTES

(4) TOLERANCE FOR TOP OF BEAM IS ± 1".

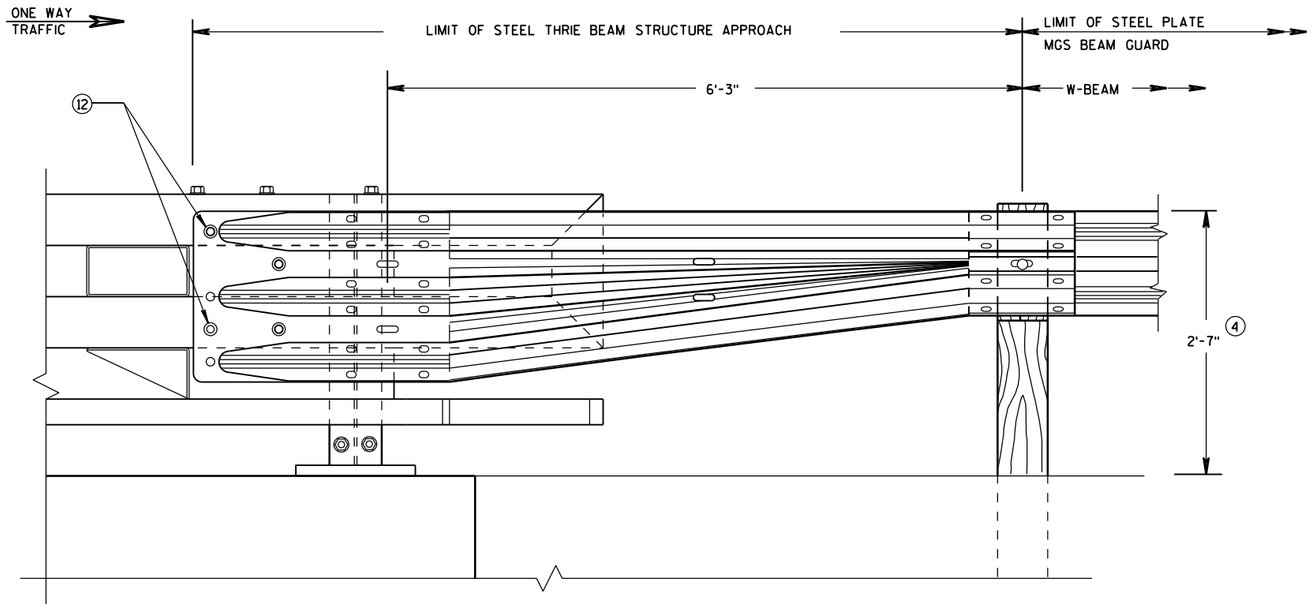
(12) BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND ½-INCH BEYOND NUT.

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June, 2015
DATE
FHWA

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER



FRONT VIEW

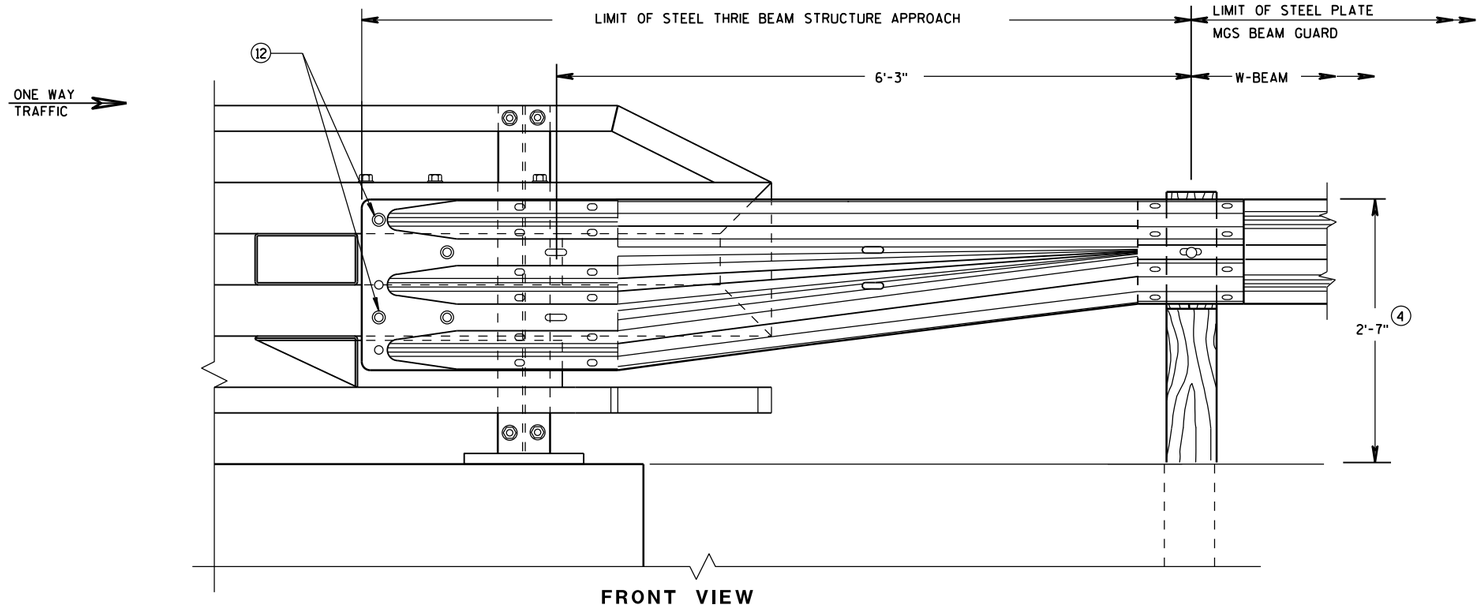
W BEAM TRANSITION AND CONNECTION TO BRIDGE RAILING TYPE "NY3"

(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

GENERAL NOTES

(4) TOLERANCE FOR TOP OF BEAM IS ± 1".

(12) 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 CONNECTOR PLATE. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND ½-INCH BEYOND NUT.



FRONT VIEW

W BEAM TRANSITION AND CONNECTION TO BRIDGE RAILING TYPE "NY4"

(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

Sheet 44

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

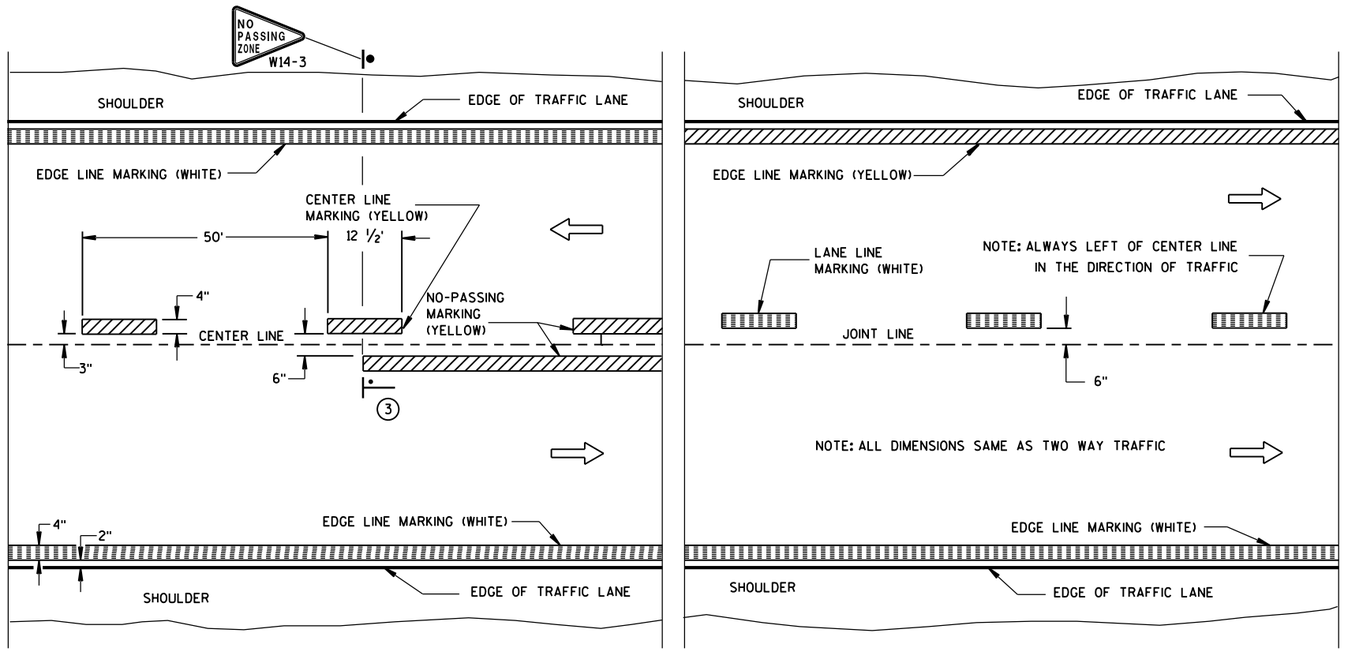
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June, 2015
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

6

S.D.D. 14 B 45-4L

15C8 sheet a: Pavement Marking (Mainline)



TWO WAY TRAFFIC

ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING

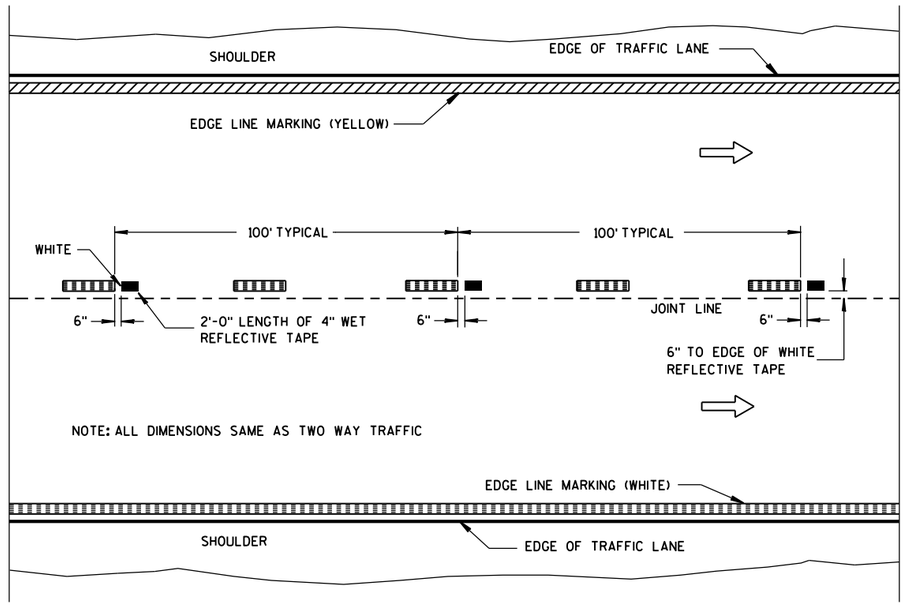
GENERAL NOTES

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

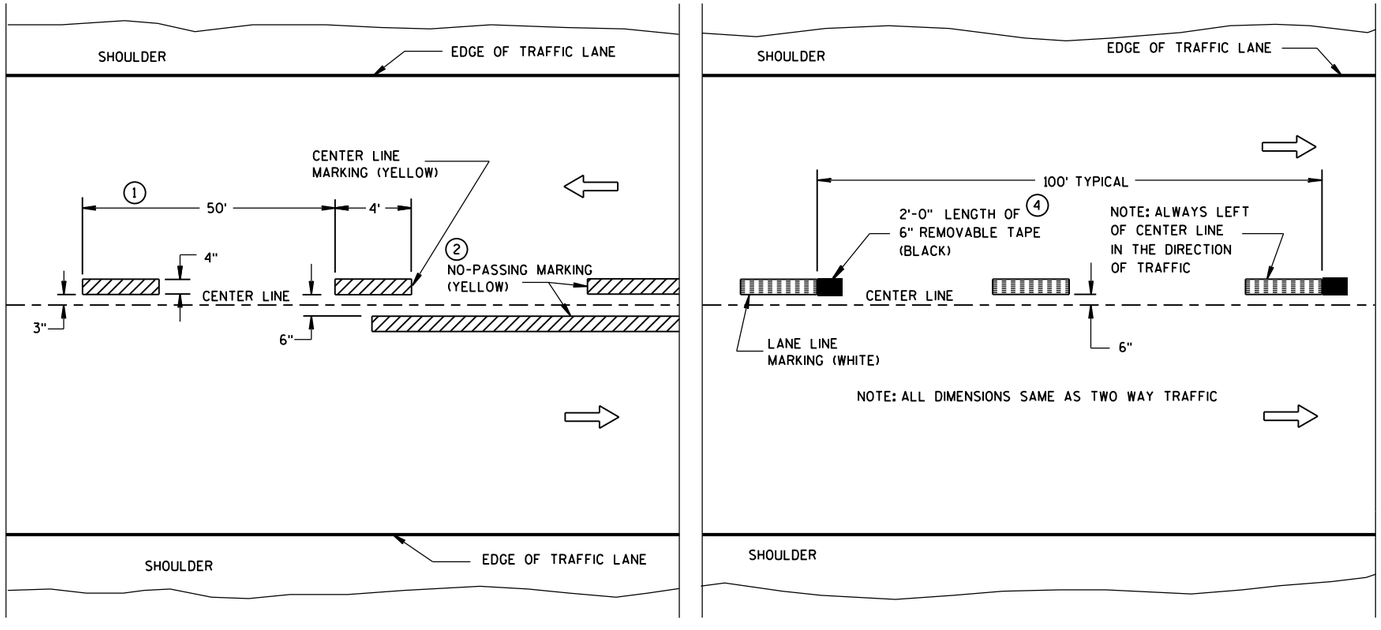
1. HALF CYCLE LENGTHS (25'±) WITH 2' MINIMUM STRIPE LENGTHS SHALL BE PROVIDED ON ROADWAYS (INCLUDING TEMPORARY TRAVELED WAYS) WITH REVERSE CURVATURE, CURVATURE OF OVER 5 DEGREES OR WHEN DIRECTED BY THE ENGINEER TO MARK UNUSUAL ALIGNMENT OF THE TRAVELED WAY.
2. NO PASSING ZONE TEMPORARY PAVEMENT MARKING 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



TWO WAY TRAFFIC

ONE WAY TRAFFIC

TEMPORARY (INTERMEDIATE) PAVEMENT MARKING

(SHOWS CYCLE FOR TEMPORARY CENTER LINE OR TEMPORARY LANE LINE MARKING)

LEGEND

"T" MARKING

POST MOUNTED SIGN

Sheet 45

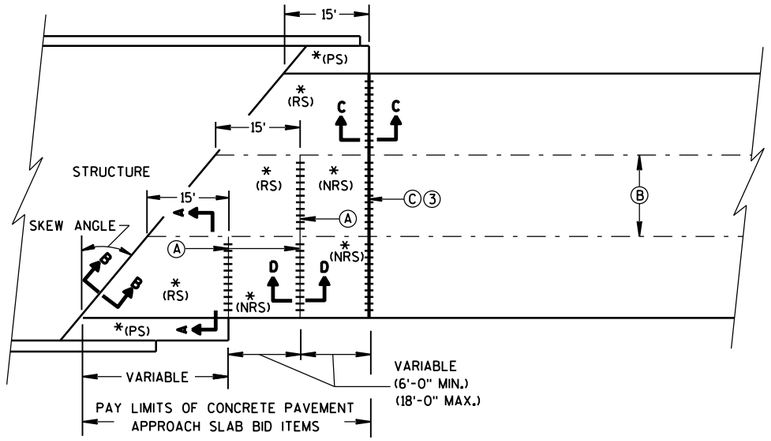
PAVEMENT MARKING (MAINLINE)
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED 5-13-2013 DATE /S/ Travis Feltes STATE TRAFFIC ENGINEER FHWA

6

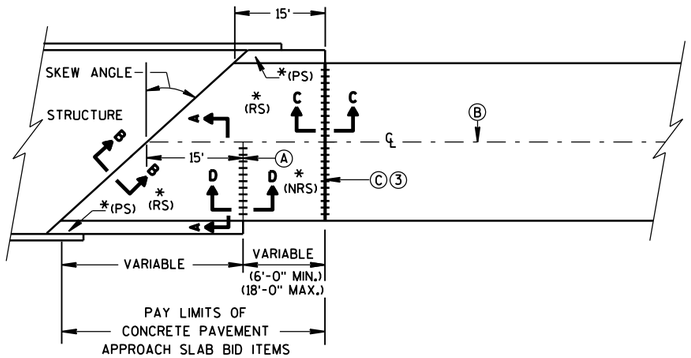
6

S.D.D. 15 C 8-16a

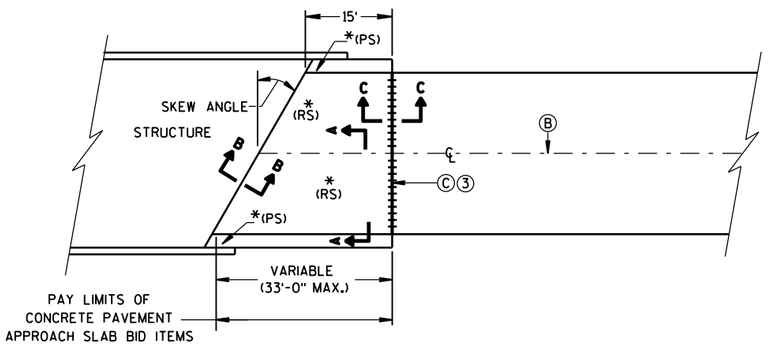
S.D.D. 15 C 8-16a



SKEWED APPROACH
(PAVEMENT MORE THAN 2 LANES)



SKEWS >20°
(PAVEMENT WIDTH ≤30')

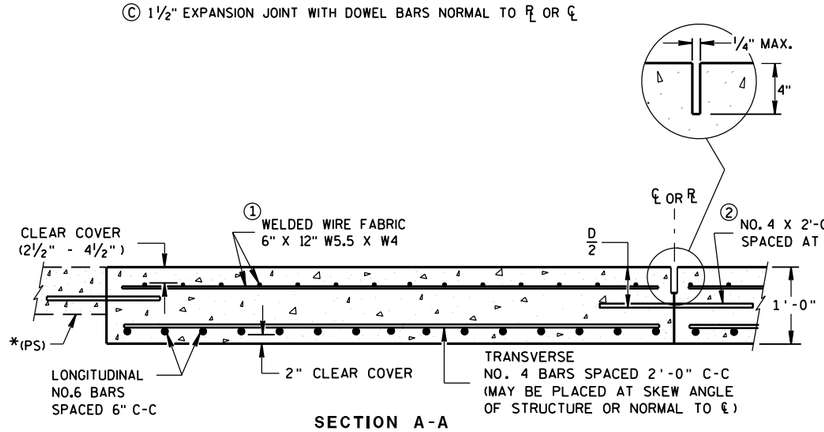


SKEWS ≤20°
(PAVEMENT WIDTH ≤30')
APPROACH SLAB AND ADJACENT PAVEMENT

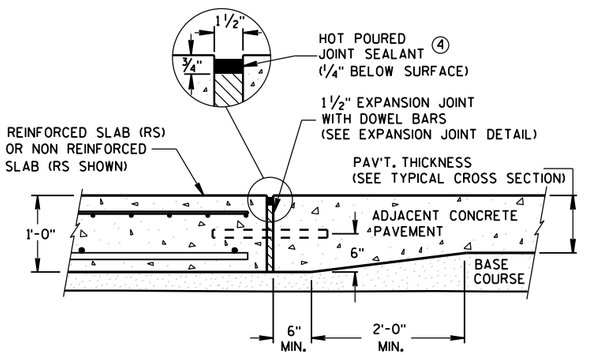
*(RS) = REINFORCED CONCRETE SLAB
*(PS) = PAVED CONCRETE SHOULDER OR CONCRETE DRAINAGE SLAB
(SEE DETAILS ELSEWHERE IN THE PLAN)
*(NRS) = NON-REINFORCED CONCRETE SLAB

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

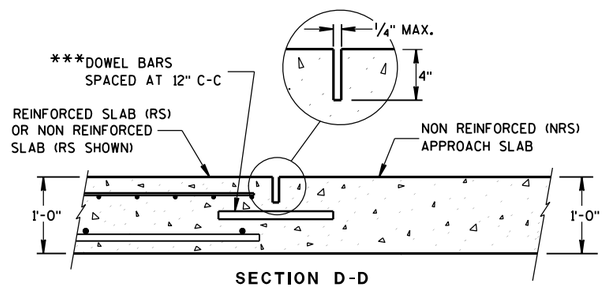
Ⓐ STANDARD CONTRACTION JOINT NORMAL TO ℄ OR ℄
Ⓑ STANDARD LONGITUDINAL JOINT WITH TIE BARS.
Ⓒ 1½" EXPANSION JOINT WITH DOWEL BARS NORMAL TO ℄ OR ℄



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.

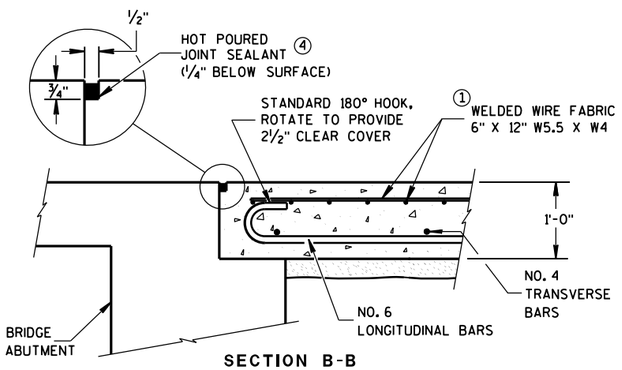
① THE CONTRACTOR MAY USE NO. 4 BARS SPACED AT 2'-0" C-C IN BOTH THE LONGITUDINAL AND TRANSVERSE DIRECTIONS FOR TOP REINFORCEMENT AS AN ALTERNATIVE TO THE WELDED WIRE FABRIC.

② THE CONTRACTOR MAY OMIT TIE BARS BETWEEN REINFORCED SLABS WHERE SLAB REINFORCEMENT BARS EXTEND ACROSS THE CENTERLINE OR REFERENCE LINE.

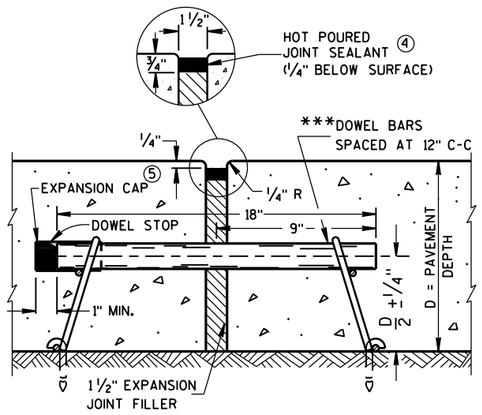
③ DO NOT CONSTRUCT AN EXPANSION JOINT OR INSTALL DOWEL BARS WHEN ABUTTING AN HMA PAVEMENT.

④ USE A JOINT SEALANT MEETING THE REQUIREMENTS OF ASTM D6690.

⑤ 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
DATE
FHWA

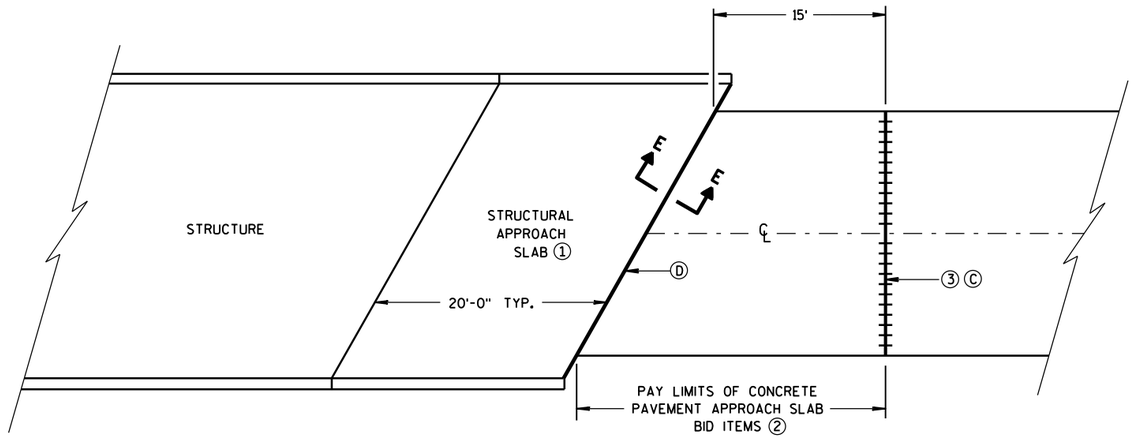
/S/ Peter Kemp, P.E.
PAVEMENT SUPERVISOR

6

S.D.D. 13 B 2-8a

6

S.D.D. 13 B 2-8a



GENERAL NOTES

ALL PROJECTS THAT INVOLVE A STRUCTURAL APPROACH SLAB WILL ALSO HAVE A CONCRETE PAVEMENT APPROACH SLAB.

① SEE BRIDGE PLAN.

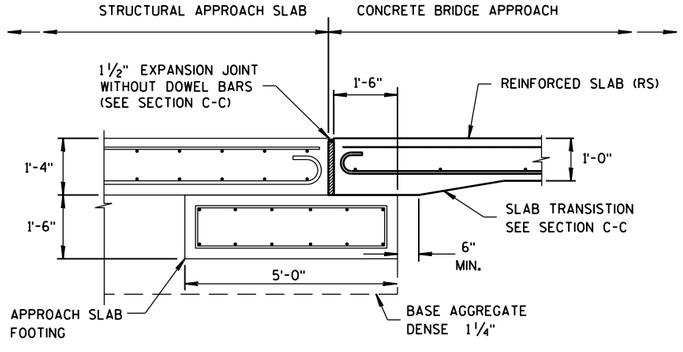
② CONFORM TO SHEET 13 B 2(A) FOR CONCRETE PAVEMENT APPROACH SLAB DETAILS.

③ DO NOT CONSTRUCT AN EXPANSION JOINT OR INSTALL DOWEL BARS WHEN ABUTTING AN HMA PAVEMENT.

Ⓒ 1½" EXPANSION JOINT WITH DOWEL BARS NORMAL TO ℄ OR ℄

Ⓓ 1½" EXPANSION JOINT (NO DOWELS)

BRIDGE APPROACHES



SECTION E-E

FOOTING DETAIL

STRUCTURAL APPROACH SLAB TO CONCRETE BRIDGE APPROACH

STRUCTURAL APPROACH SLAB AND CONCRETE PAVEMENT APPROACH SLAB

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

June, 2015 — DATE

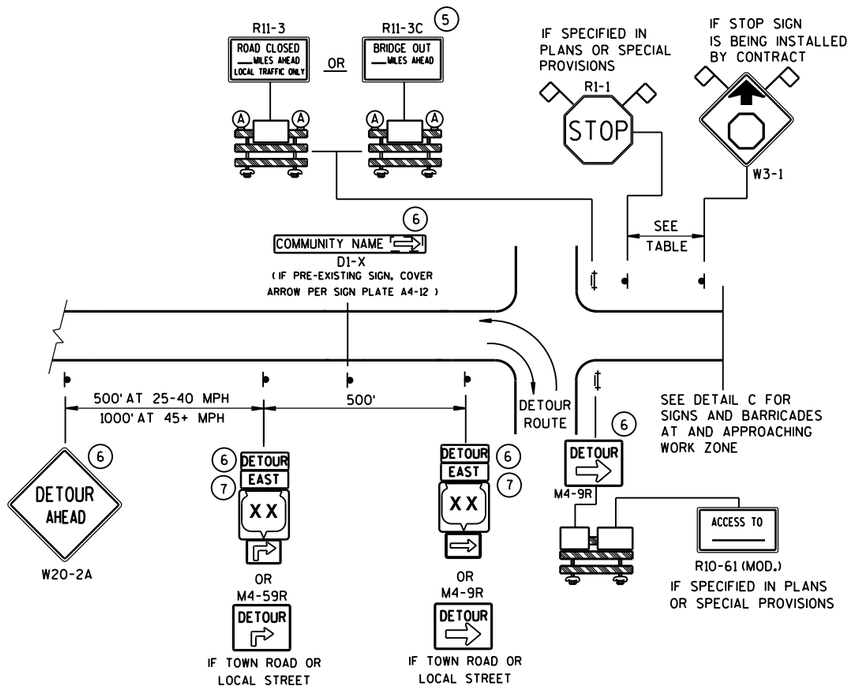
/S/ Peter Kemp, P.E. — PAVEMENT SUPERVISOR

FHWA

6

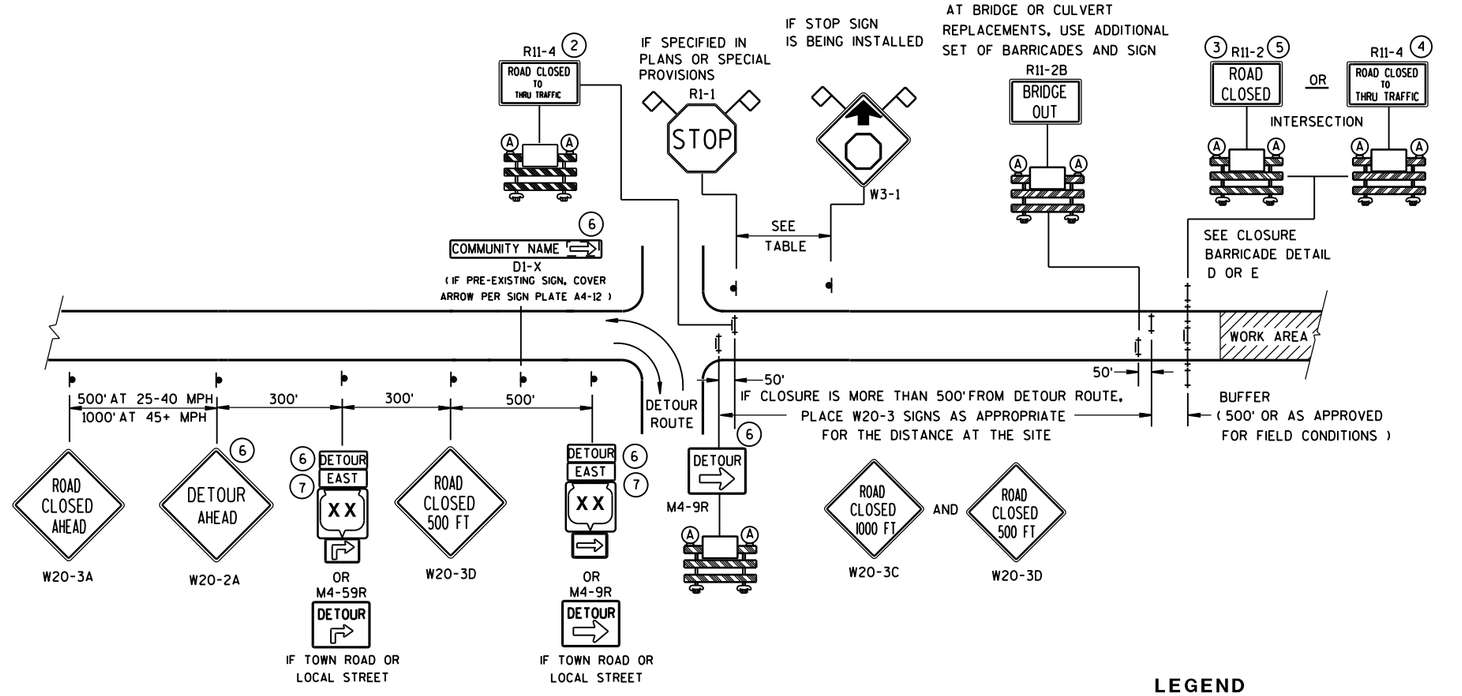
S.D.D. 13 B 2-8b

15C2 sheet a: Barricades and Signs for Mainline Closures



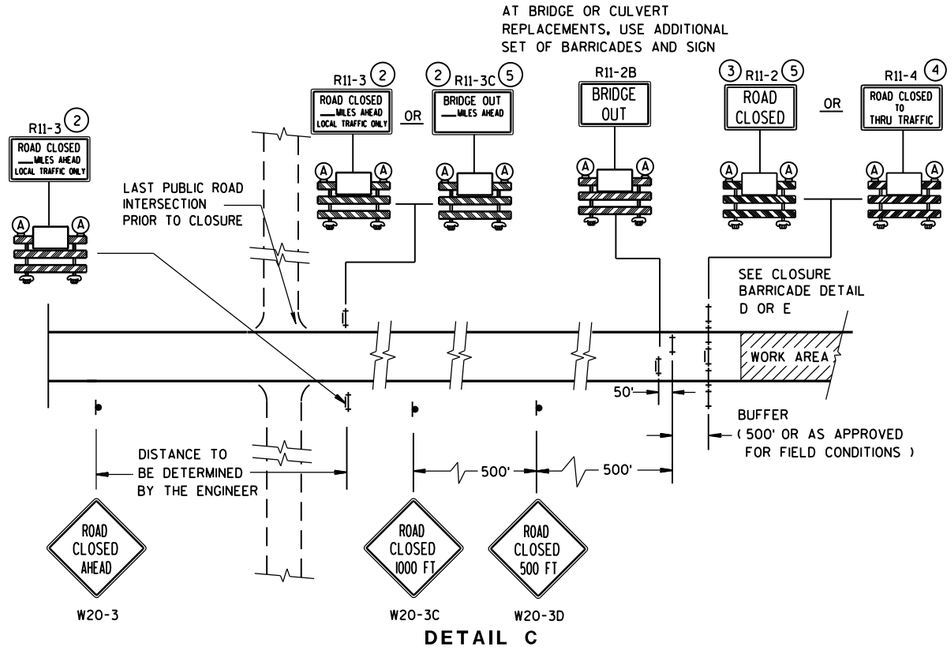
DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR

WORK ZONE GREATER THAN ½ MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)



DETAIL B
MAINLINE CLOSURE WITH POSTED DETOUR

WORK ZONE LESS THAN ½ MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)



DETAIL C
MAINLINE CLOSURE, NO POSTED DETOUR

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

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

LEGEND

- SIGN ON PERMANENT SUPPORT
- TYPE III BARRICADE
- TYPE III BARRICADE WITH ATTACHED SIGN
- (A) TYPE "A" WARNING LIGHT (FLASHING)
- WORK AREA
- DETOUR / EAST — M4-8 / M3-X
- XX — M1-4; COUNTY XX — M1-5A; XX — M1-6
- M05-1 OR M06-1
- FLAGS, 16" X 16" MIN., (ORANGE)

Sheet 48

BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

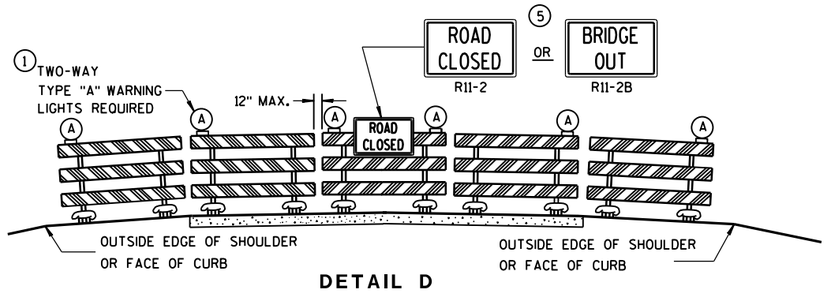
Sept. 2015 — DATE
/S/ Peter Amakobe Atepe — STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER
FHWA

6

S.D.D. 15 C 2-6a

6

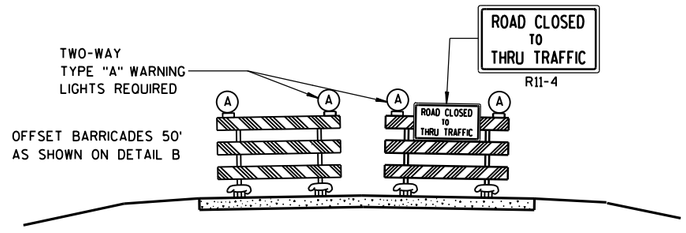
S.D.D. 15 C 2-6a



DETAIL D

ROAD CLOSURE BARRICADE DETAIL

APPROACH VIEW



DETAIL E

LANE CLOSURE BARRICADE DETAIL

APPROACH VIEW

SEE SDD 15C2-SHEET "**a**" FOR LEGEND

GENERAL NOTES

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

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

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

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

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

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

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

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

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

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:
- R11-2 SHALL BE 48" X 30".
- R11-3, R11-4 AND R10-61 SHALL BE 60" X 30".
- M4-9 SHALL BE 30" X 24".
- M3-X SHALL BE 24" X 12". (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS.)
- M4-8 SHALL BE 24" X 12". (30" X 15" IF NEEDED TO MATCH EXISTING SIGNS.)
- M1-4, M1-5A, AND M1-6 SHALL BE 24" X 24". (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS.)
- M05-1 AND M06-1 SHALL BE 21" X 21". (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS.)
- D1-X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.
- R1-1 SHALL BE 36" X 36".

(1) TWO WARNING LIGHTS SHALL BE PROVIDED ON THE CENTER BARRICADE AND A MINIMUM OF ONE WARNING LIGHT SHALL BE PROVIDED ON EACH OF THE OTHER BARRICADES WITHIN THE ROADWAY LIMITS. SPACING OF THE WARNING LIGHTS SHALL BE UNIFORM TO THE EDGE OF ROADWAY AS SHOWN (APPROX. 8-FOOT LIGHT SPACING).

(2) THESE SIGNS AND BARRICADES ARE NOT REQUIRED IF ROAD CLOSURE BEGINS AT INTERSECTION.

(3) FOR ROAD CLOSURE WITHOUT LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL D.

(4) FOR ROAD CLOSURE WITH LOCAL ACCESS TO PROJECT, SEE LANE CLOSURE BARRICADE DETAIL E.

(5) FOR BRIDGE OR CULVERT REPLACEMENTS, SUBSTITUTE "BRIDGE OUT" INSTEAD OF "ROAD CLOSED" ON R11-2 AND R11-3 SIGNS.

(6) INSTALL DETOUR AND COMMUNITY GUIDE SIGNS AND ARROWS ONLY IF SPECIFIED IN THE CONTRACT. IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. MODIFY EXISTING SIGNS WHERE POSSIBLE. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. IF DETOUR SIGNS ARE BEING INSTALLED BY OTHERS, PLACE THE CONTRACTED TRAFFIC CONTROL SIGNS TO ALLOW FOR PLACEMENT OF ALL WARNING, DETOUR AND GUIDE SIGNS AS SHOWN.

(7) "EAST" CARDINAL DIRECTION MARKERS AND RIGHT TURN ARROWS ARE SHOWN. USE OTHER CARDINAL DIRECTIONS AND ARROWS AS APPROPRIATE.

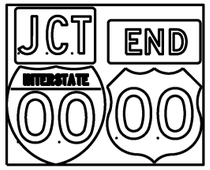
BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

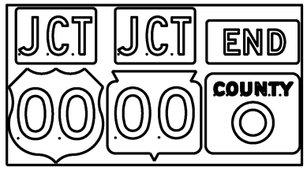
Sept. 2015 — DATE
/S/ Peter Amakobe Atepe — STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER
FHWA

TYPICAL ASSEMBLIES

J1-1

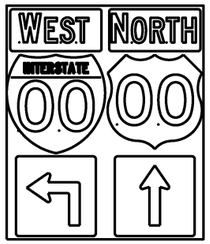


J1-2

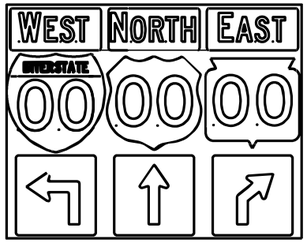


J1-3

J2-1



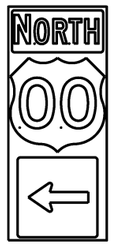
J2-2



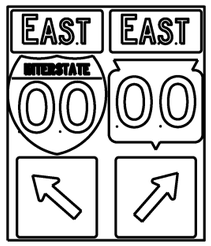
J2-3

JV

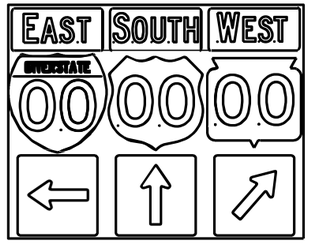
(Typical Vertical J-Assembly
See Note 10 and 11)



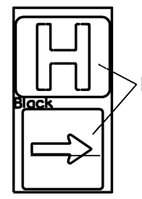
J3-1



J3-2

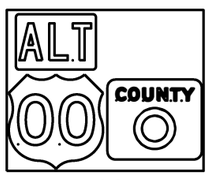


J3-3

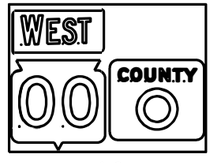


JH-1

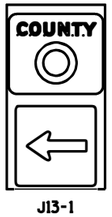
J4-1



J4-2



J4-2



J13-1

J12-1

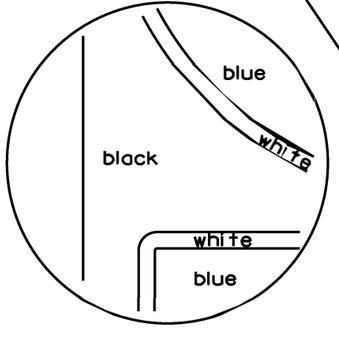
J32-1

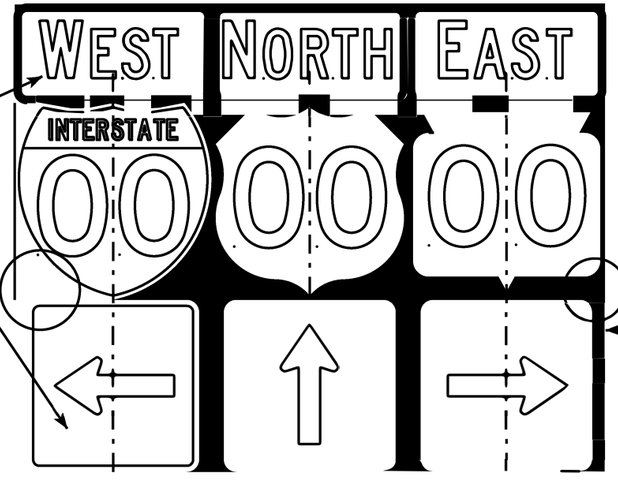
J33-1

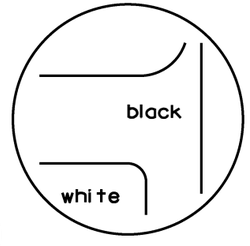
J23-1

J22-1

[blue background with interstate]







[black background]

NOTES

1. Signs are Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - Black Non-reflective
   Message - see Note 5
3. Message Series - See Note 5
4. Corners shall be square or rounded if base material is plywood. If base material is metal the corners shall be rounded.
5. The colors and message spacing on each marker shall be according to the applicable route marker panel specifications.
6. Certain marker heads require the component pieces to be the same color. As an example, all the components used with an M1-1 Interstate marker shall be blue.
7. Single panel j-assemblies shall only be used with route marker shields that are same size. If the route marker shields are different size use multiple piece component.
8. Route assemblies that have 24 inch route shields and have dimensions greater than 48 inches (both vertical and horizontal) shall have one horizontal splice between the arrows and route shields. Vertical splices shall not be used on route assemblies with a horizontal dimension of 144 inches or less. The contractor shall not use more than one vertical joint per sign and the joint shall be between route shields.
9. Route assemblies that have 36 inch shields and have dimensions greater than 48 inchs (both vertical and horizontal) shall have two horizontal splices. One horizontal splice shall be between the cardinal direction and route shields and the other horizontal splice shall be between the arrows and route shields. Vertical splices shall not be used on route assemblies with a horizontal dimension of 144 or less. The contractor shall not use more than one vertical joint per sign and the joint shall be between route shields.
10. All Vertical J Assemblies are given a Sign Code of JV
11. For JV Assemblies that have a mixture of Interstate and non Interstate shields, arrows and cardinals shall be white on blue.

ROUTE MARKERS & COMPONENTS
IN TYPICAL ASSEMBLIES

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R. Rauch
for State Traffic Engineer

DATE 2/06/14 PLATE NO. A2-1S.8

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE		SHEET NO: 50	E

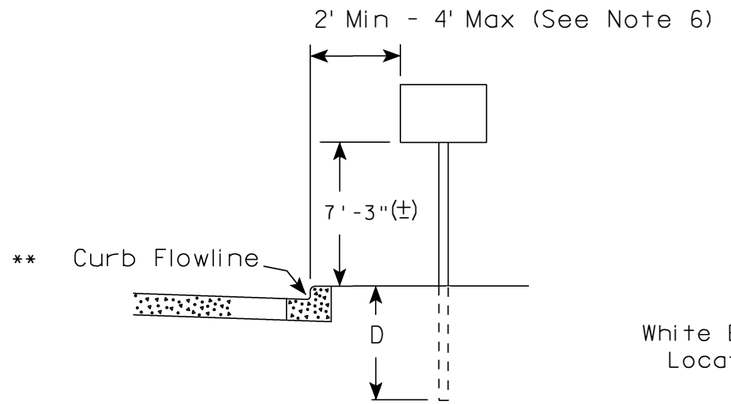
FILE NAME : C:\CAEFiles\Projects\tr_stdplate\A21S.DGN PLOT DATE : 06-FEB-2014 14:10 PLOT BY : mscsja PLOT NAME :

WISDOT/CADDS SHEET 42

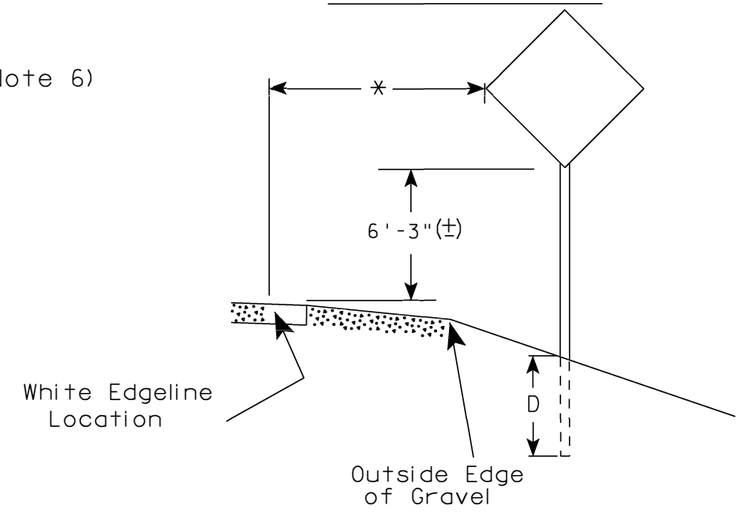
7

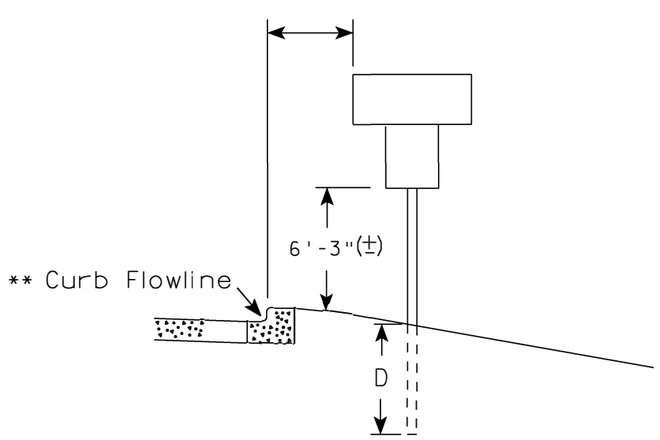
7

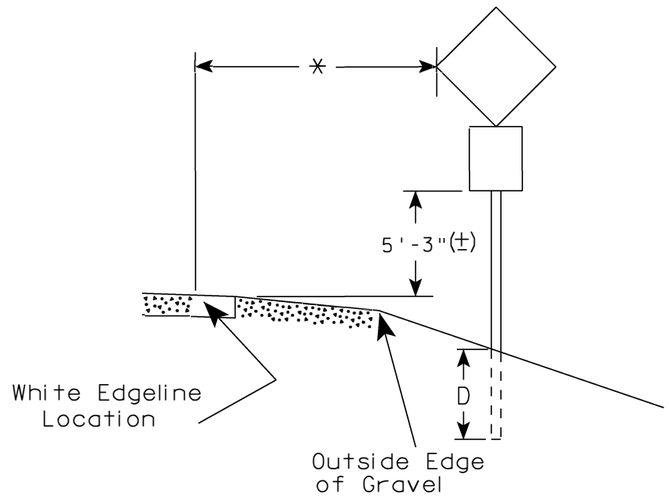
URBAN AREA



RURAL AREA (See Note 2)







** The existence of curb and gutter does not in itself mandate the vertical clearance illustrated. That height is typically measured where there is sidewalk adjacent to the roadway or parking is permitted. In the absence of sidewalk vertical clearance is measured from the top of the curb. Offset of signs is measured from the flow line.

* 6 feet from edge of a paved shoulder or 12 feet from the edge of pavement (edge line location) or 2 feet from outside edge of gravel, whichever is greater unless directed by project engineer.

POST EMBEDMENT DEPTH

Area of Sign Installation (Sq. Ft.)	D (Min)
20 or Less	4'
Greater than 20	5'

GENERAL NOTES

1. Signs wider than 4 feet or 20 sq.ft or larger, shall be mounted on multiple posts. Refer to plate A4-4.
2. If signs are mounted on barrier wall, see A4-10 sign plate.
3. For expressways and freeways, mounting height is 7'- 3" (±) or 6'-3" (±) depending upon existence of a sub-sign.
4. Minimum mounting height for J assemblies (A2-1S) is 7'-3" (±) or 6'-3" (±) per urban or rural detail respectively.
5. Minimum mounting height for signs mounted on traffic signal poles is 5'- 3" (±).
6. Offset distance shall be consistent with existing signs or consistent throughout length of project.
7. The (±) tolerance for mounting height is 3 inches.
8. Folding signs shall be mounted at a height of 5'-3" (±) or as directd by the Engineer.
9. The Double Arrow sign (W12-1) shall be mounted at a height of 2'-3" (±). The Chevron sign (W1-8), Roundabout Chevron panel (R6-4B), Enhanced Reference Markers, Clearance Markers (W5-52), Mile Markers (D10 series), In Road Object Markers (W5-54) & End of Road Markers (W5-56) shall be mounted at a height of 4'-3" (±).

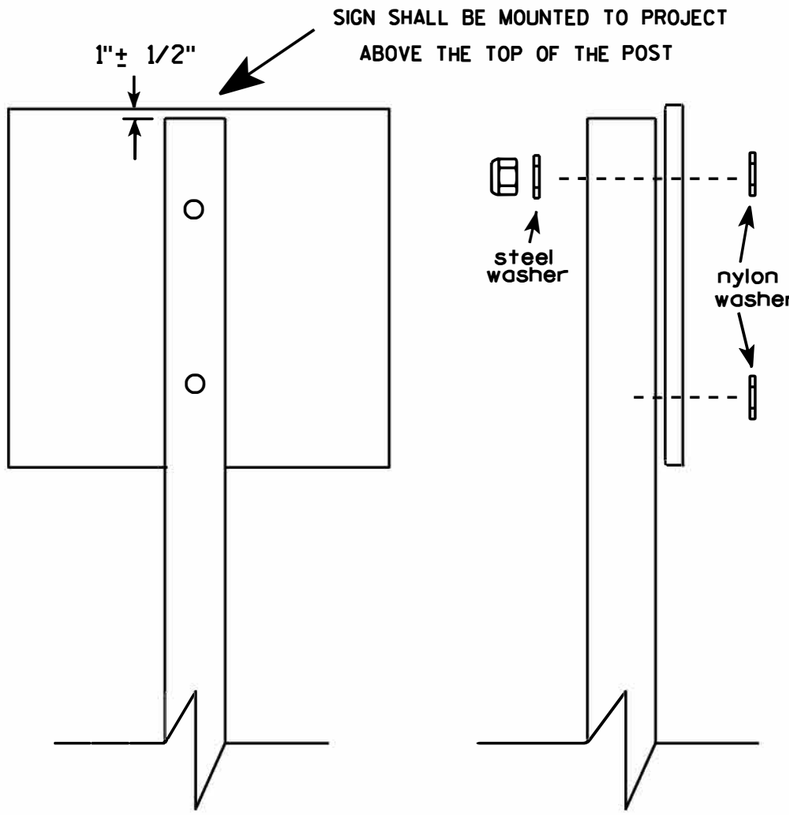
TYPICAL INSTALLATION OF PERMANENT TYPE II SIGNS ON SINGLE POSTS

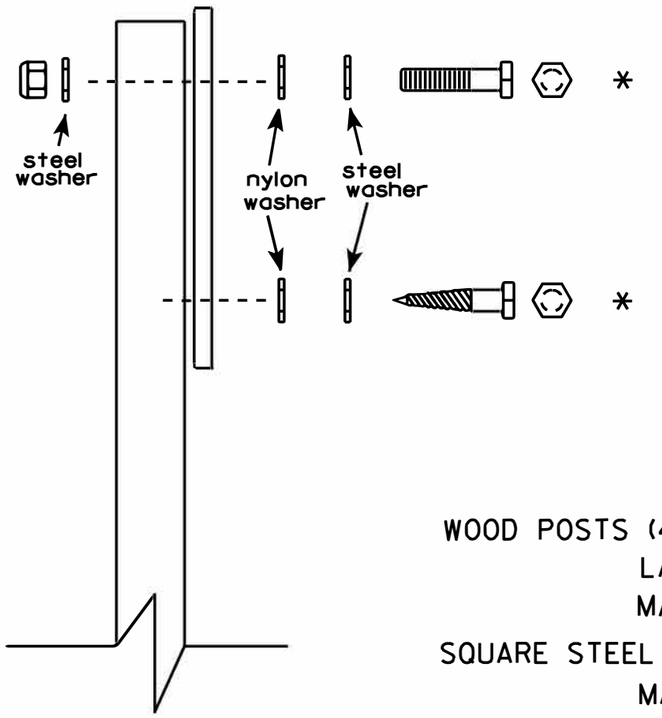
WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 7/23/15 PLATE NO. A4-3.20

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE		SHEET NO: 51	E





Nuts, bolts and lags used for mounting signs shall have hexagonal heads and shall be either :

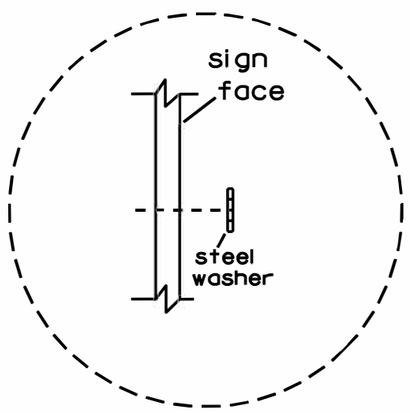
a. Hot dip galvanized in accordance with ASTM Designation: A 153, Class D, or SC 3
b. Electro-galvanized in accordance with ASTM Designation : B 633, TYPE III, SC 3.

Threads on bolts and nuts shall be manufactured with sufficient allowance for the cadmium plate or galvanized coating to permit the nuts to run freely on the bolts.

WOOD POSTS (4" x 4" or 4" x 6")
LAG SCREWS - 3/8" X 3"
MACHINE BOLTS - 5/16" X 6-1/2" or 7" Length w/ nuts

SQUARE STEEL POSTS (2" x 2")
MACHINE BOLTS - 3/8" X 3-1/4" Length w/ nuts
RIVETS - 9/32 " (6605-9-6) BULB-TITE, TRI-FOLD, ALUMINUM BODY/MANDREL
O.D. FLANGE .720-.765 INCH, GRIP RANGE .042-.375 INCH

WASHERS (ALL POSTS) -
1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL
1-1/4" O.D. X 3/8" I.D. X .080 NYLON for all Type H signs.



Washer Placement when Sign Has Other Than Type H or Type F Face

* Two different fastening systems are shown for illustration purposes. On any individual sign, either one or the other system shall be used. Actual number of fasteners per sign varies with the sign area, but normally there are two. For a single post installation, all signs greater than 9 sq. ft. require the use of 3 fasteners.

ATTACHMENT OF SIGNS TO POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
For State Traffic Engineer

DATE 3/23/10 PLATE NO. A4-8.7

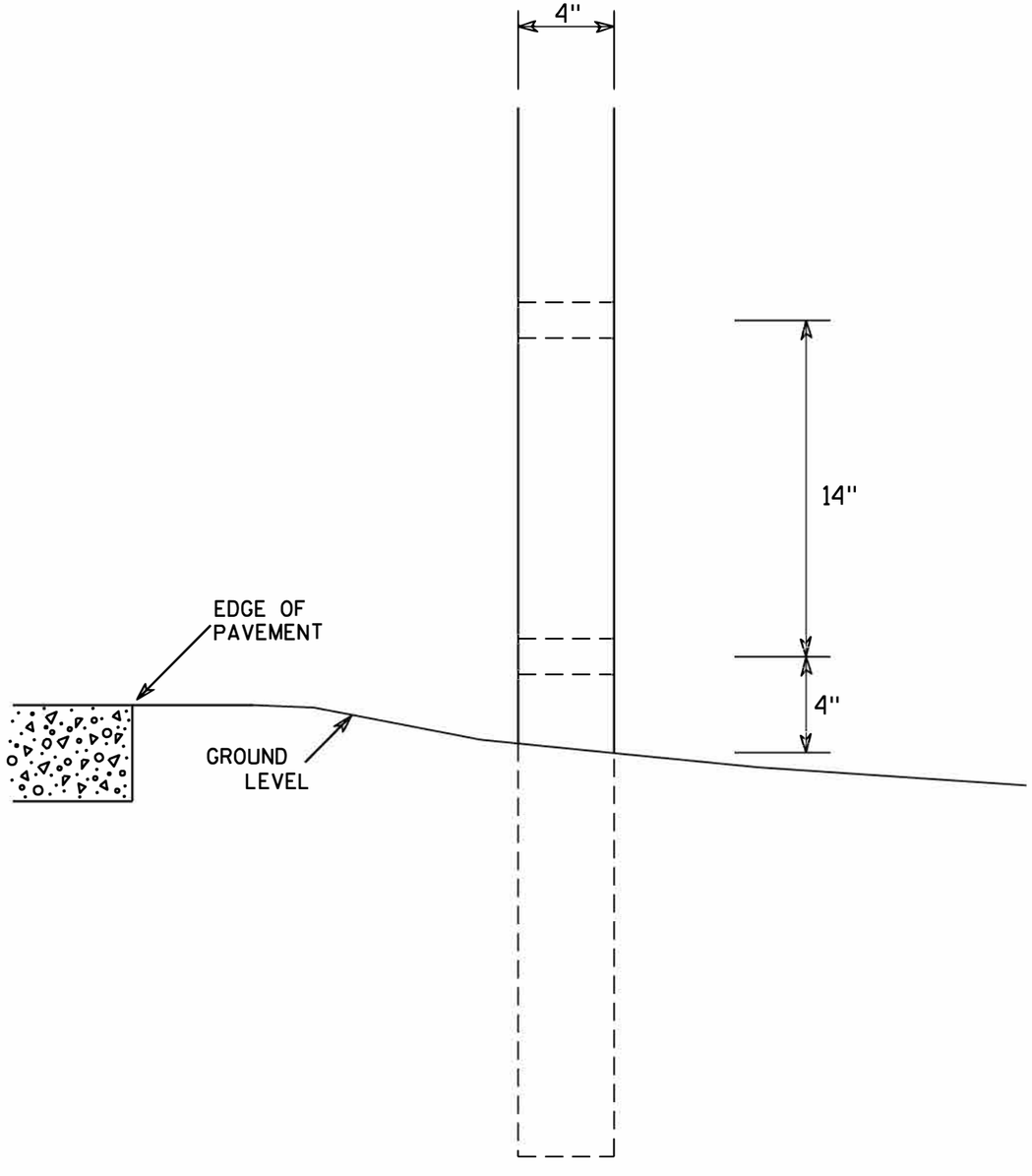
PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE		SHEET NO: 52	E

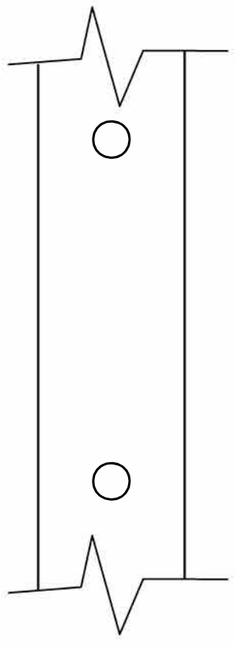
FILE NAME : C:\Users\PROJECTS\tr_stdplate\A48.DGN PLOT DATE : 23-MAR-2010 10:15 PLOT BY : ditjph

WISDOT/CADDS SHEET 42

7

7





SIDE VIEW

GENERAL NOTES

1. All 4 x 6 Wood Posts shall be modified by having two 1½" diameter holes drilled perpendicular to the roadway centerline.

7

7

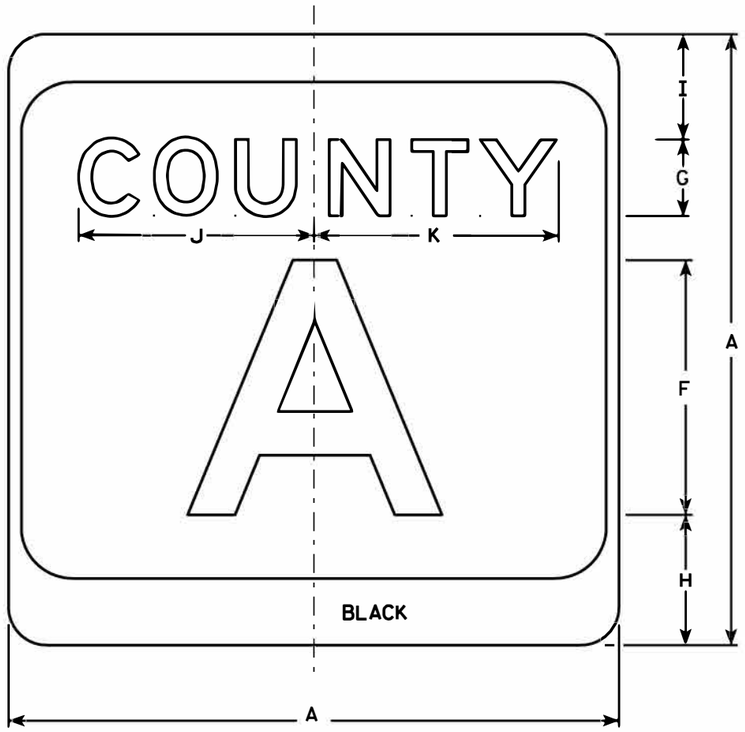
4 X 6 WOOD POST MODIFICATIONS

WISCONSIN DEPT OF TRANSPORTATION

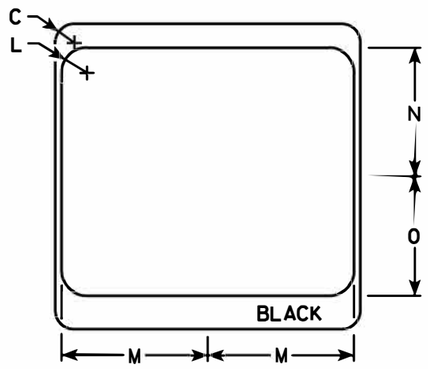
APPROVED Chester J Spagg for State Traffic Engineer

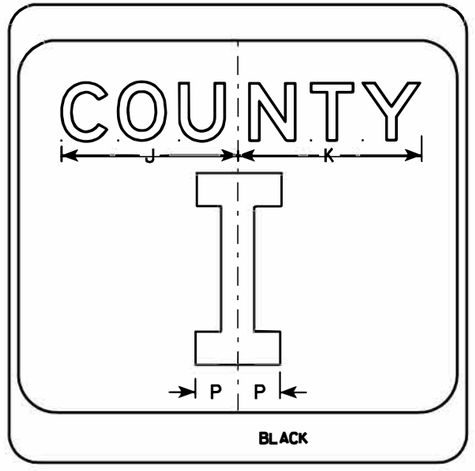
DATE 3/27/97 PLATE NO. A4-11.2

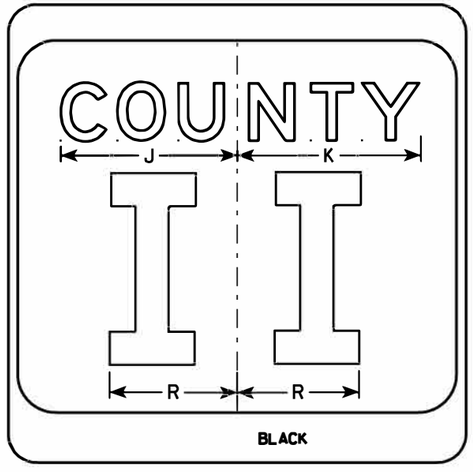
PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE		SHEET NO: 53	E



M1-5A







NOTES

1. Sign is Type II - see Note 7 - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - White & Black - See Note 7
   Message - Black
3. Message Series - see Note 5
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
5. Message Series E for 1 letter.
   Message Series D for 2 letters unless message is too big then Series C.
   Message Series C for 3 letters unless message is too big then Series B.
6. Substitute appropriate letters & optically center to achieve proper balance.
7. Permanent Signs
   Background - Type H Reflective
   Detour or temporary Signs
   Background - Reflective

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2	24		1 1/2			10	3	5 1/8	4 1/8	9 1/4	9 5/8	2	11 1/2	10 1/8	9 3/8	2 1/4		6 5/8									4.0
3	36		2 1/4			16	4	7 5/8	5 5/8	12 1/4	12 7/8	3	17 1/8	15 1/4	14	3 3/8		10									9.0
4	36		2 1/4			16	4	7 5/8	5 5/8	12 1/4	12 7/8	3	17 1/8	15 1/4	14	3 3/8		10									9.0
5	36		2 1/4			16	4	7 5/8	5 5/8	12 1/4	12 7/8	3	17 1/8	15 1/4	14	3 3/8		10									9.0

CTH MARKER
M1-5A FOR ASSEMBLIES

WISCONSIN DEPT OF TRANSPORTATION

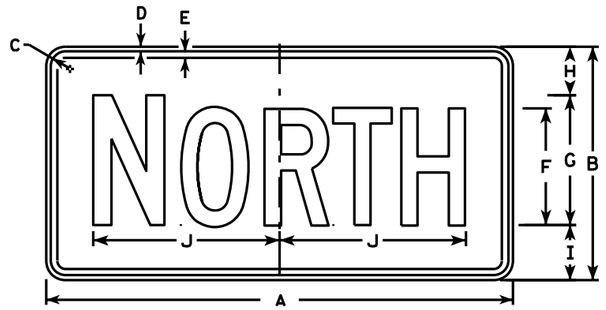
APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 9/27/11 PLATE NO. M1-5A.8

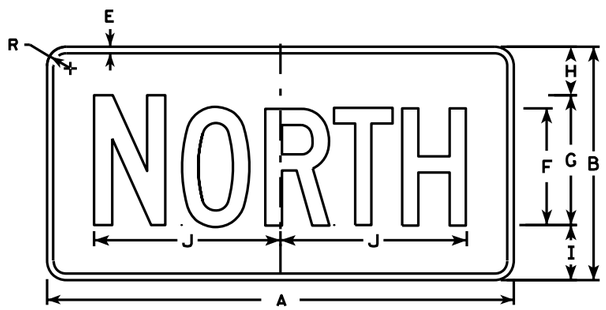
PROJECT NO: 316046 | HWY: CTH N | COUNTY: DANE | SHEET NO: 54 | E

7

FILE NAME : C:\Users\PROJECTS\tr_stdplate\M15A.DGN PLOT DATE : 29-SEP-2011 11:25 PLOT BY : mscsja PLOT NAME : PLOT SCALE : 5.959043:1.000000 WISDOT/CADDS SHEET 42



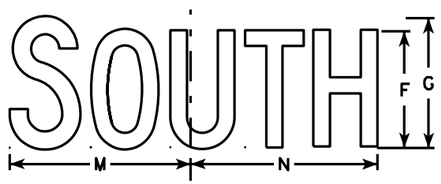
M3-1
MM3-1
MP3-1



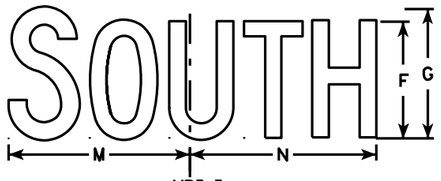
MB3-1
MK3-1
MN3-1

M3-2
MM3-2
MP3-2

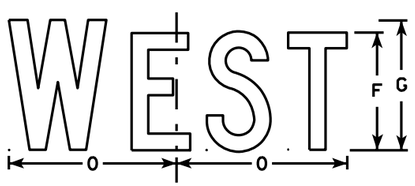
MB3-2
MK3-2
MN3-2



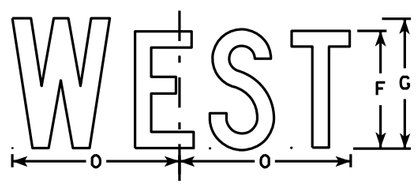
M3-3
MM3-3
MP3-3



MB3-3
MK3-3
MN3-3



M3-4
MM3-4
MP3-4



MB3-4
MK3-4
MN3-4

NOTES

1. All Signs Type II - Type H
2. Color:
   Background - See note 5
   Message - See note 5
3. Message Series - C
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
5. M3-1 thru M3-4 Background - White
   Message - Black
   MB3-1 thru MB3-4 Background - Blue
   Message - White
   MK3-1 thru MK3-4 Background - Green
   Message - White
   MM3-1 thru MM3-4 Background - White
   Message - Green
   MN3-1 thru MN3-4 Background - Brown
   Message - White
   MP3-1 thru MP3-4 Background - White
   Message - Blue
6. Note the first letter of each direction is larger than the remainder of the message.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2	24	12	1 1/8	3/8	3/8	6	7	2 1/4	2 3/4	10 1/4	7 7/8	8 3/8	10 1/4	9 3/4	8 3/4			1 1/2									2.00
3	36	18	1 1/8	3/8	1/2	9	10	3 3/4	4 1/4	14 3/8	12	12 1/8	14	14 1/8	13			1 1/2									4.5
4	36	18	1 1/8	3/8	1/2	9	10	3 3/4	4 1/4	14 3/8	12	12 1/8	14	14 1/8	13			1 1/2									4.5
5	36	18	1 1/8	3/8	1/2	9	10	3 3/4	4 1/4	14 3/8	12	12 1/8	14	14 1/8	13			1 1/2									4.5

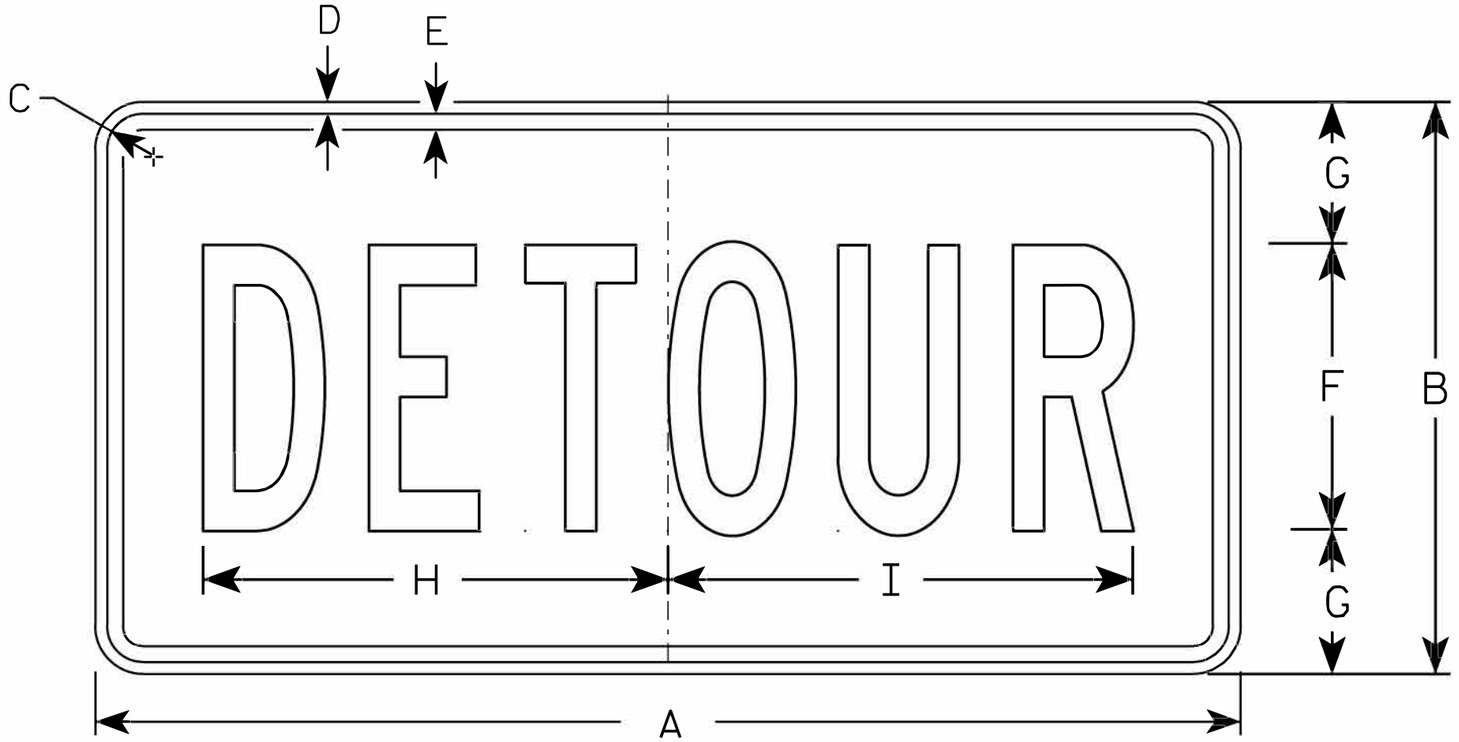
STANDARD SIGNS
M3-1 thur M3-4
SERIES

WISCONSIN DEPT OF TRANSPORTATION

APPROVED 49 Matthew R Rauch for State Traffic Engineer

DATE 10/15/15 PLATE NO. M3-1.14

PROJECT NO: 316046 | HWY: CTH N | COUNTY: DANE | SHEET NO: 55 | E



M4-8

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - Orange
   Message - Black
3. Message Series - B
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2	24	12	1 1/8	3/8	3/8	6	3	10	10 1/4																		2.0
3	36	18	1 1/8	3/8	1/2	9	4 1/2	14 5/8	14 1/2																		4.5
4																											
5																											

STANDARD SIGN
M4-8

WISCONSIN DEPT OF TRANSPORTATION

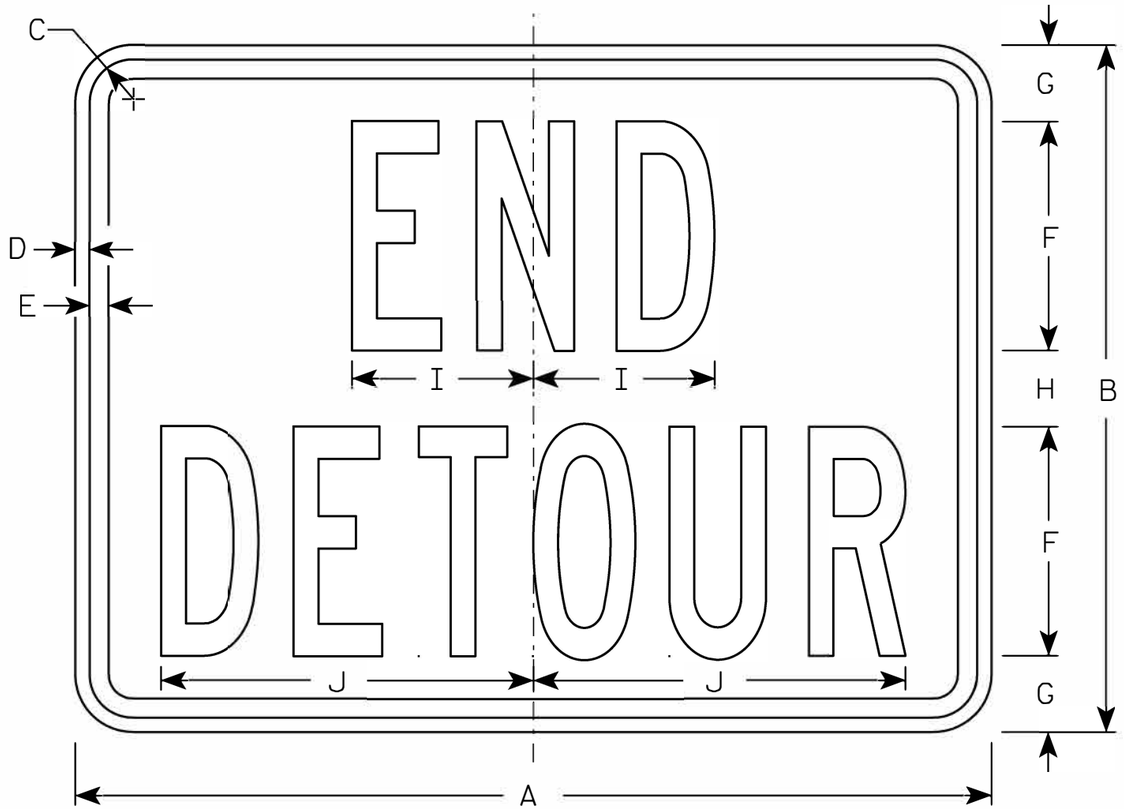
APPROVED Matthew P Rauch
for State Traffic Engineer

DATE 11/10/10 PLATE NO. M4-8.2

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE		SHEET NO: 56	E

FILE NAME : C:\Users\PROJECTS\tr_stdplate\M48.DGN PLOT DATE : 10-NOV-2010 13:18 PLOT BY : ditjph PLOT NAME : PLOT SCALE : 4.767233:1.000000

7



M4-8A

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - Orange
   Message - Black
3. Message Series - B
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2	24	18	1 1/8	3/8	1/2	6	2	2	4 3/4	9 3/4																	3.0
3	30	24	1 1/8	3/8	1/2	8	2 1/2	3	6 3/4	13																	5.0
4																											
5																											

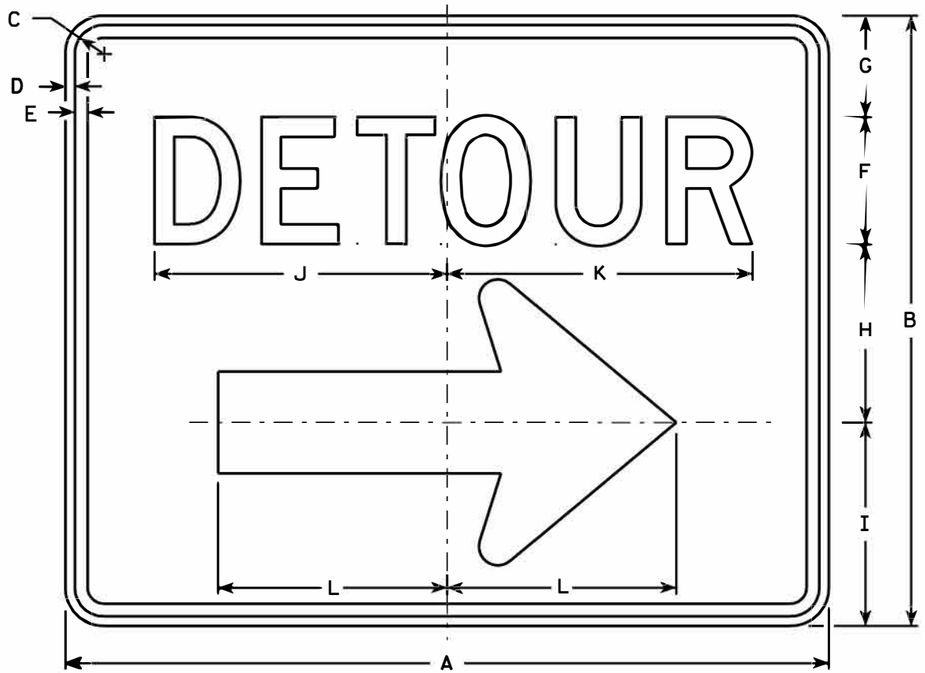
STANDARD SIGN
M4-8A

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 3/9/11 PLATE NO. M4-8A.2

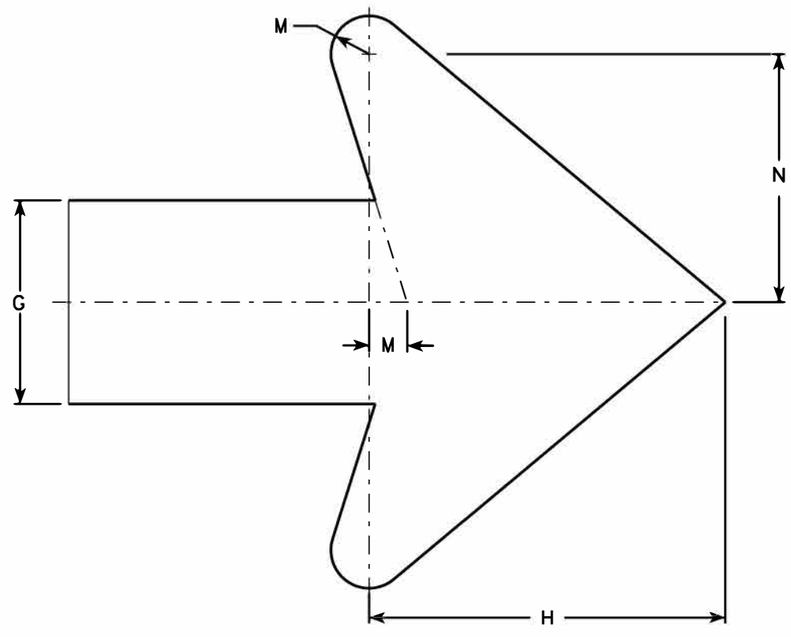
PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE		SHEET NO: 57	E



M4-9R

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - Orange
   Message - Black
3. Message Series - D
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
5. M4-9L is the same as M4-9R except the arrow is reversed.



Arrow Detail

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2	30	24	1 1/8	3/8	1/2	5	4	7	8	11 1/2	12	9	3/4	4 7/8													5.00
3	30	24	1 1/8	3/8	1/2	5	4	7	8	11 1/2	12	9	3/4	4 7/8													5.00
4	48	36	1 3/8	1/2	5/8	8	6	10 1/2	11 5/8	20 5/8	20 1/2	13 1/4	1 1/8	6 7/8													12.0
5	48	36	1 3/8	1/2	5/8	8	6	10 1/2	11 5/8	20 5/8	20 1/2	13 1/4	1 1/8	6 7/8													12.0

STANDARD SIGN
M4-9 R & L

WISCONSIN DEPT OF TRANSPORTATION

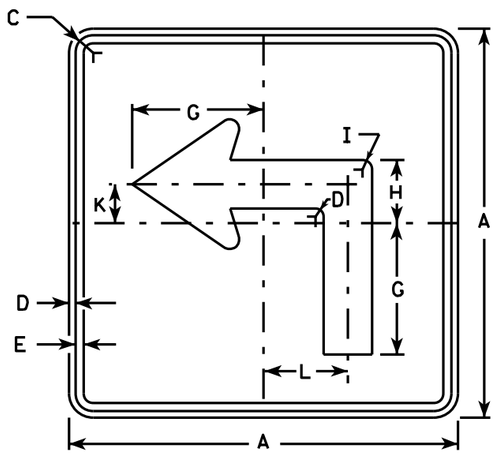
APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 3/9/11 PLATE NO. M4-9R.4

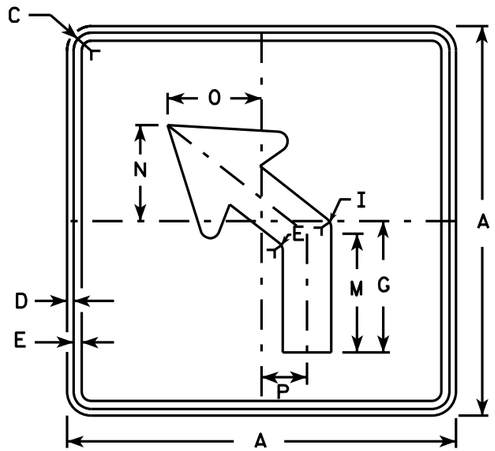
PROJECT NO: 316046 | HWY: CTH N | COUNTY: DANE | SHEET NO: 58 | E

FILE NAME : C:\Users\PROJECTS\tr_stdplate\M49R.DGN PLOT DATE : 09-MAR-2011 11:17 PLOT BY : mscj9h PLOT NAME : PLOT SCALE : 5.959043:1.000000

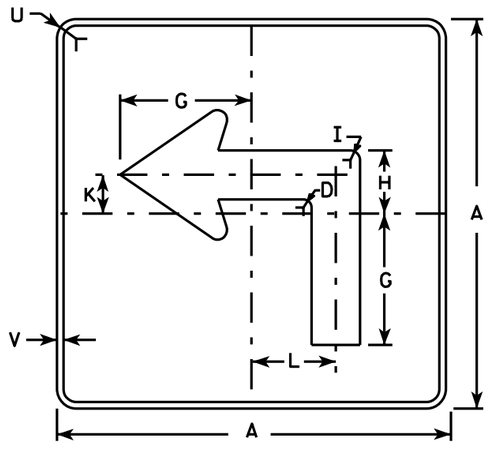
WISDOT/CADDS SHEET 42



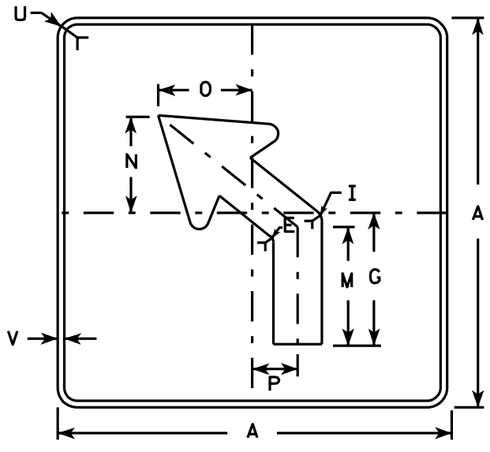
M5-1L
MM5-1L
M05-1L
MP5-1L



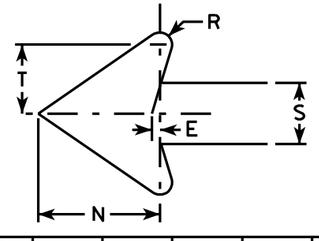
M5-2L
MM5-2L
M05-2L
MP5-2L



MB5-1L
MK5-1L
MN5-1L
MR5-1L



MB5-2L
MK5-2L
MN5-2L
MR5-2L



NOTES

1. Signs are Type II - Type H reflective except as shown
2. Color:
   Background - See note 4
   Message - See note 4
3. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
4. M5-1 and M5-2 Background - White
   Message - Black
   MB5-1 and MB5-2 Background - Blue
   Message - White
   MK5-1 and MK5-2 Background - Green
   Message - White
   MM5-1 and MM5-2 Background - White
   Message - Green
   MN5-1 and MN5-2 Background - Brown
   Message - White
   M05-1 and M05-2 Background - Orange - Type F Reflective
   Message - Black
   MP5-1 and MP5-2 Background - White - Type H Reflective
   Message - Blue
   MR5-1 and MR5-2 Background - Brown
   Message - Yellow
5. M5-1R same as M5-1L except arrow points right.
6. M5-2R same as M5-2L except arrow tilts right.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2	21		1 1/8	3/8	3/8		7	3 3/8	5/8		2 1/8	4 1/2	6 3/8	5 1/4	5	2 1/2		1/2	2 5/8	3	1 1/2	1/2					3.06
3	30		1 3/8	1/2	5/8		10 1/8	4 7/8	7/8		3	6 1/2	9 1/8	7 1/2	7 1/4	3 1/2		3/4	3 3/4	4 1/4	1 7/8	1/2					6.25
4	30		1 3/8	1/2	5/8		10 1/8	4 7/8	7/8		3	6 1/2	9 1/8	7 1/2	7 1/4	3 1/2		3/4	3 3/4	4 1/4	1 7/8	1/2					6.25
5	30		1 3/8	1/2	5/8		10 1/8	4 7/8	7/8		3	6 1/2	9 1/8	7 1/2	7 1/4	3 1/2		3/4	3 3/4	4 1/4	1 7/8	1/2					6.25

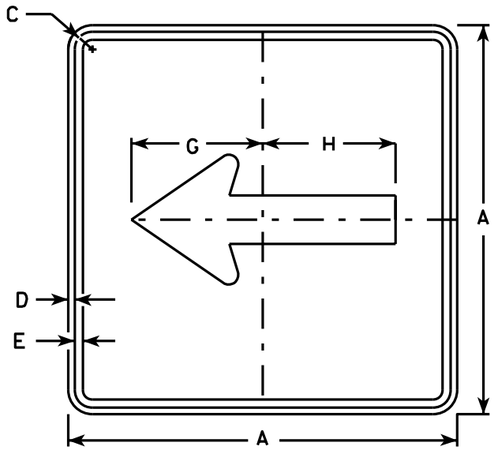
STANDARD SIGN
M5-1 & M5-2

WISCONSIN DEPT OF TRANSPORTATION

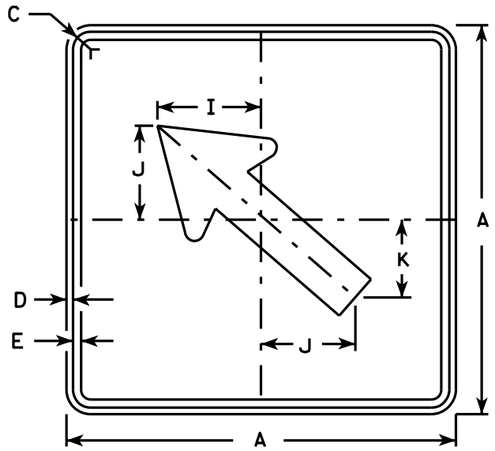
APPROVED 53 Matthew R Rauch
for State Traffic Engineer

DATE 10/15/15 PLATE NO. M5-1.13

PROJECT NO: 316046 | HWY: CTH N | COUNTY: DANE | SHEET NO: 59 | E



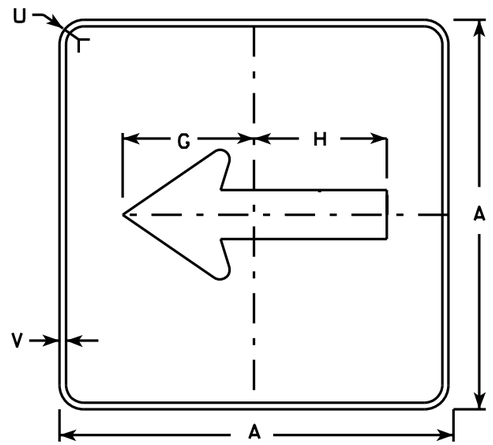
M6-1
MM6-1
MO6-1
MP6-1



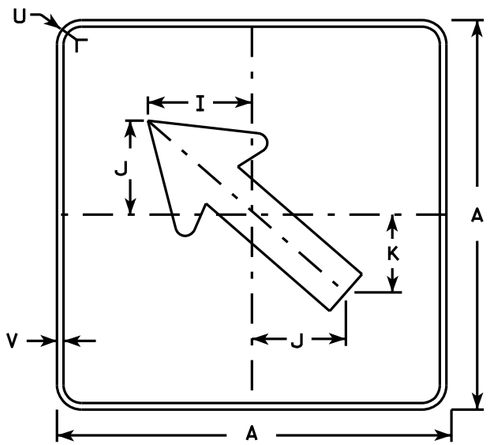
M6-2
MM6-2
MO6-2
MP6-2

NOTES

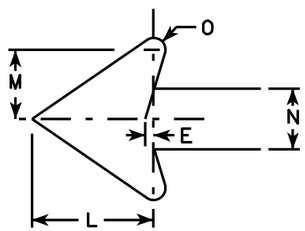
1. Signs are Type II - Type H except as Shown
2. Color:
   Background - See note 4
   Message - See note 4
3. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
4. M6-1 and M6-2 Background - White
   Message - Black
   MB6-1 and MB6-2 Background - Blue
   Message - White
   MK6-1 and MK6-2 Background - Green
   Message - White
   MM6-1 and MM6-2 Background - White
   Message - Green
   MN6-1 and MN6-2 Background - Brown
   Message - White
   MO6-1 and MO6-2 Background - Orange - Type F Reflective
   Message - Black
   MP6-1 and MP6-2 Background - White
   Message - Blue
   MR6-1 and MR6-2 Background - Brown
   Message - Yellow



MB6-1
MK6-1
MN6-1
MR6-1



MB6-2
MK6-2
MN6-2
MR6-2



SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2	21		1 1/8	3/8	3/8		7 1/2	7 1/8	5 5/8	5	4 1/4	5 1/4	3	2 5/8	1/2						1 1/2	1/2						3.06
3	30		1 3/8	1/2	5/8		10 3/4	10 1/4	8	7 1/4	6	7 1/2	4 1/4	3 3/4	3/4						1 7/8	1/2						6.25
4	30		1 3/8	1/2	5/8		10 3/4	10 1/4	8	7 1/4	6	7 1/2	4 1/4	3 3/4	3/4						1 7/8	1/2						6.25
5	30		1 3/8	1/2	5/8		10 3/4	10 1/4	8	7 1/4	6	7 1/2	4 1/4	3 3/4	3/4						1 7/8	1/2						6.25

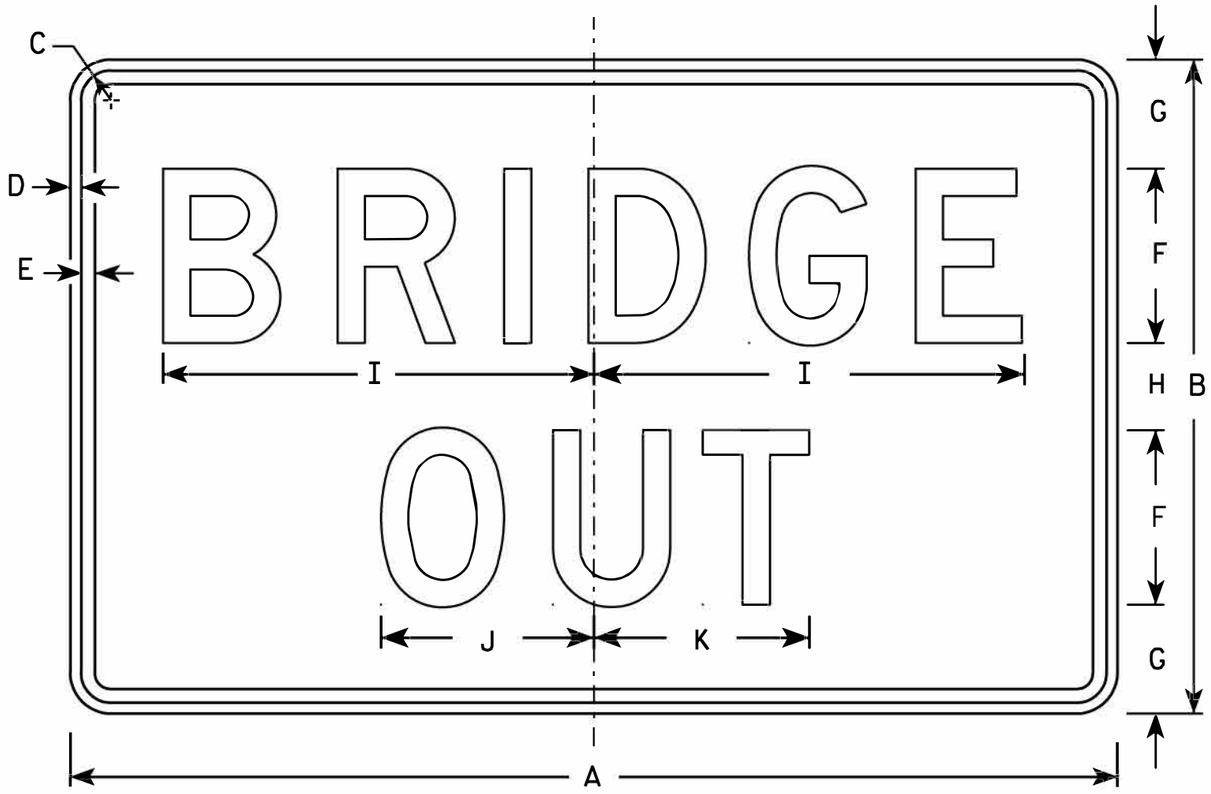
STANDARD SIGN
M6-1 & M6-2
SERIES

WISCONSIN DEPT OF TRANSPORTATION

APPROVED 54 Matthew R Rauch
for State Traffic Engineer

DATE 10/15/15 PLATE NO. M6-1.15

PROJECT NO: 316046 | HWY: CTH N | COUNTY: DANE | SHEET NO: 60 | E



R11-2B

NOTES

1. Sign is Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - White
   Message - Black
3. Message Series - D
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2S	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
2M	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
3	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
4	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
5	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0

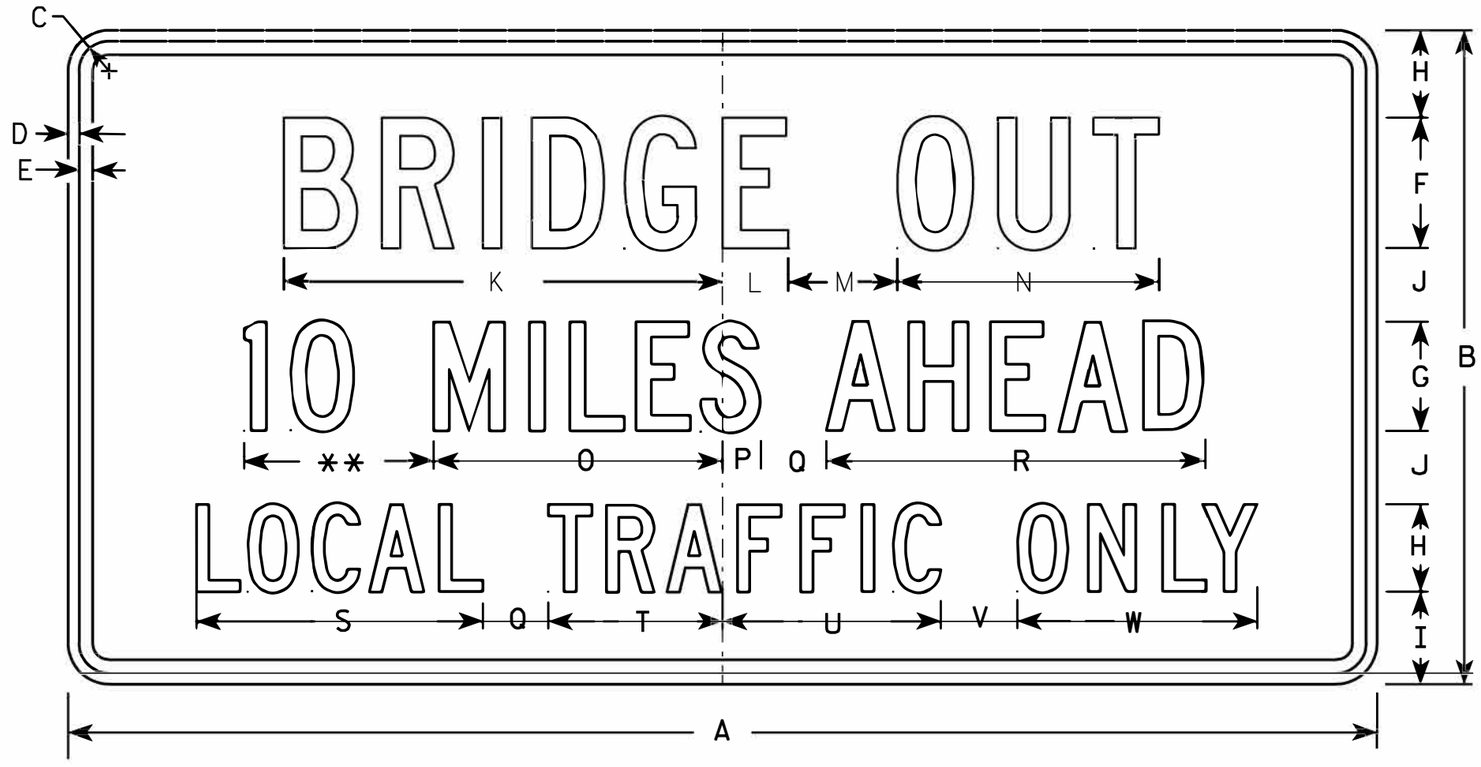
STANDARD SIGN
R11-2B

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
For State Traffic Engineer

DATE 4/1/11 PLATE NO. R11-2B.2

PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE		SHEET NO: 61	E



R11-3B

NOTES

1. Sign is Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - White
   Message - Black
3. Message Series - C
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
5. Substitute appropriate numerals and optically adjust spacing to achieve proper balance.

** See Note 5

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	36	18	1 3/8	1/2	5/8	4	3	2 1/2	2	2	13 1/4	2 1/4	3	8	8	1 1/2	2	10 3/4	8 3/8	4 3/4	6 1/2	2	6 3/4				4.5
2S	60	30	1 3/8	1/2	5/8	6	5	4	4 1/4	3 3/8	20 1/8	3	5	12	13 1/4	1 3/4	3	17 3/8	13 1/8	8	10	3 1/2	11				12.5
2M	60	30	1 3/8	1/2	5/8	6	5	4	4 1/4	3 3/8	20 1/8	3	5	12	13 1/4	1 3/4	3	17 3/8	13 1/8	8	10	3 1/2	11				12.5
3																											
4																											
5																											

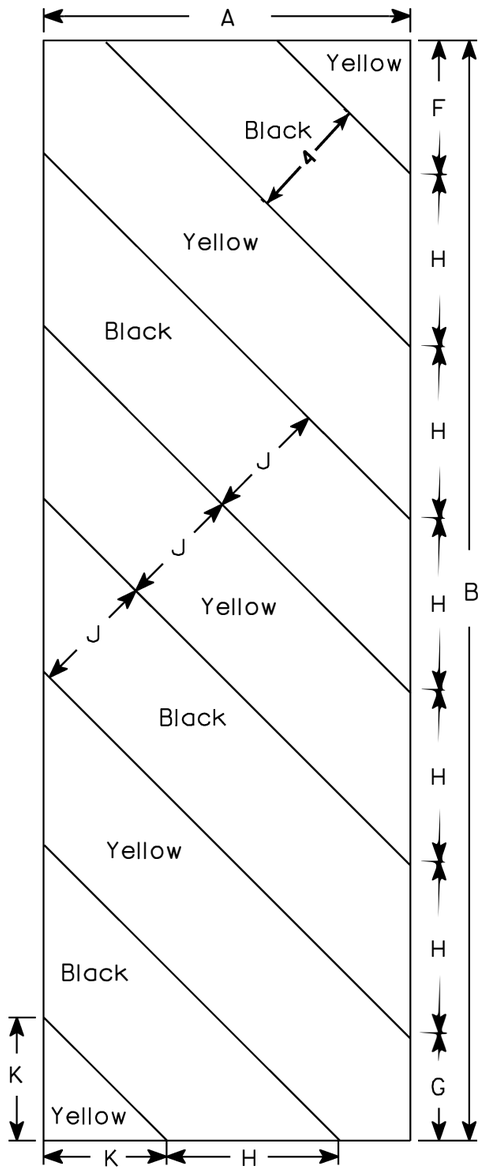
STANDARD SIGN
R11-3B

WISCONSIN DEPT OF TRANSPORTATION

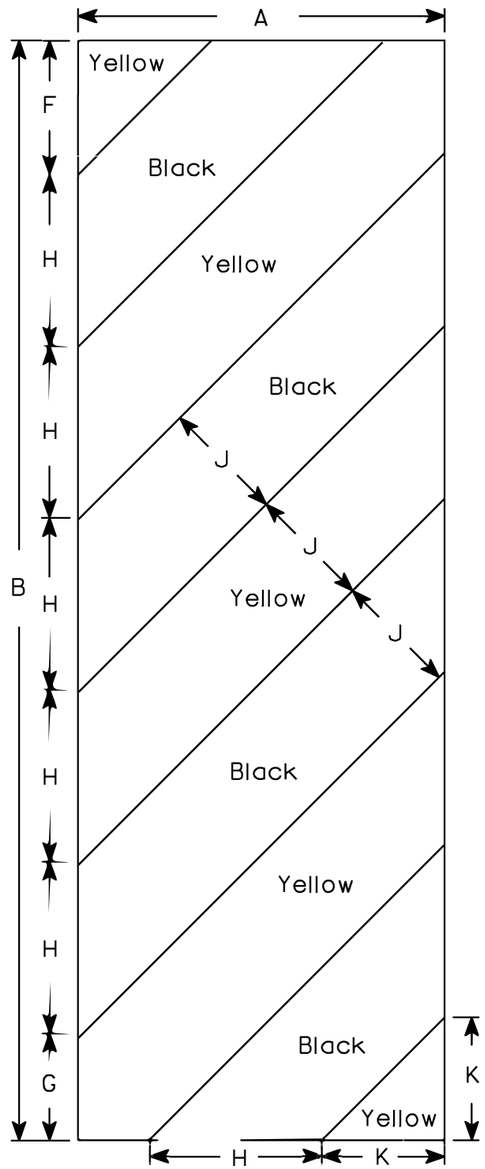
APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 4/1/11 PLATE NO. R11-3B.2

PROJECT NO: 316046 | HWY: CTH N | COUNTY: DANE | SHEET NO: 62 | E



W5-52L



W5-52R

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - Yellow
   Message - Black
3. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
4. Alternate colors of stripes as shown.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2S	12	36				4 3/8	3 1/2	5 5/8	45°	4	4																3.0
2M	12	36				4 3/8	3 1/2	5 5/8	45°	4	4																3.0
3	18	54				6	5 1/2	8 1/2	45°	6	6 9/16																6.75
4																											
5																											

STANDARD SIGN
W5-52L & W5-52R

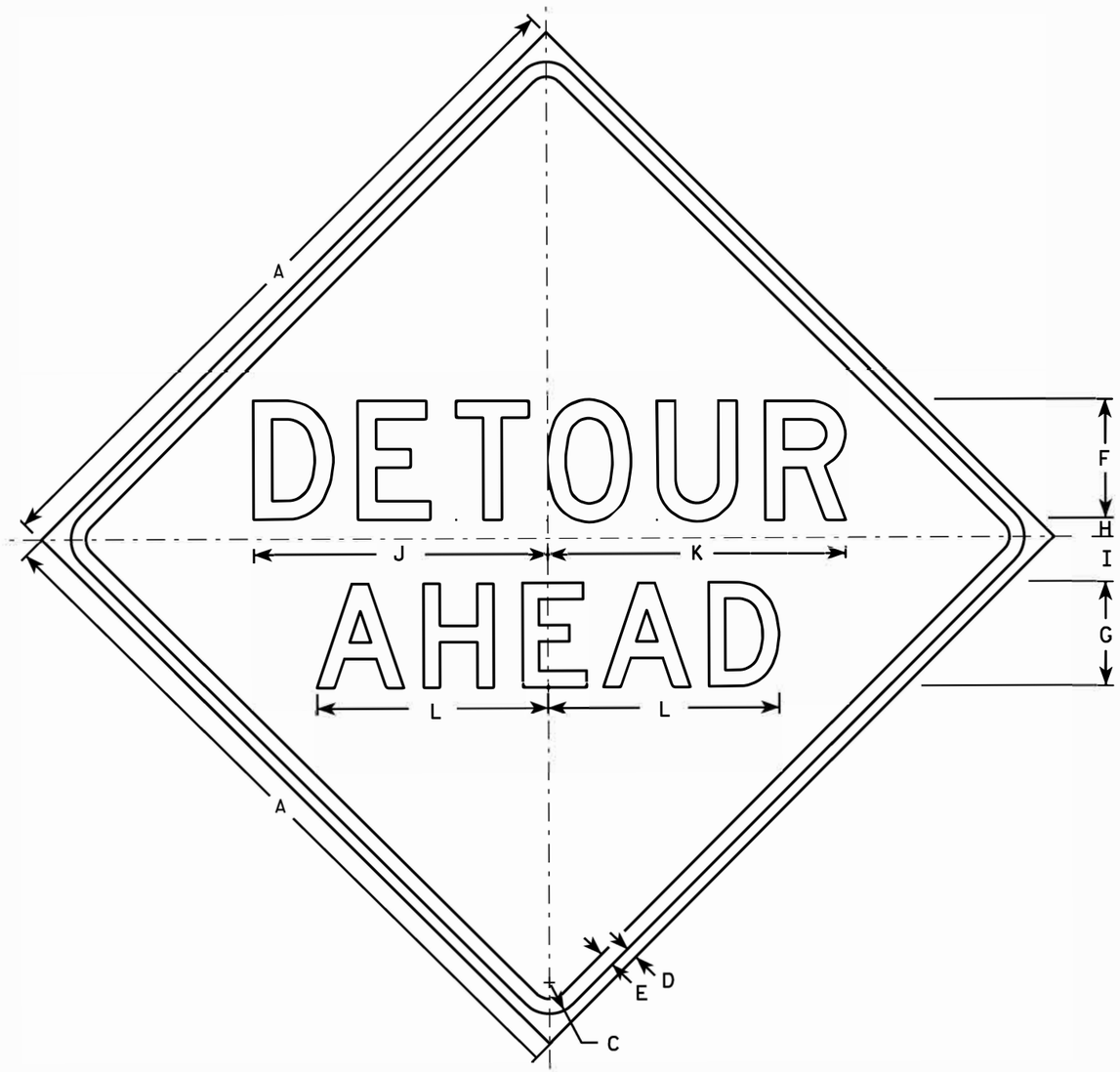
WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer
DATE 5/29/12 PLATE NO. W5-52.9

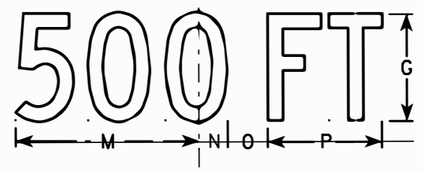
PROJECT NO: 316046 | HWY: CTH N | COUNTY: DANE | SHEET NO: 63 | E

7

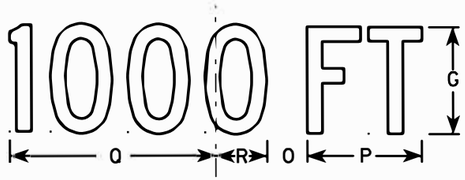
FILE NAME : C:\CAEFiles\Projects\tr_stdplate\W552.DGN PLOT DATE : 29-MAY-2012 13:03 PLOT BY : mscsja PLOT NAME : PLOT SCALE : 4.961899:1.000000
WISDOT/CADDS SHEET 42



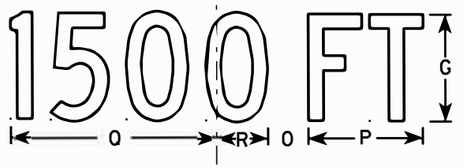
W20-2A



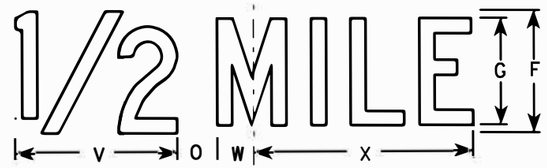
W20-2D



W20-2C



W20-2B



W20-2G

W20-2F

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - Orange
   Message - Black
3. Message Series - See note 5
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
5. Line 1 is Series D.
   Line 2 is Series D for AHEAD and Series C for all other distances.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	36		1 5/8	5/8	3/4	6	5	1	2 1/4	14 3/4	15	11 5/8	9	1 3/8	1 7/8	5 5/8	10 1/8	2 1/2	1 1/8	4 1/2	3 1/2	8	1 3/4	10 3/4			9.0
2S	48		2 1/4	3/4	1	8	7	1 1/4	3	19 3/4	20	15 1/2	12	1 7/8	2 5/8	7 1/2	13 1/2	3 3/8	1 1/2	6	4 5/8	10 5/8	2 3/8	14 3/8			16.0
2M	48		2 1/4	3/4	1	8	7	1 1/4	3	19 3/4	20	15 1/2	12	1 7/8	2 5/8	7 1/2	13 1/2	3 3/8	1 1/2	6	4 5/8	10 5/8	2 3/8	14 3/8			16.0
3	48		2 1/4	3/4	1	8	7	1 1/4	3	19 3/4	20	15 1/2	12	1 7/8	2 5/8	7 1/2	13 1/2	3 3/8	1 1/2	6	4 5/8	10 5/8	2 3/8	14 3/8			16.0
4	48		2 1/4	3/4	1	8	7	1 1/4	3	19 3/4	20	15 1/2	12	1 7/8	2 5/8	7 1/2	13 1/2	3 3/8	1 1/2	6	4 5/8	10 5/8	2 3/8	14 3/8			16.0
5	48		2 1/4	3/4	1	8	7	1 1/4	3	19 3/4	20	15 1/2	12	1 7/8	2 5/8	7 1/2	13 1/2	3 3/8	1 1/2	6	4 5/8	10 5/8	2 3/8	14 3/8			16.0

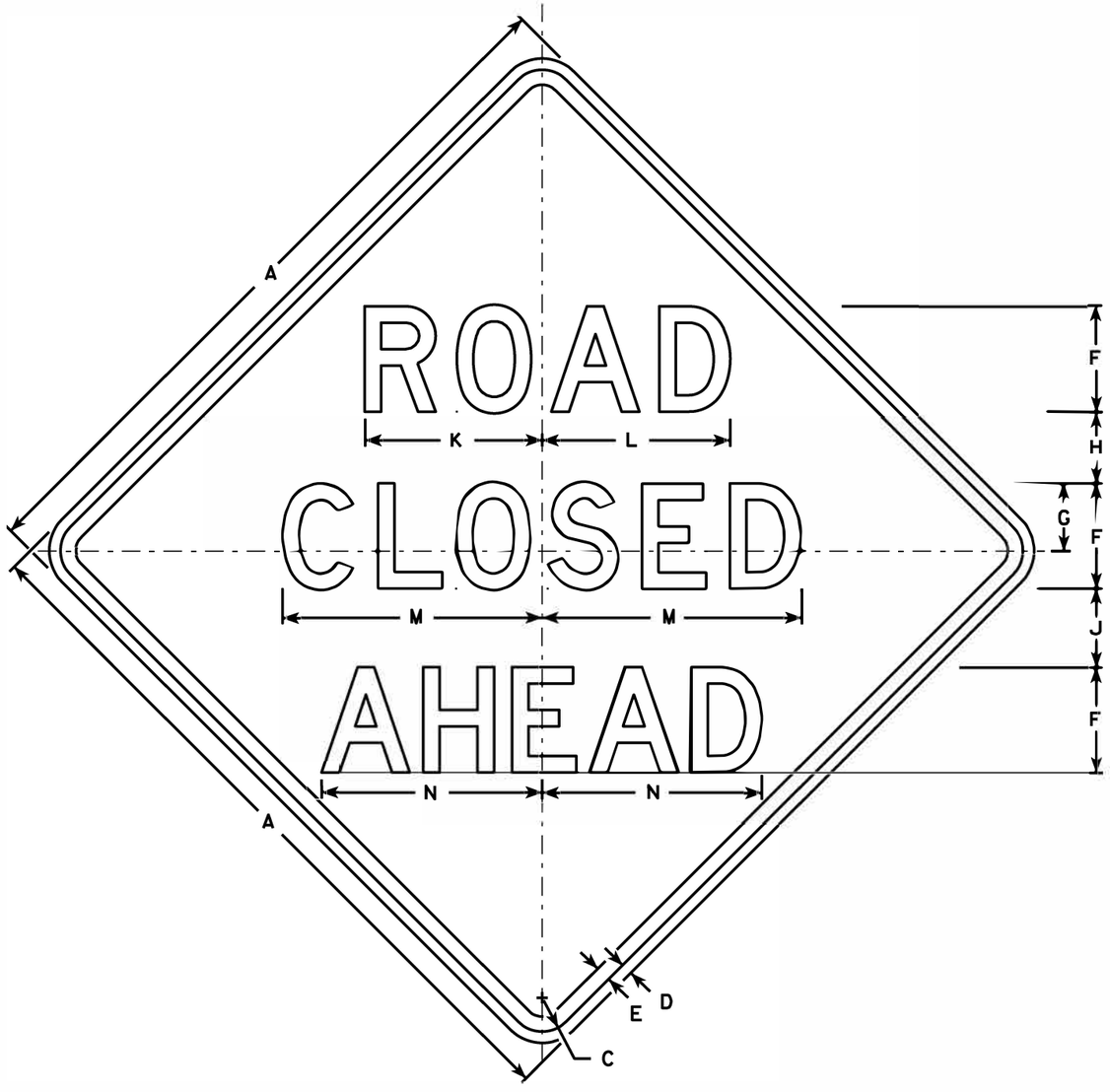
STANDARD SIGN
W20-2A,B,C,D,F & G

WISCONSIN DEPT OF TRANSPORTATION

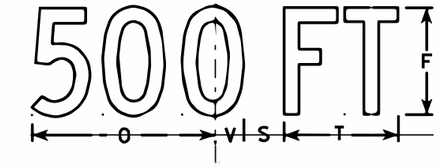
APPROVED Matthew R Rauch
for State Traffic Engineer

DATE _____ PLATE NO. W20-2.6

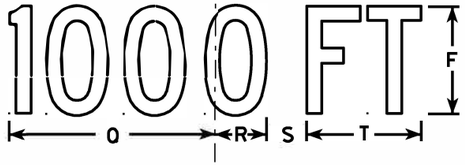
PROJECT NO: 316046 | HWY: CTH N | COUNTY: DANE | SHEET NO: 64 | E



W20-3A



W20-3D



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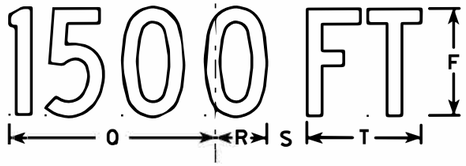
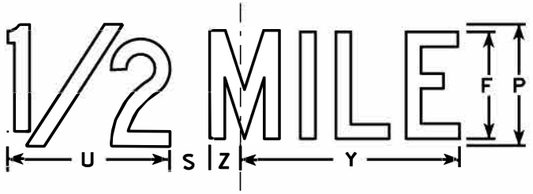
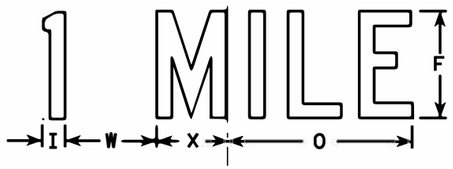


W20-3B



W20-3G



W20-3F

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - Orange
   Message - Black
3. Message Series - see note 5
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
5. Lines 1 and 2 are Series D.
   Line 3 is Series D for AHEAD and Series C for all other distances.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	O	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	36		1 5/8	5/8	3/4	5	3 3/8	3 1/2	1 1/8	4	8 3/8	8 7/8	12 1/2	11	9	6	10 1/8	2 1/2	1 7/8	5 5/8	8	1 3/8	4 1/2	3 1/2	10 3/4	1 3/4	9.0
2S	48		2 1/4	3/4	1	7	4 1/2	4 3/4	1 1/2	5 1/4	11 3/4	12 1/2	17 1/4	14 5/8	12	8	13 1/2	3 3/8	2 5/8	7 1/2	10 5/8	1 7/8	6	4 5/8	14 3/8	2 3/8	16.0
2M	48		2 1/4	3/4	1	7	4 1/2	4 3/4	1 1/2	5 1/4	11 3/4	12 1/2	17 1/4	14 5/8	12	8	13 1/2	3 3/8	2 5/8	7 1/2	10 5/8	1 7/8	6	4 5/8	14 3/8	2 3/8	16.0
3	48		2 1/4	3/4	1	7	4 1/2	4 3/4	1 1/2	5 1/4	11 3/4	12 1/2	17 1/4	14 5/8	12	8	13 1/2	3 3/8	2 5/8	7 1/2	10 5/8	1 7/8	6	4 5/8	14 3/8	2 3/8	16.0
4	48		2 1/4	3/4	1	7	4 1/2	4 3/4	1 1/2	5 1/4	11 3/4	12 1/2	17 1/4	14 5/8	12	8	13 1/2	3 3/8	2 5/8	7 1/2	10 5/8	1 7/8	6	4 5/8	14 3/8	2 3/8	16.0
5	48		2 1/4	3/4	1	7	4 1/2	4 3/4	1 1/2	5 1/4	11 3/4	12 1/2	17 1/4	14 5/8	12	8	13 1/2	3 3/8	2 5/8	7 1/2	10 5/8	1 7/8	6	4 5/8	14 3/8	2 3/8	16.0

STANDARD SIGN
W20-3A, B, C, D, F & G

WISCONSIN DEPT OF TRANSPORTATION

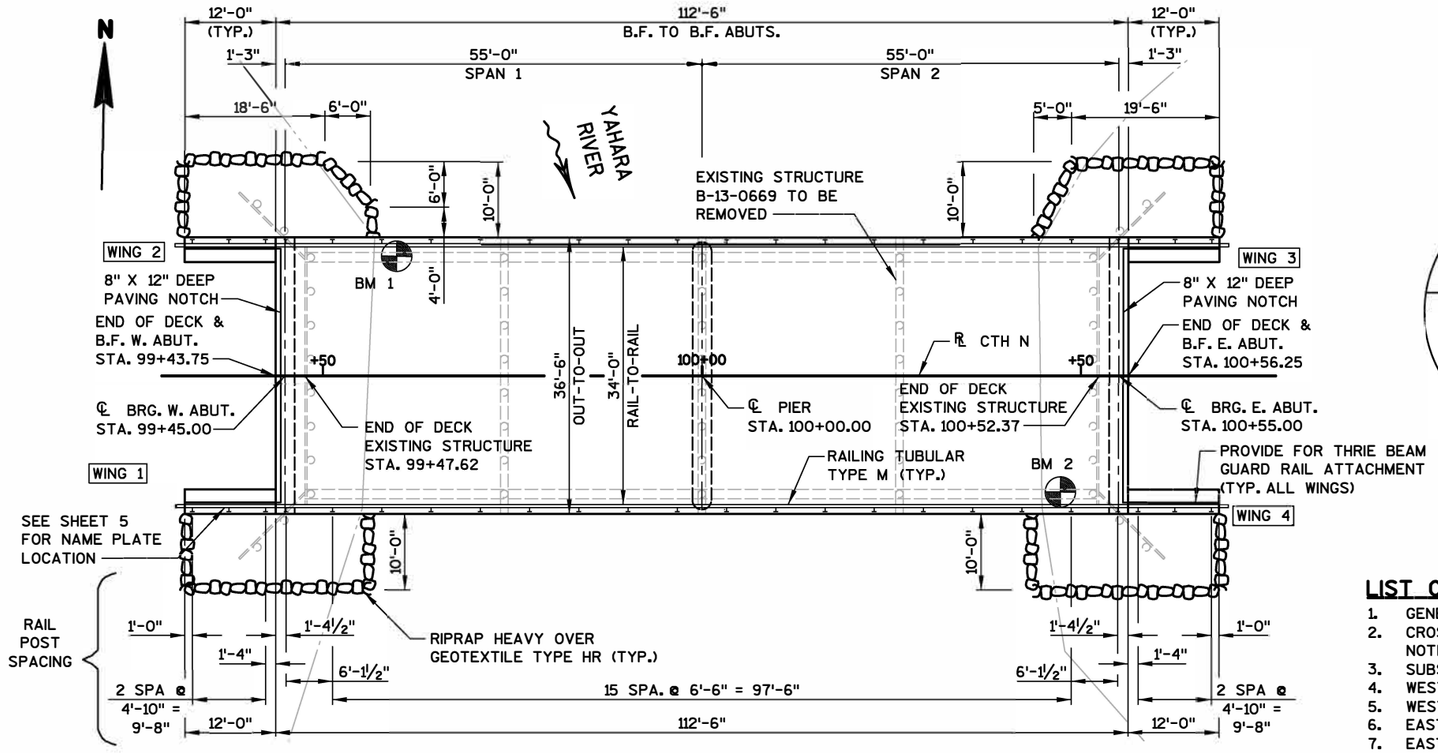
APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 3/18/11 PLATE NO. W20-3.7

PROJECT NO: 316046 | HWY: CTH N | COUNTY: DANE | SHEET NO: 65 | E

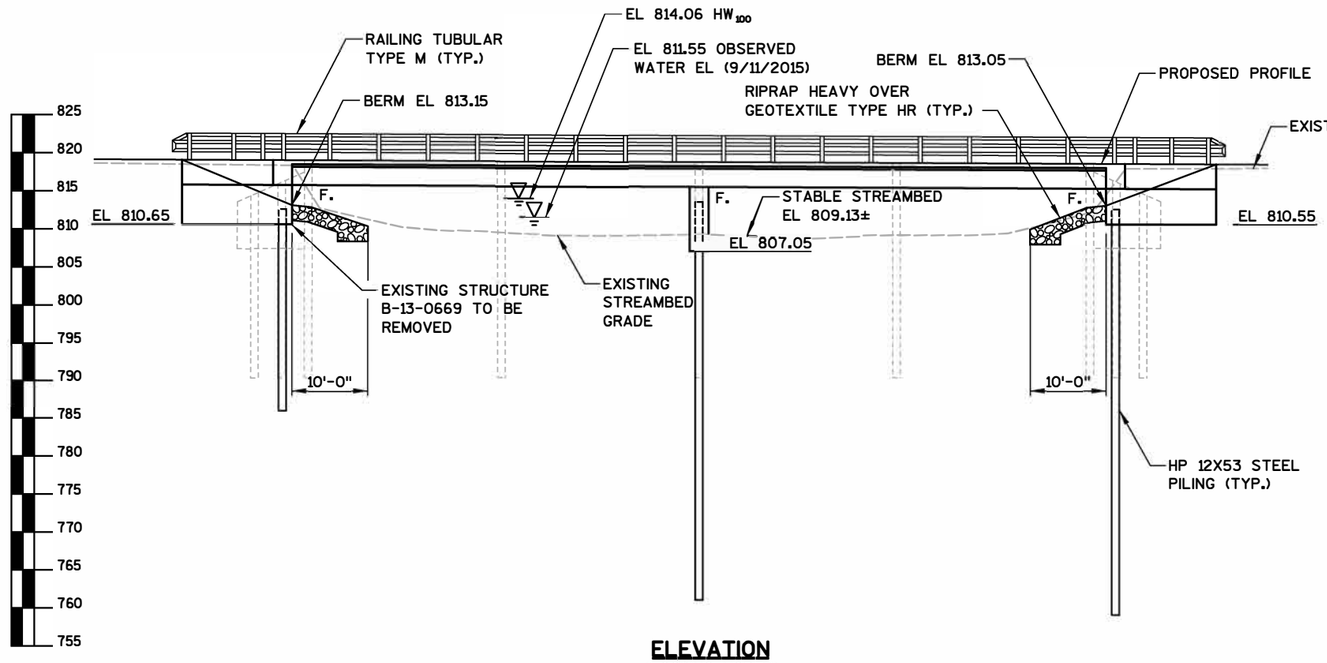
PROJECT NUMBER

316046



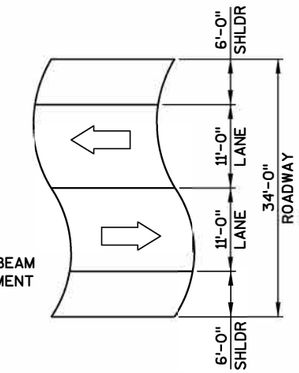
PLAN

(2-SPAN 28-INCH PRESTRESSED GIRDER)



ELEVATION

(LOOKING NORTH)



DESIGN DATA

STRUCTURE DESIGNED FOR A FUTURE WEARING SURFACE OF 20 #/S.F.

LIVE LOAD:
- DESIGN LOADING — HL-93
- INVENTORY RATING FACTOR — RF = 1.34
- OPERATING RATING FACTOR — RF = 1.76
- WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) — 250 KIPS

ULTIMATE DESIGN STRESSES:
- CONCRETE SUPERSTRUCTURE — f'c = 4,000 psi
- CONCRETE SUBSTRUCTURE — f'c = 3,500 psi
- HIGH STRENGTH BAR STEEL REINFORCEMENT — fy = 60,000 psi
- 28-INCH PRESTRESSED GIRDERS CONCRETE MASONRY — f'c = 8,000 psi
- PRESTRESSING STRANDS = 0.5-INCH DIA. WITH ULTIMATE TENSILE STRENGTH OF 270,000 PSI.

TRAFFIC DATA:
- A.D.T. (2017) : 580
- A.D.T. (2037) : 640
- DESIGN SPEED: 60 MPH

FOUNDATION DATA:

ABUTMENTS AND PIERS TO BE SUPPORTED ON HP 12X53 STEEL PILING DRIVEN TO THE FOLLOWING REQUIRED DRIVING RESISTANCES PER PILE AS DETERMINED BY THE MODIFIED GATES DYNAMIC EQUATION.

- WEST ABUTMENT — 160 T*
- PIER — 200 T*
- EAST ABUTMENT — 160 T*

* THE FACTORED AXIAL RESISTANCE OF PILES IN COMPRESSION USED FOR DESIGN IS THE REQUIRED DRIVING RESISTANCE MULTIPLIED BY A RESISTANCE FACTOR OF 0.5 USING MODIFIED GATES TO DETERMINE DRIVEN PILE CAPACITY.

ESTIMATED PILE LENTHS:
- WEST ABUTMENT — 30 FEET
- PIER — 60 FEET
- EAST ABUTMENT — 60 FEET

LIST OF DRAWINGS

HYDRAULIC DATA

- Q_{100} — 1,737 C.F.S.
- VELOCITY — 4.76 F.P.S.
- HW_{100} ELEV. — 814.06 FT.
- WATERWAY AREA (BRIDGE) — 365 S.F.
- DRAINAGE AREA — 379.4 SQ. MI.
- ROADWAY OVERTOPPING FREQUENCY — N/A
- Q_2 — 604 C.F.S.
- HW_2 — 812.20 FT.
- SCOUR CODE — 5

LEGEND

BENCH MARK

WISCONSIN
KEITH R. BEHREND E-42073 MADISON WI
PROFESSIONAL ENGINEER
Keith R. Behrend
11/17/2016

BENCH MARKS

NO.	STATION	DESCRIPTION	ELEV.
BM 1	99+59.73, 15.7' LT	CHISELED BOX ON TOP SURFACE OF EXISTING CONCRETE CURB	820.60
BM 2	100+47.33, 15.4' RT	CHISELED BOX ON TOP SURFACE OF EXISTING CONCRETE CURB	820.59

DESIGN CONTACT:
KEITH BEHREND (608) 251-4843

NO.	DATE	REVISON	BY

STRAND ASSOCIATES®
910 WEST WINGRA DRIVE
MADISON, WISCONSIN 53715
(608)-251-4843
(608) 251-8655 FAX
WWW.STRAND.COM

STRUCTURE B-13-681

CTH N OVER YAHARA RIVER

COUNTY: DANE — TOWN ~~/CITY/VILLAGE~~: DUNKIRK

DESIGN SPEC.: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

DESIGNED BY	BRL	DESIGN CK'D.	KRB	DRAWN BY	DTH	PLANS CK'D.	DJW

GENERAL PLAN

SHEET 1 OF 15

Sheet 66

8

8

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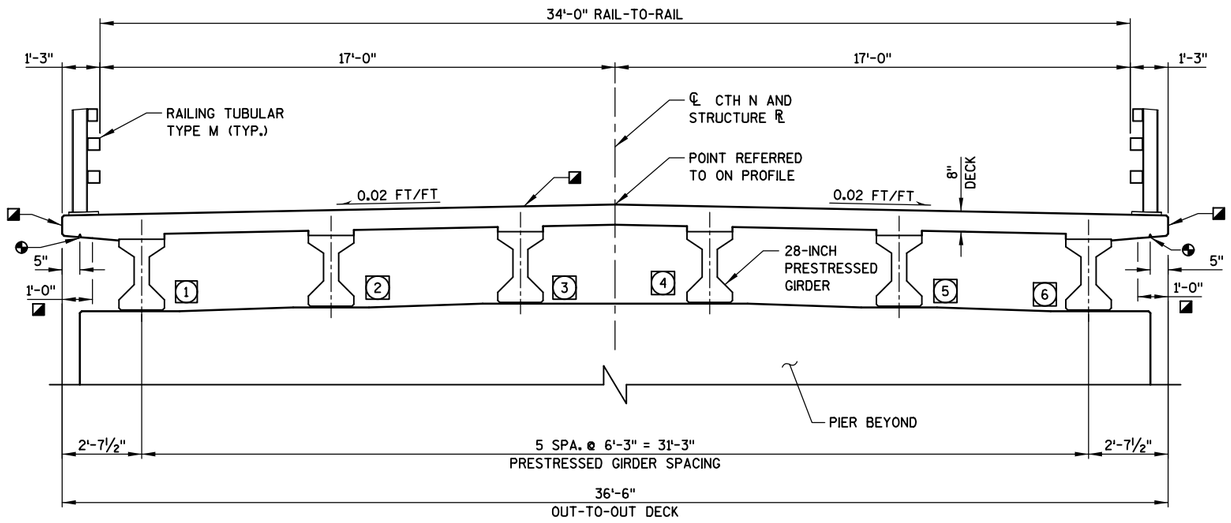
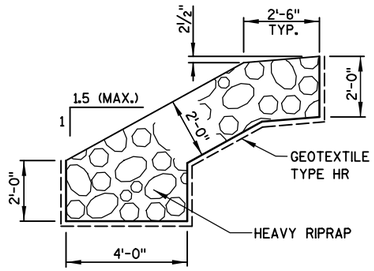


CROSS SECTION THRU SUPERSTRUCTURE

(LOOKING EAST)



RIPRAP HEAVY DETAIL

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

ALL STATIONS AND ELEVATIONS ARE IN FEET.

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

THE FIRST ONE OR TWO DIGITS OF A REINFORCING BAR MARK SIGNIFIES THE BAR SIZE.

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES BRIDGES B-13-681" SHALL BE THE EXISTING GROUNDLINE.

THE SLOPE OF THE FILL IN FRONT OF THE ABUTMENTS SHALL BE COVERED WITH HEAVY RIPRAP AND GEOTEXTILE TYPE 'HR' TO THE EXTENT SHOWN ON SHEET 1 AND IN THE ABUTMENT DETAILS.

AT THE BACK FACE OF ABUTMENTS ALL VOLUME WHICH CANNOT BE PLACED BEFORE ABUTMENT CONSTRUCTION AND IS NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH BACKFILL STRUCTURE TYPE A.

SLAB FALSEWORK SHALL BE SUPPORED ON PILES OR THE SUBSTRUCTURE UNLESS AN ALTERNATE METHOD IS APPROVED BY THE ENGINEER.

THE EXISTING STRUCTURE B-13-669, A FOUR-SPAN STEEL GIRDER BRIDGE, IS TO BE REMOVED.

FILLER SHALL CONFORM TO THE REQUIREMENTS OF AASHTO DESIGNATION M153 TYPES I, II, III OR AASHTO DESIGNATION M213.

BEVEL EXPOSED EDGES OF CONCRETE ¾" UNLESS OTHERWISE NOTED.

BAR DIMENSIONS FOR BENDING ARE OUT-TO-OUT OF BARS.

THE HAUNCH CONCRETE QUANTITY IS BASED ON THE AVERAGE HAUNCH HEIGHT SHOWN ON THE PRESTRESSED GIRDER DETAILS SHEET.

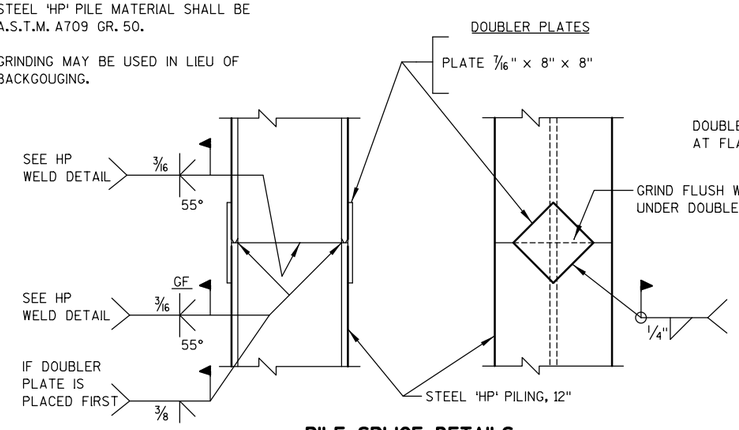
THE QUANTITY FOR BACKFILL STRUCTURE TYPE A, BID ITEM 210.1500, IS CALCULATED BASED ON THE APPLICABLE FIGURES 12.6-1 AND 12.6-2 IN THE WISCONSIN DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL.

ALL DETAILS, MATERIALS, AND FABRICATION SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE SPECIFICATIONS OF THE STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION, CURRENT EDITION. A NAME PLATE CONFORMING TO SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS AND STANDARD DETAIL DRAWING 12A3 OF THE WISCONSIN FACILITIES DEVELOPMENT MANUAL SHALL BE PROVIDED AND INSTALLED. NAME PLATE WORK SHALL BE INCIDENTAL TO "CONCRETE MASONRY BRIDGES" BID ITEM.

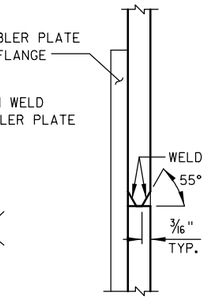
PILE SPLICE NOTES

STEEL 'HP' PILE MATERIAL SHALL BE A.S.T.M. A709 GR. 50.

GRINDING MAY BE USED IN LIEU OF BACKGOUGING.

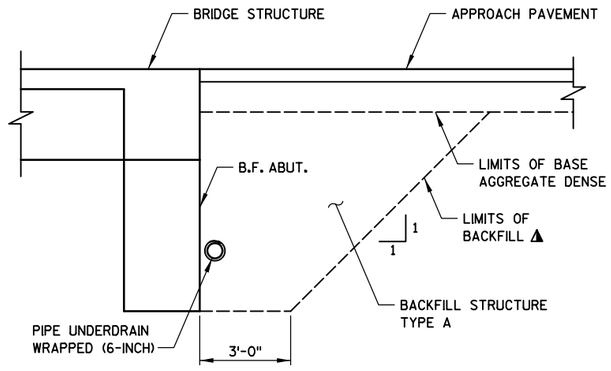


PILE SPLICE DETAILS



HP WELD DETAIL

FLANGE SHOWN, WEB SIMILAR



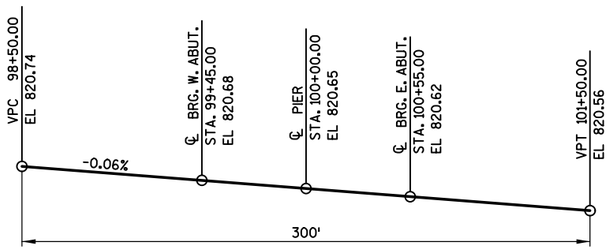
TYPICAL SECTION THRU ABUTMENT

TOTAL ESTIMATED QUANTITIES

BID NUMBER	BID ITEM	UNITS	W. ABUT.	PIER	SUPER.	E. ABUT.	TOTALS
203.0600.S	REMOVING OLD STRUCTURE OVER WATERWAY WITH MIN. DEBRIS STA. 100+00	L.S.	-	-	-	-	1
206.1000	EXCAVATION FOR STRUCTURES BRIDGE B-13-681	L.S.	-	-	-	-	1
210.1500	BACKFILL STRUCTURE TYPE A	TON	197	-	-	198	395
502.0100	CONCRETE MASONRY BRIDGES	C.Y.	45	33	130	45	253
502.3200	PROTECTIVE SURFACE TREATMENT	S.Y.	-	-	496	-	496
503.0128	PRESTRESSED GIRDER TYPE I 28-INCH	L.F.	-	-	665	-	665
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB.	3,300	1,500	-	3,280	8,080
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB.	830	50	30,480	830	32,190
506.2605	BEARING PADS ELASTOMERIC NON-LAMINATED	EACH	6	12	-	6	24
506.4000	STEEL DIAPHRAGMS B-13-681	EACH	-	-	10	-	10
513.4061	RAILING TUBULAR TYPE M B-13-681	L.F.	26.5	-	225	26.5	278
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	S.Y.	11	-	-	11	22
550.1120	PILING STEEL HP 12-INCH X 53 LB.	L.F.	150	360	-	300	810
606.0300	RIPRAP HEAVY	C.Y.	85	-	-	85	170
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	L.F.	102	-	-	102	204
645.0120	GEOTEXTILE TYPE HR	S.Y.	167	-	-	166	333
	NON-BID ITEMS						
	FILLER	SIZE	1/2" & 3/4"	3/4"	-	1/2" & 3/4"	1/2" & 3/4"

LEGEND

- ◔ ¾" V-GROOVE. EXTEND TO 6" FROM FRONT FACE OF ABUTMENT DIAPHRAGM.
- ◪ COAT WITH "PROTECTIVE SURFACE TREATMENT" AS PER THE STANDARD SPECIFICATIONS.
- (#) GIRDER NUMBER.
- ▲ BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.



PROFILE GRADE LINE

PROJECT NUMBER 316046

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

DRAWN BY DTH | PLANS CK'D. DJW

CROSS SECTION, QUANTITIES, NOTES & DETAILS

SHEET 2

Sheet 67

8

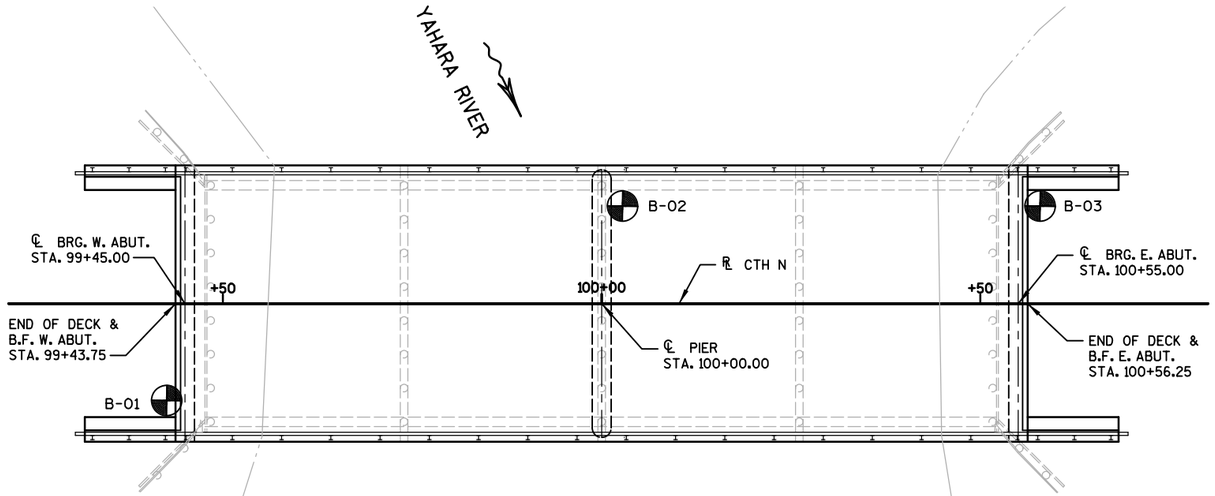
8

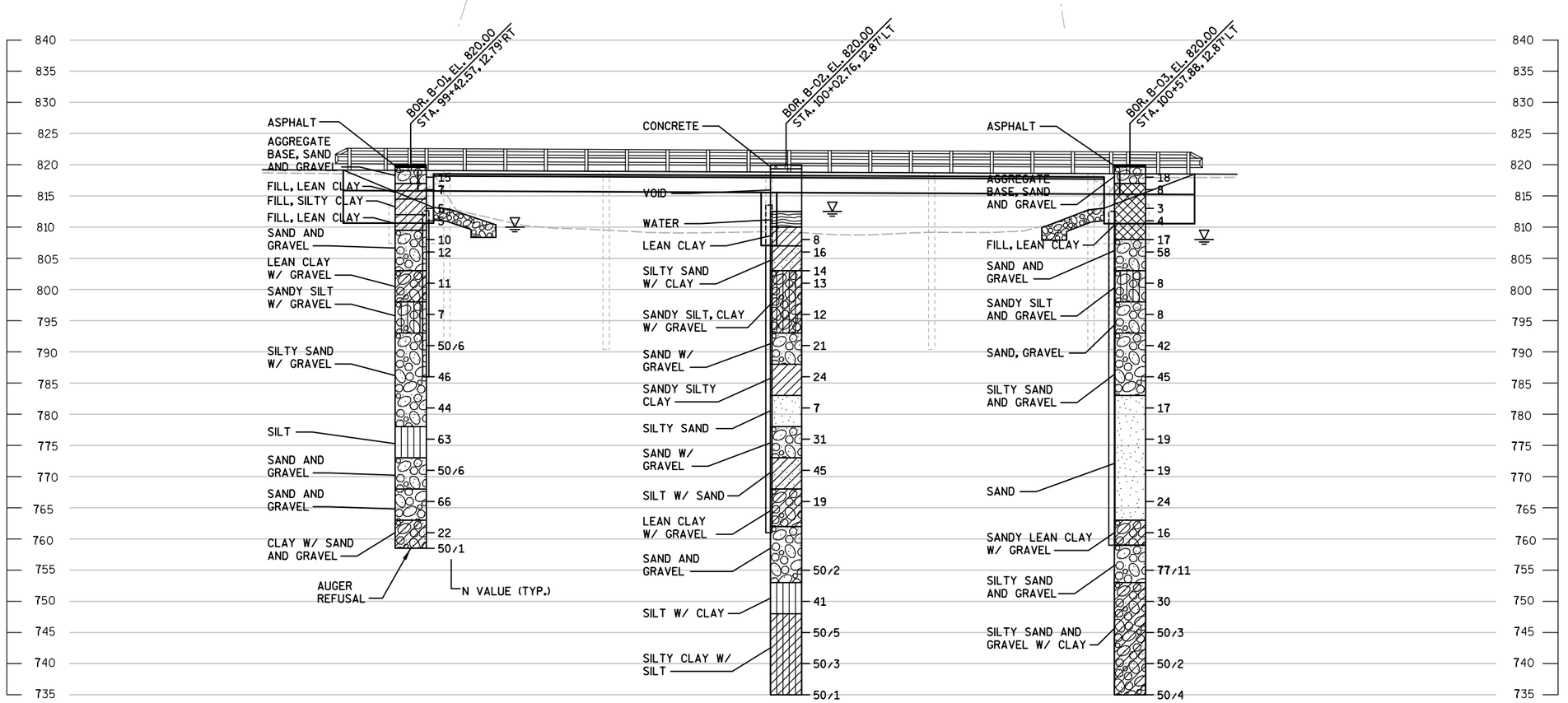
FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080102_cs.dgn

BORINGS PERFORMED AND REPORT COMPLETED BY:
PROFESSIONAL SERVICE INDUSTRIES (PSI)
821 CORPORATE COURT
WAUKESHA, WI 53189

BORINGS WERE PERFORMED ON 12/12/2015, 12/16/2015, 12/17/2015, 1/22/2016.

BORING	DATE COMPLETED	NORTHING (Y)	EASTING (X)
1	12/16/15	404,962.39	876,022.99
2	12/17/15, 1/22/16	404,989.02	876,082.76
3	12/12/15, 1/22/16	404,989.92	876,137.87
BORINGS COMPLETED BY: PSI			
REPORT COMPLETED BY: PSI			
ALL COORDINATES REFERENCED TO DANE COUNTY COORDINATE SYSTEM			





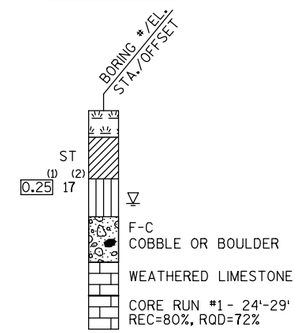
PROJECT NUMBER

316046

MATERIAL SYMBOLS

ASPHALT	TOPSOIL	PEAT
CONCRETE	FILL	GRAVEL
SAND	CLAY	SILT
BOULDERS OR COBBLES	LIMESTONE	BEDROCK (UNKNOWN)
SHALE	SANDSTONE	IGNEOUS/ META

LEGEND OF BORING



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

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

GROUND WATER ELEVATION

- ▽ AT TIME OF DRILLING
- ▼ END OF DRILLING
- ▼ AFTER DRILLING

ABBREVIATIONS

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

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

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

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

DRAWN BY DTH | PLANS CK'D. DJW

SUBSURFACE EXPLORATION

SHEET 3

Sheet 68

8

8

SCALE =

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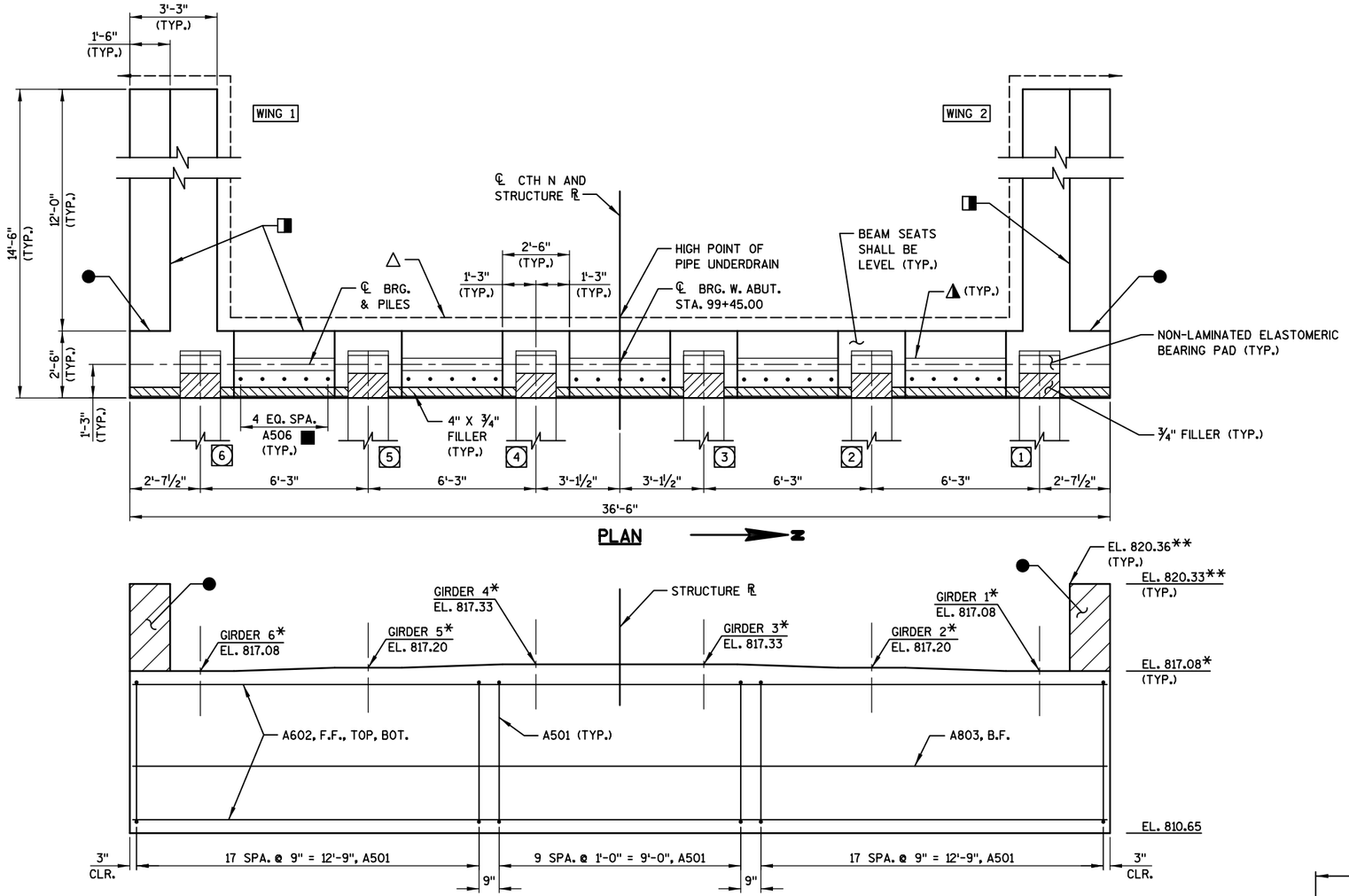


PROJECT NUMBER

316046

NOTES

SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF ½" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER 1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONCRETE. EXTEND SEALER 3" BELOW FINISHED ROADWAY SURFACE AT INSIDE FACE.

ADJUST A501 BARS INTERFERING WITH PILES.

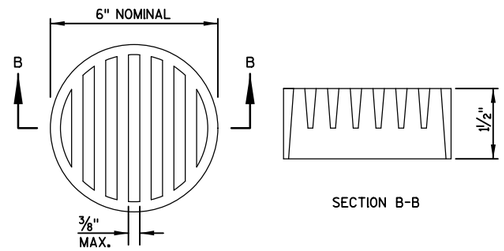
SEE SHEET 2 FOR PILE SPLICE DETAILS.

SEE SHEET 5 FOR REINFORCING DETAILS.

WEST ABUTMENT TO BE SUPPORTED ON PILING STEEL 12-INCH X 53 LB WITH A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE AT WEST ABUTMENT. ESTIMATED 30 FEET LONG EACH.

LEGEND

- ● ½" FILLER. EXTEND FROM ABUT. SEAT TO TOP OF WING. INCLUDED IN WING LENGTH.
- ◨ 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- (#) INDICATES GIRDER NUMBER.
- * ELEVATION GIVEN AT ℄ BRG.
- ** ELEVATION GIVEN AT B.F. ABUTMENT.
- ■ THESE BARS MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE.
- △ PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. HIGH POINT EL. 812.50 AT ℞. ATTACH RODENT SHIELD AT ENDS OF PIPE. SEE DETAIL THIS SHEET.
- ◭ KEYED CONST. JOINT FORMED BY BEVELED 2"X6".



NOTES;
DIMENSIONS ARE APPROXIMATE. THE GRATE IS SIZED TO FIT INTO A PIPE COUPLING. ORIENT SHIELD SO SLOTS ARE VERTICAL.

THE RODENT SHIELD, PIPE COUPLING AND ATTACHMENT SCREWS SHALL BE INCLUDED WITH BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH."

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

RODENT SHIELD DETAIL

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

DRAWN BY DTH | PLANS CK'D. DJW

WEST ABUTMENT

SHEET 4

Sheet 69

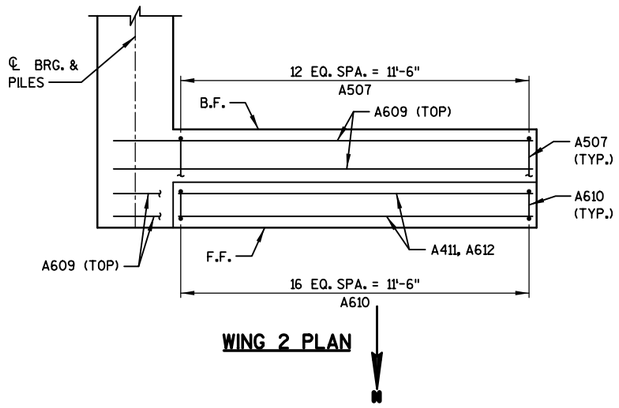
8

8

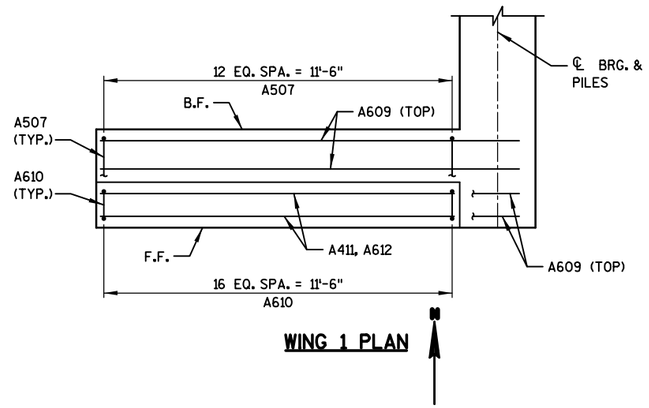
FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080104_wa.dgn

PROJECT NUMBER

316046



WING 2 PLAN



WING 1 PLAN

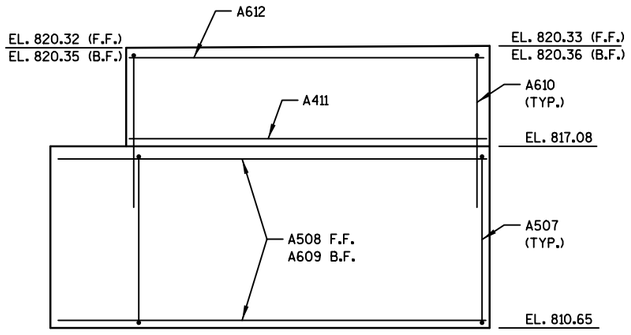
LEGEND

- ◭ KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2"x6".
- ◨ 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- ■ THESE BARS MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE.
- △ PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. HIGH POINT EL 812.50 AT ℄. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN AS DETIALED ON SHEET 4.

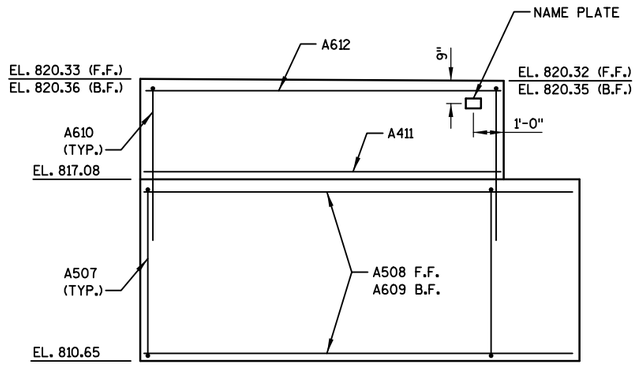
WEST ABUTMENT BILL OF BARS

UNCOATED: 3,300 LBS
COATED: 830 LBS

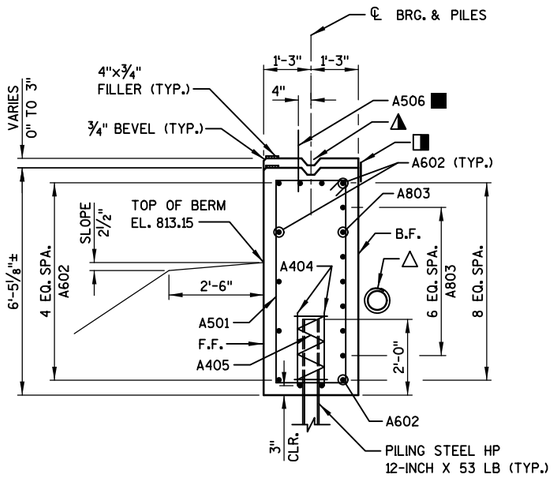
MARK	NO. REQ'D	LENGTH	BENT	COAT	LOCATION
A501	46	16'-9"	X		BODY - VERT. - STIRRUPS
A602	11	36'-2"			BODY - F.F., TOP, BTM. - HORIZ.
A803	7	38'-5"	X		BODY - B.F. - HORIZ.
A404	12	2'-3"			BODY - PILES - VERT.
A405	6	28'-0"	X		BODY - PILES - SPIRAL
A506	25	2'-0"		X	BODY - TOP - VERT.
A507	26	18'-5"	X		WINGS - LOWER - STIRRUPS
A508	14	14'-2"			WINGS - LOWER - F.F. - HORIZ
A609	16	14'-2"			WINGS - LOWER - B.F. & TOP - HORIZ
A610	34	11'-4"	X	X	WINGS - UPPER - VERT.
A411	16	11'-7"		X	WINGS - UPPER - F.F., B.F. - HORIZ.
A612	4	11'-7"		X	WINGS - UPPER - TOP - HORIZ.



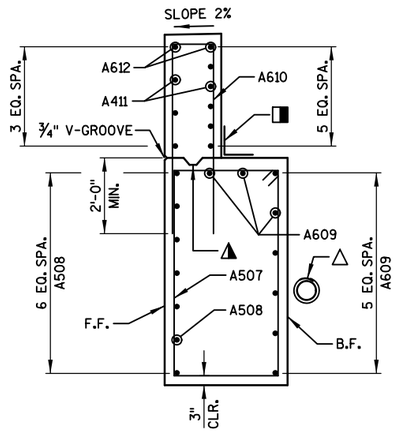
WING 2 ELEVATION
(FRONT FACE)



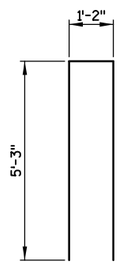
WING 1 ELEVATION
(FRONT FACE)



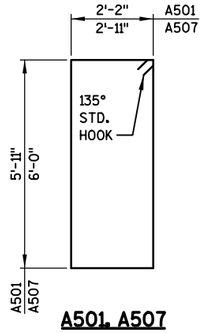
TYPICAL THRU BODY SECTION



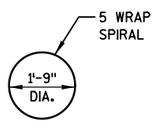
TYPICAL WING SECTION



A610



A501, A507



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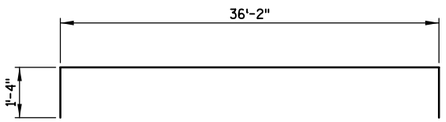

A803

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

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WEST ABUTMENT DETAILS

SHEET 5

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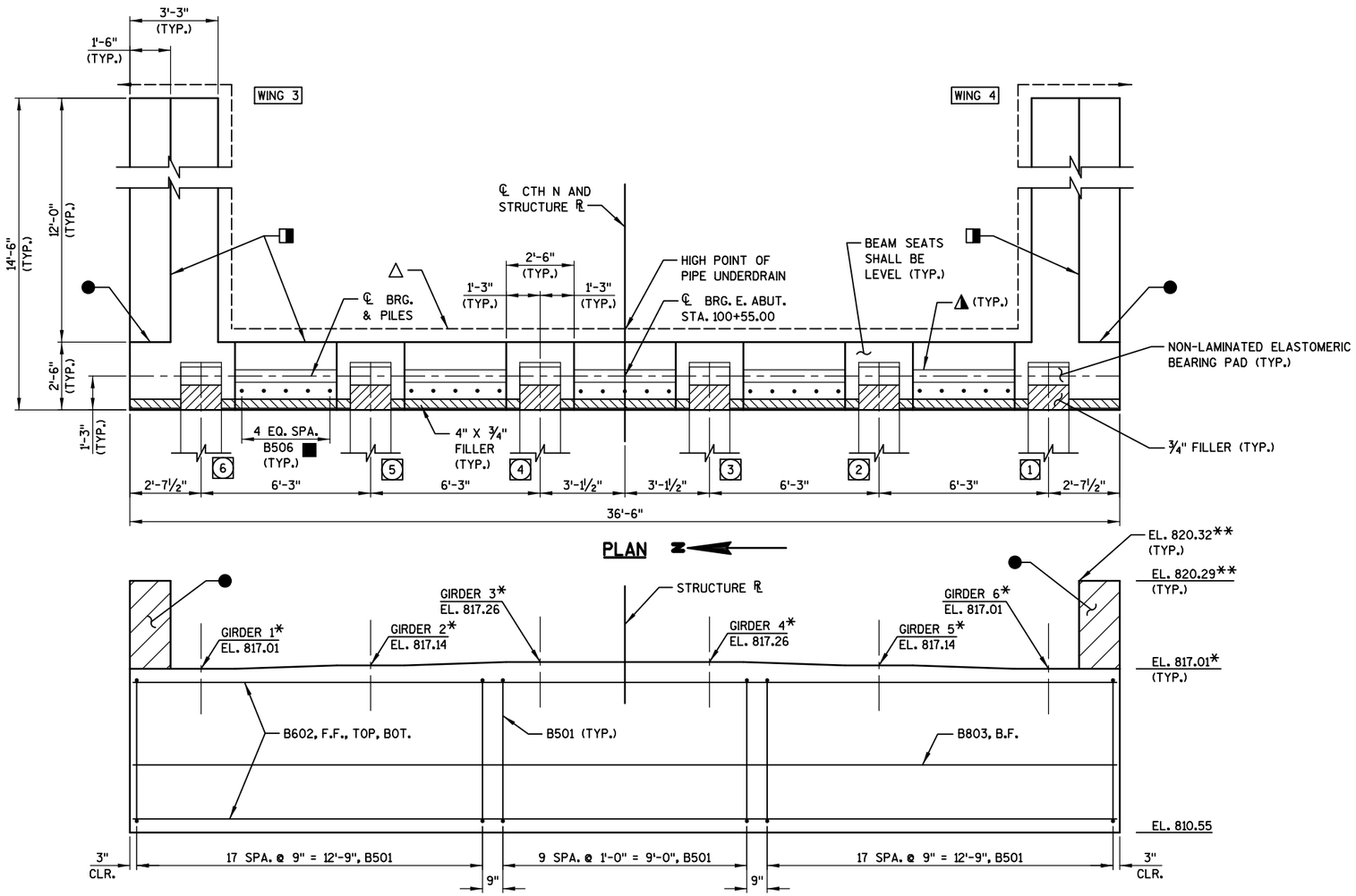
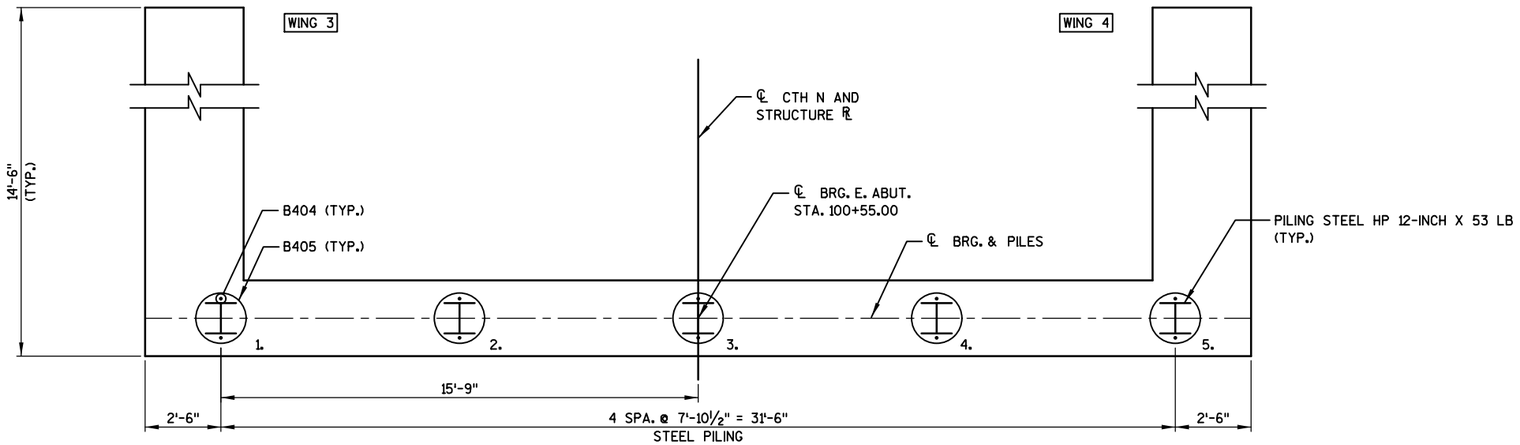
FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080105_wd.dgn





PROJECT NUMBER

316046

NOTES

SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF ½" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER 1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONCRETE. EXTEND SEALER 3" BELOW FINISHED ROADWAY SURFACE AT INSIDE FACE.

ADJUST B501 BARS INTERFERING WITH PILES.

SEE SHEET 2 FOR PILE SPLICE DETAILS.

SEE SHEET 7 FOR REINFORCING DETAILS.

EAST ABUTMENT TO BE SUPPORTED ON PILING STEEL 12-INCH X 53 LB WITH A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE AT WEST ABUTMENT. ESTIMATED 60 FEET LONG EACH.

LEGEND

- ● ½" FILLER. EXTEND FROM ABUT. SEAT TO TOP OF WING. INCLUDED IN WING LENGTH.
- ◨ 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- (#) INDICATES GIRDER NUMBER.
- * ELEVATION GIVEN AT ℄ BRG.
- ** ELEVATION GIVEN AT B.F. ABUTMENT.
- ■ THESE BARS MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE.
- △ PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. HIGH POINT EL. 812.50 AT ℞. ATTACH RODENT SHIELD AT ENDS OF PIPE. SEE SHEET 4 FOR DETAIL.
- ◭ KEYED CONST. JOINT FORMED BY BEVELED 2"X6".

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EAST ABUTMENT

SHEET 6

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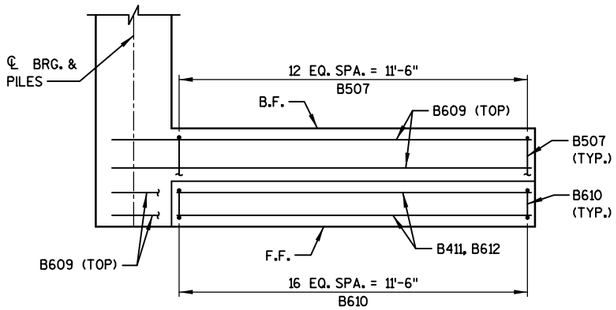
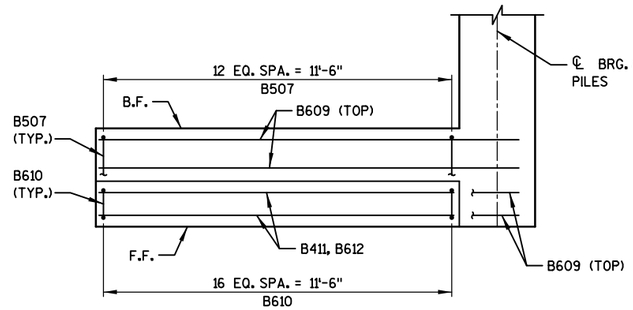
FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080106_ea.dgn

PROJECT NUMBER

316046



WING 4 PLAN



WING 3 PLAN

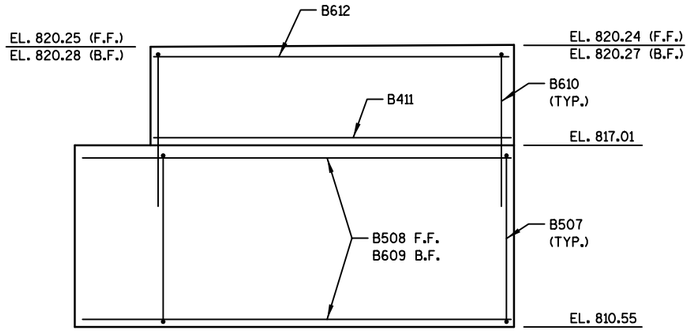
LEGEND

- ◭ KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2"x6".
- ◨ 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- ■ THESE BARS MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE.
- △ PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. HIGH POINT EL. 812.50 AT ℄. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN AS DETAILED ON SHEET 4.

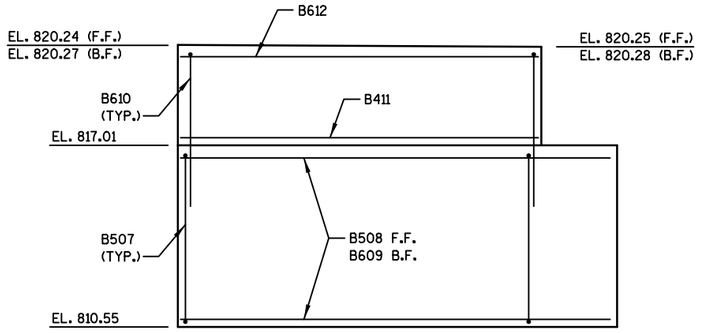
EAST ABUTMENT BILL OF BARS

UNCOATED: 3,280 LBS
COATED: 830 LBS

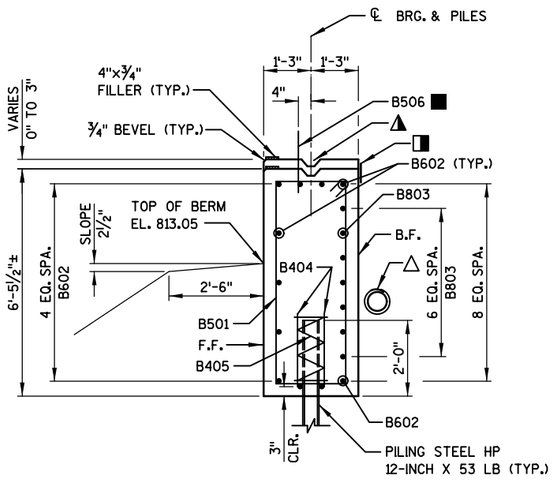
MARK	NO. REQ'D	LENGTH	BENT	COAT	LOCATION
B501	46	16'-9"	X		BODY - VERT. - STIRRUPS
B602	11	36'-2"			BODY - F.F., TOP, BTM. - HORIZ.
B803	7	38'-5"	X		BODY - B.F. - HORIZ.
B404	10	2'-3"			BODY - PILES - VERT.
B405	5	28'-0"	X		BODY - PILES - SPIRAL
B506	25	2'-0"		X	BODY - TOP - VERT.
B507	26	18'-5"	X		WINGS - LOWER - STIRRUPS
B508	14	14'-2"			WINGS - LOWER - F.F. - HORIZ
B609	16	14'-2"			WINGS - LOWER - B.F. & TOP - HORIZ
B610	34	11'-4"	X	X	WINGS - UPPER - VERT.
B411	16	11'-7"		X	WINGS - UPPER - F.F., B.F. - HORIZ.
B612	4	11'-7"		X	WINGS - UPPER - TOP - HORIZ.



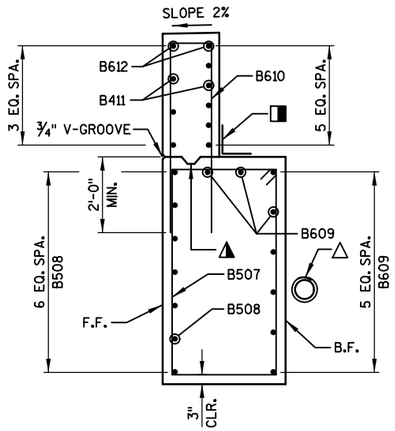
WING 4 ELEVATION
(FRONT FACE)



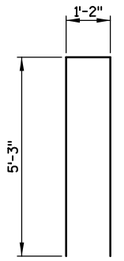
WING 3 ELEVATION
(FRONT FACE)



TYPICAL THRU BODY SECTION



TYPICAL WING SECTION



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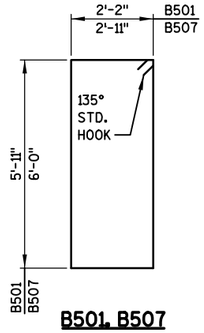
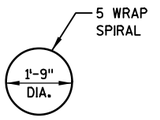
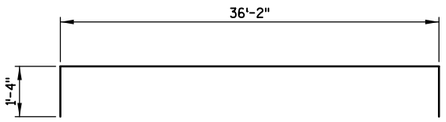


B501, B507



B405



B803

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

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EAST ABUTMENT DETAILS

SHEET 7

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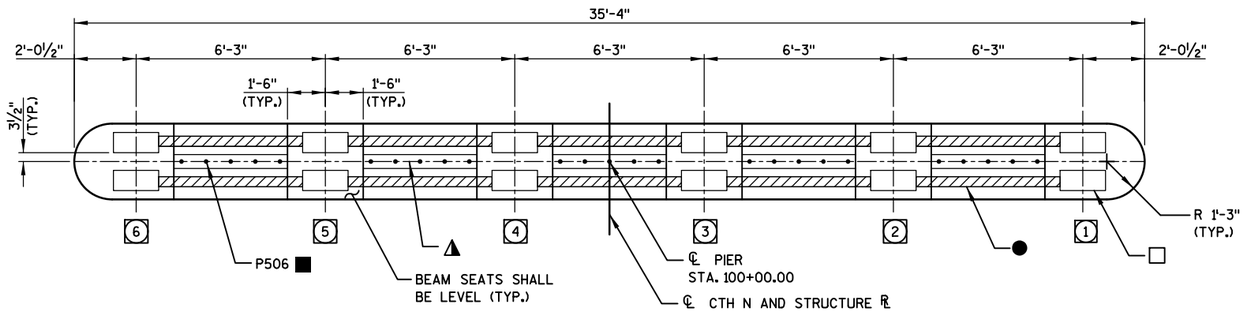
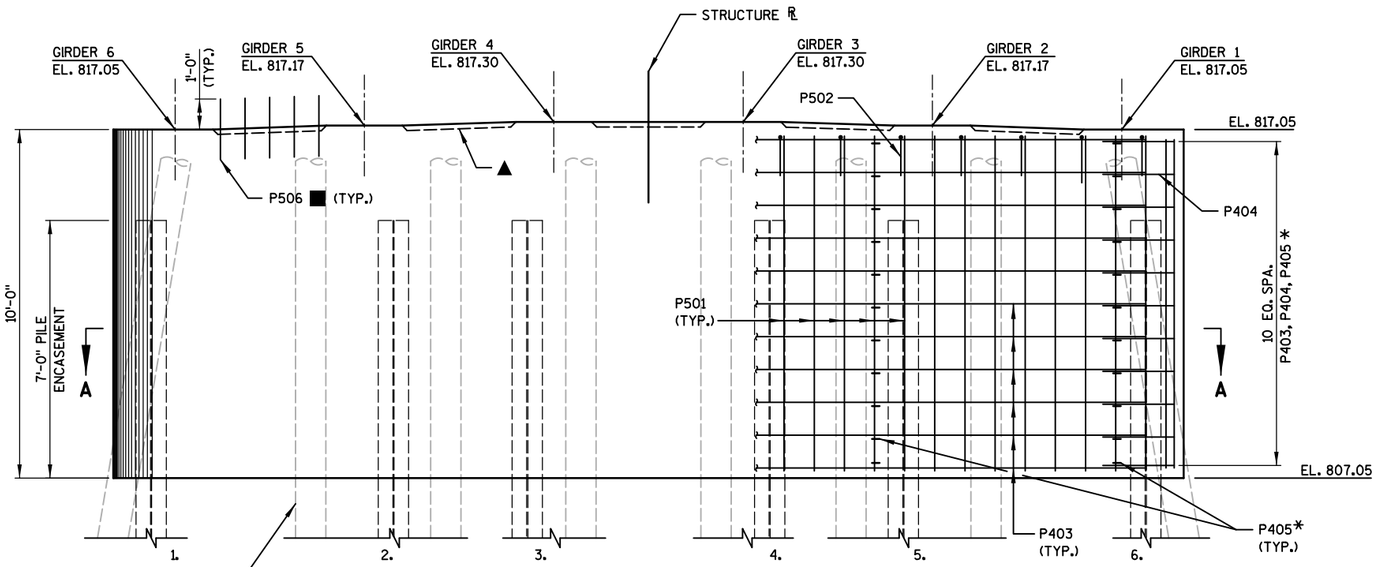
FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080107_ed.dgn

PROJECT NUMBER

316046

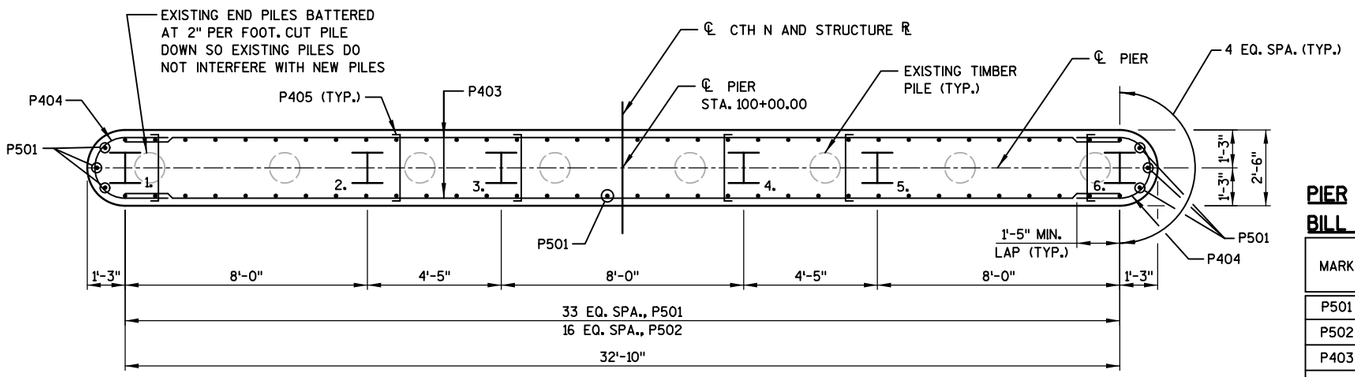


PIER TOP PLAN



ELEVATION

(LOOKING WEST)



SECTION A-A

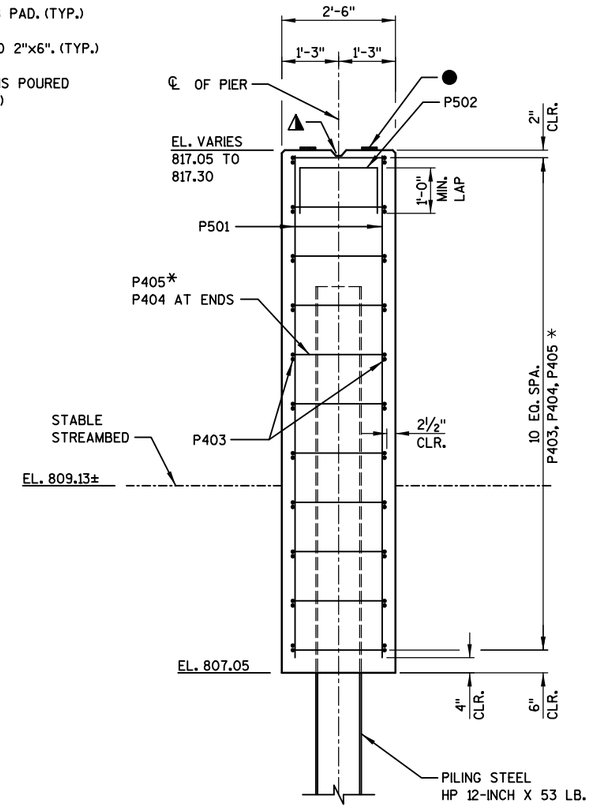
LEGEND

- (#) INDICATES GIRDER NUMBER.
- ● 4"x¾" PREFORMED FILLER BETWEEN GIRDERS. (TYP.)
- □ ½"x8"x18" NON-LAMINATED ELASTOMERIC BEARING PAD. (TYP.)
- ◭ KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2"x6". (TYP.)
- ■ THESE BARS MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET AS TAKEN PLACE. (TYP.)
- * ADJACENT TO EACH PILE, ONE SIDE ONLY.

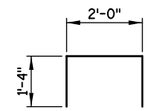
NOTES

SEE SHEET 2 FOR PILE SPLICE DETAILS.

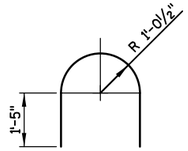
PIER TO BE SUPPORTED ON PILING STEEL 12-INCH X 53 LB WITH A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE AT PIER. ESTIMATED 60 FEET LONG EACH.



TYPICAL SECTION THRU PIER



P502



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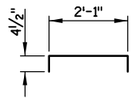

P405

PIER BILL OF BARS

UNCOATED: 1,500 LBS
COATED: 50 LBS

MARK	NO. REQ'D	LENGTH	BENT	COAT	LOCATION
P501	74	9'-6"			PIER - VERT.
P502	17	4'-5"	X		PIER - STIRRUPS - TOP - VERT.
P403	22	32'-10"			PIER - SIDES - HORIZ.
P404	22	6'-1"	X		PIER - ENDS - HORIZ.
P405	66	2'-8"	X		PIER - TIES - HORIZ.
P506	25	2'-0"		X	PIER - DOWELS - VERT.

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

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PIER

SHEET 8

Sheet 73

8

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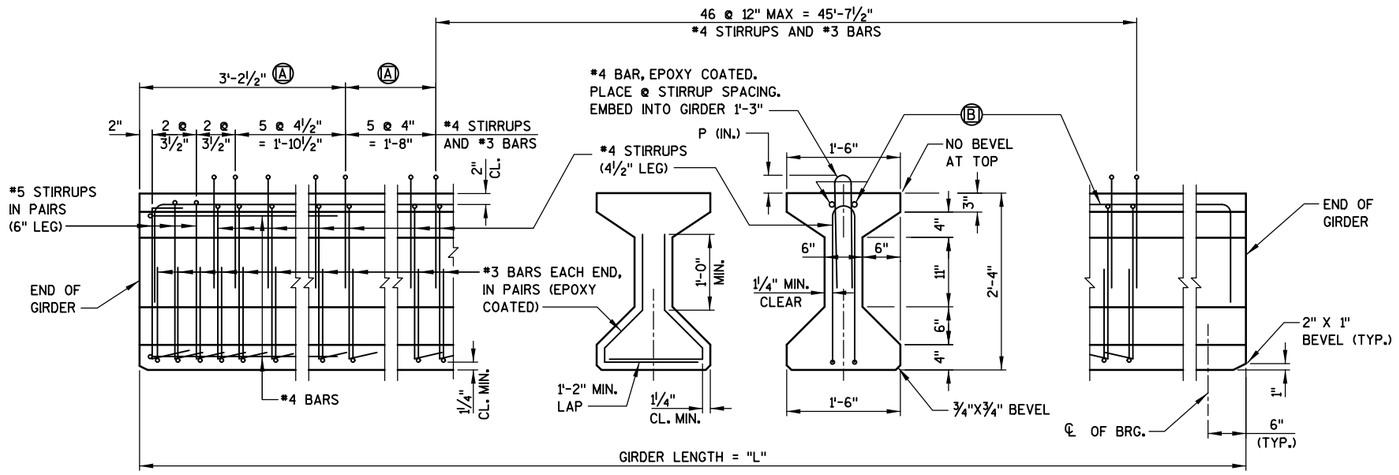
FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080108_pd.dgn

PROJECT NUMBER

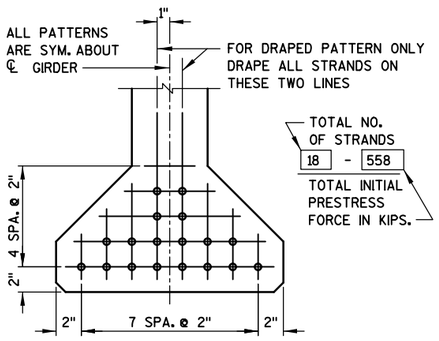
316046



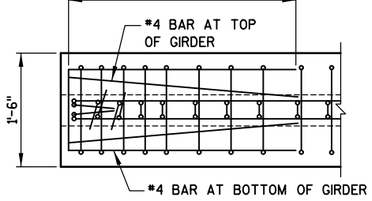
SIDE VIEW & TYPICAL SECTION IN SPAN

Ⓐ DETAIL TYP. AT EACH END

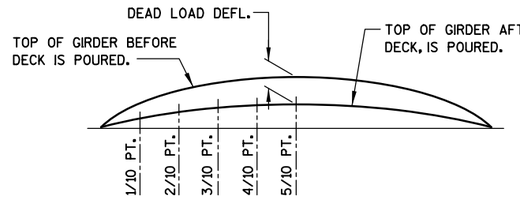
Ⓑ 2-BARS (NO. 5) BEND DOWN 16 BAR DIA. AT ENDS



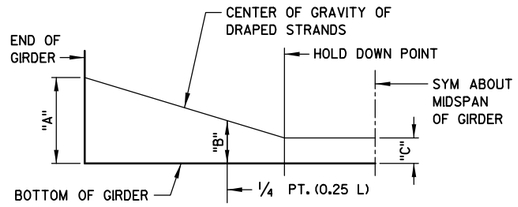
TYP. STRAND PATTERN



TOP VIEW OF GIRDER ENDS



DEAD LOAD DEFLECTION DIAGRAM



DRAPED STRAND PROFILE

* THE THEORETICAL INITIAL CAMBER VALUE AT THE TIME OF STRAND RELEASE AT MIDSPAN MULTIPLIED BY A FACTOR OF 1.4 TO ACCOUNT FOR CAMBER GROWTH FROM THE TIME OF STRAND RELEASE TO JOBSITE PLACEMENT.

SPAN	CAMBER (IN.) *
1, 2	1½

THESE VALUES ARE NOT TO BE USED IN DETERMINING 'T', USE ACTUAL GIRDER SHOTS.

THESE VALUES ARE FOR INFORMATIONAL PURPOSES ONLY.

GENERAL NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 2" OF GIRDER, WHICH SHALL RECEIVE A SMOOTH FINISH. AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 2" OF THE TOP FLANGE.

DO NOT APPLY CONCRETE SEALER OR EPOXY TO SURFACES RECEIVING APPLICATION OF CONCRETE STAINING.

THE GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE GIRDERS. SEE SECT. 503.3.3 OF WISDOT STANDARD SPECIFICATIONS FOR GUIDANCE.

STRANDS SHALL BE FLUSH WITH END OF GIRDER. FOR GIRDER ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER.

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

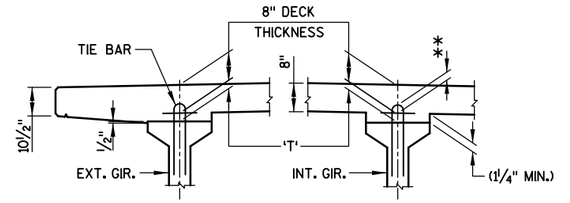
SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT.

AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A497 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

PRESTRESSING STRANDS SHALL BE 0.6" DIA.-7 WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

BEND EACH END OF #4 STIRRUPS 4½" AND #5 STIRRUPS 6".

FOR DIAPHRAGM INSERT & CONNECTON DETAILS SEE "STEEL DIAPHRAGM" SHEET.



DECK HAUNCH DETAIL

IF 1¼" MINIMUM HAUNCH HEIGHT AT EDGE OF GIRDER CANNOT BE MAINTAINED, THE GRADE LINE MAY BE REVISED BY THE ENGINEER AT THE OPTION OF THE CONTRACTOR, THE PLAN DECK THICKNESS SHALL BE HELD. NOTIFY THE ENGINEER IF THE GRADE LINE IS RAISED FROM THE PLAN PROFILE BY MORE THAN ½" OR,

** IF 3" MINIMUM DECK EMBEDMENT OF TIE BAR CANNOT BE OBTAINED.

TO DETERMINE 'T', ELEV. OF TOP OF GIR'S. AT ℄ OF SUBSTRUCTURE UNITS & AT 1/10 POINTS OF EACH SPAN SHALL BE TAKEN. THEN FOLLOW THIS PROCESS:

TOP OF DECK ELEV. AT FINAL GRADE
- TOP OF GIRDER ELEVATION
+ DEAD LOAD DEFLECTION
- DECK THICKNESS
= HAUNCH HEIGHT 'T'

NOTE: AN AVERAGE HAUNCH ('T') OF 2½" WAS USED IN THE QUANTITY "CONCRETE MASONRY BRIDGES".

* MINIMUM CYLINDER STRENGTH OF CONCRETE @ TIME OF TRANSFER OF PRESTRESS FORCE.

GIRDER DATA

SPAN	GIRDER	GIRDER LENGTH "L"	DEAD LOAD DEFL. (IN.) 1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	CONC. STRGTH. f'c (p.s.i.)	"P" 1ST ⅓ OF GIRDER	"P" MID ⅓ OF GIRDER	"P" END ⅓ OF GIRDER	DIA. OF STRAND (IN.)	DRAPED PATTERN TOTAL NO. OF STRANDS	f'ci (P.S.I.) *	(IN.) "A"	"B" MIN.	"B" MAX.	"C"	UNDRAPED PATTERN TOTAL NO. OF STRANDS	f'ci (P.S.I.) *
1,2	1,6	55'-4½"	0.23	0.44	0.61	0.71	0.75	0.71	0.61	0.44	0.23	8,000	7	7	7	0.5	18	6,800	23	9½	12½	5	--	--
1,2	2-5	55'-4½"	0.23	0.43	0.59	0.70	0.73	0.70	0.59	0.43	0.23	8,000	7	7	7	0.5	18	6,800	23	9½	12½	5	--	--

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

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28" PRESTRESSED GIRDER DETAILS

SHEET 9

Sheet 74

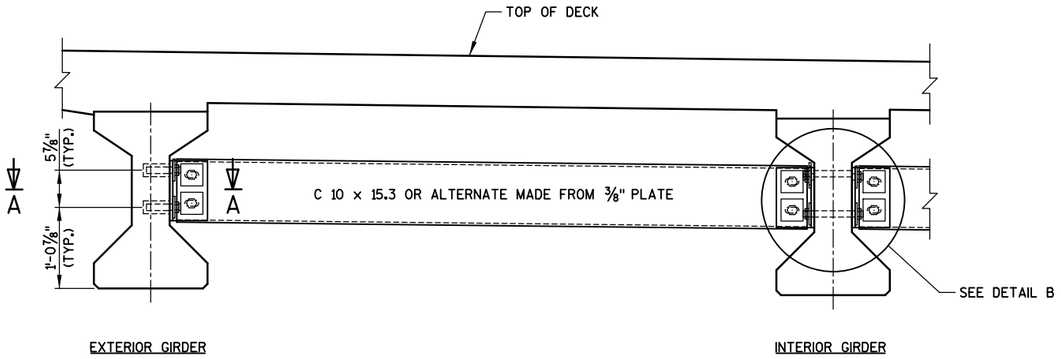
8

8

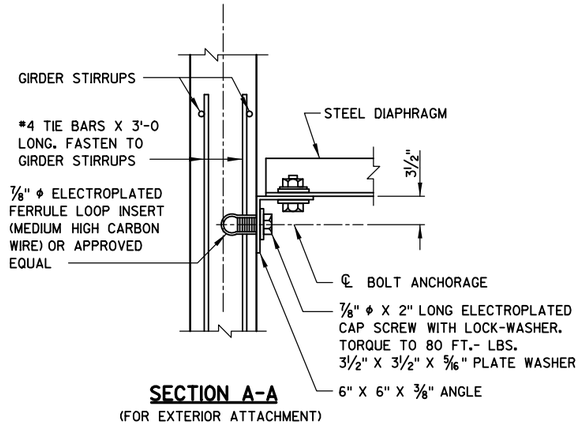
FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080109_gd.dgn

PROJECT NUMBER

316046



PART TRANSVERSE SECTION AT DIAPHRAGM



SECTION A-A

(FOR EXTERIOR ATTACHMENT)

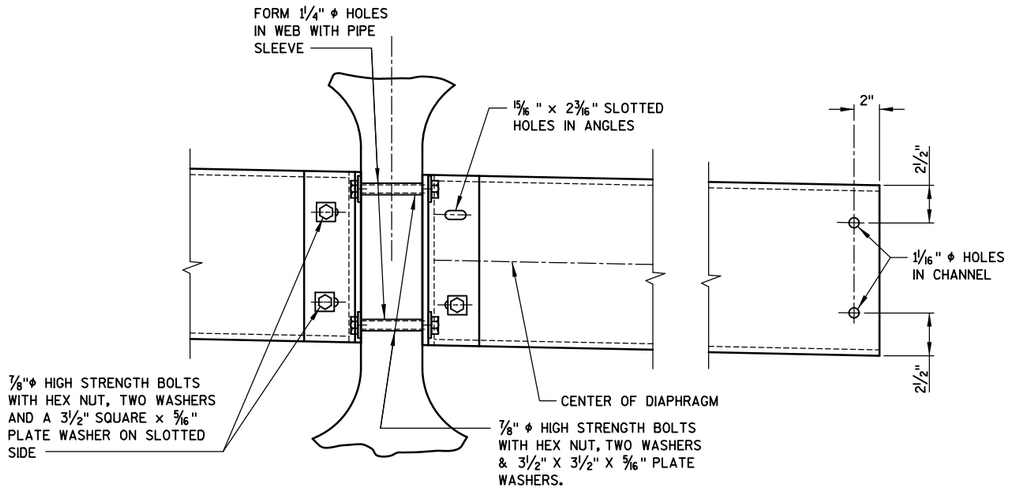
NOTES

ALL DIAPHRAGM MATERIAL NOT EMBEDDED IN THE CONCRETE GIRDER SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "STEEL DIAPHRAGMS B-13-681", EACH.

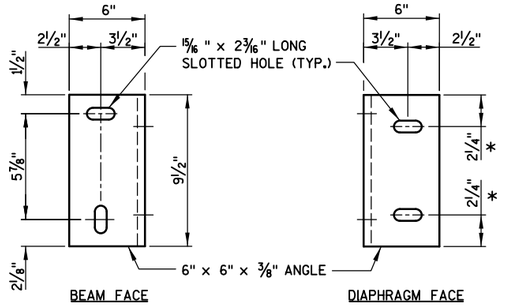
EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36. ALL BOLTS, NUTS AND WASHERS SHALL BE ASTM A325 TYPE 1.

ALL DIAPHRAGM STRUCTURAL STEEL SHOWN SHALL BE HOT-DIPPED GALVANIZED. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C. GALVANIZED NUTS SHALL BE TAPPED OVERSIZED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A563 AND SHALL MEET THE REQUIREMENTS OF SUPPLEMENTARY REQUIREMENT S1 OF ASTM A563, LUBRICANT AND TEST FOR COATED NUTS.

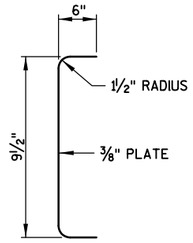


DETAIL B

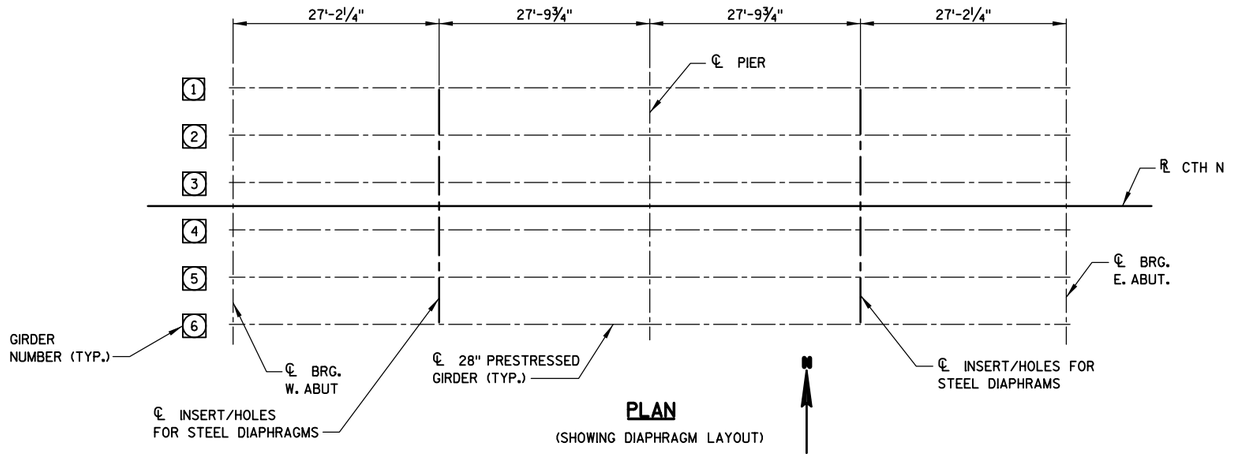


DIAPHRAGM SUPPORT

* 2½" FOR ALTERNATE PLATE DIAPHRAGM



SECTION THRU ALTERNATE DIAPHRAGM



PLAN

(SHOWING DIAPHRAGM LAYOUT)

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

DRAWN BY DTH | PLANS CK'D. DJW

STEEL DIAPHRAGM

SHEET 10

Sheet 75

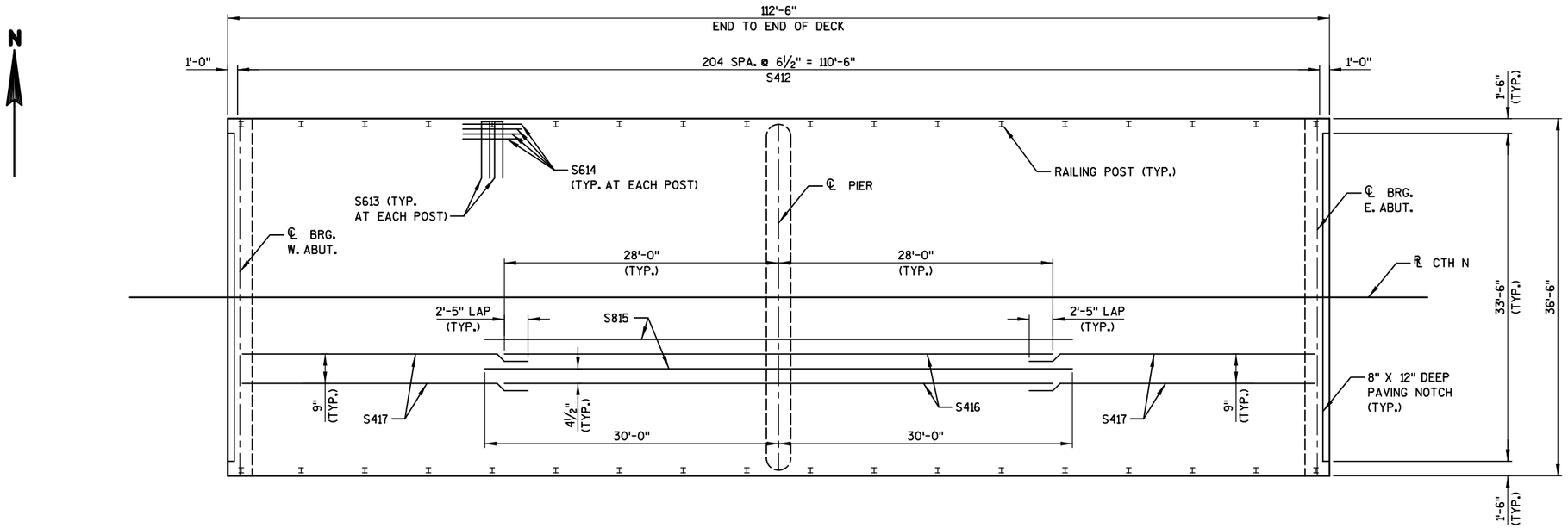
8

8

FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080110_sd.dgn

PROJECT NUMBER

316046

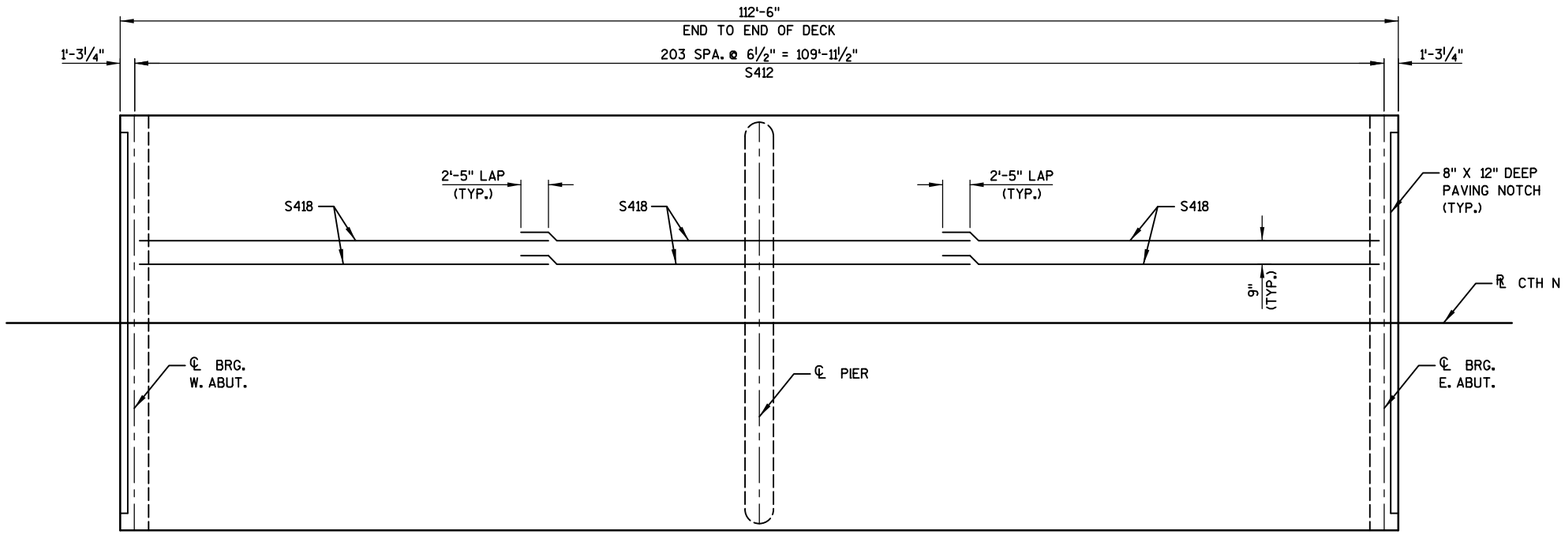


PLAN

(SHOWING TOP MAT SLAB REINFORCING)

NOTES

SEE SHEET 14 FOR REINFORCING DETAILS.



PLAN

(SHOWING BOTTOM MAT SLAB REINFORCING)

8

8

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

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SUPERSTRUCTURE PLAN

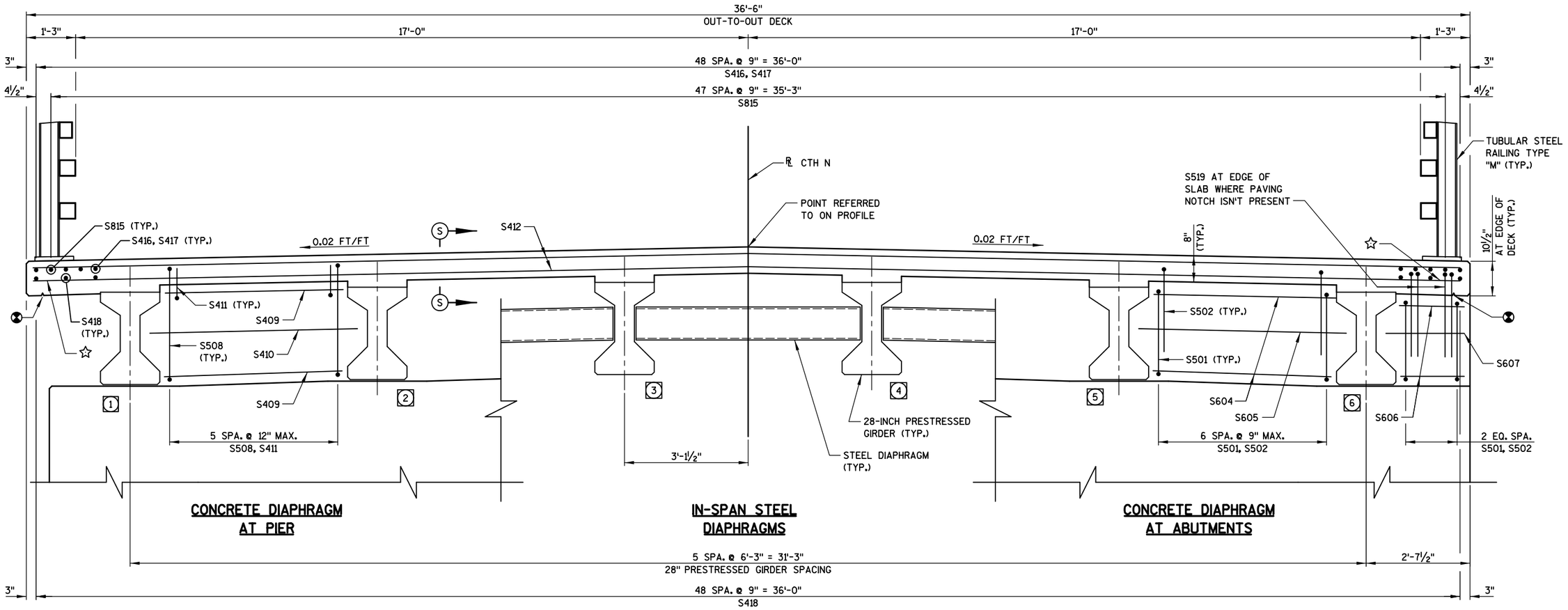
SHEET 11

Sheet 76

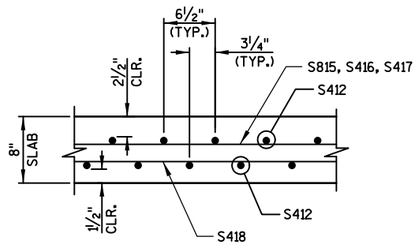
FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080111_sp.dgn

PROJECT NUMBER

316046



CROSS SECTION THRU DECK
(LOOKING EAST)



SECTION S-S

NOTES

SEE SHEET 14 FOR REINFORCING DETAILS.

LEGEND

(#) INDICATES GIRDER NUMBER.

¾" V-GROOVE REQ'D. EXTEND TO 6" FROM F.F. OF ABUTMENT DIAPHRAGM.

☆ SEE TOP MAT SLAB REINFORCING PLAN FOR ADDITIONAL REINFORCING AT RAILING POSTS.

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

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SUPERSTRUCTURE SECTION

SHEET 12

Sheet 77

8

8

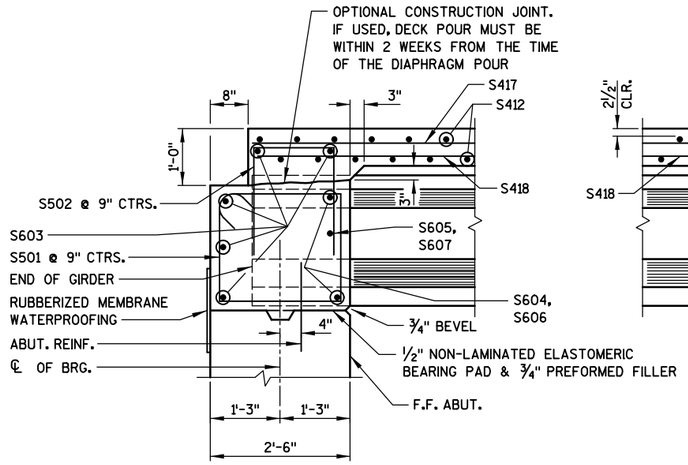
FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080112_ss.dgn

PROJECT NUMBER
316046

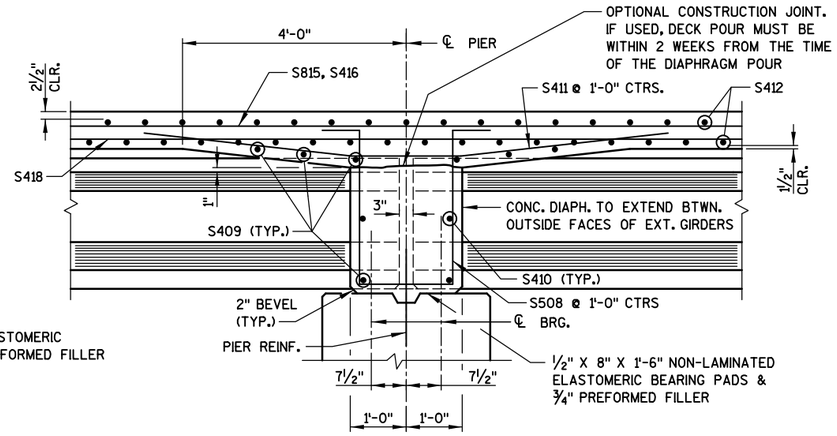
NOTES

SEE SHEET 14 FOR REINFORCING DETAILS.

PART LONGIT. SECTION

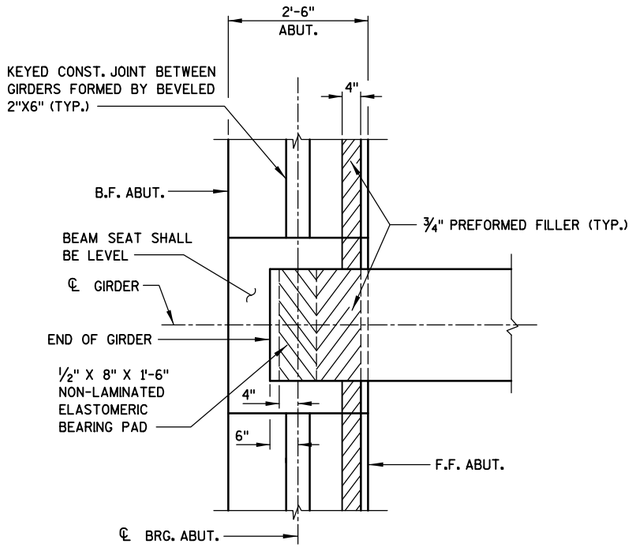


AT ABUTMENTS



AT PIER

BEARING PAD DETAILS



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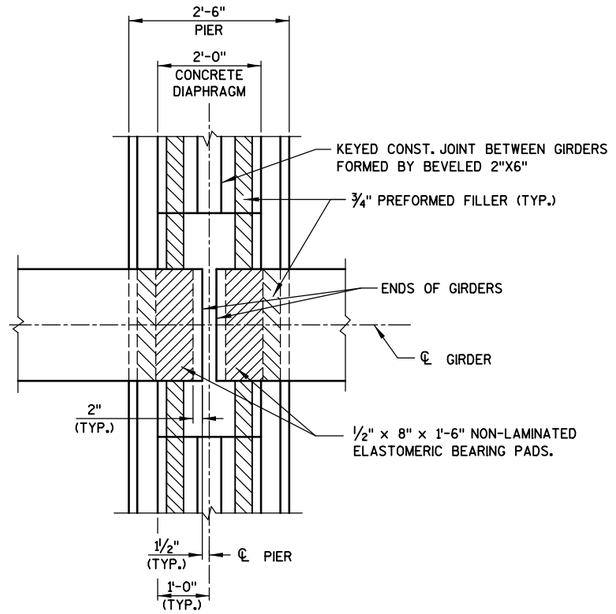

AT PIER

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

DRAWN BY DTH | PLANS CK'D. DJW

SUPERSTRUCTURE DETAILS - 1

SHEET 13

Sheet 78

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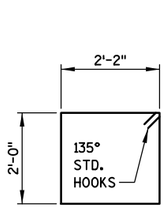
FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080113_sd.dgn

PROJECT NUMBER
316046

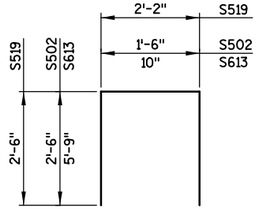
TOP OF DECK ELEVATIONS

LOCATION	STATION	TOP OF DECK ELEVATIONS								
		NORTH EOD	GIRDER 1	GIRDER 2	GIRDER 3	REF. LINE	GIRDER 4	GIRDER 5	GIRDER 6	SOUTH EOD
		18.25' LEFT	15.625' LEFT	9.375' LEFT	3.125' LEFT	0	3.125' RIGHT	9.375' RIGHT	15.625' RIGHT	18.25' RIGHT
C/L BRG. W. ABUT.	99+45.00	820.32	820.37	820.50	820.62	820.68	820.62	820.50	820.37	820.32
0.1L POINT	99+50.50	820.31	820.37	820.49	820.62	820.68	820.62	820.49	820.37	820.31
0.2L POINT	99+56.00	820.31	820.36	820.49	820.61	820.68	820.61	820.49	820.36	820.31
0.3L POINT	99+61.50	820.31	820.36	820.49	820.61	820.67	820.61	820.49	820.36	820.31
0.4L POINT	99+67.00	820.30	820.36	820.48	820.61	820.67	820.61	820.48	820.36	820.30
0.5L POINT	99+72.50	820.30	820.35	820.48	820.60	820.67	820.60	820.48	820.35	820.30
0.6L POINT	99+78.00	820.30	820.35	820.48	820.60	820.66	820.60	820.48	820.35	820.30
0.7L POINT	99+83.50	820.29	820.35	820.47	820.60	820.66	820.60	820.47	820.35	820.29
0.8L POINT	99+89.00	820.29	820.34	820.47	820.59	820.66	820.59	820.47	820.34	820.29
0.9L POINT	99+94.50	820.29	820.34	820.47	820.59	820.65	820.59	820.47	820.34	820.29
C/L PIER	100+00.00	820.29	820.34	820.46	820.59	820.65	820.59	820.46	820.34	820.29
0.1L POINT	100+05.50	820.28	820.33	820.46	820.58	820.65	820.58	820.46	820.33	820.28
0.2L POINT	100+11.00	820.28	820.33	820.46	820.58	820.64	820.58	820.46	820.33	820.28
0.3L POINT	100+16.50	820.28	820.33	820.45	820.58	820.64	820.58	820.45	820.33	820.28
0.4L POINT	100+22.00	820.27	820.32	820.45	820.57	820.64	820.57	820.45	820.32	820.27
0.5L POINT	100+27.50	820.27	820.32	820.45	820.57	820.63	820.57	820.45	820.32	820.27
0.6L POINT	100+33.00	820.27	820.32	820.44	820.57	820.63	820.57	820.44	820.32	820.27
0.7L POINT	100+38.50	820.26	820.31	820.44	820.56	820.63	820.56	820.44	820.31	820.26
0.8L POINT	100+44.00	820.26	820.31	820.44	820.56	820.62	820.56	820.44	820.31	820.26
0.9L POINT	100+49.50	820.26	820.31	820.43	820.56	820.62	820.56	820.43	820.31	820.26
C/L BRG. E. ABUT.	100+55.00	820.25	820.30	820.43	820.55	820.62	820.55	820.43	820.30	820.25

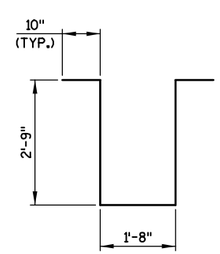
ELEVATIONS SHOWN ARE FINISHED GRADE ELEVATIONS.



S501



S502, S613, S519

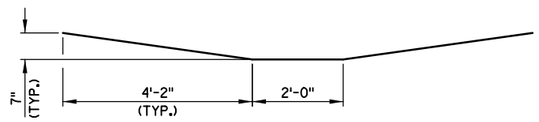


S508

SUPERSTRUCTURE
BILL OF BARS

COATED: 30,480 LBS

MARK	NO. REQ'D	LENGTH	BENT	COAT	LOCATION
S501	82	8'-11"	X	X	ABUT. DIAPHRAGM - VERT.
S502	82	6'-3"	X	X	ABUT. DIAPHRAGM - VERT.
S603	10	36'-2"		X	ABUT. DIAPHRAGM - HORIZ. - B.F., TOP
S604	20	4'-5"		X	ABUT. DIAPHRAGM - HORIZ. - F.F.
S605	10	5'-5"		X	ABUT. DIAPHRAGM - HORIZ. - F.F.
S606	8	1'-6"		X	ABUT. DIAPHRAGM - HORIZ. - F.F. - ENDS
S607	4	2'-0"		X	ABUT. DIAPHRAGM - HORIZ. - F.F. - ENDS
S508	30	8'-4"	X	X	PIER DIAPHRAGM - VERT.
S409	40	4'-5"		X	PIER DIAPHRAGM - HORIZ.
S410	10	5'-5"		X	PIER DIAPHRAGM - HORIZ.
S411	30	10'-5"	X	X	PIER DIAPHRAGM - HORIZ.
S412	409	36'-2"		X	SLAB - TRANSVERSE - TOP AND BOTTOM
S613	72	12'-0"	X	X	SLAB - TRANSVERSE - AT RAILING POSTS
S614	144	6'-0"		X	SLAB - LONG. - AT RAILING POSTS
S815	48	60'-0"		X	SLAB - LONG. - TOP
S416	49	56'-0"		X	SLAB - LONG. - TOP
S417	98	29'-10"		X	SLAB - LONG. - TOP
S418	147	29'-4"		X	SLAB - LONG. - BOTTOM
S519	8	6'-11"	X	X	ABUT. DIAPHRAGM - VERT. - EDGE OF SLAB



S411

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

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SUPERSTRUCTURE DETAILS - 2

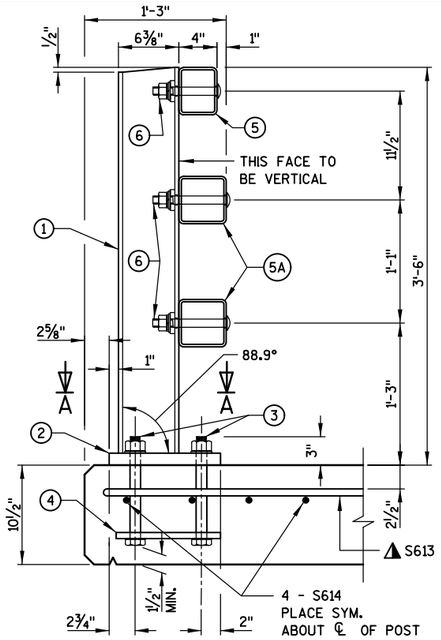
SHEET 14

Sheet 79

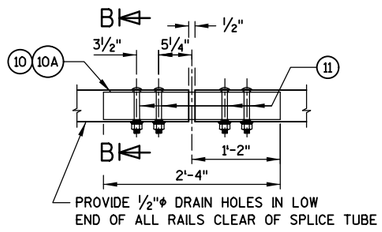
FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080114_sd.dgn

PROJECT NUMBER

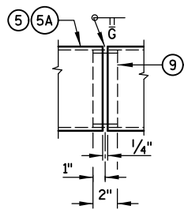
316046



SECTION THRU RAILING ON DECK

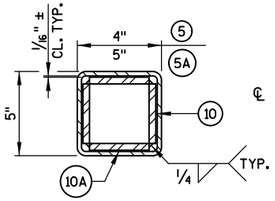


FIELD ERECTION JOINT DETAIL

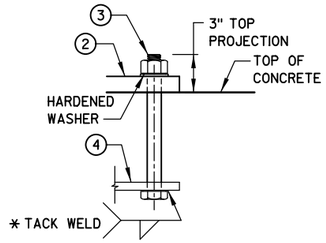


SHOP RAIL SPLICE DETAIL

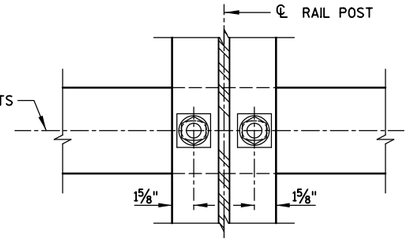
LOCATION MUST BE SHOWN ON SHOP DRAWINGS



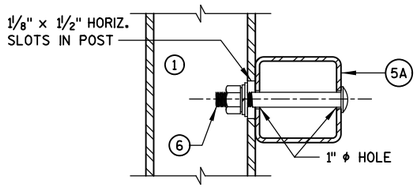
SECTION B-B



ANCHOR BOLTS



SECTION THRU POST WEB



SECTION THRU RAIL

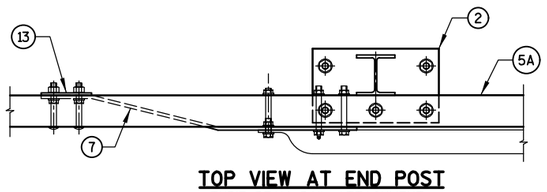
NOTE: CONNECTIONS AT LOWER RAILS SHOWN. CONNECTIONS AT TOP RAIL SIMILAR.

TYPICAL RAIL TO POST CONNECTIONS

LEGEND

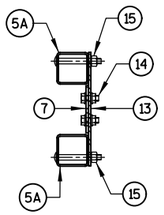
⚠ TIE TO TOP MAT OF STEEL.

✳ FOR ANCHOR BOLTS IN WINGS, TACK WELD MAY BE USED IN FIELD AFTER ANCHOR PLATE IS IN POSITIOIN IF REQ'D. FOR CONSTRUCTIBILITY.



TOP VIEW AT END POST

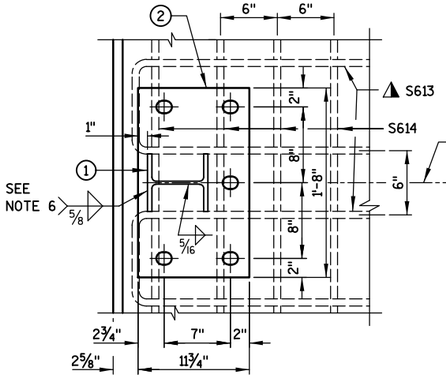
THRIE BEAM RAIL ATTACHMENT



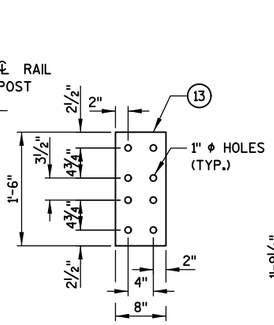
SECTION C-C

LEGEND

1. W6 X 25 WITH 1 1/8" X 1 1/2" HORIZ. SLOTS ON EACH SIDE OF POST FOR BOLT NO.6. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY. PLACE POST VERTICAL. PLACE POSTS NORMAL TO GRADE LINE.
2. PLATE 1 1/4" X 11 3/4" X 1'-8" WITH 1 5/16" X 1 5/8" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1 AS SHOWN. SLOTS PARALLEL TO SHORT SIDE OF PLATE.
3. ASTM A449 - 1" DIA. ANCHOR BOLTS WITH NUT AND HARDENED WASHER (ALL GALVANIZED). 5 REQ'D PER POST. THREAD 3" AND PLACE NORMAL TO PLATE NO. 2. CHAMFER TOP OF BOLTS BEFORE THREADING. USE 1'-9" LONG IN ABUTMENT WINGS. AT POST ON CONCRETE SLAB SUPERSTRUCTURES USE 10 3/4" LONG. (AN EQUIVALENT THREADED ROD WITH NUTS AND HARDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINGS IF REQ'D FOR CONSTRUCTIBILITY.)
4. 5/8" X 11" X 1'-8" ANCHOR PLATE (GALVANIZED) WITH 1 3/16" DIA. HOLES FOR ANCHOR BOLTS NO. 3.
5. TS 5 X 4 X 0.25 STRUCTURAL TUBING. ATTACH TO NO. 1 WITH NO. 6.
5A. TS 5 X 5 X 0.25 STRUCTURAL TUBING. ATTACH TO NO. 1 WITH NO. 6.
6. 7/8" DIA. A325 SLOTTED ROUND HEAD BOLT WITH NUT, 3/16" X 1 5/8" X 1 5/8" WASHER, AND LOCK WASHER (2 REQ'D. AT EACH RAIL TO POST LOCATION.)
7. 1/2" THK. BACK-UP PLATE WITH 2 - 7/8" X 1 1/2" THREADED SHOP WELDED STUDS (NO. 12). BOLT TO RAIL AS SHOWN IN DETAIL. REQUIRED AT THRIE BEAM GUARD RAIL ATTACHMENTS ONLY. PLACE SYMMETRICALLY ABOUT TUBES NO. 5A.
8. 1" DIA. HOLES IN PLATE NO. 7 & TUBES NO. 5A FOR 7/8" DIA. A325 BOLTS WITH HEX NUTS AND WASHERS. 6 HOLES IN TUBES AND PLATE NO. 7.
9. SPLICE SLEEVE FABRICATED FROM 1/4" PLATE. PROVIDE "SLIDING FIT".
10. 3/8" X 3 5/8" X 2'-4" PLATE. 2 PER RAIL. USED IN NO. 5 & 5A.
10A. 3/8" X 2 5/8" X 2'-4" PLATE USED IN NO. 5, 3/8" X 3 5/8" X 2'-4" PLATE USED IN NO. 5A. 2 PER RAIL.
11. 7/8" ϕ A325 ROUND HEAD BOLT WITH NUT, WASHER, AND LOCK WASHER. USE 15/16 " X 1 1/4" LONGIT. SLOTTED HOLES AT FIELD JOINTS AND 15/16 " X 2 1/4" MIN. LONGIT. SLOTTED HOLES AT EXP. JOINTS IN PLATE NO. 10A.
12. 7/8" DIA. X 1 1/2" LONG THREADED SHOP WELDED STUDS (2 REQ'D).
13. 3/8" X 8" X 1'-6" PLATE. BOLT TO RAIL AS SHOWN IN DETAIL. REQ'D AT THRIE BEAM GUARD RAIL ATTACHMENTS ONLY. PLACE SYM. SBOUT TUBES NO. 5A.
14. 7/8" DIA. X 2" LONG A325 HEX BOLT WITH NUT AND WASHER (5 REQ'D.).
15. 1" ϕ HOLES IN TUBES NO. 5A FOR 7/8" DIA. A325 ROUND HEAD BOLT WITH NUT, WASHER AND LOCK WASHER (4 REQ'D.). 4 HOLES IN TUBES.

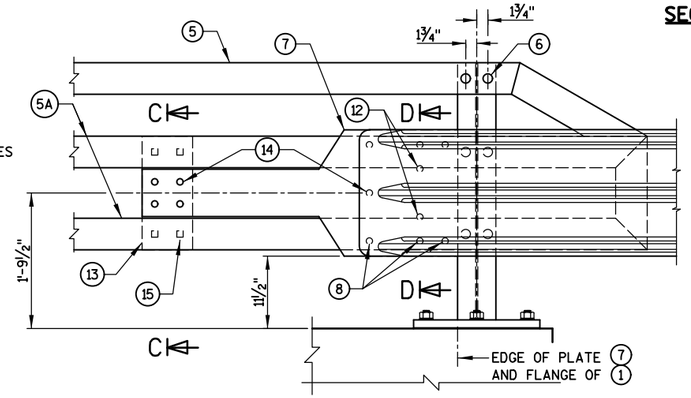


SECTION A-A



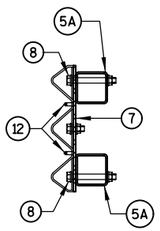
ANCHOR PLATE

AT BEAM GUARD ATTACHMENT

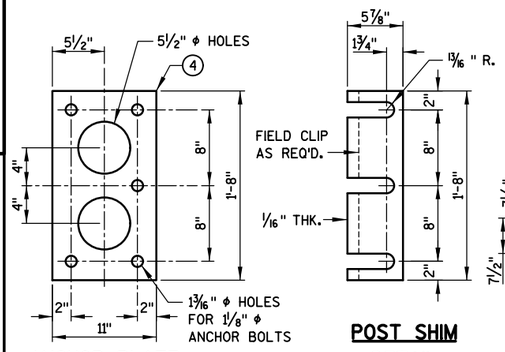


DETAIL AT END POST

THRIE BEAM RAIL ATTACHMENT



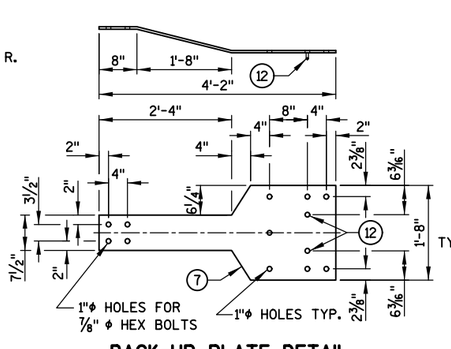
SECTION D-D



ANCHOR PLATE

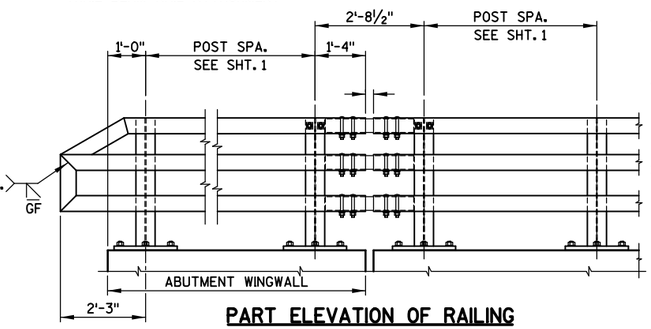
AT RAIL TO DECK CONNECTION

POST SHIM DETAIL



BACK-UP PLATE DETAIL

AT BEAM GUARD ATTACHMENT



PART ELEVATION OF RAILING

GENERAL NOTES

1. BID ITEM SHALL BE "RAILING TUBULAR TYPE M B-13-681" WHICH INCLUDES ALL ITEMS SHOWN.
2. RAIL POST AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 50. HOLLOW RAILING STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B OR C WITH A CERTIFIED FY = 50 KSI. ANCHOR PLATES, AND SPLICE TUBE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 36.
3. THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.
4. RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF THREE (3) POSTS WITHOUT SPLICES WHERE POSSIBLE.
5. ENDS OF TUBE SECTIONS SHALL BE SAWED. GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.
6. WELD IS THE SAME ON BOTH FLANGES. FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING.
7. FILL BOLT SLOT OPENINGS IN POST SHIMS AND PLATE NO. 2 AND CAULK AROUND PERIMETER OF PLATE NO. 2 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. STEEL POST SHIMS MAY BE USED UNDER POSTS WHERE REQ'D. FOR ALIGNMENT.
8. POST BASE PLATES SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUT.
9. ALL MATERIAL SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, ALL STEEL RAILING POSTS & STEEL TUBING SHALL BE GIVEN A NO. 6 BLAST CLEANING BY SSPC SPECIFICATIONS.
10. THIS RAILING MEETS NCHRP REPOST 350 EVALUATION CRITERIA FOR TEST LEVEL 4 (TL-4).

NO.	DATE	REVISION	BY

STRUCTURE B-13-681

DRAWN BY DTH | PLANS CK'D. DJW

RAILING TUBULAR TYPE M

SHEET 15

Sheet 80

8

8

FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\080115_ts.dgn

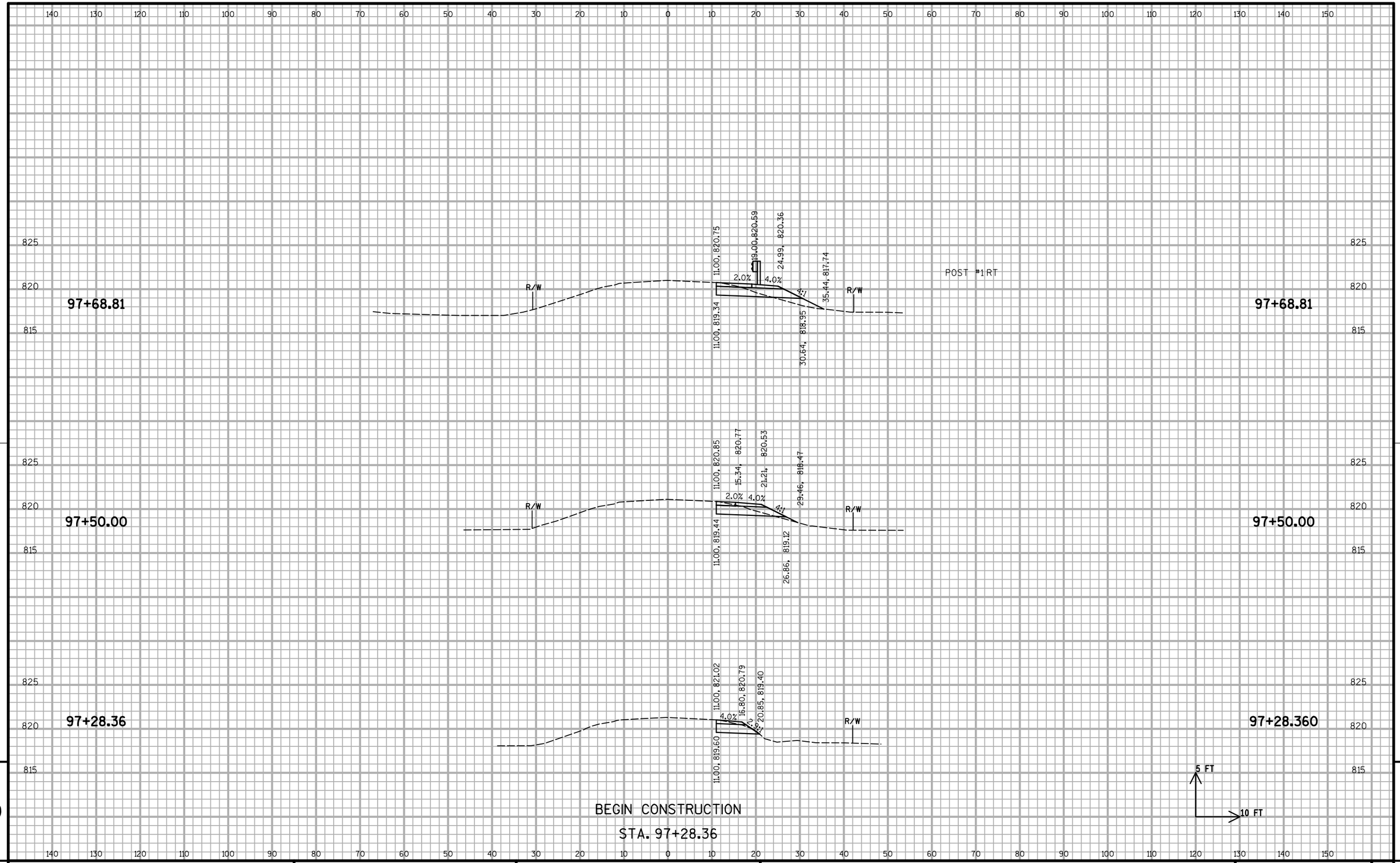
EARTHWORK SUMMARY											
			AREA (SF)			INCREMENTAL VOL (CY) (UNADJUSTED)			CUMULATIVE VOLUME (CY)		
STATION	REAL STATION	DISTANCE	CUT	SALVAGED/UNUSABLE PAVEMENT MATERIAL	FILL	CUT	SALVAGED/UNUSABLE PAVEMENT MATERIAL	UNEXPANDED FILL	CUT 1.00 NOTE 1	EXPANDED FILL 1.25 NOTE 4	MASS ORDINATE
97+28.36	9728.36		9		2						
97+50.00	9750.00	21.64	10	0	1	8	0	1	8	1	7
97+68.81	9768.81	18.81	10	0	5	7	0	2	15	4	11
97+93.81	9793.81	25.00	19	0	7	13	0	5	28	10	18
98+00.00	9800.00	6.19	19	0	8	4	0	2	32	13	20
98+18.81	9818.81	18.81	20	0	15	13	0	8	45	23	23
98+43.81	9843.81	25.00	21	0	11	19	0	12	64	38	27
98+50.00	9850.00	6.19	51	9.2	10	8	1	3	72	41	30
98+68.81	9868.81	18.81	47	9.2	10	34	6	7	106	50	49
99+00.00	9900.00	31.19	34	9.2	52	46	11	36	152	95	39
99+47.62	9947.62	47.62	34	9.2	52	60	16	92	212	210	-32
Bridge											
100+52.37	10052.37		40	9.2	20						
101+00.00	10100.00	47.63	40	9.2	20	71	16	35	71	44	11
101+31.19	10131.19	31.19	55	9.2	53	55	11	42	126	96	3
101+50.00	10150.00	18.81	148	9.2	0	71	6	18	197	119	45
101+56.19	10156.19	6.19	128	0	0	32	1	0	229	119	76
101+81.19	10181.19	25.00	46	0	25	80	0	11	309	133	143
102+00.00	10200.00	18.81	25	0	72	25	0	34	334	175	125
102+06.19	10206.19	6.19	27	0	72	6	0	17	340	196	110
102+31.19	10231.19	25.00	41	0	18	32	0	42	372	249	89
102+50.00	10250.00	18.81	9	0	39	17	0	20	389	274	81
102+89.82	10289.82	39.82	9	0	39	14	0	57	403	345	24

NOTES:
1 - CUT: CUT INCLUDES SALVAGED/UNUSABLE PAVEMENT MATERIAL
2 - SALVAGED/UNUSABLE PAVEMENT MATERIAL: is not shown in cross sections
3 - FILL: Does not include Unusable Pavement Exc Volume
4 - MASS ORDINATE: Cut - Salvaged/Unusable Pavement Material - FILL*FILL Factor

9

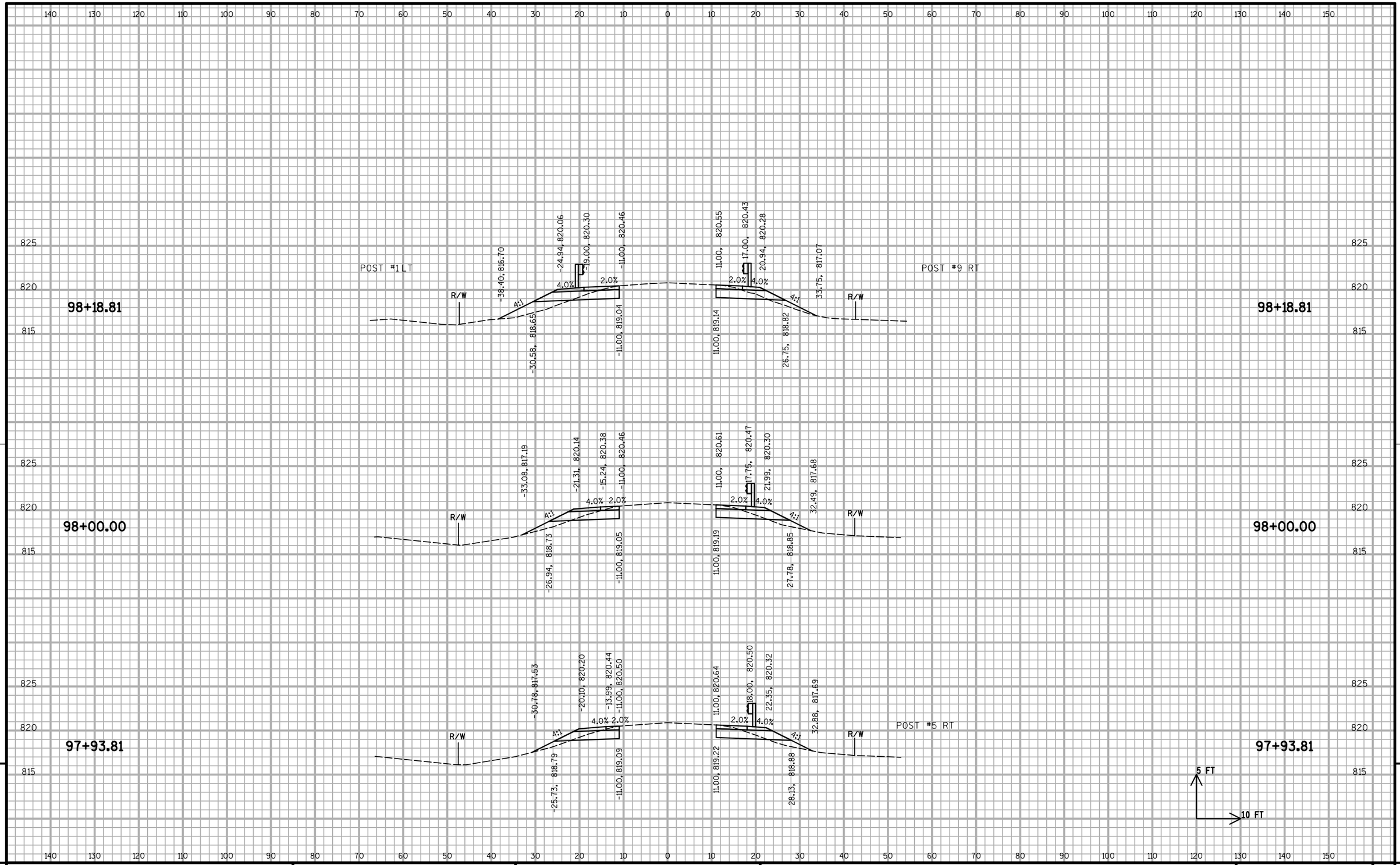
9

PROJECT NO: 316046 | HWY: CTH N | COUNTY: DANE | EARTHWORK | SHEET 81 | E



PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	CROSS SECTIONS: CTH N	SHEET 82	E

FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\090101_XS.dgn PLOT DATE : 1/10/2017 PLOT BY : _username_ PLOT NAME : PLOT SCALE : $$.....plotscale.....$$ WISDOT/CADDS SHEET 21



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PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	CROSS SECTIONS: CTH N	SHEET 83	E

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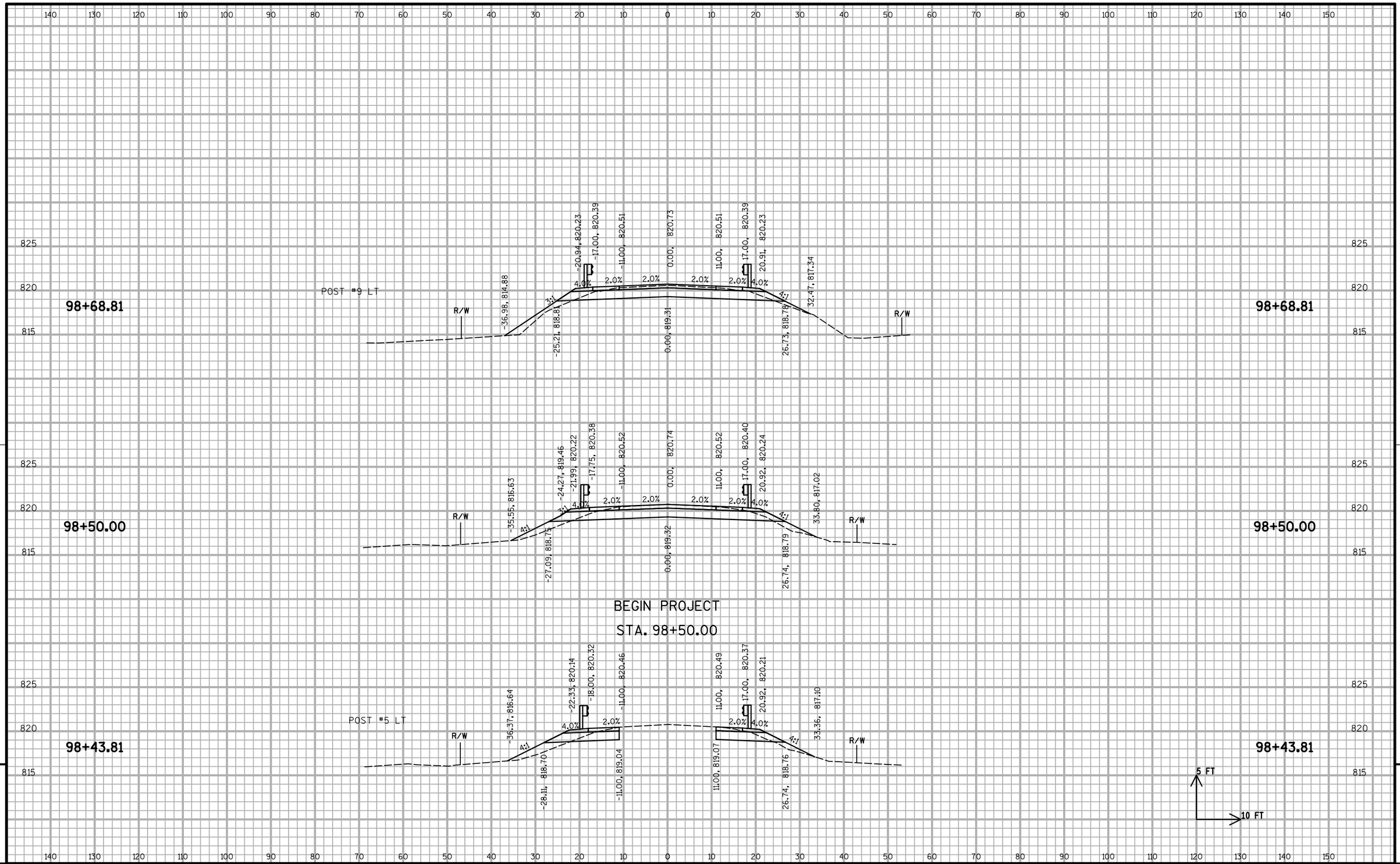

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PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	CROSS SECTIONS: CTH N	SHEET 84	E

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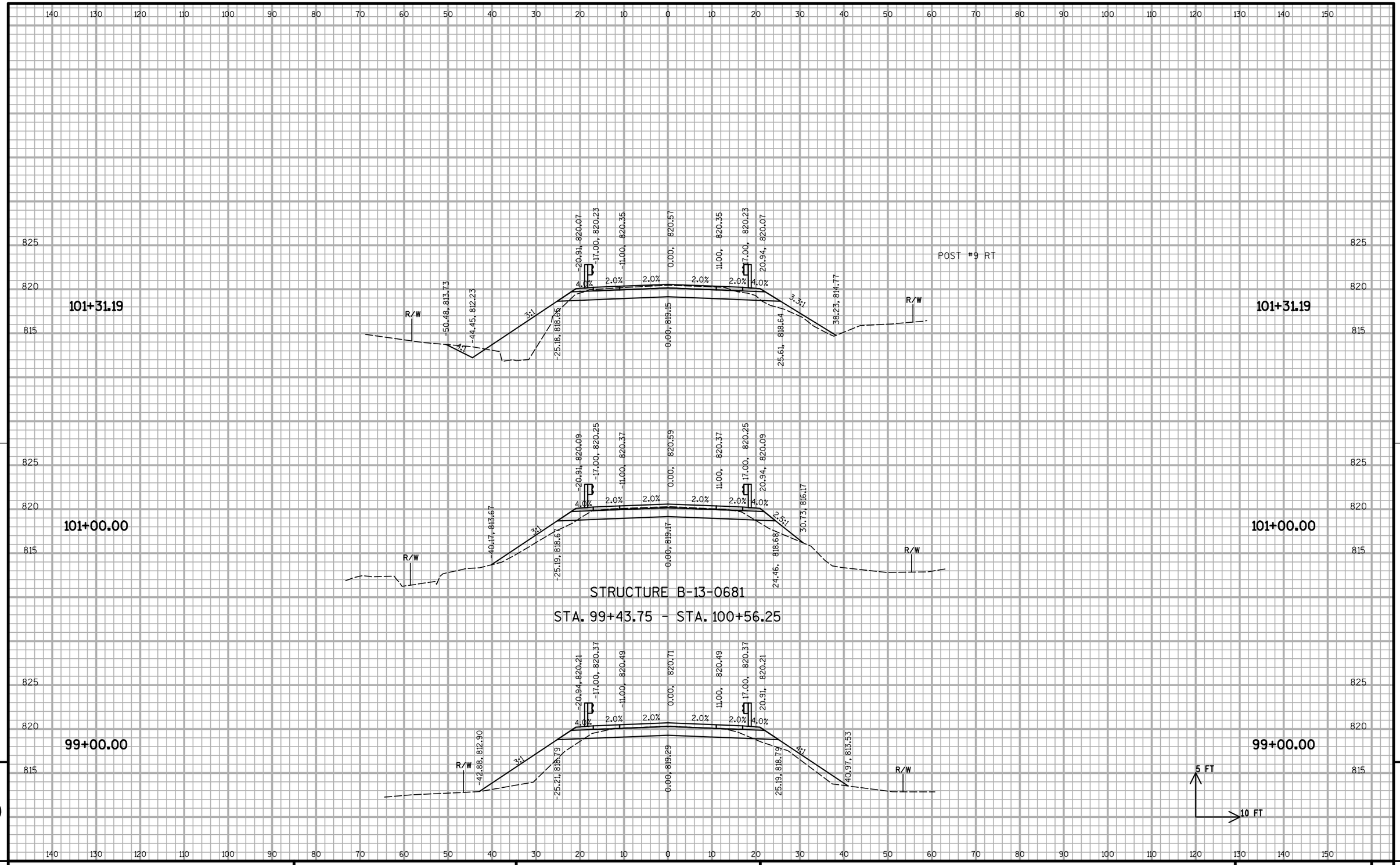

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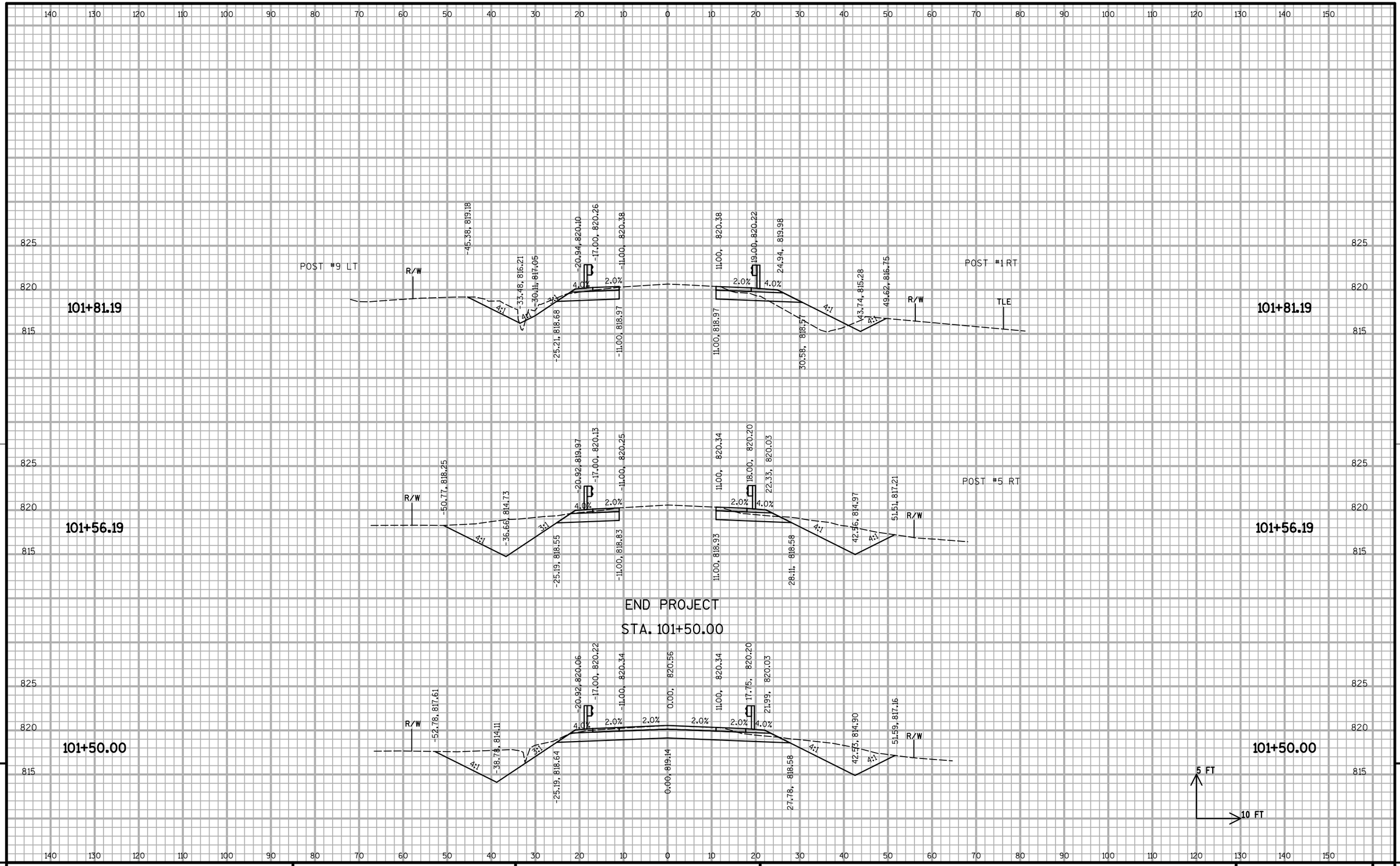
PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	CROSS SECTIONS: CTH N	SHEET 85	E

FILE NAME : S:\MAD\1100--1199\1124\013\Micros\Plan\090101_XS.dgn PLOT DATE : 1/10/2017 PLOT BY : _username_ PLOT NAME : PLOT SCALE : $$.....plotscale.....$$ WISDOT/CADDS SHEET 21



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PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	CROSS SECTIONS: CTH N	SHEET 86	E

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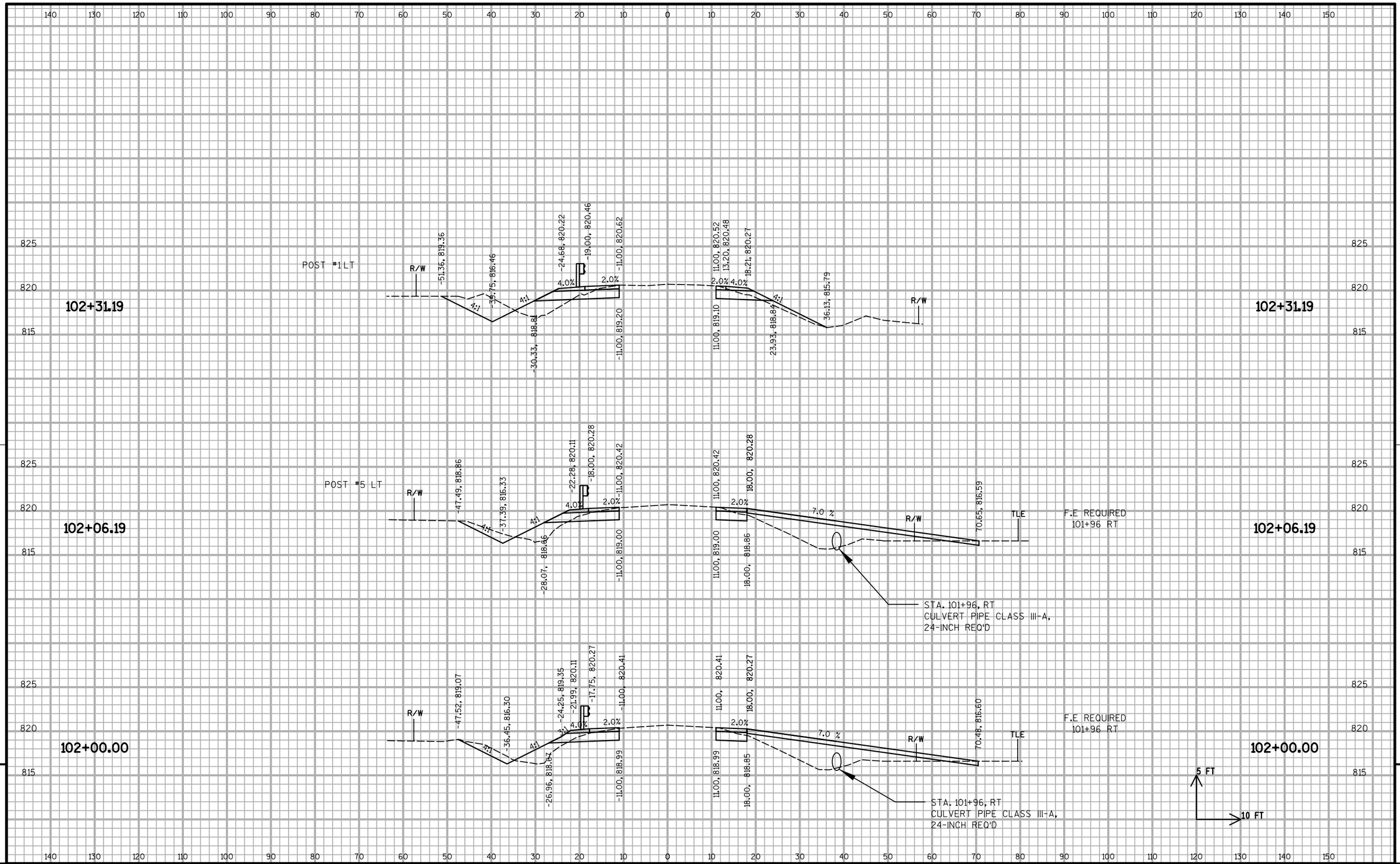

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PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	CROSS SECTIONS: CTH N	SHEET 87	E

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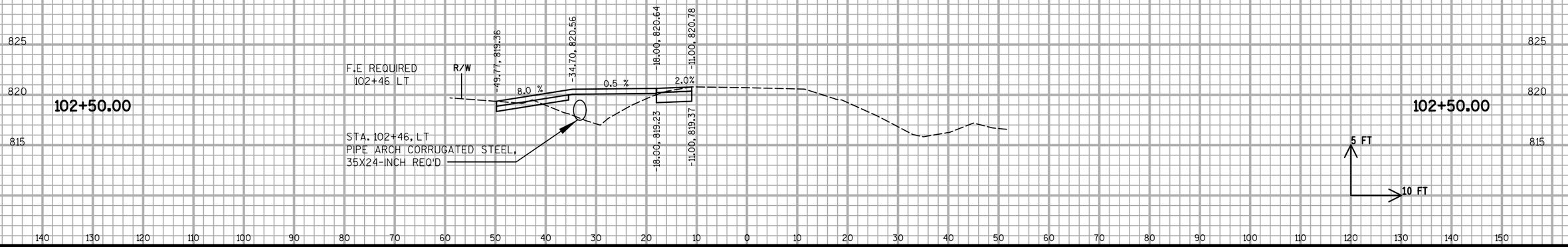
END CONSTRUCTION

STA. 102+88.88



PROJECT NO: 316046	HWY: CTH N	COUNTY: DANE	CROSS SECTIONS: CTH N	SHEET 88	E