SEL FEB 2015

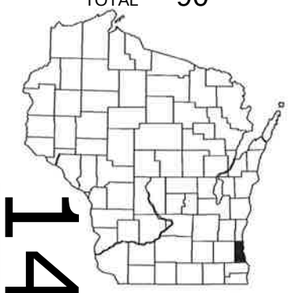
PROJECT ID WITH: NONE 2660-05-70

COUNTY MILWAUKEE

ORDER OF SHEETS

SECTION NO.	1	TITLE
SECTION NO.	2	TYPICAL SECTIONS AND DETAILS
SECTION NO.	3	ESTIMATE OF QUANTITIES
SECTION NO.	3	MISCELLANEOUS QUANTITIES
SECTION NO.	4	RIGHT OF WAY PLAT
SECTION NO.	5	PLAN
SECTION NO.	6	STANDARD DETAIL DRAWINGS
~~SECTION NO.~~	~~7~~	~~SIGN PLATES~~
SECTION NO.	8	STRUCTURE PLANS
SECTION NO.	9	COMPUTER EARTHWORK DATA
~~SECTION NO.~~	~~9~~	~~CROSS SECTIONS~~

TOTAL 90



14

DESIGN DESIGNATION

A.D.T. (CURRENT)	=	2,300
A.D.T. (2034)	=	2,300
D.H.V.	=	200
D.	=	60%
T.	=	3.3%
DESIGN SPEED	=	30 M.P.H.
ESALS	=	164,250

CONVENTIONAL SYMBOLS

PLAN

- COUNTY LINE
- TOWNSHIP OR RANGE LINE
- SECTION LINE
- CORPORATE OR CITY LIMITS
- PROPERTY LINE (P.L.)
- STANDARD BENCH MARK
- EXISTING RIGHT OF WAY LINE (R/W)
- PROPOSED SEWER LATERAL (SIZE)
- REFERENCE LINE
- CONCRETE WALK/DWY. REMOVAL
- LIMITS OF CONCRETE PAVEMENT REMOVAL
- COMBUSTIBLE FLUIDS (CAUTION)
- RAILROADS
- FENCE (TYPE)
- CATCH BASIN OR INLET EXISTING PROPOSED

PROFILE

- GRADE LINE
- ORIGINAL GROUND
- GRADE ELEVATION 95.35

UTILITIES

- ELECTRIC — E —
- FIBER OPTIC — FO —
- GAS — G —
- SANITARY SEWER — SAN —
- STORM SEWER — STO —
- TELEPHONE — T —
- WATER — W —
- TRAFFIC & ELECTRICAL SERVICES — TE&ES —
- MILWAUKEE METRO SEWERAGE DIST — MMSD —
- CABLE TELEVISION — TV —
- FIRE & POLICE CALL BOX
- LIGHT POLE
- POWER POLE
- TELEPHONE OR TELEGRAPH POLE
- TRAFFIC SIGNAL
- TRAFFIC SIGNAL CONTROL BOX
- HYDRANT
- GAS OR WATER GATE VALVE
- MANHOLES - SEWER ○ UTILITY (TYPE) □
- TREES - EXISTING ◑ TO BE REMOVED

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

SOUTH WHITNALL AVENUE

BRIDGE OVER UNION PACIFIC RAILROAD

LOCAL STREET

MILWAUKEE COUNTY

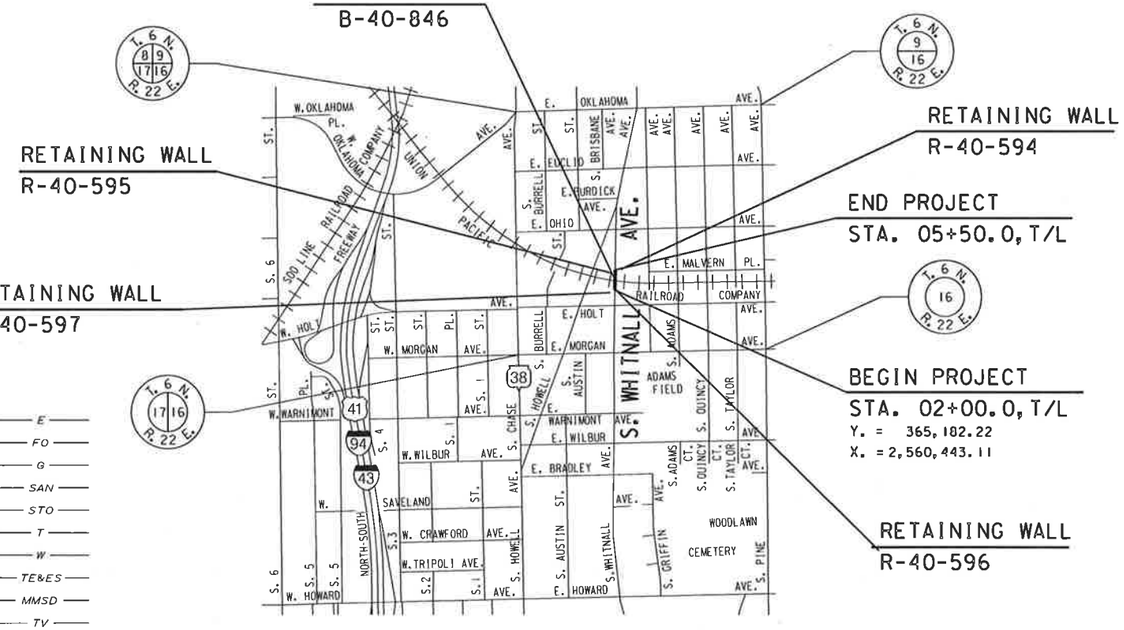
STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
2660-05-70	WISC 2015091	1

STATE PROJECT NUMBER

2660-05-70

STRUCTURE

B-40-846



LAYOUT

SCALE 1/2 MI.

TOTAL NET LENGTH OF CENTERLINE = 0.066 MILES (URBAN)

THE COORDINATES ON THIS PLAN ARE BASED ON THE WISCONSIN STATE PLANE COORDINATE SYSTEM, MILWAUKEE COUNTY, NAD 27 SOUTH ZONE.

ELEVATIONS SHOWN ON THIS PLAN ARE REFERENCED TO THE CITY OF MILWAUKEE DATUM.

TO CONVERT ELEVATIONS SHOWN ON THIS PLAN TO NATIONAL GEODEDIC VERTICAL DATUM OF 1929, ADD 580.603 TO ELEVATIONS SHOWN ON THIS PLAN.

Accepted For
City of Milwaukee

7/29/14 (Date) Commissioner of Public Works

Original Plans Prepared By

WISCONSIN PROFESSIONAL ENGINEER JEFFREY S. POLENSKE E-36628 MILWAUKEE WIS

7/29/14 (Date) City Engineer

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor City of Milwaukee

Designer City of Milwaukee

Management Consultant DAAR Engineering Inc.

C.O. Examiner

APPROVED FOR THE DEPARTMENT

DATE: 7/31/14 (Management Consultant Signature)

E

FILE NAME = W:\SPR\WHITNALL AVE BRIDGE\TITLE.DGN

GENERAL NOTES

1. ALL OPENINGS BELOW SUBGRADE, RESULTING FROM REMOVALS OR ABANDONMENTS, SHALL BE BACKFILLED WITH BASE AGGREGATE DENSE, 1-1/4 INCH. THE COST OF THIS WORK SHALL BE INCIDENTAL TO BID ITEM BASE AGGREGATE DENSE 1-1/4 INCH.

2. ALL DISTURBED AREAS, NOT SURFACED, ARE TO BE COVERED WITH 4" OF TOPSOIL, AND EITHER SODDED AND FERTILIZED, OR SEEDED AND FERTILIZED WITH AN EROSION MAT PLACED ON TOP UNLESS OTHERWISE SHOWN ON PLAN OR DIRECTED BY THE ENGINEER.

3. NO TREES OR SHRUBS SHALL BE REMOVED UNLESS DESIGNATED FOR REMOVAL BY THE ENGINEER.

4. TRANSVERSE JOINTS IN THE SIDEWALK SHALL BE CONSTRUCTED AT INTERVALS EQUAL TO THE WIDTH OF THE CONCRETE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

5. THE LOCATION OF EXISTING AND PROPOSED UTILITY INSTALLATIONS AS SHOWN ON THE PLAN IS APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT AREA WHICH ARE NOT SHOWN.

6. CONSTRUCTION PERMITS FOR SIDEWALK &/ OR CONCRETE DRIVEWAY WORK HAVE BEEN OBTAINED, WHICH RIGHTS SHALL BE EXTENDED TO THE CONTRACTORS.

STANDARD ABBREVIATIONS

ASPH.	- ASPHALT
B.M.	- BENCH MARK
CTR.	- CENTER
C/L	- CENTER LINE
COMB.	- COMBINED
CONC.	- CONCRETE
C.W.	- CONCRETE WALK
COR.	- CORNER
C	- CURB
ELEV.	- ELEVATION
ENT.	- ENTRANCE
EXIST.	- EXISTING
F	- FLANGE
G	- GUTTER, OR GAS
HYD.	- HYDRANT
LT.	- LEFT
MMSD	- MILWAUKEE METROPOLITAN SEWERAGE DISTRICT
P/L.	- PROPERTY LINE
R OR RAD.	- RADIUS
RET.	- RETAINING
RT.	- RIGHT
R/W	- RIGHT OF WAY
TEL	- AMERITECH
TES	- TRAFFIC ENGINEERING, AND ELECTRICAL SERVICES
T/L	- TRANSIT LINE
WEP	- WISCONSIN ELECTRIC POWER

ORDER OF SECTION 2 SHEETS

2

2

UTILITY CONTACTS

CITY OF MILWAUKEE, UTILITY COORDINATOR

ANTHONY J. KOTECKI
841 N. BROADWAY, RM 710
MILWAUKEE, WI 53202
PHONE: 414-286-2433
anthony.kotecki@milwaukee.gov

WE ENERGIES - GAS & ELECTRIC

LA TROY BRUMFIELD
333 W. EVERETT ST.
MILWAUKEE, WI 53203
PHONE: 414-221-5617
latroy.brumfeld@we-energies.com

TIME WARNER CABLE

STEVE CRAMER
1320 N. DR. MARTIN LUTHER KING JR. DR.
MILWAUKEE, WI 53212
PHONE: 414-277-4045
steve.cramer@twcable.gov

AT & T LOCAL

DEBBIE SADDLER
3701 W. BURNHAM ST. SUITE C
MILWAUKEE, WI 53215
PHONE: 414-459-3572
d.saddler@northwindtech.com

OTHER CONTACTS

WISCONSIN DEPT. OF NATURAL RESOURCES

KRISTINA BETZOLD
2300 N. DR. MARTIN LUTHER KING JR. DR.
MILWAUKEE, WI 53212-0436
PHONE: 414-263-8517
kristina.betzold@wisconsin.gov

MILWAUKEE COUNTY TRANSIT SYSTEM

DAVID ZIAREK
1942 N. 17TH ST.
MILWAUKEE, WI 53205
PHONE: 414-343-1764
dziarek@mcts.org

MILWAUKEE PUBLIC SCHOOLS

MICHELLE J. NATE
CHIEF OPERATIONS OFFICER
5225 W. VLIET ST.
P.O.BOX 2181
MILWAUKEE, WI 53201-2181
PHONE: 414-475-8336
natemj@milwaukee.k12.wi.us

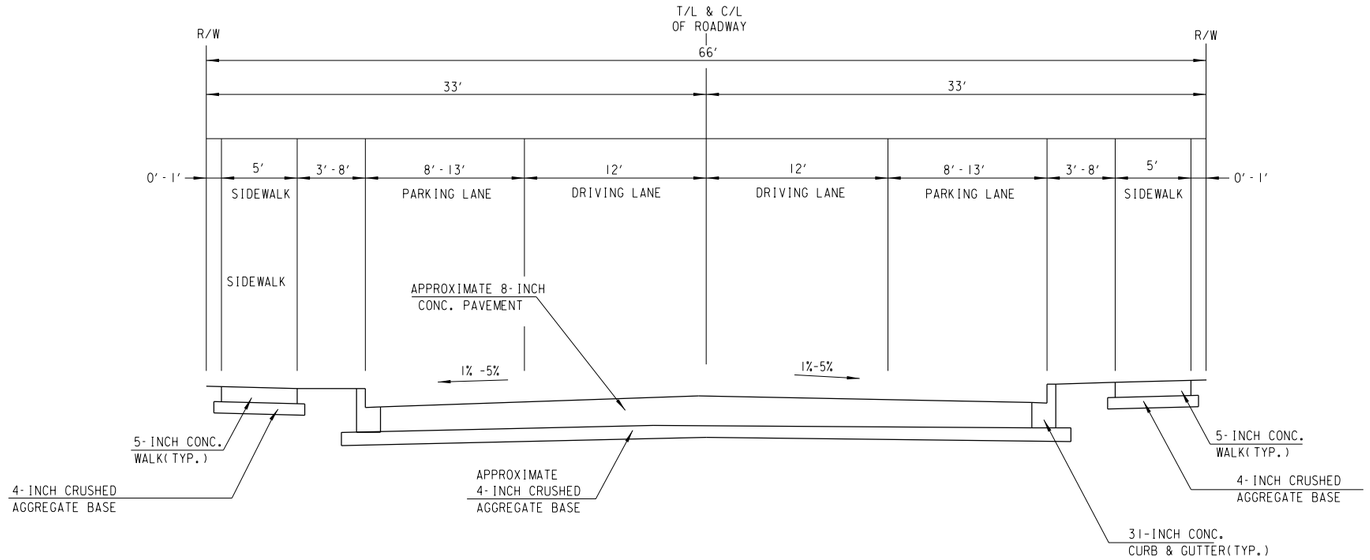
MIDWEST FIBER NETWORKS

JOEL BOJARSKI
3701 W.BURNHAM ST. SUITE C
MILWAUKEE, WI 53215
PHONE: 414-459-3551
jbojarski@midwestfibernetworks.com

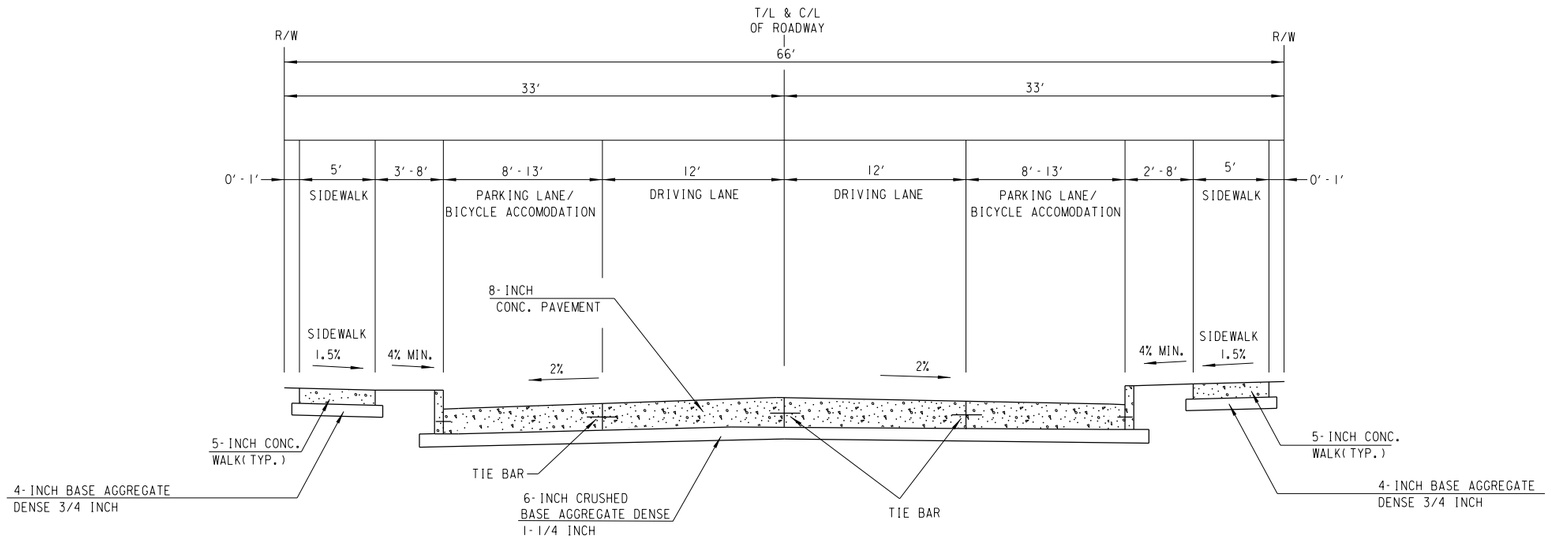
DESIGN CONSULTANT

SAMUEL MEDHIN
CITY OF MILWAUKEE
841 N. BROADWAY, RM 902
MILWAUKEE, WI 53202
PHONE: 414-286-0474
samuel.medhin@milwaukee.gov

DIGGERS HOTLINE
Dial 811 or (800) 242-8511
www.DiggersHotline.com



TYPICAL EXISTING SECTION
SOUTH WHITNALL AVENUE
STA. 02+00.00 TO STA. 02+96.50
STA. 04+21.30 TO STA. 05+50.00
LOOKING NORTH

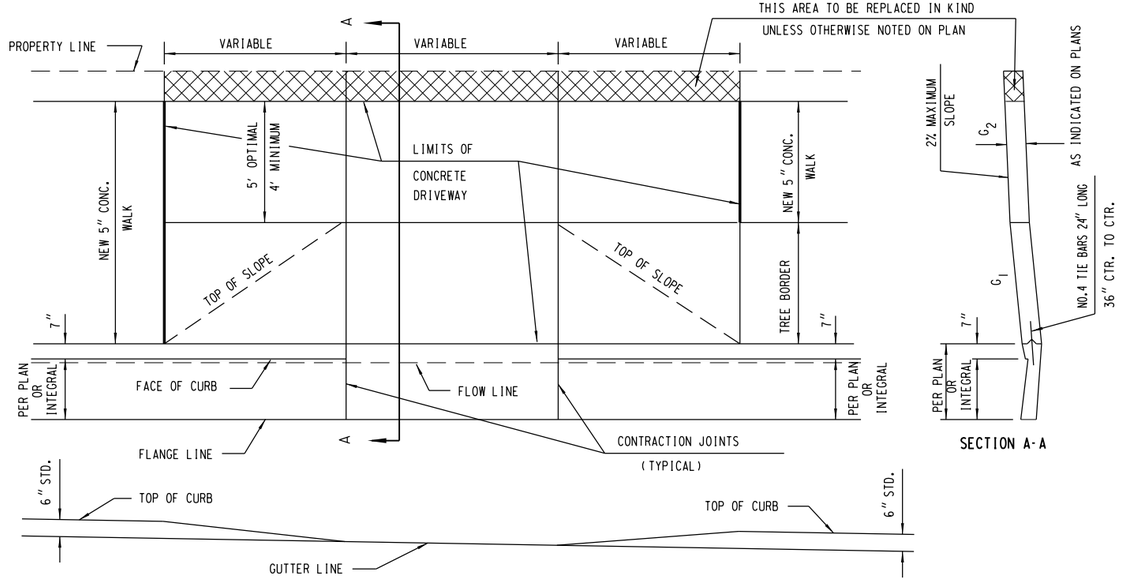


TYPICAL FINISHED SECTION
SOUTH WHITNALL AVENUE
STA. 02+00.00 TO STA. 02+96.50
STA. 04+21.30 TO STA. 05+50.00
LOOKING NORTH

STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	TYPICAL SECTION	SCALE FEET	SHEET NO: 4 E

FILE NAME: W:\SPR\WHITNALL AVE BRIDGE\TYPSEC.DGN

2



DRIVEWAY CONSTRUCTION NOTES

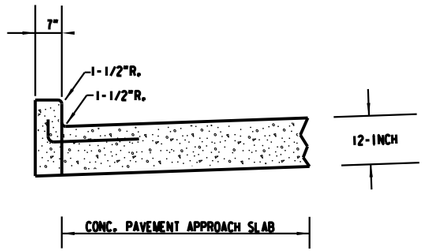
CONSTRUCT DRIVEWAY TO PROPERTY LINE ONLY WHEN MATCHING EXISTING DRIVEWAY AND INSTALL 1/2" EXPANSION JOINT MATERIAL BETWEEN NEW AND OLD DRIVEWAY. PLACE DUMMY JOINT AT CENTER OF DRIVEWAY AND AT ALL JOINTS IN THE GUTTER

DEPRESSED CONCRETE DRIVEWAY (MODIFIED)

(C)

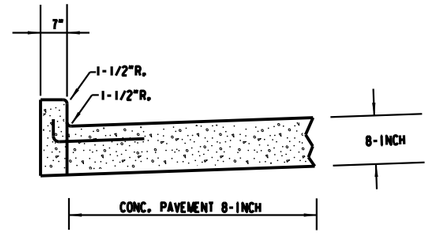
STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	CONSTRUCTION DETAILS	SCALE FEET	SHEET NO: 5	E

FILE NAME: W:\SPR\WHITNALL AVE BRIDGE CONDET.DGN



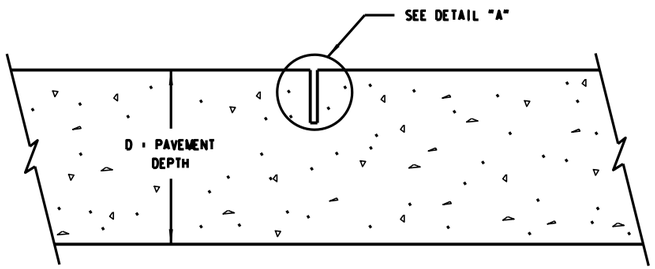
CONCRETE CURB TYPE D ITEM 601.0110

(J)

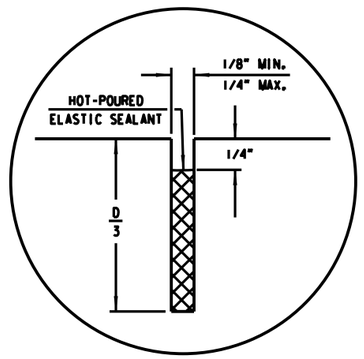


CONCRETE CURB TYPE D ITEM 601.0110

(A)



CONTRACTION JOINT



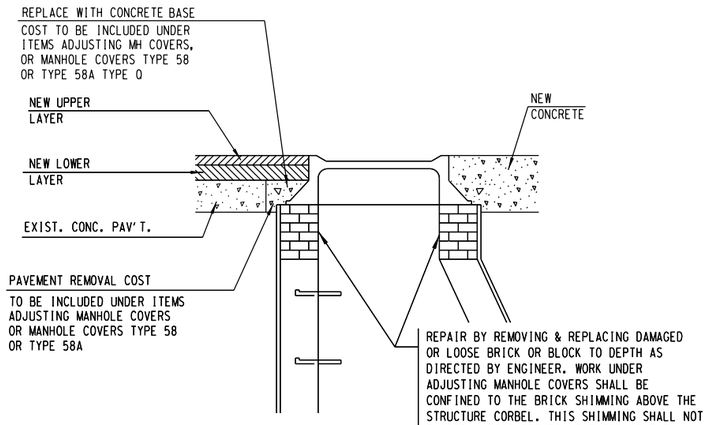
DETAIL "A"

JOINT SEALING ITEM SPV.0180

STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	CONSTRUCTION DETAILS	SCALE FEET	SHEET NO: 6 E

FILE NAME: W:\SPR\WHITNALL AVE BRIDGE CONDET.DGN

2



ADJUSTING MANHOLE COVERS OR
MANHOLE COVERS TYPE 58 OR TYPE 58A

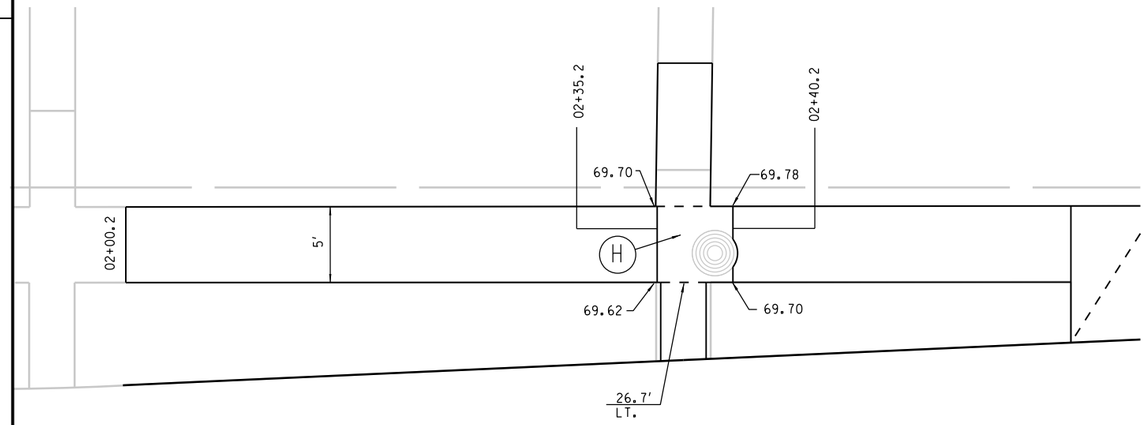
CONSTRUCTION NOTES

1. LOCATIONS OF STRUCTURES IN CURB & GUTTER SECTIONS REFER TO FACE OF CURB.
2. LOCATIONS OF STRUCTURES NOT IN CURB AND GUTTER SECTIONS REFER TO CENTERLINE OF STRUCTURE.
3. GRATE & RIM ELEVATIONS ARE GIVEN AT FLOW LINE OF INLET COVER OR AT CENTER-LINE OF MANHOLE COVER.

2

S. WHITNALL AVE. (WEST SIDE)

N

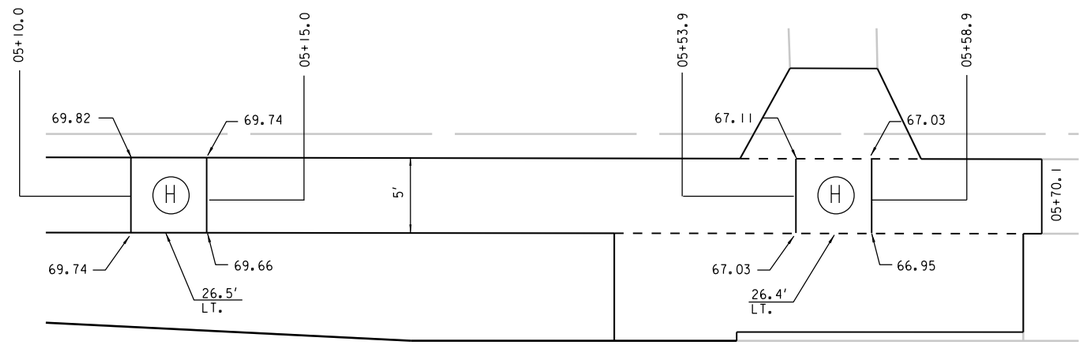


Ⓗ CONST. 5-INCH CONC. SIDEWALK LANDING AREA (5' X 5')

1" = 10'

S. WHITNALL AVE. (WEST SIDE)

N



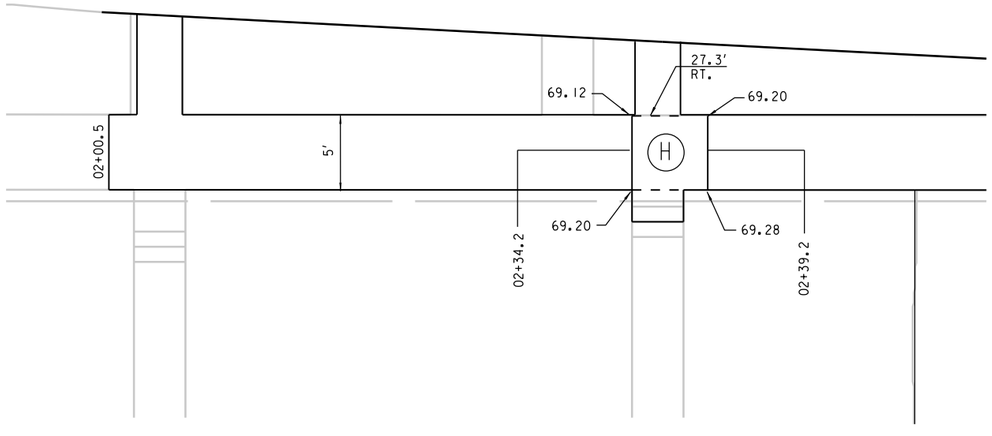
Ⓗ CONST. 5-INCH CONC. SIDEWALK LANDING AREA (5' X 5')

1" = 10'

2

Ⓗ CONST. 5-INCH CONC. SIDEWALK LANDING AREA (5' X 5')

N

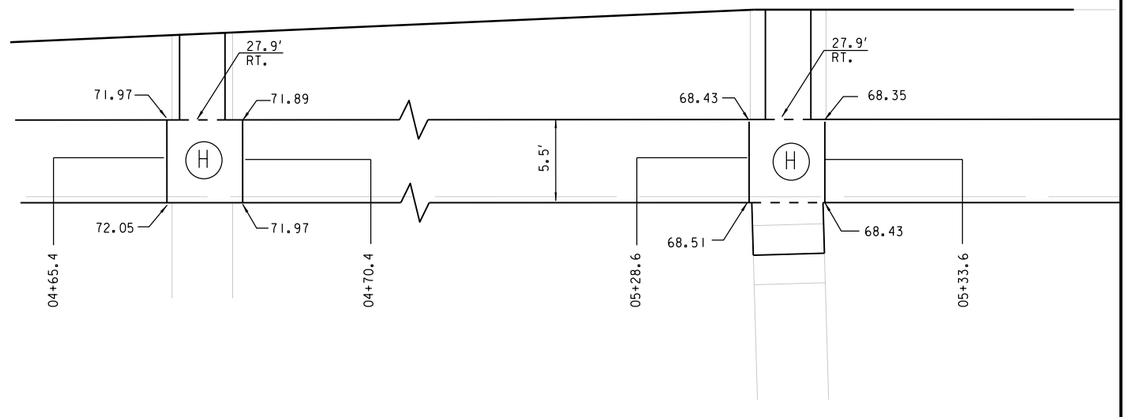


S. WHITNALL AVE. (EAST SIDE)

1" = 10'

Ⓗ CONST. 5-INCH CONC. SIDEWALK LANDING AREA (5' X 5')

N



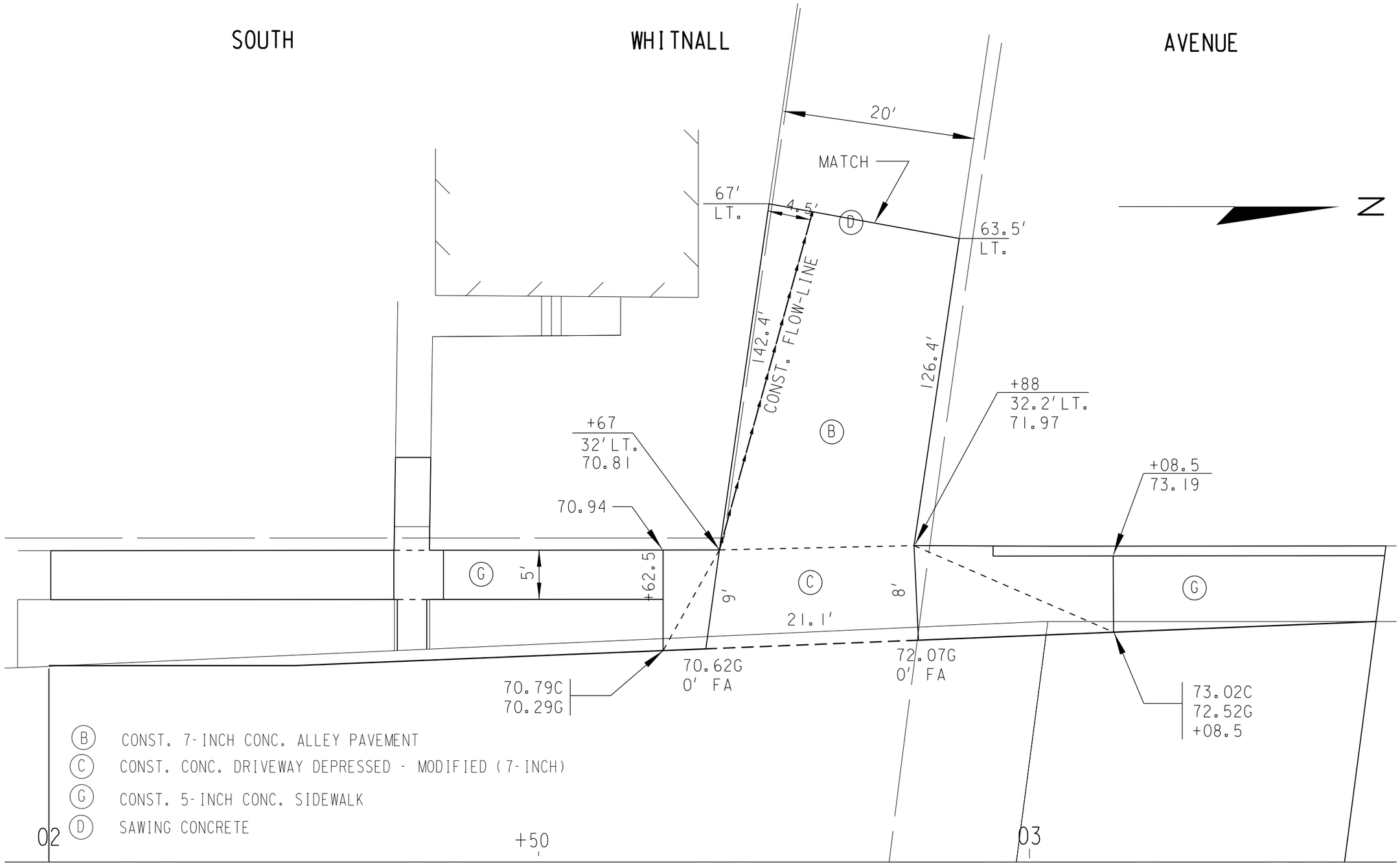
S. WHITNALL AVE. (EAST SIDE)

1" = 10'

STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	LANDING DETAILS	SCALE FEET	SHEET NO: 8	E

FILE NAME: W:\SPR\WHITNALL AVE BRIDGE\LANDINGS.DGN

SOUTH WHITNALL AVENUE



STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	ALLEY DETAIL	SCALE FEET 0' 10'	SHEET NO: 9	E

FILE NAME: W:\SPR\WHITNALL AVE BRIDGE\ ALLEYDET.DGN

SOUTH WHITNALL AVENUE

N

BEGIN ROADWAY WORK
STA 2+00.0, T/L

END ROADWAY WORK
STA 5+50.0, T/L

E. HOLT AVE.

UNION PACIFIC RAILROAD

EXISTING BRIDGE DECK

BRIDGE ABUTMENT WALL

OVERHEAD LINES TO BE REMOVED

PROPOSED UNDERGROUND

CAUTION

ABANDONED

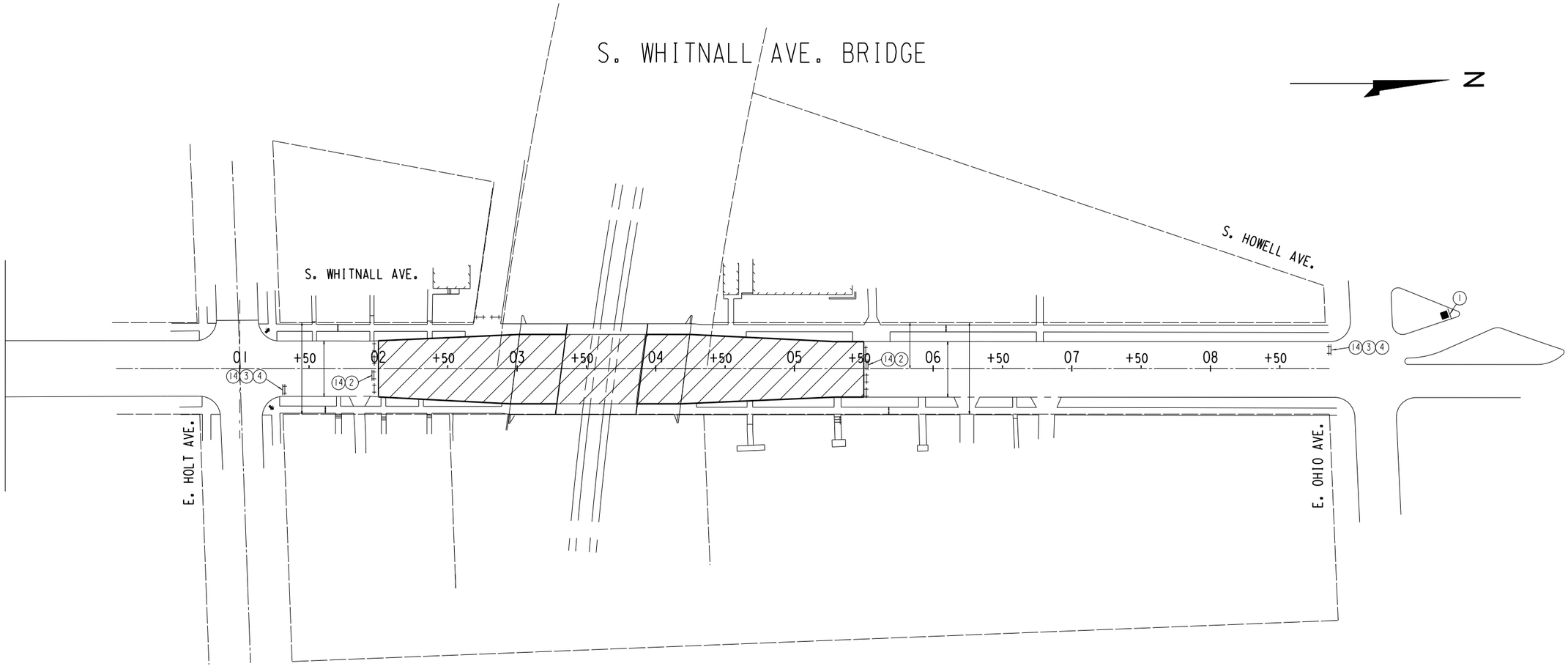
BUSH

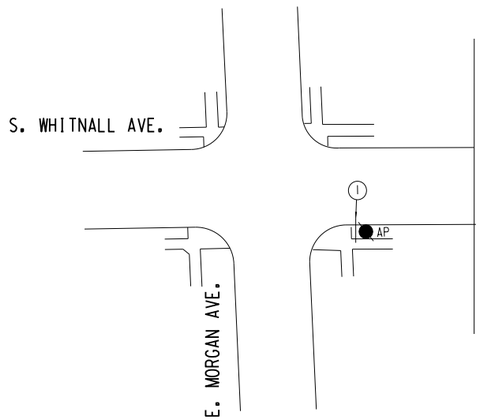
STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	UTILITIES	SCALE FEET 0' 40'	SHEET NO: 10	E

FILE NAME: W:\SPR\WHITNALL AVE BRIDGE\ UTILITYPLAN.DGN

2

S. WHITNALL AVE. BRIDGE





LEGEND

W20-3 ROAD WORK AHEAD 48" X48" — 1

R11-2 ROAD CLOSED 48" X30" — 2

R11-4 ROAD CLOSED TO THRU TRAFFIC 30" X48" — 3

W01-7 24" X48" — 4

TYPE III BARRICADES — 14

TYPE III BARRICADES W/ SIGN — 14 + X

SIGNS BANDED TO UTILITY POLE

WORK AREA

SIGN ATTACHED TO 4" X 4" WOOD POST

NOTE: ALL SIGNING SHALL BE THE CONTRACTOR'S RESPONSIBILITY SEE SDD TRAFFIC CONTROL, SIDEWALK CLOSURE CONTRACTOR RESPONSIBLE FOR COVERING ALL CONFLICTING PAVEMENT MARKINGS.

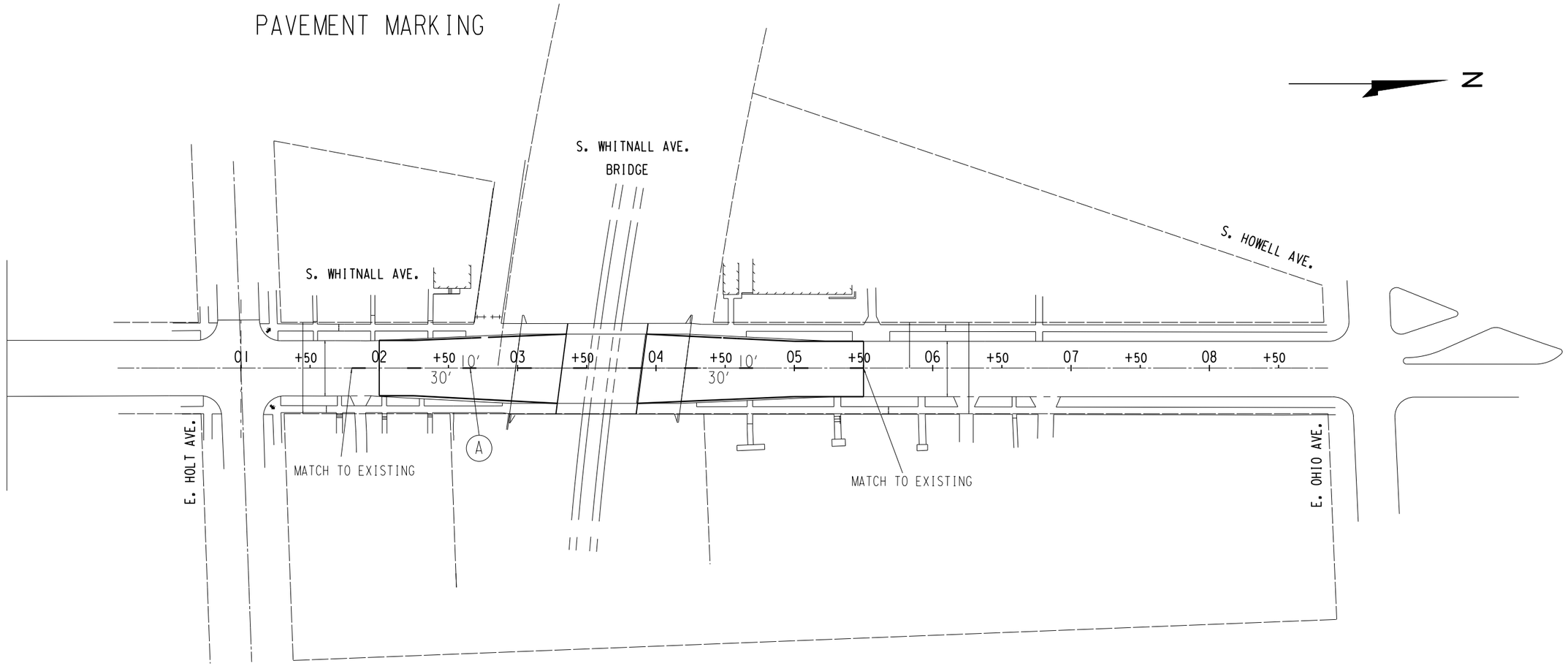
SHEET 1 OF 1

STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	TRAFFIC CONTROL	SCALE FEET 0' 80'	SHEET NO:	E

FILE NAME= W:\SPR\WHITNALL AVE BRIDGE\BRIDGE TRAFFIC.DGN

REVISED: 7-01 2014

PAVEMENT MARKING



(A) PAVEMENT MARKING EPOXY - 4-INCH YELLOW

SHEET 1 OF 1

STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	PAVEMENT MARKING	SCALE FEET 0' 80'	SHEET NO: 12 E

FILE NAME = W:\SPR\WHITNALL AVE BRIDGE\BRIDGE PAVEMARK.DGN

DATE 09DEC14 E S T I M A T E O F Q U A N T I T I E S

LINE NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	2660-05-70 QUANTITY
0010	201.0110	CLEARING	SY	300.000	300.000
0020	201.0120	CLEARING	ID	10.000	10.000
0030	201.0210	GRUBBING	SY	300.000	300.000
0040	201.0220	GRUBBING	ID	10.000	10.000
0050	203.0200	REMOVING OLD STRUCTURE (STATION) 01. 3+61.03 3+61.03	LS	1.000	1.000
0060	203.0225.S	DEBRIS CONTAINMENT (STRUCTURE) 01. B-40-846	LS	1.000	1.000
0070	204.0100	REMOVING PAVEMENT	SY	1,590.000	1,590.000
0080	204.0155	REMOVING CONCRETE SIDEWALK	SY	380.000	380.000
0090	205.0100	EXCAVATION COMMON	CY	710.000	710.000
0100	206.1000	EXCAVATION FOR STRUCTURES BRIDGES (STRUCTURE) 01. B-40-846	LS	1.000	1.000
0110	210.0100	BACKFILL STRUCTURE	CY	3,980.000	3,980.000
0120	305.0110	BASE AGGREGATE DENSE 3/4-INCH	TON	85.000	85.000
0130	305.0120	BASE AGGREGATE DENSE 1 1/4-INCH	TON	410.000	410.000
0140	415.0080	CONCRETE PAVEMENT 8-INCH	SY	1,020.000	1,020.000
0150	415.0310	CONCRETE ALLEY	SY	70.000	70.000
0160	415.0410	CONCRETE PAVEMENT APPROACH SLAB	SY	340.000	340.000
0170	416.0170	CONCRETE DRIVEWAY 7-INCH	SY	60.000	60.000
0180	416.0610	DRILLED TIE BARS	EACH	20.000	20.000
0190	502.0100	CONCRETE MASONRY BRIDGES	CY	865.000	865.000
0200	502.3200	PROTECTIVE SURFACE TREATMENT	SY	422.000	422.000
0210	504.0500	CONCRETE MASONRY RETAINING WALLS	CY	68.000	68.000
0220	505.0405	BAR STEEL REINFORCEMENT HS BRIDGES	LB	30,505.000	30,505.000
0230	505.0605	BAR STEEL REINFORCEMENT HS COATED BRIDGES	LB	93,240.000	93,240.000
0240	505.0615	BAR STEEL REINFORCEMENT HS COATED RETAINING WALLS	LB	6,460.000	6,460.000
0250	516.0100	DAMPPROOFING	SY	412.000	412.000
0260	516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	62.000	62.000
0270	517.1010.S	CONCRETE STAINING (STRUCTURE) 01. R-40-846	SF	533.000	533.000
0280	517.1010.S	CONCRETE STAINING (STRUCTURE) 02. R-40-594	SF	181.000	181.000
0290	517.1010.S	CONCRETE STAINING (STRUCTURE) 03. R-40-595	SF	181.000	181.000
0300	517.1010.S	CONCRETE STAINING (STRUCTURE) 04. R-40-596	SF	181.000	181.000
0310	517.1010.S	CONCRETE STAINING (STRUCTURE) 05. R-40-597	SF	181.000	181.000
0320	517.1015.S	CONCRETE STAINING MULTI-COLOR (STRUCTURE) 01. R-40-846	SF	498.000	498.000
0330	517.1015.S	CONCRETE STAINING MULTI-COLOR (STRUCTURE) 02. R-40-594	SF	176.000	176.000
0340	517.1015.S	CONCRETE STAINING MULTI-COLOR (STRUCTURE) 03. R-40-595	SF	176.000	176.000
0350	517.1015.S	CONCRETE STAINING MULTI-COLOR (STRUCTURE) 04. R-40-596	SF	176.000	176.000
0360	517.1015.S	CONCRETE STAINING MULTI-COLOR (STRUCTURE) 05. R-40-597	SF	176.000	176.000
0370	517.1050.S	ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 01. R-40-846	SF	498.000	498.000
0380	517.1050.S	ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 02. R-40-594	SF	176.000	176.000
0390	517.1050.S	ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 03. R-40-595	SF	176.000	176.000

3

DATE 09DEC14 E S T I M A T E O F Q U A N T I T I E S

LINE NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	2660-05-70 QUANTITY
0400	517.1050.S	ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 04. R-40-596	SF	176.000	176.000
0410	517.1050.S	ARCHITECTURAL SURFACE TREATMENT (STRUCTURE) 05. R-40-597	SF	176.000	176.000
0420	550.2124	PILING CIP CONCRETE 12 3/4 X 0.25-INCH	LF	6,240.000	6,240.000
0430	601.0110	CONCRETE CURB TYPE D	LF	580.000	580.000
0440	602.0410	CONCRETE SIDEWALK 5-INCH	SF	3,420.000	3,420.000
0450	611.9705	SALVAGED MANHOLE COVERS	EACH	6.000	6.000
0460	612.0106	PIPE UNDERDRAIN 6-INCH	LF	288.000	288.000
0470	612.0206	PIPE UNDERDRAIN UNPERFORATED 6-INCH	LF	20.000	20.000
0480	619.1000	MOBILIZATION	EACH	1.000	1.000
0490	623.0200	DUST CONTROL SURFACE TREATMENT	SY	1,360.000	1,360.000
0500	625.0100	TOPSOIL	SY	1,000.000	1,000.000
0510	628.1504	SILT FENCE	LF	270.000	270.000
0520	628.1520	SILT FENCE MAINTENANCE	LF	270.000	270.000
0530	628.2023	EROSION MAT CLASS II TYPE B	SY	300.000	300.000
0540	629.0210	FERTILIZER TYPE B	CWT	1.000	1.000
0550	630.0120	SEEDING MIXTURE NO. 20	LB	3.000	3.000
0560	631.1000	SOD LAWN	SY	700.000	700.000
0570	642.5201	FIELD OFFICE TYPE C	EACH	1.000	1.000
0580	643.0100	TRAFFIC CONTROL (PROJECT) 01. 2660-05-70	EACH	1.000	1.000
0590	643.0420	TRAFFIC CONTROL BARRICADES TYPE III	DAY	990.000	990.000
0600	643.0705	TRAFFIC CONTROL WARNING LIGHTS TYPE A	DAY	1,980.000	1,980.000
0610	643.0900	TRAFFIC CONTROL SIGNS	DAY	770.000	770.000
0620	645.0111	GEOTEXTILE FABRIC TYPE DF SCHEDULE A	SY	160.000	160.000
0630	646.0106	PAVEMENT MARKING EPOXY 4-INCH	LF	100.000	100.000
0640	650.4500	CONSTRUCTION STAKING SUBGRADE	LF	300.000	300.000
0650	650.6500	CONSTRUCTION STAKING STRUCTURE LAYOUT (STRUCTURE) 01. R-40-846	LS	1.000	1.000
0660	650.6500	CONSTRUCTION STAKING STRUCTURE LAYOUT (STRUCTURE) 02. R-40-594	LS	1.000	1.000
0670	650.6500	CONSTRUCTION STAKING STRUCTURE LAYOUT (STRUCTURE) 03. R-40-595	LS	1.000	1.000
0680	650.6500	CONSTRUCTION STAKING STRUCTURE LAYOUT (STRUCTURE) 04. R-40-596	LS	1.000	1.000
0690	650.6500	CONSTRUCTION STAKING STRUCTURE LAYOUT (STRUCTURE) 05. R-40-597	LS	1.000	1.000
0700	650.7000	CONSTRUCTION STAKING CONCRETE PAVEMENT	LF	300.000	300.000
0710	650.9910	CONSTRUCTION STAKING SUPPLEMENTAL CONTROL (PROJECT) 01. 2660-05-70	LS	1.000	1.000
0720	652.0230	CONDUIT RIGID NONMETALLIC SCHEDULE 40 2 1/2-INCH	LF	288.000	288.000
0730	690.0250	SAWING CONCRETE	LF	88.000	88.000
0740	715.0415	INCENTIVE STRENGTH CONCRETE PAVEMENT	DOL	500.000	500.000
0750	715.0502	INCENTIVE STRENGTH CONCRETE STRUCTURES	DOL	9,330.000	9,330.000
0760	ASP.1T0A	ON-THE-JOB TRAINING APPRENTICE AT $5.00/HR	HRS	900.000	900.000
0770	ASP.1T0G	ON-THE-JOB TRAINING GRADUATE AT $5.00/HR	HRS	900.000	900.000
0780	SPV.0060	SPECIAL 01. CONCRETE BASES	EACH	2.000	2.000
0790	SPV.0090	SPECIAL 01. CONSTRUCTION STAKING CONCRETE WALK	LF	620.000	620.000
0800	SPV.0090	SPECIAL 02. REMOVING EXISTING TIMBER PILING	LF	760.000	760.000
0810	SPV.0105	SPECIAL 01. RAILING STEEL TYPE C2 GALVANIZED B-40-846	LS	1.000	1.000

3

DATE 09DEC14 E S T I M A T E O F Q U A N T I T I E S

LINE NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	2660-05-70 QUANTITY
0820	SPV.0105	SPECIAL 02. RAILING STEEL TYPE C2 GALVANIZED R-40-594	LS	1.000	1.000
0830	SPV.0105	SPECIAL 03. RAILING STEEL TYPE C2 GALVANIZED R-40-595	LS	1.000	1.000
0840	SPV.0105	SPECIAL 04. RAILING STEEL TYPE C2 GALVANIZED R-40-596	LS	1.000	1.000
0850	SPV.0105	SPECIAL 05. RAILING STEEL TYPE C2 GALVANIZED R-40-597	LS	1.000	1.000
0860	SPV.0165	SPECIAL 01. WALL CONCRETE PANEL MECHANCIALLY STABILIZED EARTH LRFD/QMP	SF	2,200.000	2,200.000
0870	SPV.0165	SPECIAL 02. TEMPORARY SHORING RAILROAD	SF	910.000	910.000
0880	SPV.0180	SPECIAL 01. JOINT SEALING	SY	1,360.000	1,360.000

3

3

REMOVALS

2660-05-70

CATEGORY 0010

		CLEARING	GRUBBING	REMOVING PAVEMENT	REMOVING CONCRETE SIDEWALK	SAWING CONCRETE
ITEM NO.		201.0120	201.0220	204.0100	204.0155	690.0250
UNIT PAY		ID	ID	SY	SY	LF
LOCATION						
STA 2+00 TO 5+50	LT	0	0	830	190	40
SUBTOTALS (LEFT)		**0**	**0**	**830**	**190**	40
STA 2+00 TO 5+50	RT	10	10	760	190	48
SUBTOTALS (RIGHT)		**10**	**10**	**760**	**190**	48
GRAND TOTALS		**10**	**10**	**1,590**	**380**	**88**

CATEGORY 0020

		CLEARING	GRUBBING
ITEM NO.		201.0110	201.0220
UNIT PAY		SY	SY
LOCATION			
STA 2+00 TO 5+50	LT	150	150
SUBTOTALS (LEFT)		**150**	**150**
STA 2+00 TO 5+50	RT	150	150
SUBTOTALS (RIGHT)		**150**	**150**
GRAND TOTALS		**300**	**300**

3

CONCRETE CONSTRUCTION ITEMS

2660-05-70

		BASE AGGREGATE DENSE 3/4-INCH	BASE AGGREGATE DENSE 1 ¼-INCH	CONCRETE PAVEMENT 8-INCH	CONCRETE ALLEY 7-INCH	CONCRETE PAVEMENT APPROACH SLAB	CONCRETE DRIVEWAY 7-INCH	CONCRETE CURB TYPE D	CONCRETE SIDEWALK 5-INCH	INCENTIVE STRENGTH CONCRETE PAVEMENT
ITEM NO.		305.0110	305.0120	415.0800	415.0310	415.0410	416.0170	601.0110	602.0410	715.0415
UNIT PAY		TON	TON	SY	SY	SY	SY	LF	SF	DOL
CATEGORY		0010	0010	0010	0010	0010	0010	0010	0010	0010
LOCATION										
STA 2+00 TO 5+50	LT	40	220	510	70	170	60	290	1580	
SUBTOTALS (LEFT)		**40**	**220**	**510**	**70**	**170**	**60**	**290**	**1580**	
STA 2+00 TO 5+50	RT	45	190	510	0	170	0	290	1840	
SUBTOTALS (RIGHT)		**45**	**190**	**510**	**0**	**170**	**0**	**290**	**1840**	
GRAND TOTALS		**85**	**410**	**1020**	**70**	**340**	**60**	**580**	**3420**	**500**

3

2660-05-70

			DRILLED TIE BARS	DUST CONTROL SURFACE TREATMENT	JOINT SEALING
		ITEM NO.	416.0610	623.0200	SPV.0180.01
		UNIT PAY	EACH	SY	SY
CATEGORY			0010	0010	0010
LOCATION					
STA 2+00 TO 5+50		LT	10	680	680
	SUBTOTALS (LEFT)		**10**	**680**	**680**
STA 2+00 TO 5+50		RT	10	680	680
	SUBTOTALS (RIGHT)		**10**	**680**	**680**
	GRAND TOTALS		**20**	**1360**	**1360**

3

CONSTRUCTION STAKING ROADWAY ITEMS

2660-05-70

		CONSTRUCTION STAKING SUBGRADE	CONSTRUCTION STAKING CONCRETE PAVEMENT	CONSTRUCTION STAKING SUPPLEMENTAL CONTROL	CONSTRUCTION STAKING CONCRETE WALK
ITEM NO		650.4500	650.7000	650.9910	SPV.0090.01
UNIT PAY		LF	LF	LS	LF
CATEGORY		0010	0010	0010	0010
LOCATION					
STA 2+00 TO STA 5+50	LT	150	150		310
SUBTOTALS (LEFT)		**150**	**150**		**310**
STA 2+00 TO STA 5+50	RT	150	150		310
SUBTOTALS (RIGHT)		**150**	**150**		**310**
GRAND TOTALS		**300**	**300**	**1**	**620**

3

MISCELLANEOUS LANDSCAPING ITEMS

2660-05-70

CATEGORY 0010	ITEM NO.		TOPSOIL 625.0100	FERTILIZER TYPE B 629.0210	SOD LAWN 631.1000
	UNIT PAY		SY	CWT	SY
LOCATION					
STA 2+00 TO STA 5+50		LT	410		410
	SUBTOTALS (LEFT)		**410**		**410**
STA 2+00 TO STA 5+50		RT	290		290
	SUBTOTALS (RIGHT)		**290**		**290**
	GRAND TOTALS		**700**	**0.7**	**700**

CATEGORY 0020	ITEM NO.		TOPSOIL 625.0100	SILT FENCE 628.1504	SILT FENCE MAINTENANCE 628.1520	EROSION MAT CLASS II TYPE B 628.2023	FERTILIZER TYPE B 629.0210	Seeding Mixture No. 20 630.0120
	UNIT PAY		SY	LF	LF	SY	CWT	LB
LOCATION								
STA 2+00 TO STA 5+50		LT	150	130	130	150		1.5
	SUBTOTALS (LEFT)		**150**	**130**	**130**	**150**		**1.5**
STA 2+00 TO STA 5+50		RT	150	140	140	150		1.5
	SUBTOTALS (RIGHT)		**150**	**140**	**140**	**150**		**1.5**
	GRAND TOTALS		**300**	**270**	**270**	**300**	**0.3**	**3**

3

2660-05-70

0010 PARTICIPATING

SALVAGED MANHOLE COVERS				
GROUP CODE	NO.	LOCATION	PROP. ELEV.	REMARKS
0010	201	STA 2 + 35.8 - 14.9 ' LT	69.04	
0010	202	STA 2 + 39.5 - 13.0 ' RT	69.13	
0010	203	STA 4 + 81.1 - 16.7 ' LT	70.64	

0010 SALVAGED MANHOLE COVERS (611.9705) 3

0030 NON PARTICIPATING

SALVAGED MANHOLE COVERS				
GROUP CODE	NO.	LOCATION	PROP. ELEV.	REMARKS
0030	401	STA 2 + 34.5 - 20.5 ' RT	68.39	
0030	402	STA 2 + 39.1 - 28.5 ' LT	69.73	
0030	403	STA 4 + 76.7 - 11.6 ' LT	71.14	

0030 SALVAGED MANHOLE COVERS (611.9705) 3

2660-05-70

PAVEMENT MARKING QUANTITIES (CATEGORY 0010 - PARTICIPATING)				
GROUP CODE	ITEM NUMBER	DESCRIPTION	UNIT	QUANTITY
0010	646.0106	PAVEMENT MARKING EPOXY 4-INCH	LF	100

Estimate of Traffic Control Items Required (0010 Participating)

Items		Stage 1 (Each) * (Days)		Total
(1)643.0420	Traffic Control, Barricades, Type III	9	990	990
643.0705	Traffic Control, Warning Lights, Type "A" (Flashing)	18	1,980	1,980
643.0900	Traffic Control, Signs	7	770	770

(1) All Type III Barricades have 2 flashing yellow lights

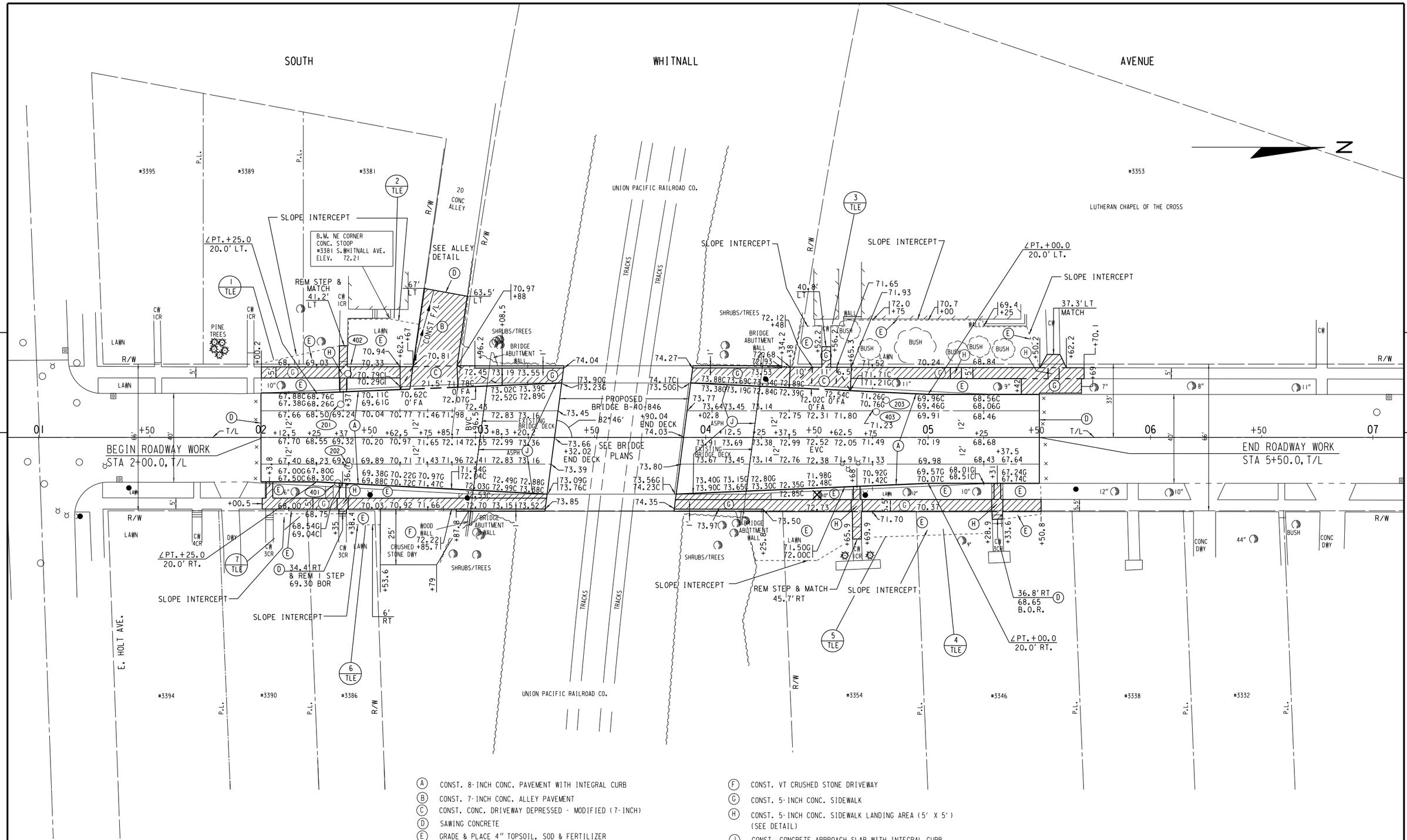
Items	Stage 1 (Each)	(Total)
W020-3	1	1
R11-2	2	2
R11-4	2	2
W01-7	2	2
Total	7	7

3

EARTHWORK SUMMARY

Station	Location	Common (1) Item #205.0100 Cut (2) CY	EBS Excavation (3) CY	Salvaged/ Unuseable Pavement Material (4) CY	Available Material (5) CY	Unexpanded Fill CY	Expanded Fill (6) CY	Mass Ordinate +/- (7) CY	Waste CY	Borrow CY
2+00 to 5+50	S. Whitnall Avenue	710	-	528	182	0	0	710	710	-

1) Common Excavation is the cut quantity. Item number 205.0100. No EBS Excavation is expected.
2) Salvaged/Useable Pavement material is included in Cut.
3) EBS Excavation to be backfilled with base aggregate dense 1-1/4". Note: This is designers choice, can be backfilled with Borrow, or cut as well.
4) Salvaged/Useable Pavement Material
5) Available Material = Cut - Salvaged/Unuseable Pavement Material
6) Expanded Fill. Factor = 1.20.
7) The Mass ordinate (+ or -) quantity represents the difference in cut and fill quantities. (+) indicates excess material (waste) and (-) indicates a shortage (borrow).



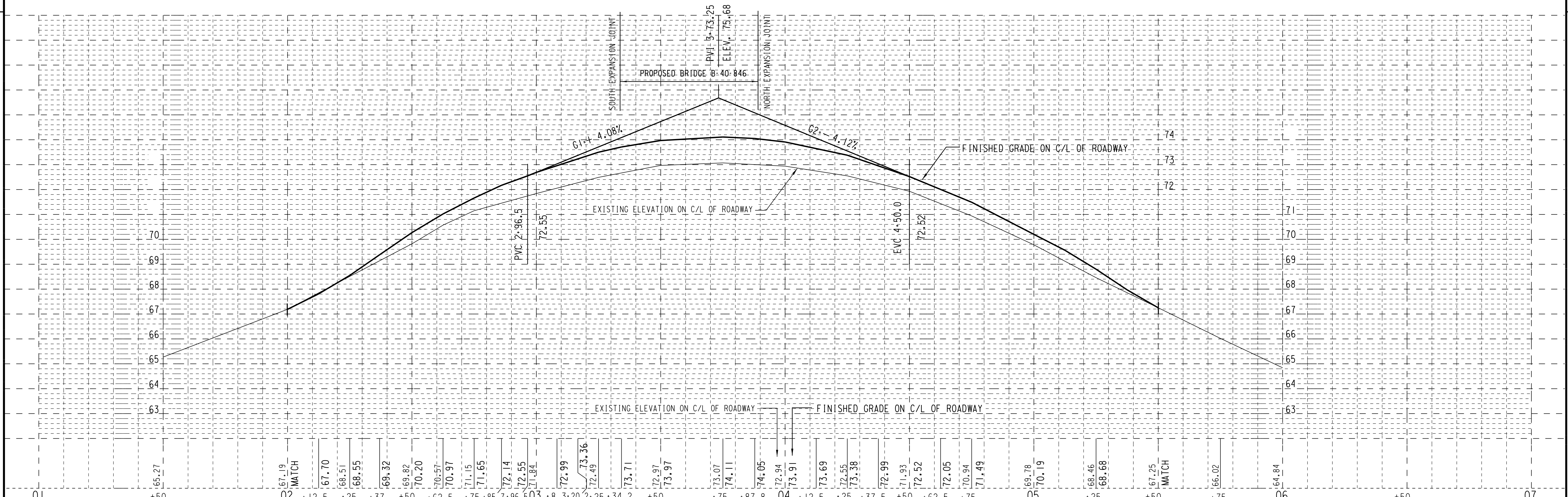
(A) CONST. 8-INCH CONC. PAVEMENT WITH INTEGRAL CURB
(B) CONST. 7-INCH CONC. ALLEY PAVEMENT
(C) CONST. CONC. DRIVEWAY DEPRESSED - MODIFIED (7-INCH)
(D) SAWING CONCRETE
(E) GRADE & PLACE 4" TOPSOIL, SOD & FERTILIZER
(F) CONST. VT CRUSHED STONE DRIVEWAY
(G) CONST. 5-INCH CONC. SIDEWALK
(H) CONST. 5-INCH CONC. SIDEWALK LANDING AREA (5' X 5') (SEE DETAIL)
(J) CONST. CONCRETE APPROACH SLAB WITH INTEGRAL CURB (SEE DETAIL)

STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	PLAN	SCALE FEET 0' 40'	SHEET NO: 24	E

FILE NAME: W:\SPR\WHITNALL AVE BRIDGE\ 01-06.DGN

5

5



STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	PROFILE	SCALE FEET	SHEET NO: 25	E

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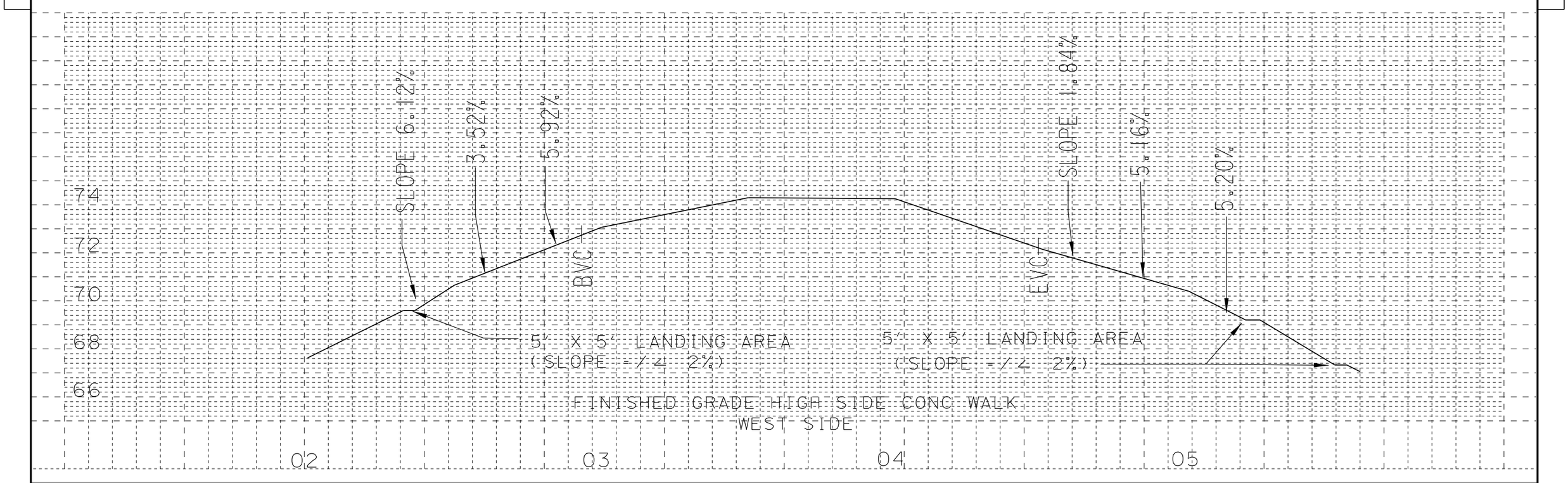

STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	PROFILE	SCALE FEET	SHEET NO: 26	E

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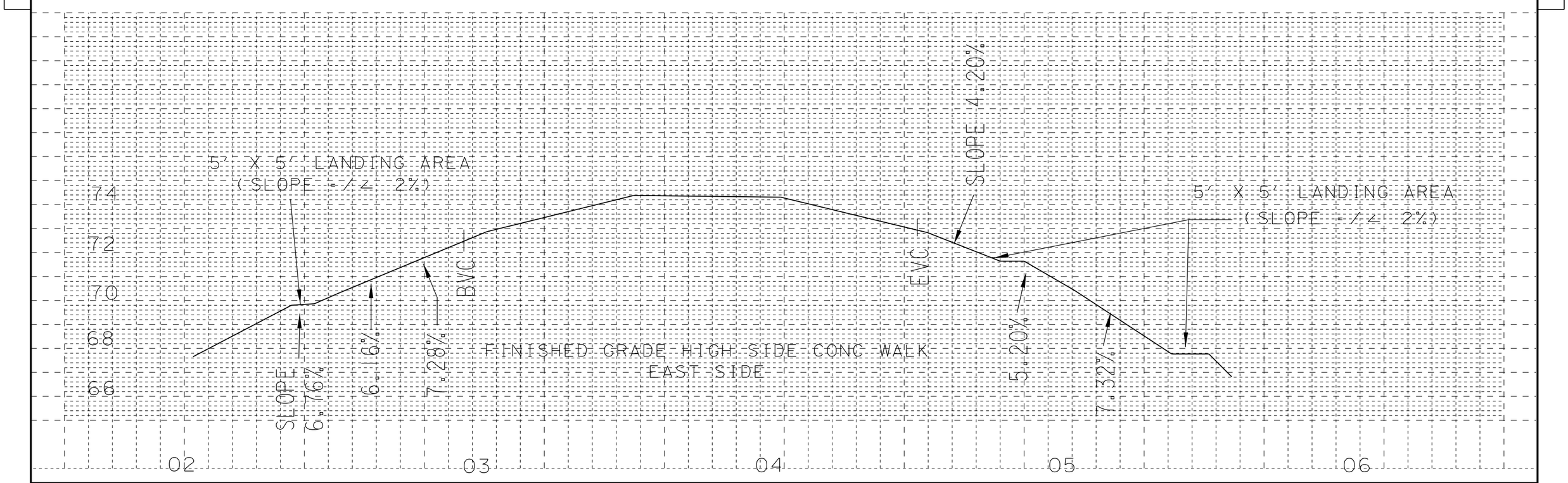


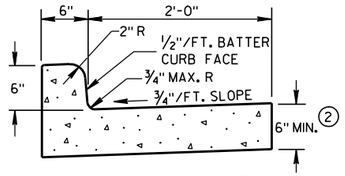
STATE PROJECT NUMBER 2660-05-70 - -	HWY: LOCAL STREET	COUNTY: MILWAUKEE	PROFILE	SCALE FEET	SHEET NO: 27	E

FILE NAME: W:\SPR\WHITNALL AVE BRIDGE\ 01-06.DGN

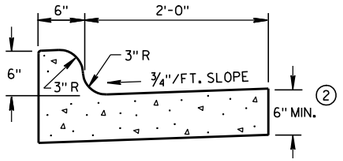
Standard Detail Drawing List

08D01-17	CONCRETE CURB, CONCRETE CURB AND GUTTER AND TIES
08E09-06	SILT FENCE
09B02-08	CONDUIT UNDER PAVED HIGHWAYS
12A03-10	NAME PLATE (STRUCTURES)
13B02-07A	CONCRETE BRIDGE APPROACH
13C01-16	CONCRETE PAVEMENT LONGITUDINAL JOINTS AND TIES
13C04-16	URBAN NON-DOWELED CONCRETE PAVEMENT
13C18-02A	CONCRETE PAVEMENT JOINTING
13C18-02B	CONCRETE PAVEMENT STEEL REINFORCEMENT
13C18-02C	CONCRETE PAVEMENT JOINT TIES
13C18-02D	CONCRETE PAVEMENT JOINTING AT UTILITY FIXTURES
14A01-03	TREE PRESERVATION DETAILS
15C02-05A	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C02-05B	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C03-02	BARRICADES AND SIGNS FOR SIDEROAD CLOSURES
15C08-16A	PAVEMENT MARKING (MAINLINE)

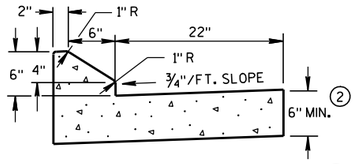
6



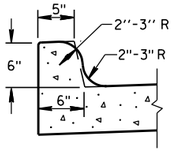
TYPES A & D (1)



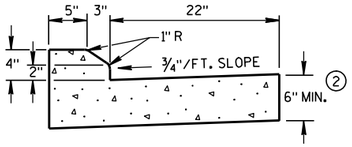
TYPES K & L (1)



6" SLOPED CURB TYPES G & J (1)

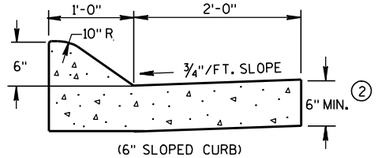


OPTIONAL CURB SHAPE FOR TYPES K & L (1)

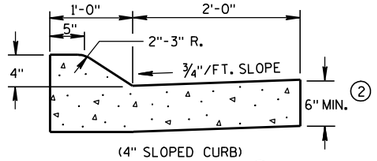


4" SLOPED CURB TYPES G & J (1)

CONCRETE CURB & GUTTER 30"

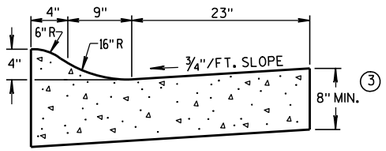


(6" SLOPED CURB)



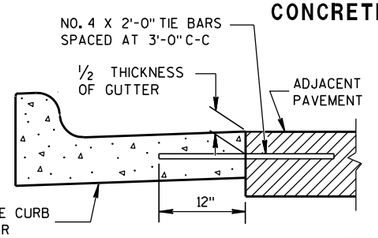
(4" SLOPED CURB)

TYPES A & D (1)

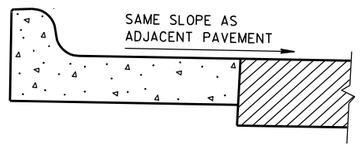


4" SLOPED CURB TYPES R & T (1) (4)

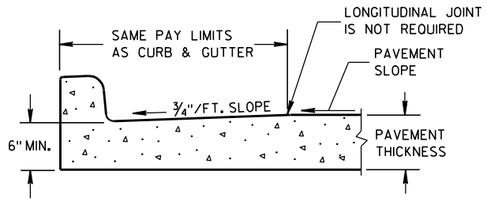
CONCRETE CURB & GUTTER 36"



TYPICAL TIE BAR LOCATION (1)



REVERSE SLOPE GUTTER (5)
(TYPICAL FOR ALL CURB & GUTTER TYPES)



PARTIAL SECTION OF PAVEMENT WITH INTEGRAL CURB & GUTTER

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

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

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

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

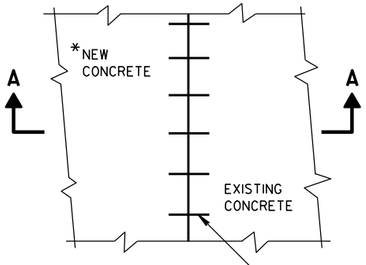
(1) TIE BARS ARE REQUIRED FOR CURB AND GUTTER TYPES A, G, K AND R.

(2) THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.

(3) THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 8" MINIMUM GUTTER THICKNESS IS MAINTAINED.

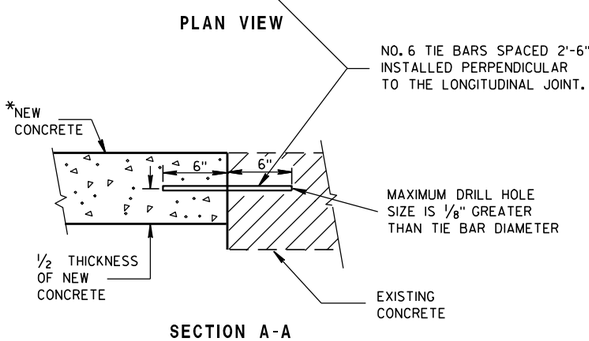
(4) THE FACE OF CURB IS 6" FROM THE BACK OF CURB.

(5) WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATION(S) WILL BE SHOWN ELSEWHERE IN THE PLAN.



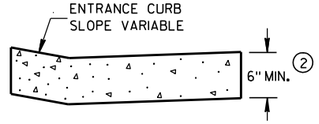
*NEW CURB & GUTTER, SURFACE DRAINS, CONCRETE PAVEMENT OR OTHER NEW CONCRETE.

PLAN VIEW

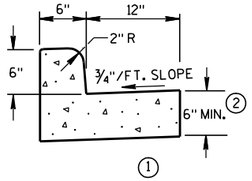


SECTION A-A

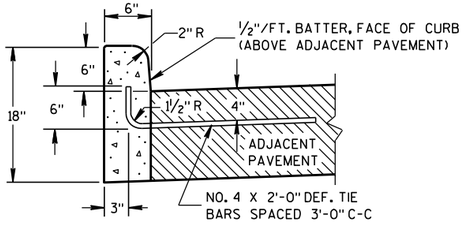
TIE BARS DRILLED INTO EXISTING PAVEMENT



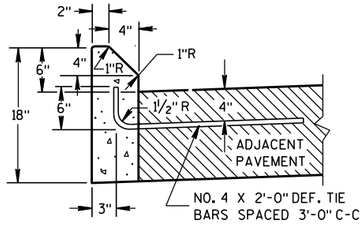
DRIVEWAY ENTRANCE CURB
(WHEN DIRECTED BY THE ENGINEER)



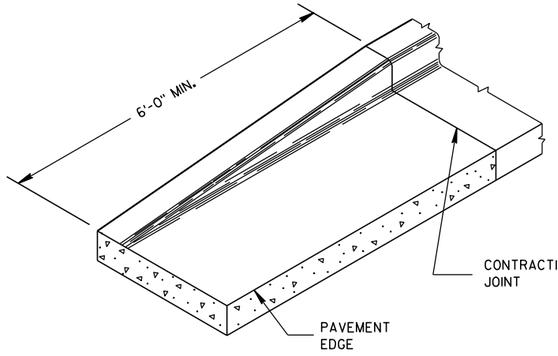
(1)
TYPES A & D
CONCRETE CURB & GUTTER 18"



(1)
TYPES A & D



(1)
TYPES G & J



END SECTION CURB & GUTTER

CONCRETE CURB

CONCRETE CURB, CONCRETE CURB & GUTTER AND TIES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
9/4/08 DATE
/S/ Jerry H. [illegible]
ROADWAY STANDARDS ENGINEER

FHWA

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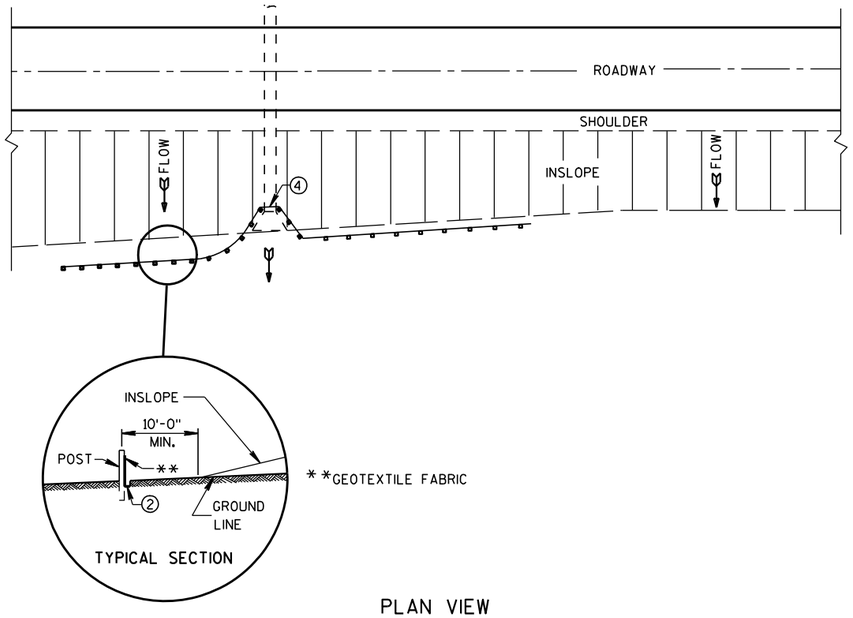
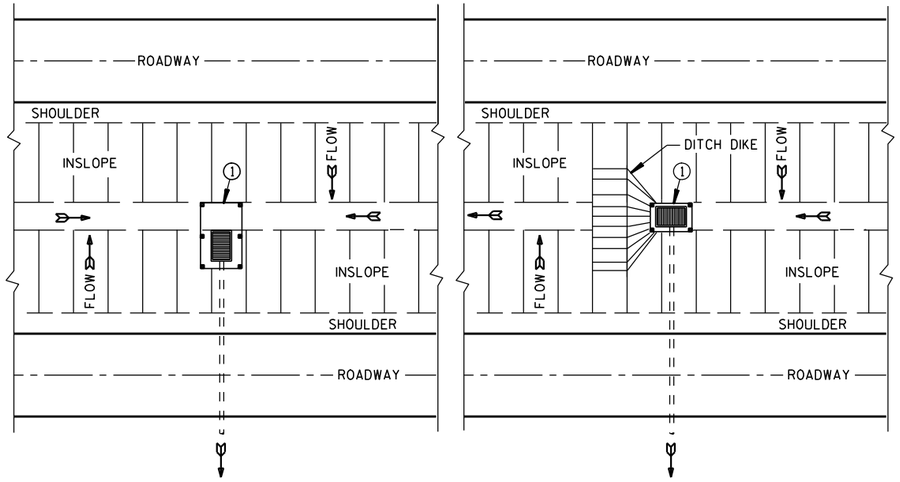


PLAN VIEW

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.

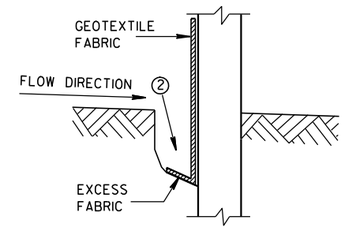
① HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.

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.

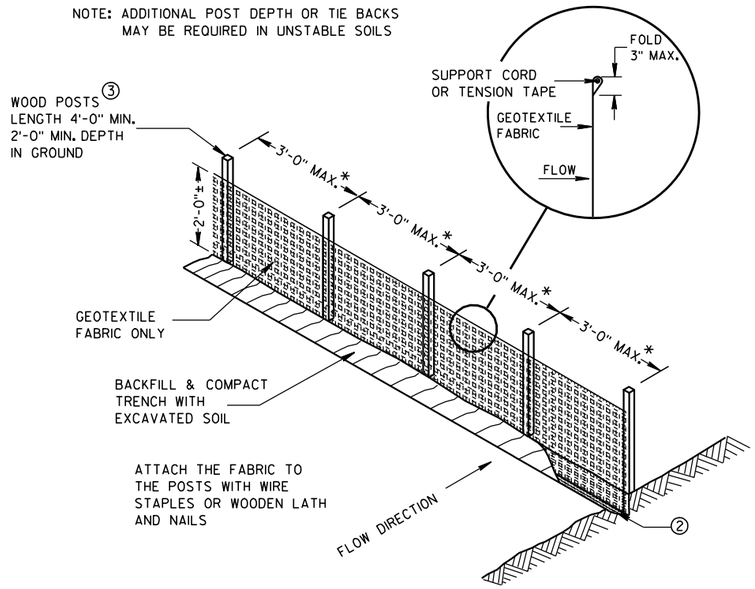
③ WOOD POSTS SHALL BE A MINIMUM SIZE OF 1⅛" X 1⅛" OF OAK OR HICKORY.

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

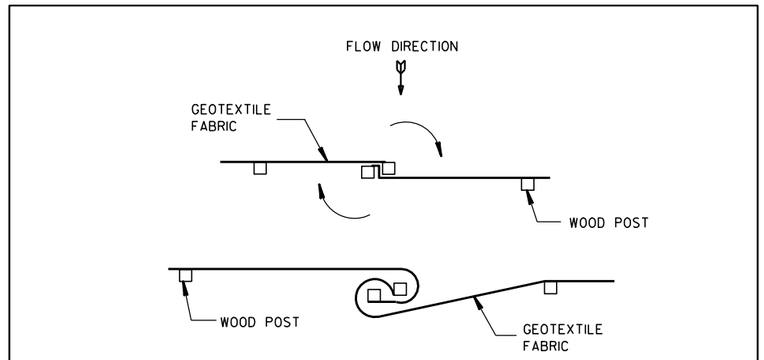
⑤ CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.



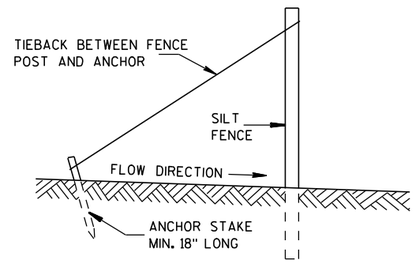
TRENCH DETAIL



SILT FENCE



JOINING TWO LENGTHS OF SILT FENCE ⑤



SILT FENCE TIE BACK

(WHEN REQUIRED BY THE ENGINEER)

SILT FENCE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
4-29-05 DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

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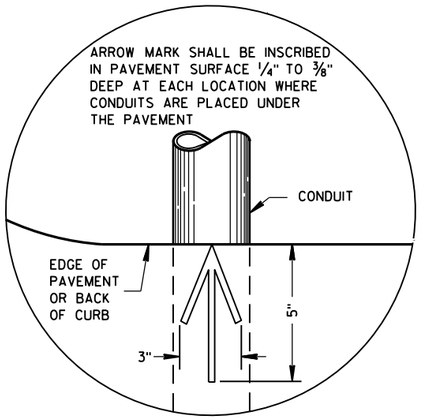
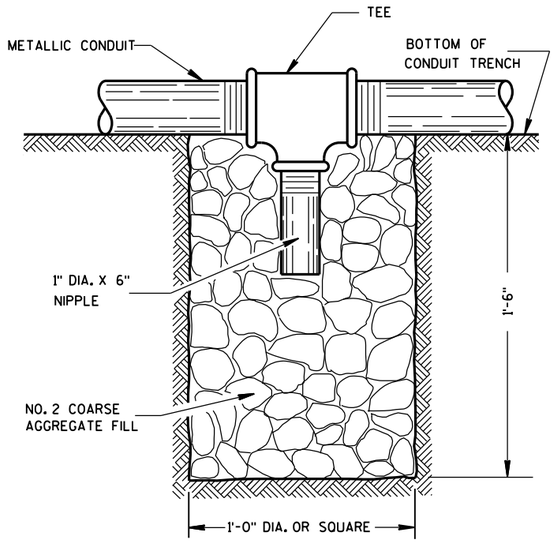
S.D.D. 8 E 9-6



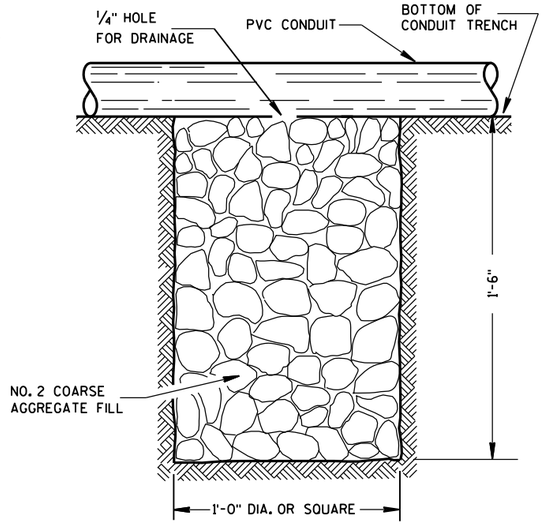
PLAN VIEW

ARROW MARK



NOTE: INSTALL AT LOCATIONS WHERE METALLIC CONDUITS CANNOT BE PITCHED TO DRAIN INTO A PULL BOX.

DRAIN SUMP FOR METALLIC CONDUIT



NOTE: INSTALL AT LOCATIONS WHERE PVC CONDUITS CANNOT BE PITCHED TO DRAIN INTO A PULL BOX.

DRAIN SUMP FOR PVC CONDUIT

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

METALLIC (STANDARD SPECIFICATION 652.2.2) OR NONMETALLIC (STANDARD SPECIFICATION 652.2.3) CONDUIT SHALL BE FURNISHED AND PLACED AS SHOWN.

DEPTH OF CONDUIT INSTALLED BELOW THE TRAVELED WAY SHALL BE 24 INCHES MINIMUM AND 36 INCHES MAXIMUM.

DEPTH OF CONDUIT INSTALLED THAT IS NOT BELOW THE TRAVELED WAY SHALL BE 18 INCHES MINIMUM AND 36 INCHES MAXIMUM.

ANY EXCEPTION TO THE MAXIMUM DEPTH SHALL BE ONLY WITH THE WRITTEN APPROVAL OF THE ENGINEER.

THE TRENCH SHALL NOT BE BACKFILLED PRIOR TO INSPECTION OF THE CONDUIT.

ALL METALLIC CONDUIT RACEWAY ENDS SHALL BE REAMED AND THREADED.

ALL METALLIC CONDUIT IN WHICH WIRE OR CABLE IS TO BE INSTALLED SHALL BE BUSHED WITH APPROVED THREADED BUSHINGS BEFORE INSTALLATION OF THE WIRE OR CABLE.

ALL METALLIC CONDUITS IN WHICH WIRE OR CABLE IS NOT TO BE INSTALLED SHALL BE CAPPED WITH THREADED PROTECTIVE CAPS, AS APPROVED BY THE ENGINEER.

ALL NONMETALLIC CONDUIT SHALL BE CAPPED OR PLUGGED IMMEDIATELY AFTER INSTALLATION AND SHALL REMAIN CAPPED OR PLUGGED UNTIL WIRE/CABLES ARE INSTALLED.

NONMETALLIC CONDUITS IN WHICH WIRE OR CABLE IS NOT BEING INSTALLED SHALL REMAIN CAPPED OR PLUGGED.

BENDING OF PVC ELECTRICAL CONDUIT SHALL BE ACCOMPLISHED BY USING A BLANKET OR EMERSION TYPE TANK DESIGNED FOR THE PURPOSE OF BENDING PVC ELECTRICAL CONDUIT.

ALL CUT ENDS SHALL BE TRIMMED INSIDE AND OUTSIDE TO REMOVE ALL ROUGH EDGES ON NONMETALLIC CONDUIT. (SEE NEC 347.5)

WHEN REQUIRED TO CONNECT NONMETALLIC CONDUIT TO METALLIC CONDUIT, ONLY U.L. LISTED ADAPTER FITTINGS SHALL BE USED.

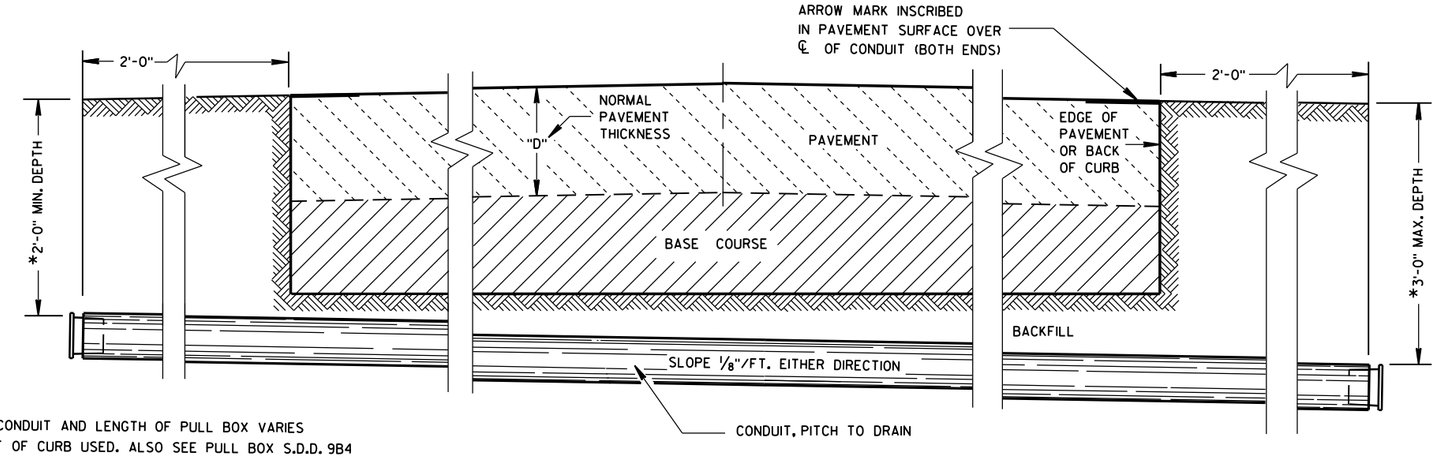
PRIOR TO CONDUIT ACCEPTANCE, CONDUIT CAPS OR PLUGS SHALL BE REMOVED, AND THE CAPS, PLUGS AND CONDUIT ENDS SHALL BE THOROUGHLY CLEANED AND THEN THE CAPS OR PLUGS REINSTALLED TO ENSURE THAT THE CAPS OR PLUGS CAN BE EASILY REMOVED IN THE FUTURE.

ALL CONDUIT BEING FURNISHED AND INSTALLED SHALL HAVE THE U.L. LABEL FIRMLY ATTACHED.

CONDUIT RUNS SHALL BE THE SAME SIZE OF CONDUIT FROM ONE END TO THE OTHER (FROM PULL BOX TO PULL BOX-OR-JUNCTION BOX TO JUNCTION BOX-OR-BASE TO BASE, ETC.).

POLY ROPE OR A PULL WIRE SHALL BE INSTALLED AS STATED IN THE STANDARD SPECIFICATION, ITEM 652.3.1.1.

ALL CONDUIT RUNS SHALL BE STRAIGHT (WITHOUT BENDS) FROM PULL BOX TO PULL BOX, PULL BOX TO BASE AND BASE TO BASE AS SHOWN ON THE PLANS.



*DEPTH OF CONDUIT AND LENGTH OF PULL BOX VARIES WITH HEIGHT OF CURB USED. ALSO SEE PULL BOX S.D.D. 9B4

SIDE ELEVATION

DETAIL FOR CONDUIT UNDER PAVED HIGHWAYS

CONDUIT UNDER PAVED HIGHWAYS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

Sept. 2014 — DATE

/S/ Ahmet Demirbilek — STATE ELECTRICAL

FHWA

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S.D.D. 9 B 2-8

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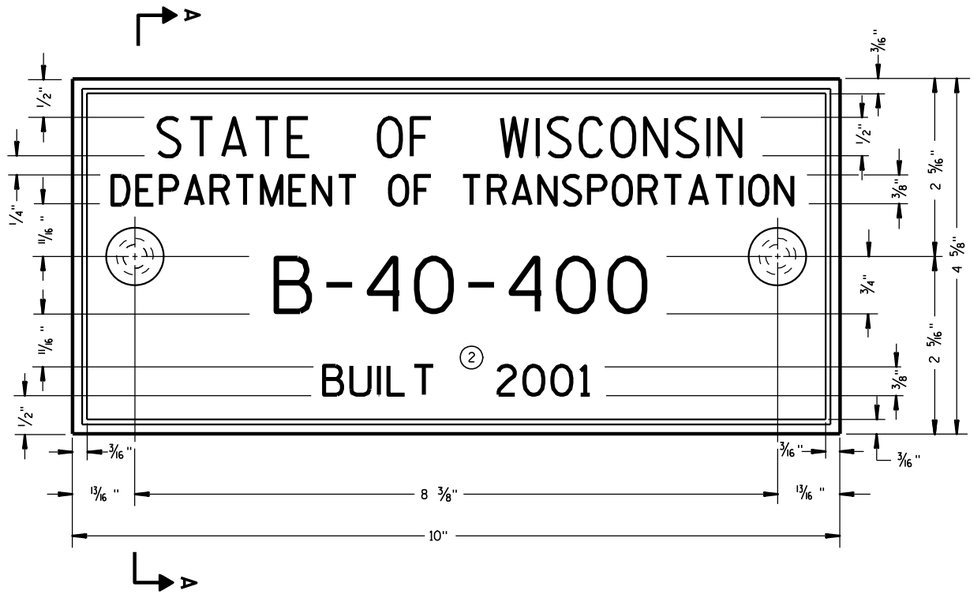
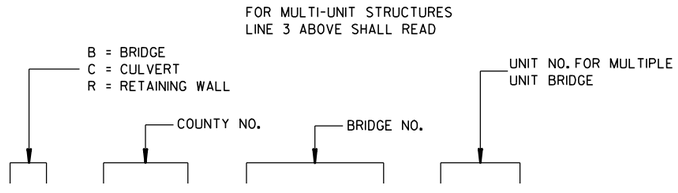


TYPICAL NAME PLATE

(BRIDGES, CULVERTS, AND RETAINING WALLS)



NUMBERING DESIGNATION MULTI-UNIT STRUCTURES

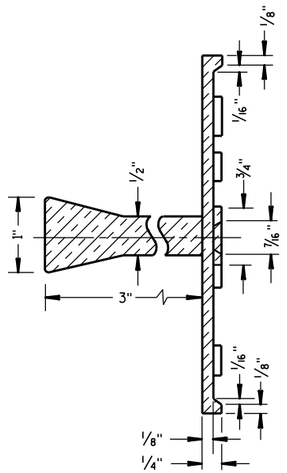
GENERAL NOTES

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

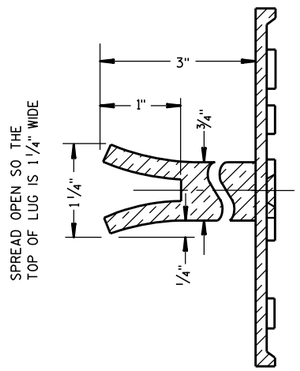
THE BRIDGE NUMBER AND YEAR BUILT SHOWN ON THIS DRAWING ARE EXAMPLES ONLY. SEE CONSTRUCTION PLANS FOR INDIVIDUAL NUMBERING AND YEAR BUILT.

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

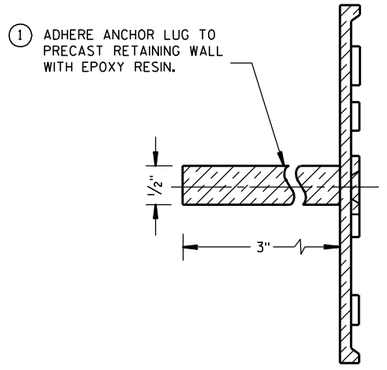
(2) REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.



SECTION A-A



ALTERNATE LUG



ALTERNATE LUG

(FOR ATTACHMENT TO PRECAST STRUCTURES)

NAME PLATE (STRUCTURES)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

3/26/10 DATE

/S/ Scot Beck -- CHIEF STRUCTURAL DEVELOPMENT ENGINEER

FHWA

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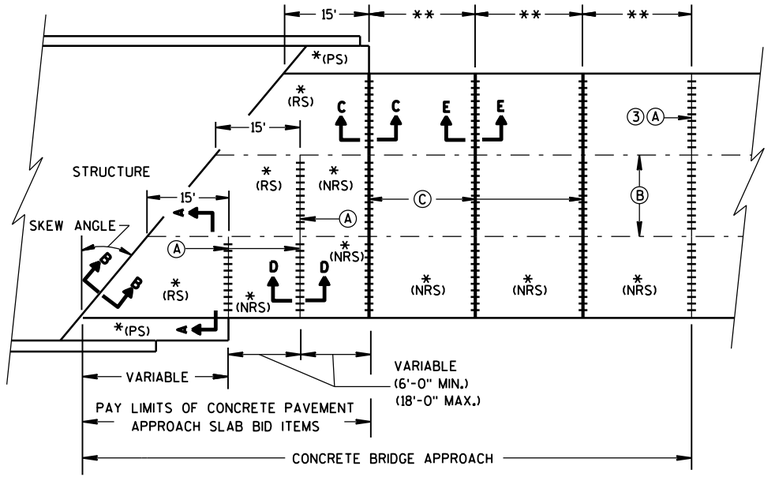
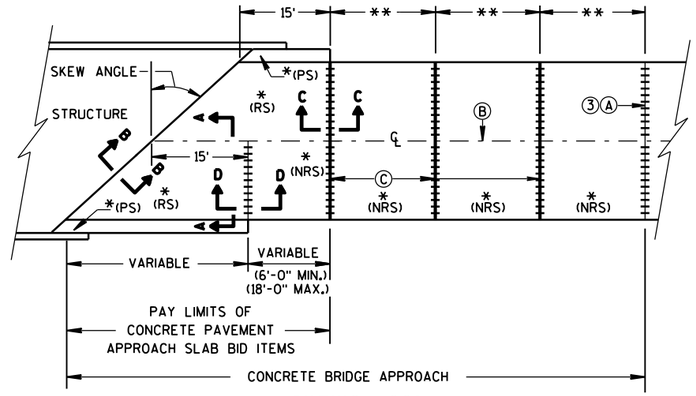
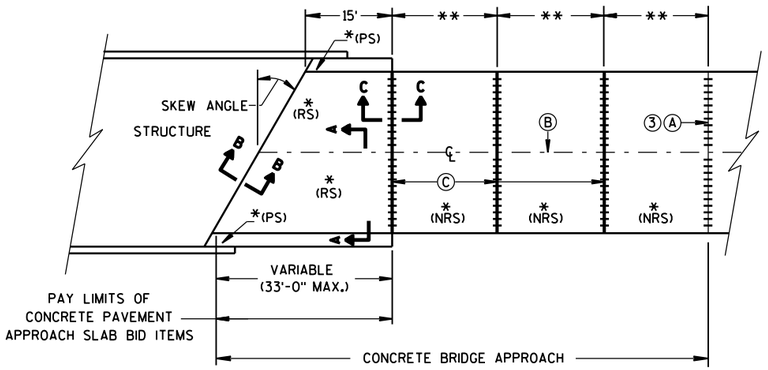


SKEWED APPROACH
(PAVEMENT MORE THAN 2 LANES)



SKEWS >30°
(PAVEMENT WIDTH ≤30')



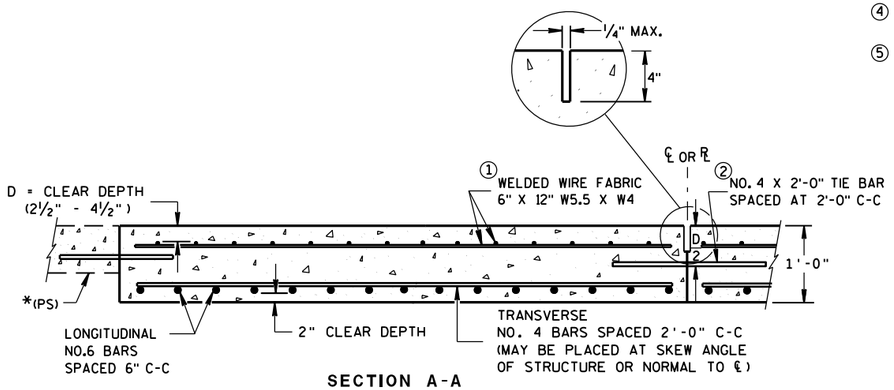
SKEWS ≤30°
(PAVEMENT WIDTH ≤30')

APPROACH SLAB AND ADJACENT PAVEMENT

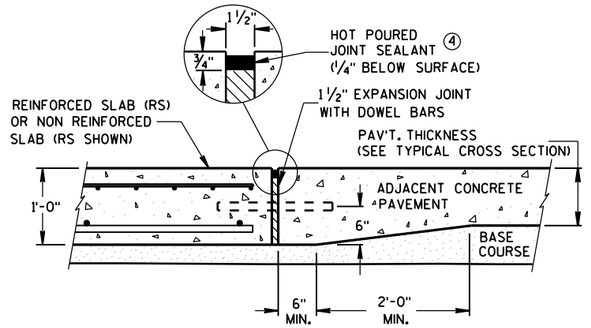
*(RS) = REINFORCED CONCRETE SLAB
*(PS) = PAVED CONCRETE SHOULDER: CONCRETE PAVEMENT, OR CONCRETE SURFACE DRAIN (SEE DETAILS ELSEWHERE IN THE PLAN)
*(NRS) = NON-REINFORCED CONCRETE SLAB

**STANDARD TRANSVERSE JOINT SPACING (SEE SDD 13C4, SDD 13C11, & SDD 13C13)
***STANDARD DOWEL BAR DIAMETER (SEE SDD 13C11, & SDD 13C13)

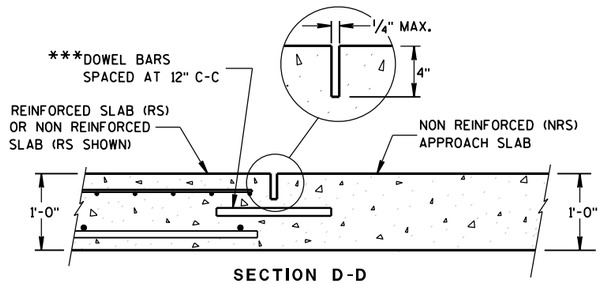
(A) STANDARD CONTRACTION JOINT NORMAL TO ℄ OR ℄
(B) STANDARD LONGITUDINAL JOINT AND TIE BARS.
(C) 1½" EXPANSION JOINT WITH DOWEL BARS NORMAL TO ℄ OR ℄



SECTION A-A
REINFORCEMENT POSITIONING DETAIL



SECTION C-C
TRANSITION DETAIL
APPROACH SLAB TO ADJACENT PAVEMENT



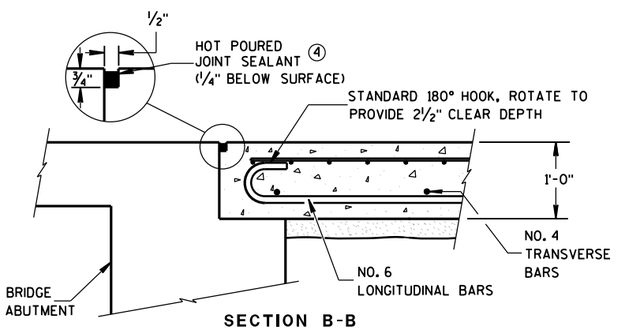
SECTION D-D
CONTRACTION JOINT

GENERAL NOTES

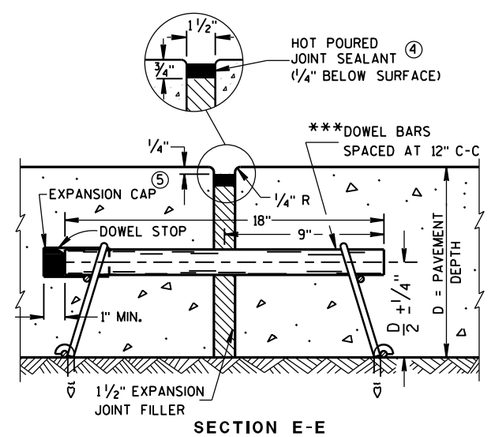
THE CONTRACTOR MAY SPLICE NO. 6 BARS IN THE APPROACH SLAB FOR SKEWED STRUCTURES ONLY. STAGGER SPLICES WITH A MAXIMUM OF ONE SPLICE PER BAR. THE LENGTH OF LAP IS 20 INCHES.

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 DOWEL A CONTRACTION JOINT THAT ABUTS 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



SECTION E-E
EXPANSION JOINT

CONCRETE BRIDGE APPROACH

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June, 2014 — DATE
/S/ Deb Bischoff — PAVEMENT POLICY & DE
EER
FHWA

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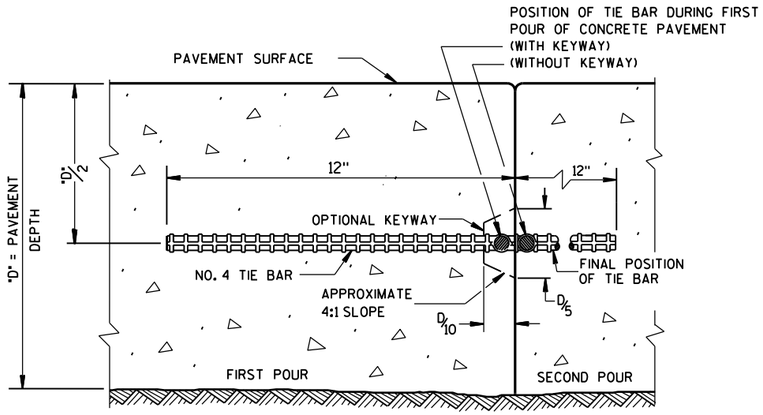
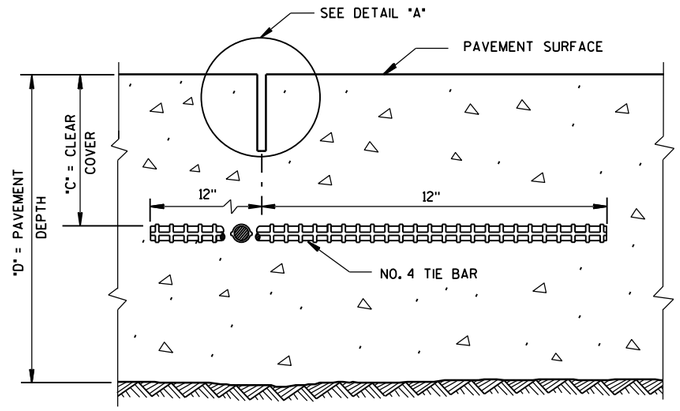
6 S.D.D. 13 B 2-7a



CONSTRUCTION JOINT



SAWED JOINT

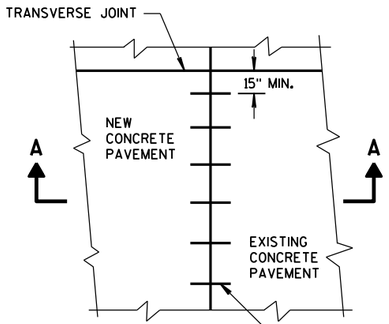
GENERAL NOTES

DO NOT SEAL OR FILL LONGITUDINAL JOINTS.

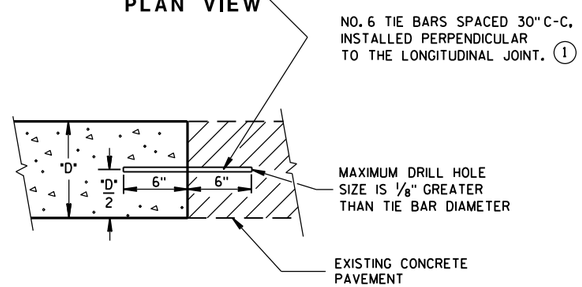
CREATE A LONGITUDINAL JOINT FOR PAVEMENT WIDTHS GREATER THAN 15 FEET.

CORRELATE LONGITUDINAL JOINTS WITH LANE LINES WHEN POSSIBLE.

(1) ANCHOR TIE BARS INTO DRILLED HOLES WITH AN EPOXY.

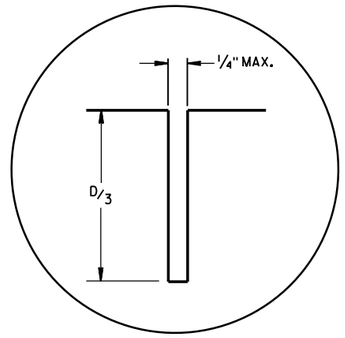


PLAN VIEW



SECTION A-A

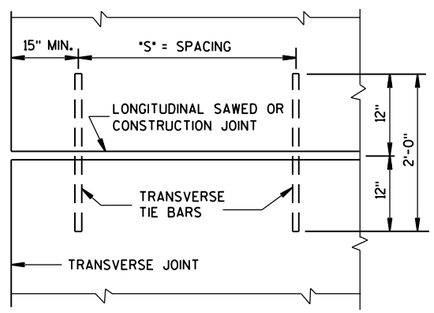
LONGITUDINAL CONSTRUCTION JOINT
TIE BARS ANCHORED
INTO EXISTING PAVEMENT



DETAIL "A"

TIE BAR TABLE

PAVEMENT DEPTH "D"	CLEAR COVER "C"	MAXIMUM TIE BAR SPACING "S"	
		PAVEMENT WIDTH	
		24' OR 26'	≥ 30'
6, 6 1/2"	3"±1/2"	48"	42"
7, 7 1/2"	3 1/4"±1"	45"	36"
8, 8 1/2"	3 3/4"±1"	39"	30"
9, 9 1/2"	4 1/4"±1"	33"	27"
10, 10 1/2"	4 3/4"±1"	30"	24"
11, 11 1/2"	5 1/4"±1"	27"	21"
12"	5 3/4"±1"	24"	21"



PLAN VIEW
SHOWING LOCATION OF TIE BARS

CONCRETE PAVEMENT
LONGITUDINAL JOINTS AND TIES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
5-3-2013 DATE
/S/ Deb Bischoff PAVEMENT POLICY & DE ...NEER
FHWA

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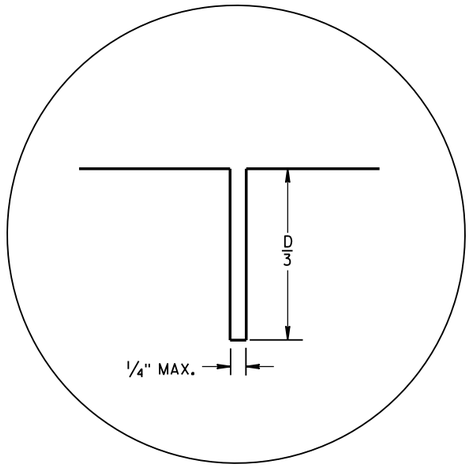
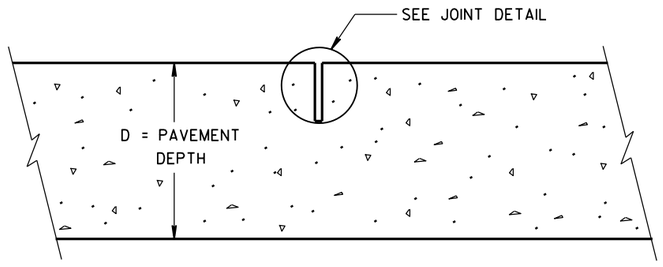


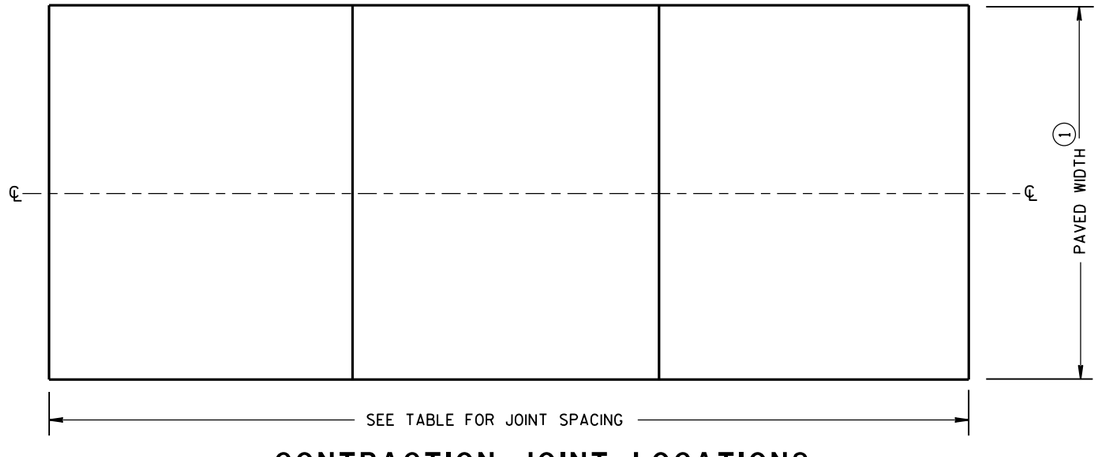
JOINT DETAIL



CONTRACTION JOINT

PAVEMENT DEPTH AND JOINT SPACING TABLE

PAVEMENT DEPTH (D)	CONTRACTION JOINT SPACING
6", 6 1/2"	12'
7", 7 1/2"	14'
8" & ABOVE	15'



CONTRACTION JOINT LOCATIONS

GENERAL NOTES

CONTRACTION JOINTS

CONSTRUCT TRANSVERSE CONTRACTION JOINTS NORMAL TO THE CENTERLINE.

LOCATE AND ORIENT CONTRACTION JOINTS THROUGH INTERSECTIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT SEAL OR FILL CONTRACTION JOINTS.

CONSTRUCTION JOINTS

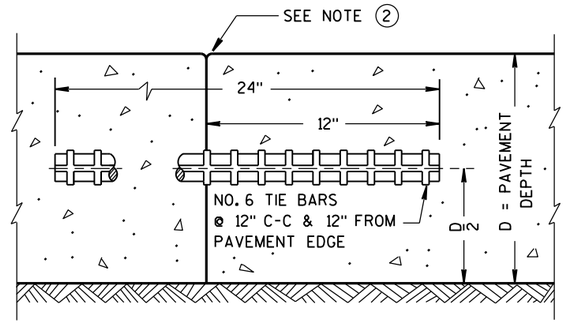
LOCATE CONSTRUCTION JOINTS A MINIMUM OF 6 FEET FROM THE NEAREST CONTRACTION JOINT AND ALIGN PARALLEL TO THE CONTRACTION JOINTS.

FORM OR SAW CONSTRUCTION JOINTS.

THE CONTRACTOR MAY INSERT TIE BARS THROUGH THE HEADER BOARD AFTER THE CONCRETE HAS BEEN PLACED.

(1) REFER TO TYPICAL CROSS SECTIONS FOR PAVED WIDTH AND LOCATION OF LONGITUDINAL JOINTS.

(2) PROVIDE A SMOOTH VERTICAL FACE FOR THE ENTIRE DEPTH OF THE PAVEMENT WHEN FORMING CONSTRUCTION JOINTS. PROVIDE A 1/4-INCH RADIUS AT FORMED JOINTS.



TIED TRANSVERSE CONSTRUCTION JOINT

6

6

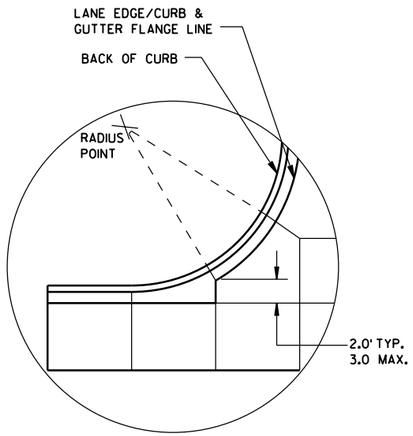
S.D.D. 13 C 4-16

S.D.D. 13 C 4-16

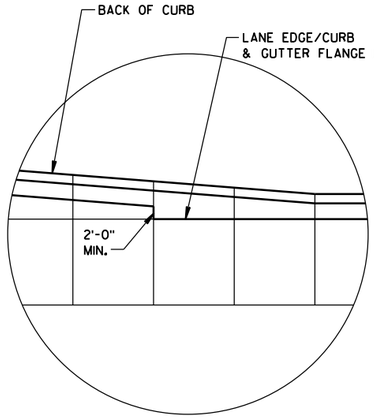
URBAN NON-DOWELED CONCRETE PAVEMENT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

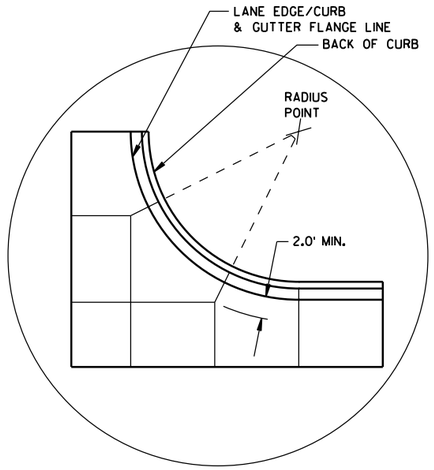
APPROVED
5-3-2013 — DATE
/S/ Deb Bischoff — PAVEMENT POLICY & DE
IEER
FHWA



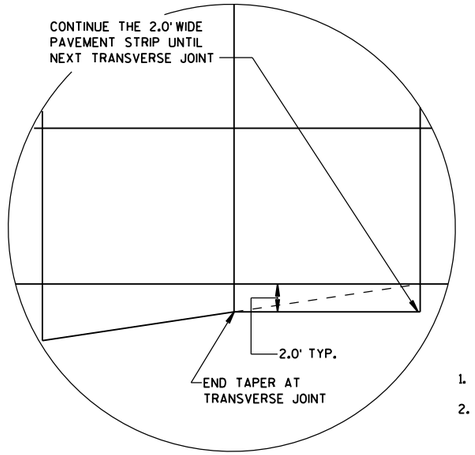
DETAIL "A"



DETAIL "B"



DETAIL "C"



DETAIL "D"

GENERAL NOTES

THE PRIMARY ROADWAY CONTROLS THE TRANSVERSE JOINT PATTERN.

ALIGN NEW JOINTS WITH EXISTING JOINTS OR CRACKS.

CONSTRUCT TRANSVERSE JOINTS PERPENDICULAR TO THE ROADWAY.

ADJUST TRANSVERSE JOINTS TO ALIGN WITH UTILITY FIXTURES (E.G. MANHOLES AND INLETS) IN THE PAVEMENT STRUCTURE WHEN POSSIBLE. WATER VALVES DO NOT REQUIRE JOINT ADJUSTMENT.

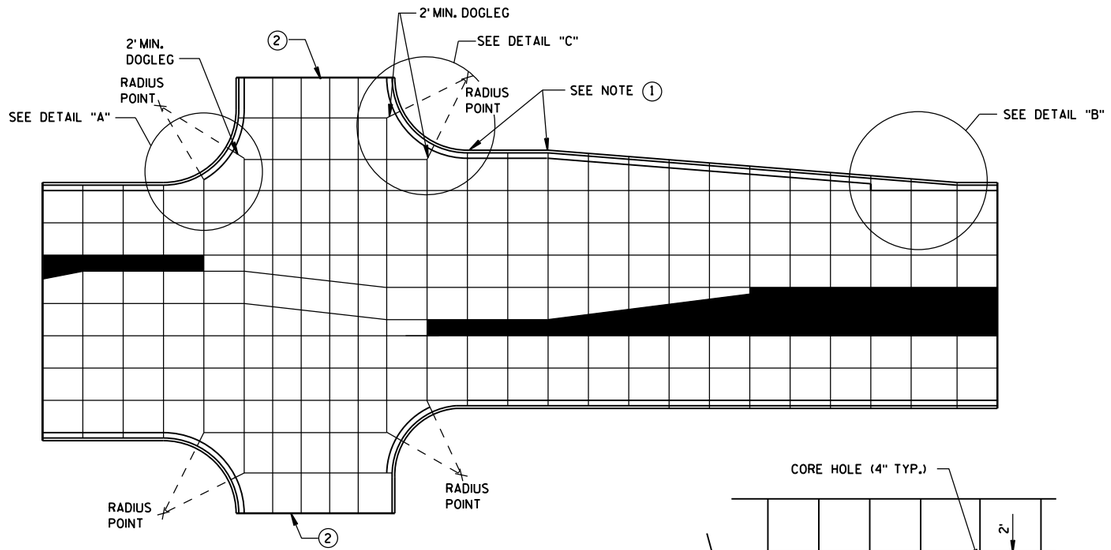
AVOID SLABS LESS THAN 2 FEET WIDE OR GREATER THAN 15 FEET WIDE.

SEE TABLE FOR TRANSVERSE JOINT SPACING. JOINT SPACING SPECIFIED IS MAXIMUM AND ACTUAL SPACING CAN BE ADJUSTED TO ACCOMMODATE INTERSECTIONS.

AVOID ANGLES LESS THAN 60° BY DOGLEGGING JOINTS THROUGH CURVE RADIUS POINTS. USE 90° ANGLES WHEN POSSIBLE.

CORRELATE LONGITUDINAL JOINTS WITH LANE LINES WHEN POSSIBLE.

1. PROVIDE TRANSVERSE JOINTS AT ALL PAVEMENT WIDTH CHANGES.
2. CONSTRUCT DOWELED EXPANSION JOINT ON THE SIDE ROAD OF AN INTERSECTION IF THE SIDE ROAD IS CONCRETE PAVEMENT AND GREATER THAN 300 FEET IN LENGTH. ALIGN EXPANSION JOINT WITH EDGE OF RADIUS.
3. THE ENGINEER MAY APPROVE SLIGHT VARIATIONS FROM THESE JOINTING DETAILS.

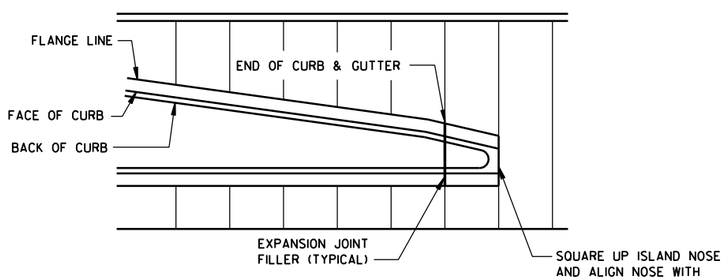


STANDARD INTERSECTION

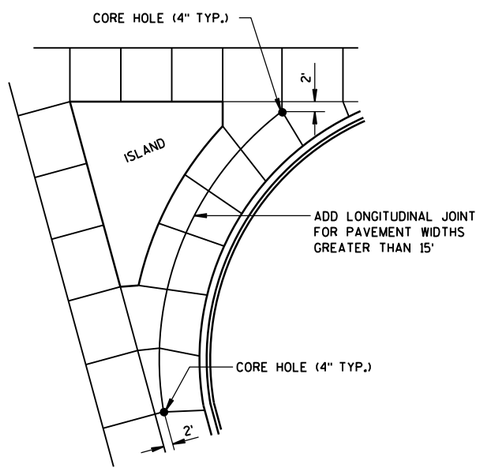
PAVEMENT DEPTH AND JOINT SPACING TABLE

PAVEMENT DEPTH (D)	CONTRACTION JOINT SPACING
6", 6½"	12'
7", 7½"	14'
8" & ABOVE	15'

SKEWED INTERSECTION



APPROACH TO MEDIAN



LARGE RIGHT TURN

CONCRETE PAVEMENT JOINTING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

6

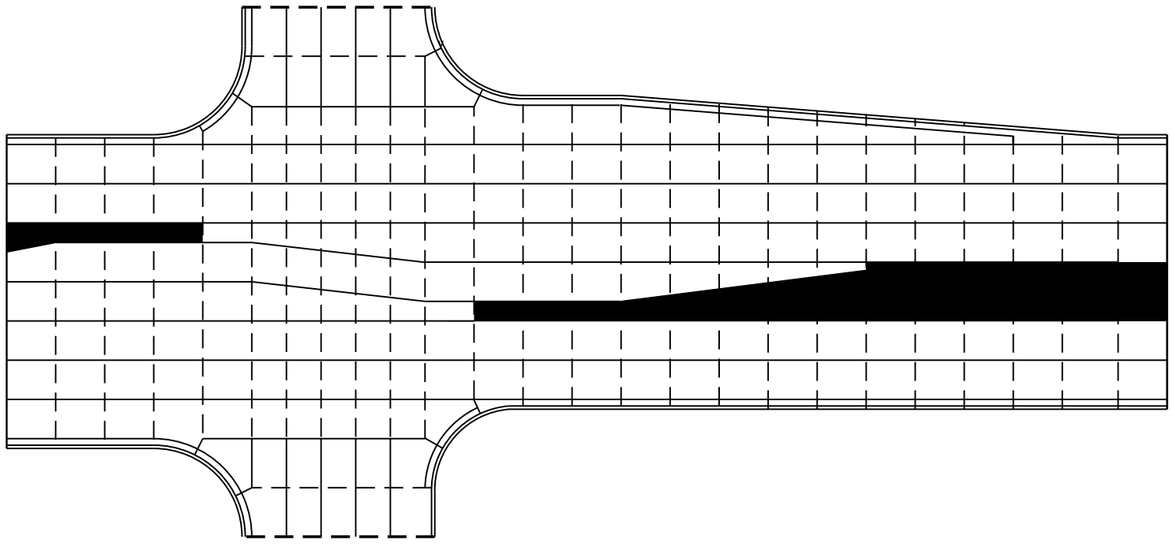
S.D.D. 13 C 18-2a

LEGEND

POTENTIAL DOWELED EXPANSION JOINT

DOWELED JOINT

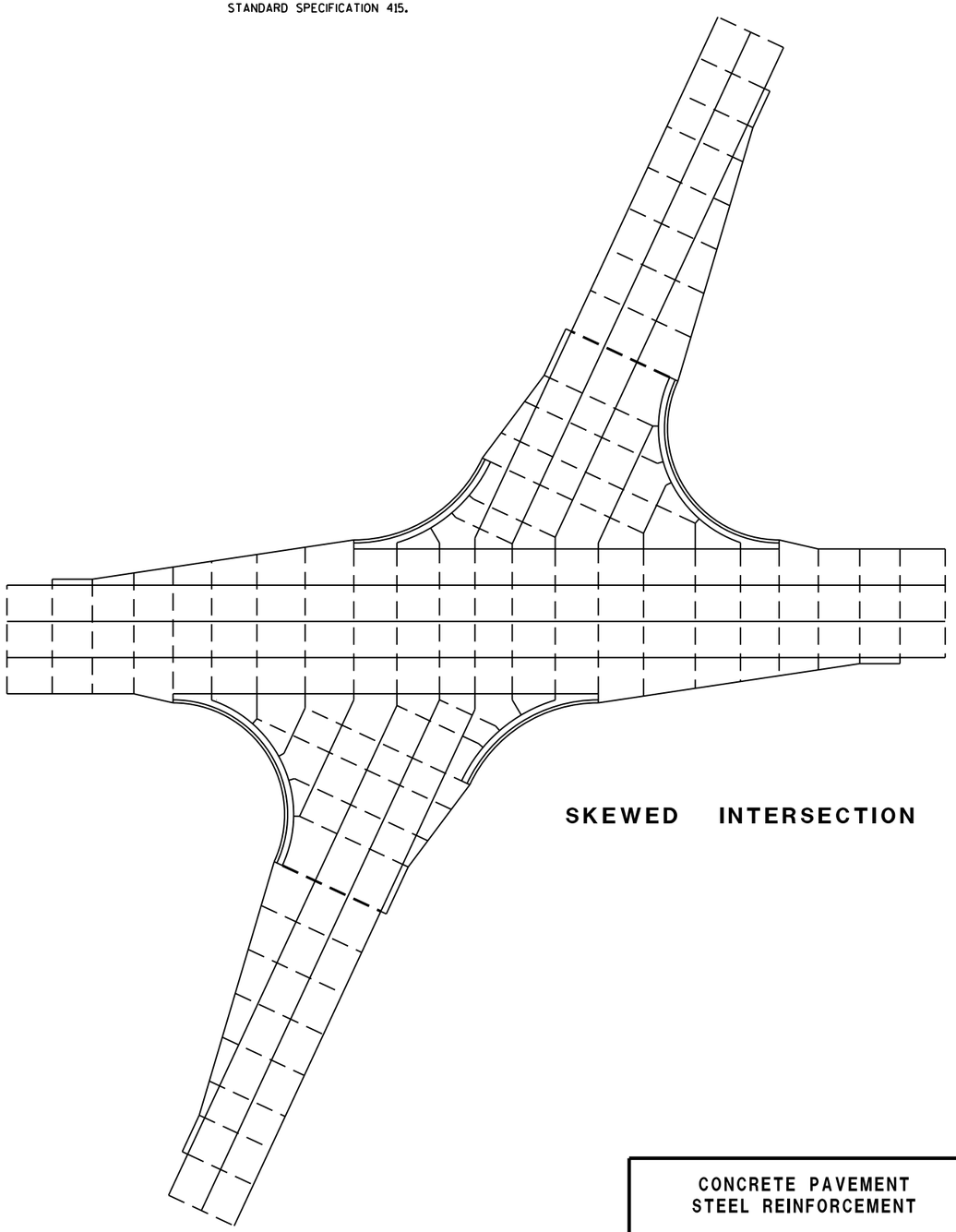
TIED JOINT



STANDARD INTERSECTION

GENERAL NOTES

USE AN EXPANSION JOINT FILLER MEETING THE REQUIREMENTS OF STANDARD SPECIFICATION 415.



SKEWED INTERSECTION

CONCRETE PAVEMENT
STEEL REINFORCEMENT

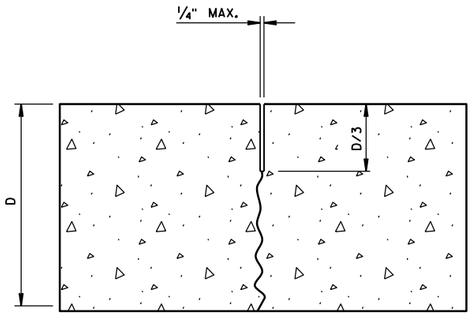
STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

6

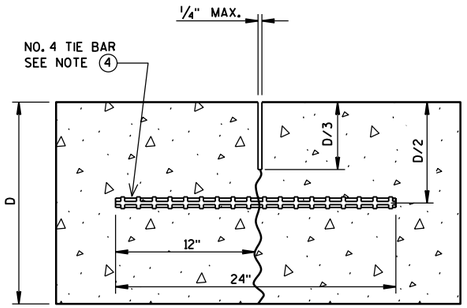
S.D.D. 13 C 18-2b

6

S.D.D. 13 C 18-2b



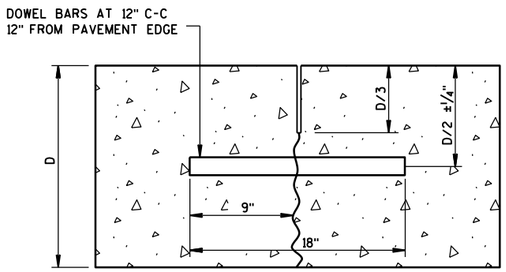
UNDOWELED-TRANSVERSE



TIED LONGITUDINAL

GENERAL NOTES

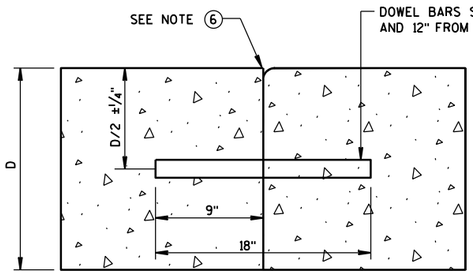
1. USE DOWELED EXPANSION JOINTS ON SIDE ROADS AT INTERSECTIONS (TO ISOLATE THE SIDE ROAD FROM THE THROUGH STREET) IF THE SIDE ROAD IS CONCRETE PAVEMENT AND GREATER THAN 300 FEET IN LENGTH.
2. SPACE CONTRACTION JOINTS IN ACCORDANCE WITH 13C4, 13C11 OR 13C13.
3. LOCATE CONSTRUCTION JOINTS A MINIMUM OF 6 FEET FROM THE NEAREST CONTRACTION JOINT AND ALIGN PARALLEL TO CONTRACTION JOINTS.
4. SPACE TIE BARS AT LONGITUDINAL CONSTRUCTION OR CONTRACTION JOINTS IN ACCORDANCE WITH SDD 13C1.
5. CONSTRUCTION JOINTS CAN BE FORMED OR SAWED.
6. IF JOINT IS FORMED, PROVIDE A 1/4-INCH RADIUS.



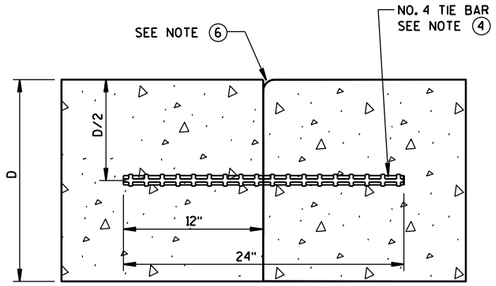
DOWELED-TRANSVERSE

CONTRACTION JOINTS

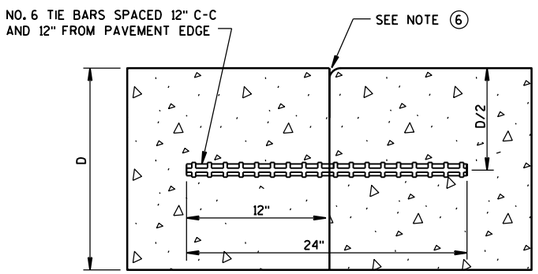
SEE NOTE (2)



DOWELED TRANSVERSE

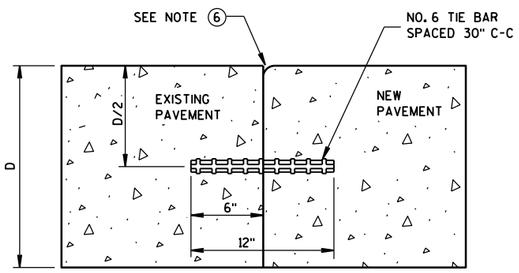


TIED LONGITUDINAL



TIED TRANSVERSE

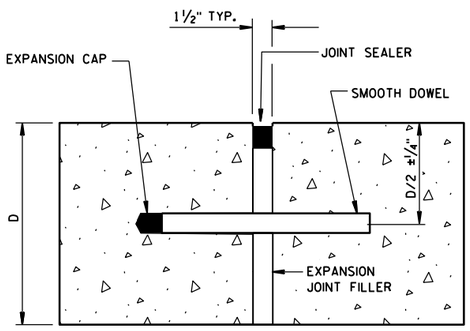
(FOR USE ON NON-DOWELED PAVEMENTS ONLY)



TIED LONGITUDINAL TO EXISTING

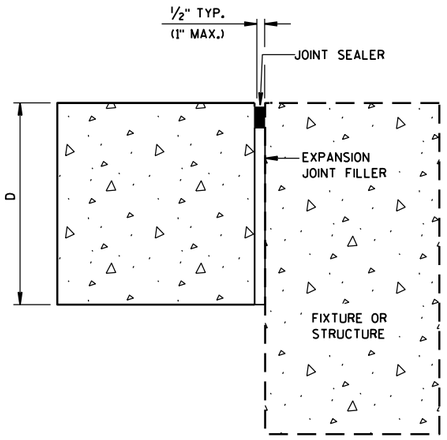
CONSTRUCTION JOINTS

SEE NOTE (5)



DOWELED-TRANSVERSE

SEE NOTE (1)



UNTIED-LONGITUDINAL

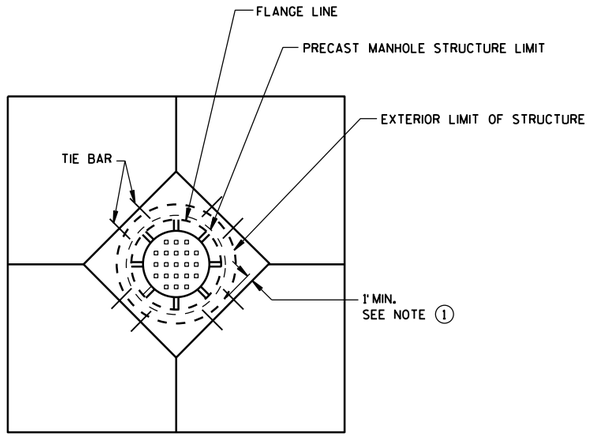
EXPANSION JOINTS

CONCRETE PAVEMENT
JOINT TYPES

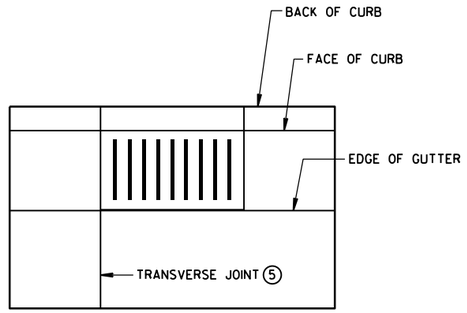
STATE OF WISCONSIN
DEPARTMENT OF TRANSPOI

6

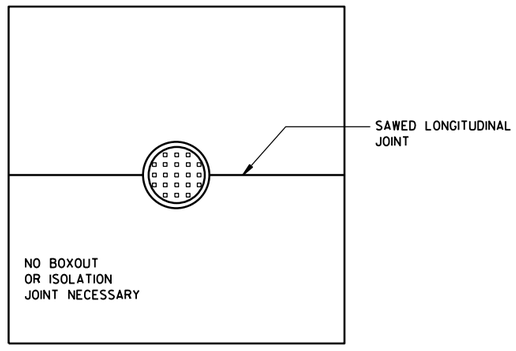
S.D.D. 13 C 18-2c



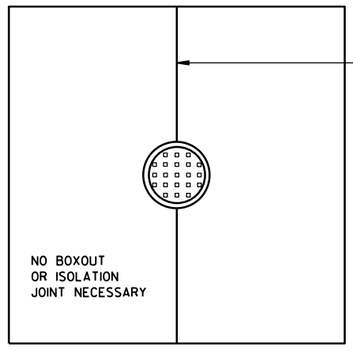
DIAGONAL MANHOLE BOXOUT FOR CONSTRUCTION JOINTS



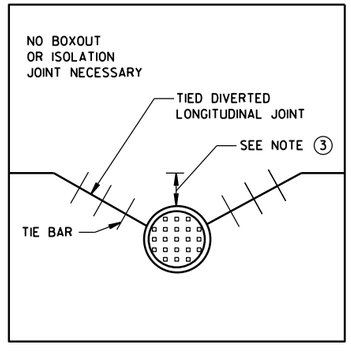
INLET WITH TRANSVERSE JOINT



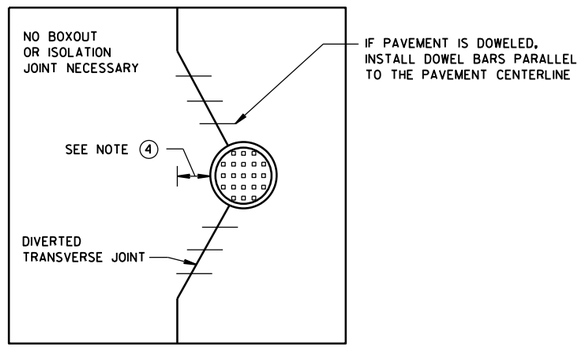
MANHOLE WITH LONGITUDINAL JOINT



MANHOLE WITH TRANSVERSE JOINT



MANHOLE WITH DIVERTED LONGITUDINAL CONTRACTION JOINT



MANHOLE WITH DIVERTED TRANSVERSE CONTRACTION JOINT

GENERAL NOTES

(1) USE BOXOUTS WHEN UTILITY STRUCTURE IS IN THE PATH OF CONSTRUCTION JOINTS. PROVIDE A 1-FOOT MINIMUM CLEARANCE BETWEEN THE EXTERIOR LIMIT OF THE STRUCTURE TO THE DIAMOND BOXOUT.

(2) ADJUST TRANSVERSE JOINT TO INTERSECT MANHOLE IF POSSIBLE.

(3) IF DISTANCE BETWEEN THE LONGITUDINAL JOINT AND THE EDGE OF MANHOLE IS 2 FEET OR LESS, DIVERT THE LONGITUDIAL JOINT AT A 2:1 TAPER RATE TO THE CENTER OF THE MANHOLE. IF THE DISTANCE IS GREATER THAN 2 FEET, DO NOT DIVERT THE JOINT AND SAW AS NORMAL. PLACE REBAR REINFORCEMENT AROUND THE MANHOLE.

(4) IF DISTANCE FROM THE EDGE OF THE MANHOLE TO THE NEAREST TRANSVERSE JOINT IS 4 FEET OR LESS, REDIRECT JOINT TO INTERSECT THE CENTER OF THE MANHOLE. IF DISTANCE IS GREATER THAN 4 FEET, DO NOT DIVERT THE JOINT AND SAW AS NORMAL. PLACE REBAR REINFORCEMENT AROUND THE MANHOLE.

(5) ALIGN TRANSVERSE JOINT WITH ONE EDGE OF INLET WHEN PRACTICAL.

CONCRETE PAVEMENT JOINTING AT UTILITY FIXTURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

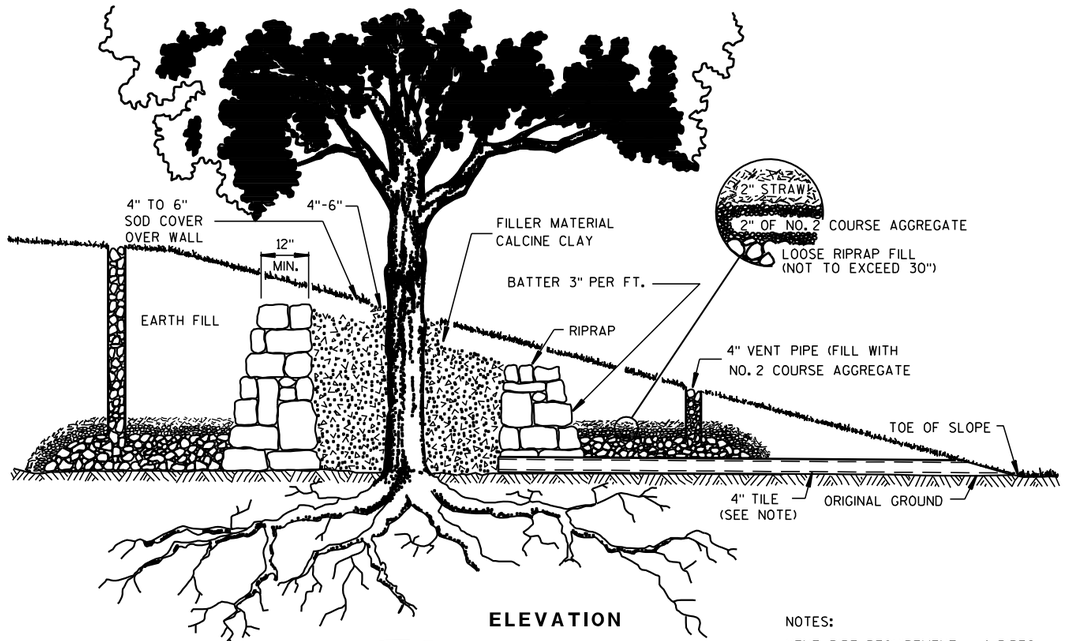
APPROVED

5-3-2013 DATE — /S/ Deb Bischoff PAVEMENT POLICY & DE — NEER

FHWA

6

S.D.D. 13 C 18-2d



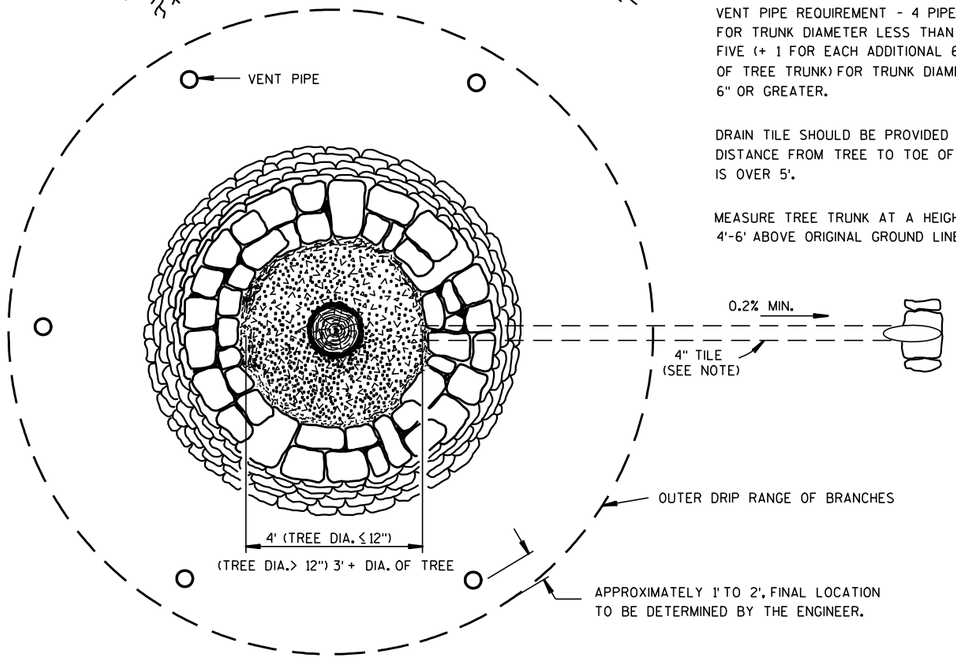
ELEVATION

NOTES:

VENT PIPE REQUIREMENT - 4 PIPES FOR TRUNK DIAMETER LESS THAN 6". FIVE (+ 1 FOR EACH ADDITIONAL 6" OF TREE TRUNK) FOR TRUNK DIAMETER 6" OR GREATER.

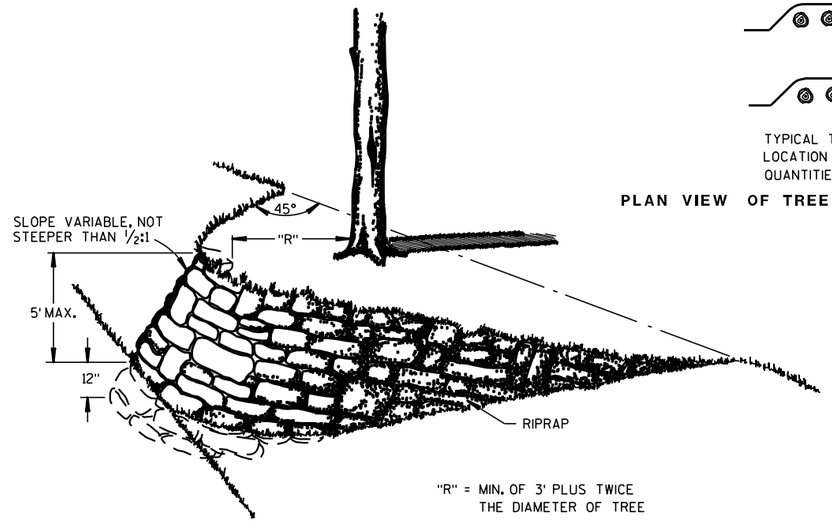
DRAIN TILE SHOULD BE PROVIDED IF DISTANCE FROM TREE TO TOE OF SLOPE IS OVER 5'.

MEASURE TREE TRUNK AT A HEIGHT 4'-6' ABOVE ORIGINAL GROUND LINE.



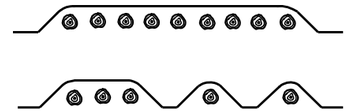
PLAN

FULL TREE WELL WITH RIPRAP WALL



"R" = MIN. OF 3' PLUS TWICE THE DIAMETER OF TREE

DETAILS OF TREE ISLAND AND ROOT PROTECTION



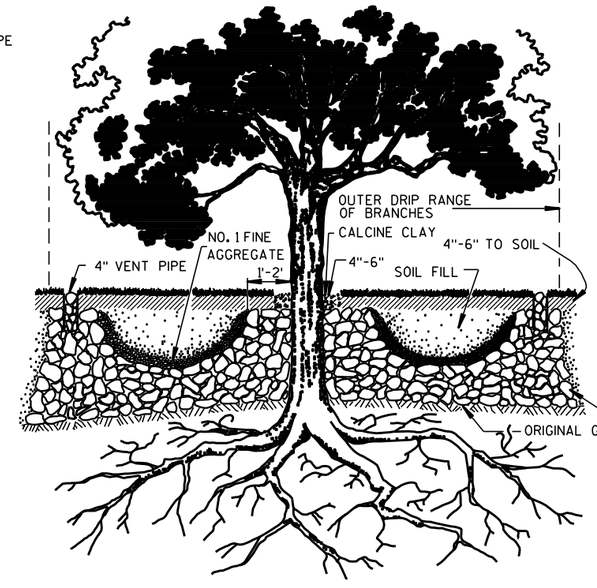
TYPICAL TREATMENTS OF ROOT PROTECTION. LOCATION SHOWN ON MISCELLANEOUS QUANTITIES SHEET.

PLAN VIEW OF TREE ISLANDS FOR ONE OR MORE TREES

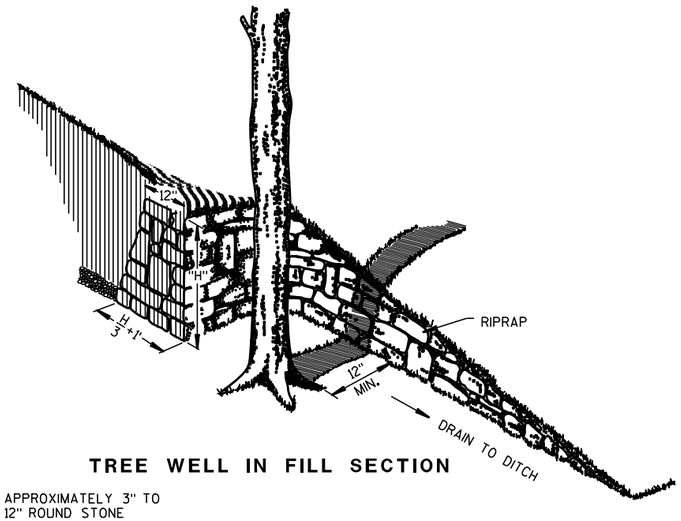
GENERAL NOTES

WALLS TO BE BUILT TO APPROXIMATE SHAPE AND DIMENSIONS SHOWN. STONE TO CONFORM TO SPECIFICATIONS FOR RIPRAP.

DETAILED DRAWINGS OF PROPOSED ALTERNATE DESIGNS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.



TREE WELL WITHOUT WALL



TREE WELL IN FILL SECTION

DETAILS FOR TREE WELLS

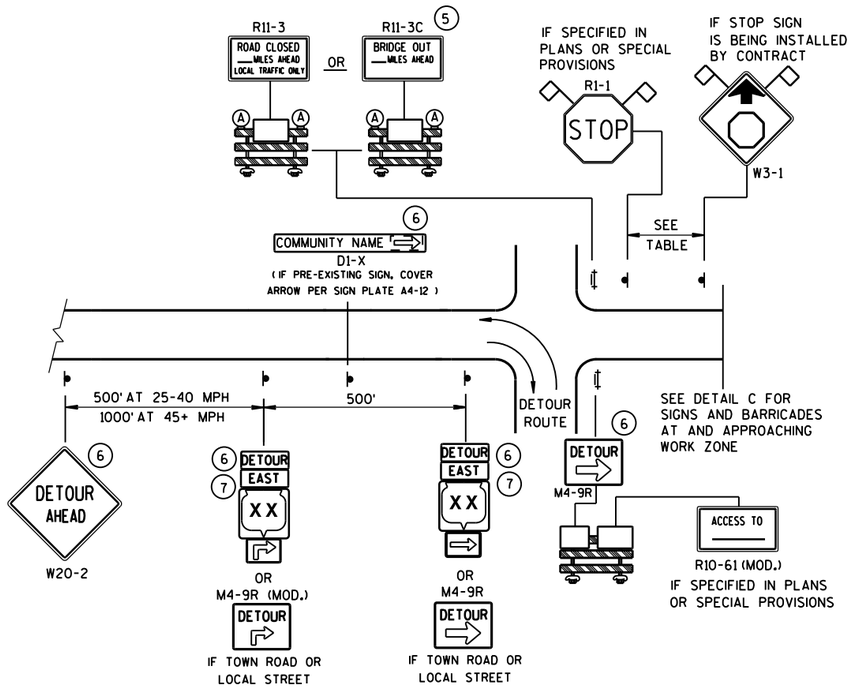
TREE PRESERVATION DETAILS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/25/76 DATE
/S/ D. L. Strand STATE DESIGN ENGINEER
FHWA

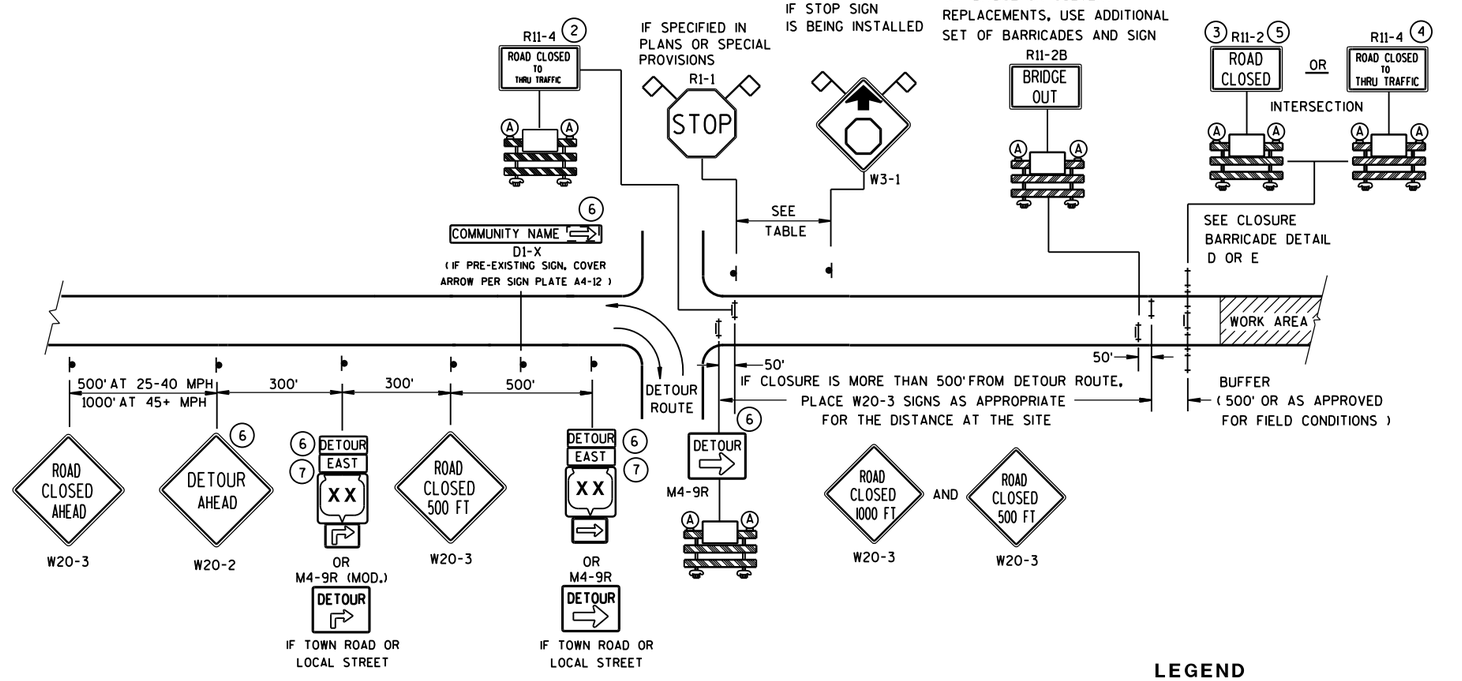
S.D.D. 14 A 1-3

6



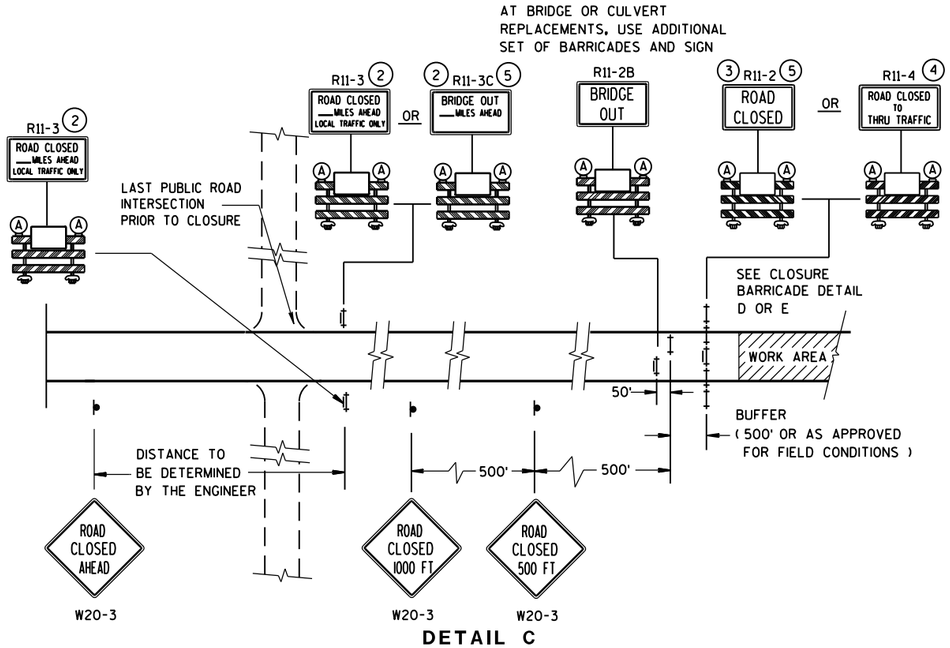
DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR

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)

BARRICADES AND SIGNS FOR MAINLINE CLOSURES

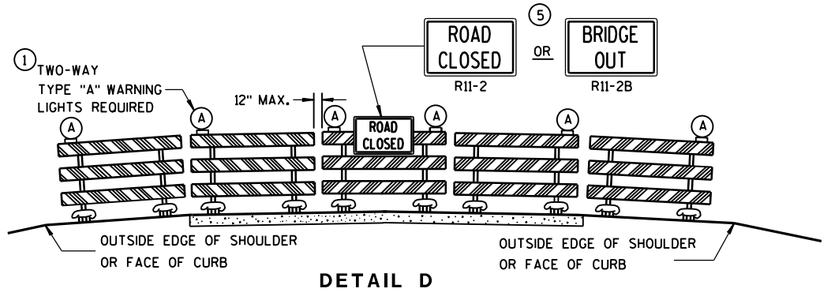
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

8/2013 DATE — /S/ Travis Feltes STATE TRAFFIC ENGINEER — DESIGN

FHWA

6

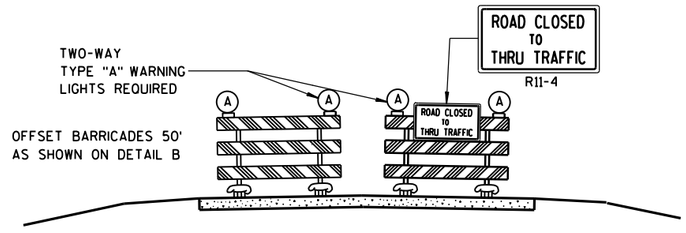
S.D.D. 15 C 2-5a



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

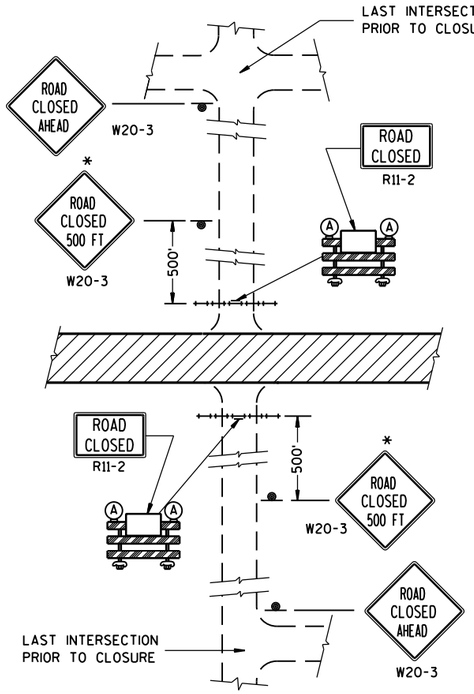
8/2013 DATE

/S/ Travis Feltes
STATE TRAFFIC ENGINEER

FHWA

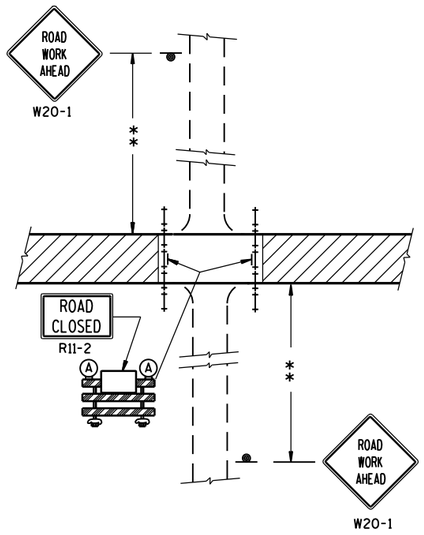
6

S.D.D. 15 C 2-5b



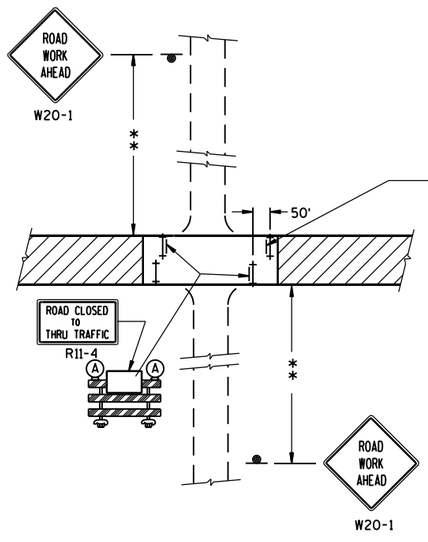
DETAIL 1

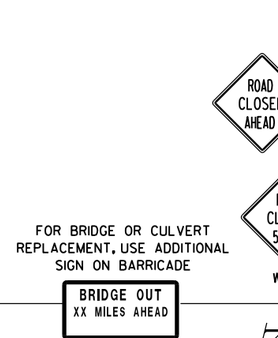
(NO ACCESS TO PROJECT)



DETAIL 2

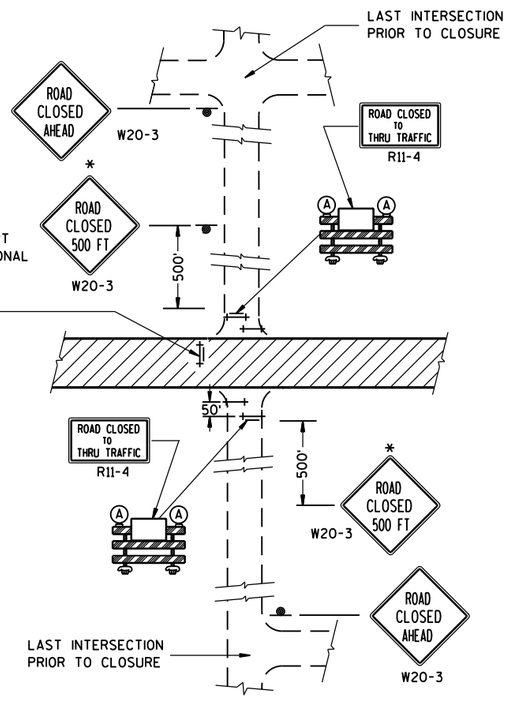
(PUBLIC CROSS-TRAFFIC MAINTAINED. NO ACCESS TO PROJECT).





DETAIL 3

(PUBLIC CROSS-TRAFFIC MAINTAINED. CONTRACTOR, LOCAL BUSINESS AND RESIDENT ACCESS).



DETAIL 4

(CONTRACTOR, LOCAL BUSINESS AND RESIDENT ACCESS TO PROJECT)

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.

IF A "STOP" SIGN MUST BE REMOVED FOR A WORK OPERATION, A TEMPORARY "STOP" SIGN SHALL BE PLACED PRIOR TO THE SIGN REMOVAL, OR A FLAGGER SHALL BE PROVIDED UNTIL THE SIGN IS RE-ESTABLISHED.

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 AND R11-4 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.

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:
R11-2 SHALL BE 48" X 30".
R11-4 AND R11-3 SHALL BE 60" X 30".

*OMIT THE "ROAD CLOSED 500 FT." SIGN IF THE LAST INTERSECTION IS 500 FT. OR LESS FROM THE WORK ZONE.

**500' MAX. OR AT LAST INTERSECTION WHICHEVER IS CLOSER.

LEGEND

- SIGN ON PERMANENT SUPPORT
- TYPE III BARRICADE
- TYPE III BARRICADE WITH ATTACHED SIGN
- (A) TYPE "A" WARNING LIGHT (FLASHING)
- WORK AREA

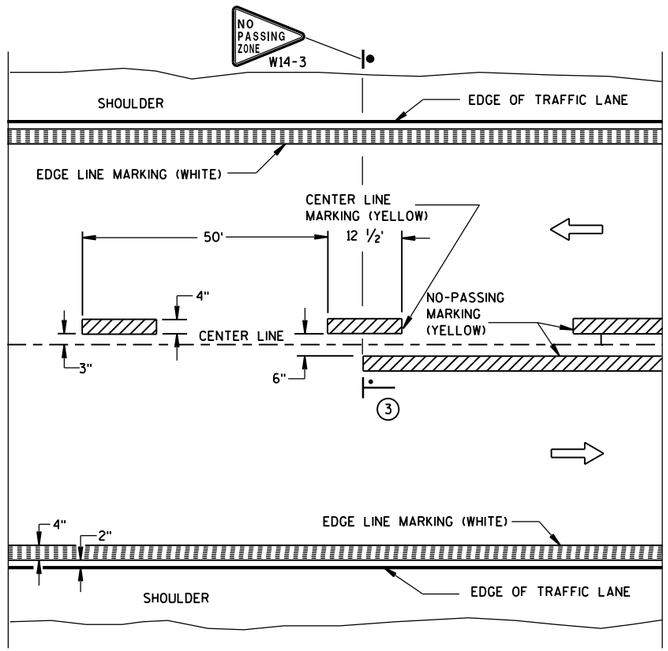
BARRICADES AND SIGNS FOR SIDEROAD CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

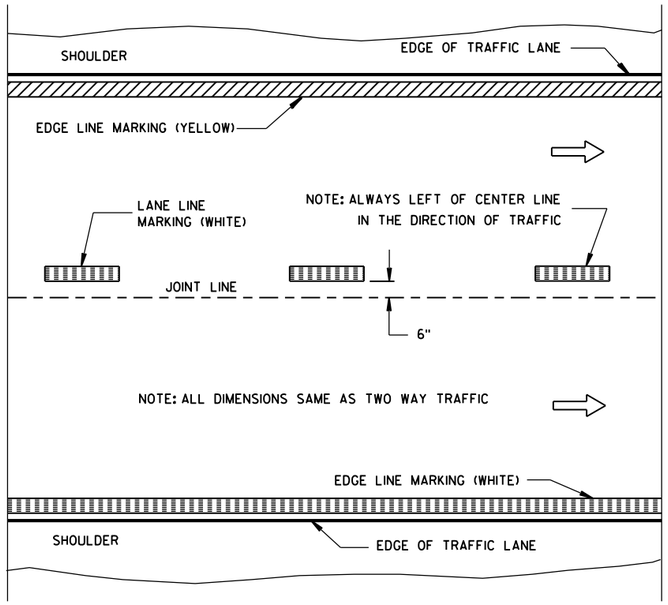
APPROVED
8/2013 — DATE
/S/ Travis Feltes — STATE TRAFFIC ENGINEER
FHWA

6

S.D.D. 15 C 3-2
S.D.D. 15 C 3-2

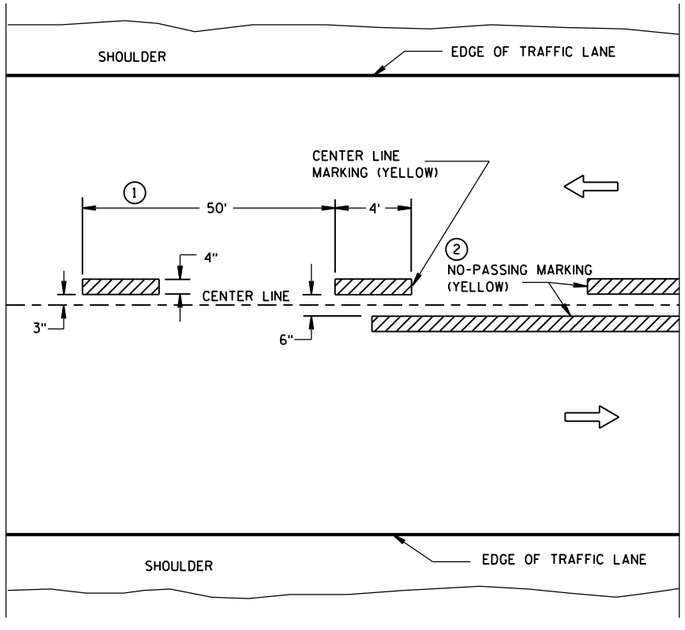


TWO WAY TRAFFIC

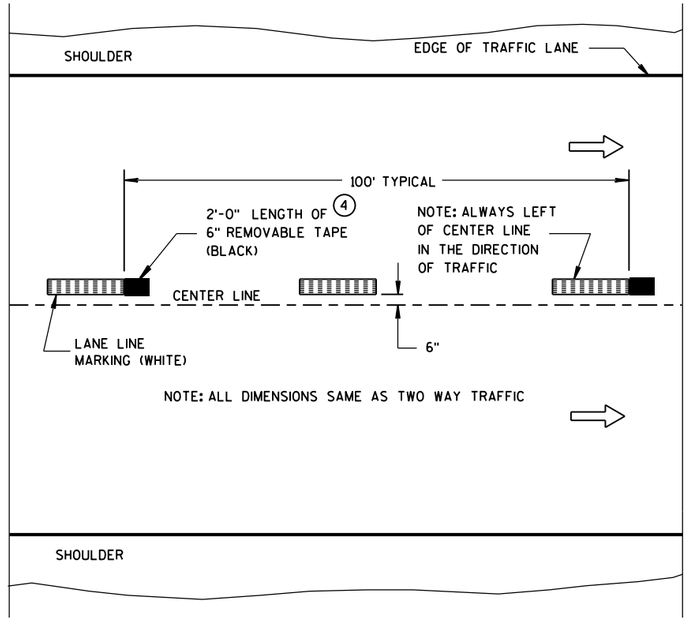


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY (INTERMEDIATE) PAVEMENT MARKING

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

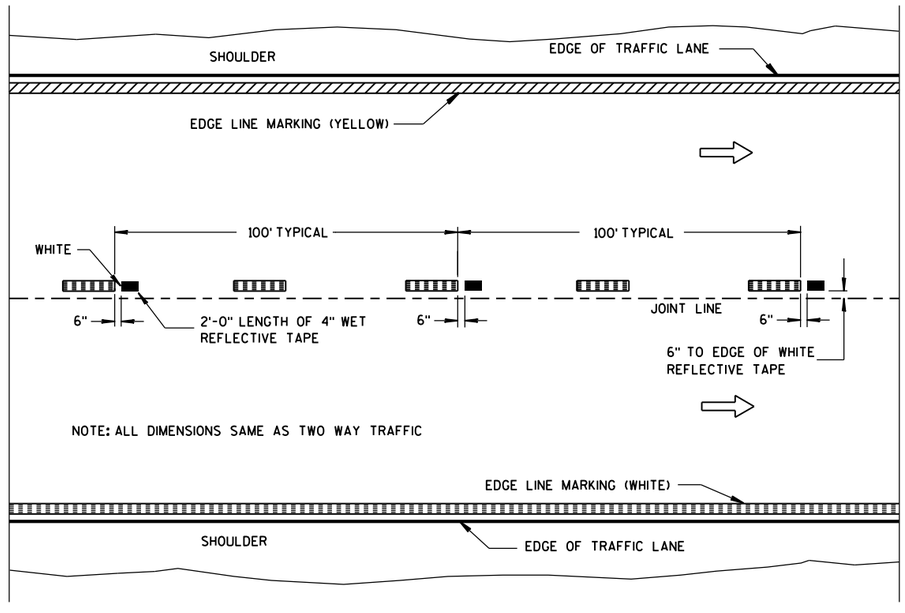
GENERAL NOTES

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

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

NOTE

ARROW SYMBOL (⇨) SHOWS DIRECTION OF TRAVEL



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

LEGEND

"T" MARKING

POST MOUNTED SIGN

PAVEMENT MARKING (MAINLINE)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

5-13-2013 DATE

/S/ Travis Feltes STATE TRAFFIC E

FHWA

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

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

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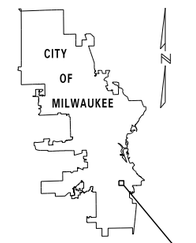
STATE PROJECT NUMBER

2660 - 05 - 70

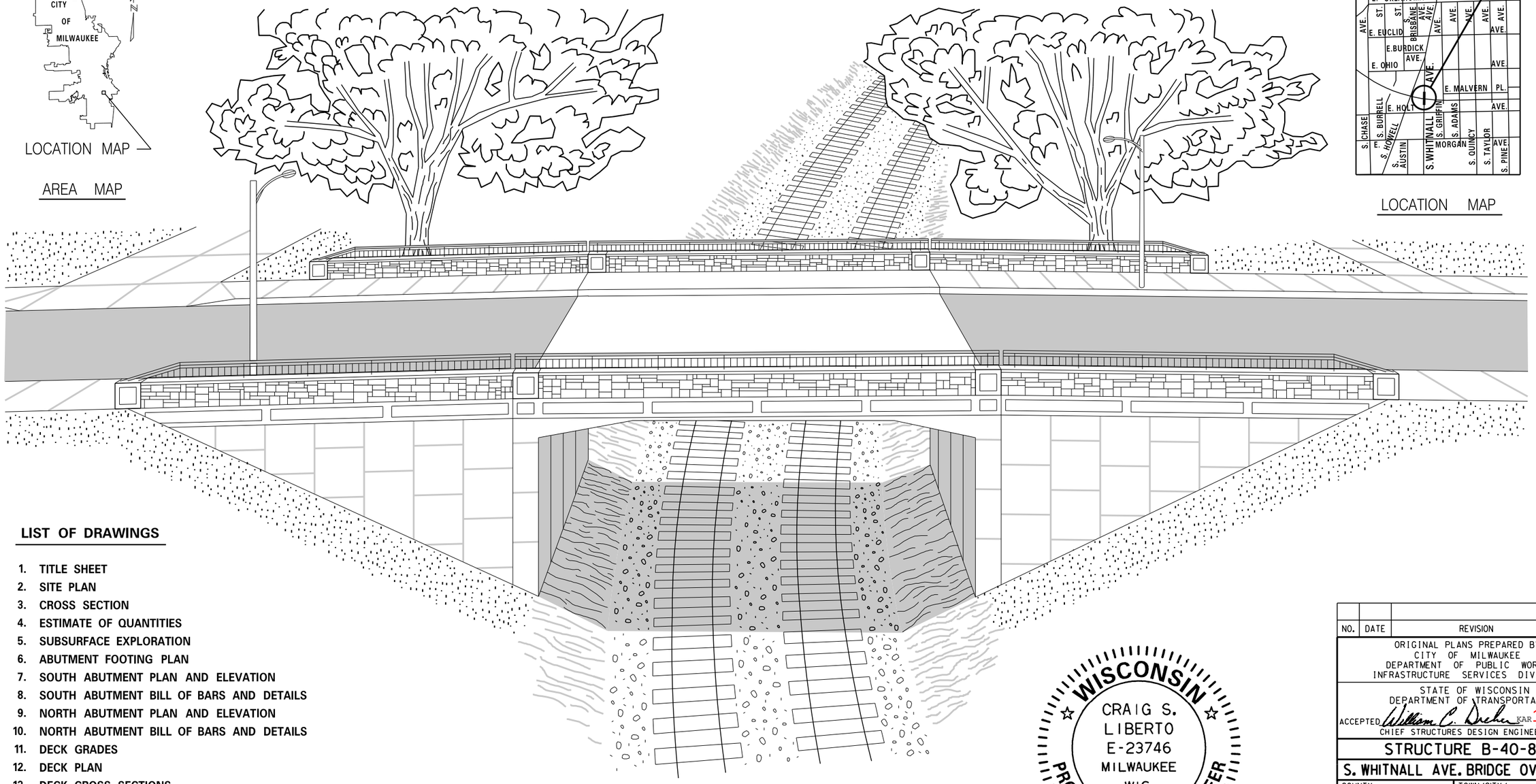
SOUTH WHITNALL AVENUE BRIDGE

OVER THE UNION PACIFIC RAILROAD



LOCATION MAP

AREA MAP



PROJECT LOCATION

LOCATION MAP

LIST OF DRAWINGS

WISCONSIN
CRAIG S. LIBERTO
E-23746
MILWAUKEE
WIS.
PROFESSIONAL ENGINEER

Craig S. Liberto 12/3/2014

NO.	DATE	REVISION	BY

ORIGINAL PLANS PREPARED BY
CITY OF MILWAUKEE
DEPARTMENT OF PUBLIC WORKS
INFRASTRUCTURE SERVICES DIVISION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

ACCEPTED William C. Dreher KAR 12/07/14
CHIEF STRUCTURES DESIGN ENGINEER DATE

STRUCTURE B-40-846

S. WHITNALL AVE. BRIDGE OVER UPRR

COUNTY	~~TOWN~~/CITY/~~VILLAGE~~
MILWAUKEE	MILWAUKEE

DESIGN SPEC. AASHTO LRFD BRIDGE DESIGN SPECIFICATION 6TH ED.

DESIGNED BY	DESIGN CK'D.	DRAWN BY	PLANS CK'D.
J.D.T.	A.R.	K.P.S.	J.D.T.

TITLE SHEET

SHEET 1 OF 17

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STATE PROJECT NUMBER
2660 - 05 - 70

SOUTH WHITNALL AVENUE OVER UNION PACIFIC RAILROAD

20'-0" R/W ALLEY

150'-0" R/W UNION PACIFIC RAILROAD (TAKEN NORMAL TO RAILROAD TRACKS)

68'-10" | 14'-8" | 66'-6"

58'-0¼" BACK OF ABUTMENTS

55'-0" C/L OF STEM

51'-11¾" INSIDE FACE OF ABUTMENTS

#3381 PROPERTY OWNER: BLAINE GRABOWSKI 3381 S. WHITNALL AVE.

CLEARING & GRUBBING FOR BRIDGE & RETAINING WALL CONST. (TYP.)

EROSION MAT AND SEEDING IN SILT FENCE AREA (TYP.)

SILT FENCE

GROUND COVER/ SCRUBS/TREES

R-40-597

R-40-595

GROUND COVER SCRUBS TREES

OVERHEAD POWER LINE TO REMAIN

PROPERTY OWNER: LUTHERAN CHAPEL OF CROSS 3320 S. HOWELL AVE.

12' BUSH

CAUTION

TEMPORARY SHORING

22'-11" CLEARANCE

22'-9" CLEARANCE

8'-6"

9'-2"

EXISTING TE&ES

EXPANSION COUPLING (TYP.)

NEW FILL

CONC

CONCRETE STREET LIGHTING POLE TO BE REPLACED

7°14' L.H.F.

EXISTING STRUCTURE P-40-644 TO BE REMOVED

C/L OF STEM S. ABUT. EL. 73.69 STA. 3+33.53

C/L OF STEM NORTH ABUTMENT EL. 74.04 STA. 3+88.53

BACK OF EXISTING S. ABUT. STA. 2+99.51

BACK OF EXISTING NORTH ABUTMENT STA. 4+22.55

C/L OF S. WHITNALL AVE.

2+50 | 3+00 | 3+50 | 4+00 | 4+50 | 5+00

END OF DECK STA. 3+32.02

END OF DECK STA. 3+90.04

STA. 3+61.03

STA. 3+68.55 S. WHITNALL AVE. STA. 20+00 N. TRACK UPRR

STA. 3+53.48 S. WHITNALL AVE. STA. 10+00 S. TRACK UPRR

18'-3⅜" | 14'-11⅝" | 18'-3¾"

ABANDONED W 12"

CONC. STREET LIGHTING POLE TO BE REPLACED

EXP. COUPLING (TYP.)

EXISTING PIER TO BE REMOVED

EXISTING PIER TO BE REMOVED

EXPANSION COUPLING (TYP.)

NAME PLATE

R-40-596

R-40-594

WOOD RETAINING WALL TO BE REMOVED

PROPERTY OWNER: PAUL J. ROULEAU & MARGARET HW 3386 S. WHITNALL AVE.

PROPERTY OWNER: EAK MANAGEMENT COMPANY LLC 3354 S. WHITNALL AVE. #3354

BM: HYDRANT 3354 S. WHITNALL AVE. STA. 4+63.85, 27.0' RT. EL. 73.75

22'-5" CLEARANCE

22'-0" POINT OF MINIMUM VERTICAL CLEARANCE

183.58' R/W

UNION PACIFIC RAILROAD (TAKEN NORMAL TO RAILROAD TRACKS)

SILT FENCE

CLEARING AND GRUBBING FOR BRIDGE AND RETAINING WALL CONSTRUCTION (TYP.)

EROSION MAT AND SEEDING IN SILT FENCE AREA (TYP.)

BM: HYDRANT 3386 S. WHITNALL AVE. STA. 2+49.06, 25.3'RT. EL. 71.36

STO 12"

SAN 8"

1'-0" RAILING | 7'-0" SDWK. | 8'-0" PARKING | 15'-0" BIKE LANE | 12'-0" DRIVING LANE | 12'-0" DRIVING LANE | 15'-0" BIKE LANE | 8'-0" PARKING | 7'-0" SDWK. | 1'-0" RAILING

8'-0" | 33'-0" | 50'-0" ROWY. | 33'-0" | 8'-0" | 66'-0" R/W

PLAN VIEW

SINGLE SPAN CONCRETE RIGID FRAME

WISDOT CONTACT: WILLIAM DREHER 608-266-8489

CONSULTANT CONTACT: CITY OF MILWAUKEE CRAIG LIBERTO 414-286-3294

C/L S. ABUT. STA. 3+33.53 EL. 73.69

C/L N. ABUT. STA. 3+88.53 EL. 74.04

POINT OF CRITICAL VERT. CLEARANCE TO BOTTOM OF SUPER.

END OF DECK STA. 3+32.02

END OF DECK STA. 3+90.04

DECORATIVE COMBINATION RAILING STEEL RAIL & FORM LINED CONC. WALL

TOP OF SDWK.

80 | 70 | 60 | 50 | 40 | 30 | 20

EXISTING ABUT. TO BE REMOVED AS NEEDED FOR MSE WALL CONST.

EXISTING GROUND LINE

NEW MSE WALL (R-40-596)

FINISHED GRADE

EL. 47.20

EL. 48.89

EL. 49.49

EL. 47.50

EL. 41.89

22'-0" MIN. NEW CRITICAL CLEARANCE

9'-6" | 8'-9⅜" | 18'-3⅜" | 6'-5⅜" | 8'-6" | 8'-9¾" | 9'-6" | 18'-3¾" | 11'-5" | 9'-2" | 9'-3⅜" | 9'-0" | 8'-6" | 9'-9¾"

6'-6" MIN.

TEMPORARY SHORING

5'-1⅝"

EXIST. FIBER OPTIC CABLE TO REMAIN

TEMPORARY SHORING

EXISTING PIERS AND FOOTINGS TO BE REMOVED. REMOVE PILES AS NEEDED TO AVOID INTERFERENCE WITH NEW PIERS/PILING.

12¾" CIP PILES (TYP.)

ESTIMATED PIPE LENGTH (TYP.) 60 FT.

APPROX. TIP ELEV. -16.5 (TYP.)

LIMIT OF R.R. R/W AT EAST

REMOVE AS NEEDED C/L ABANDONED 12" STEEL WATER MAIN EL. 42.50 APPROX.

FINISHED GRADE

EXISTING ABUT. TO BE REMOVED AS NEEDED FOR MSE WALL CONST.

EXISTING GROUND LINE

NEW MSE WALL (R-40-594)

LIMIT OF R.R. R/W AT EAST

EAST ELEVATION

LOOKING WEST (TAKEN NORMAL TO TRACKS)

NOTE:

SEE PAVING PLANS FOR CLEARING, GRUBBING, EROSION MAT,AND SILT FENCE QUANTITIES.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY KPS | PLANS CK'D. JDT JJK

SITE PLAN

SHEET 2 OF 17

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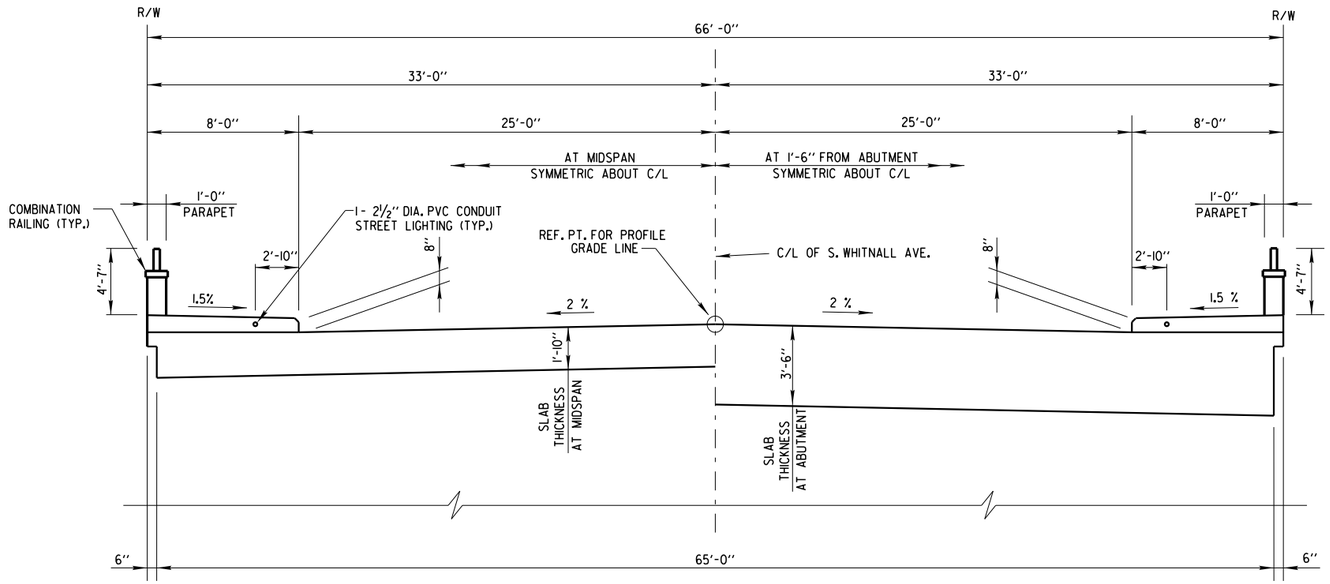
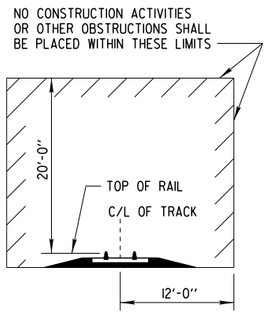
STATE PROJECT NUMBER

2660 - 05 - 70



CROSS SECTION THRU NEW BRIDGE LOOKING NORTH



MINIMUM CONSTRUCTION CLEARANCE ENVELOPE

NORMAL TO RAILROAD

TRAFFIC VOLUME

ADT (2014) = 2,300
ADT (2034) = 2,300
R.D.S. = 30 M.P.H.

DESIGN DATA

DEAD LOAD
CONCRETE = 150 LBS./C.F.
F.W.S. = 20 LBS./S.F.
PARAPET = 430 LBS./L.F.

LIVE LOAD
DESIGN LOADING : HL-93
INVENTORY RATING FACTOR : RF=1.57
OPERATING RATING FACTOR : RF=2.04
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = 250 KIPS

ULTIMATE DESIGN STRESSES
CONCRETE MASONRY (SUPERSTRUCTURE) f'c = 4,000 PSI
CONCRETE MASONRY (ALL OTHERS) f'c = 3,500 PSI
BAR STEEL REINFORCEMENT fy = 60,000 PSI

FOUNDATION DATA
ABUTMENTS TO BE SUPPORTED ON 12.75-INCH CIP PILING DRIVEN TO A REQUIRED RESISTANCE OF 160 TONS PER * PILE AS DETERMINED BY THE MODIFIED GATES DYNAMIC FORMULA. ESTIMATED 60'-0" LONG.

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

GENERAL NOTES: RAILROAD

THE PROPOSED GRADE SEPERATION PROJECT SHALL NOT INCREASE THE QUANTITY AND/OR CHARACTERISTICS OF THE FLOW IN THE RAILROAD'S DITCHES AND/OR DRAINAGE STRUCTURES.

THE ELEVATION OF THE EXISTING TOP-OF-RAIL PROFILE SHALL BE VERIFIED BEFORE BEGINNING CONSTRUCTION. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE RAILROAD PRIOR TO CONSTRUCTION.

ALL PERMANENT CLEARANCES SHALL BE VERIFIED BEFORE PROJECT CLOSING.

ALL SHORING SYSTEMS THAT IMPACT THE RAILROAD'S OPERATIONS AND/OR SUPPORTS THE RAILROAD'S EMBANKMENT SHALL BE DESIGNED AND CONSTRUCTED PER CURRENT RAILROAD GUIDELINES FOR TEMPORARY SHORING.

ALL DEMOLITIONS WITHIN THE RAILROAD'S RIGHT-OF-WAY AND/ OR DEMOLITION THAT MAY IMPACT THE RAILROAD'S TRACKS OR OPERATIONS SHALL BE IN COMPLIANCE WITH THE RAILROAD'S DEMOLITION GUIDELINES.

ERECTION OVER THE RAILROAD'S RIGHT-OF-WAY SHALL BE DESIGNED TO CAUSE NO INTERRUPTION TO ALL RAILROAD OPERATIONS.

FALSE-WORK CLEARANCES SHALL COMPLY WITH MINIMUM CONSTRUCTION CLEARANCES.

THE CONTRACTOR MUST SUBMIT A PROPOSED METHOD OF EROSION AND SEDIMENT CONTROL AND HAVE THE METHOD APPROVED BY THE RAILROAD.

FOR RAILROAD COORDINATION PLEASE REFER TO THE RAILROAD MINIMUM REQIUREMENTS AS PART OF SPECIAL PROVISIONS.

TEMPORARY SHORING SHALL NOT EXTEND ABOVE THE ELEVATION OF THE TOP OF RAIL ADJACENT TO THE SHORING.

THE CONTRACTOR SHALL MATCH INTO EXISTING SLOPES AND RAILROAD DRAINAGE DITCHES WITHIN 10 FEET OF EACH SIDE OF THE NEW STRUCTURE.

GENERAL NOTES

ALL DETAILS, MATERIALS AND FABRICATION SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION OF THE STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION EDITION OF 2015 EXCEPT AS OTHERWISE NOTED.

ALL STATIONS AND ALL ELEVATIONS ARE IN FEET.

ALL ELEVATIONS ARE REFERRED TO CITY OF MILWAUKEE DATUM = 580.6 NGVD.

DRAWINGS SHALL NOT BE SCALED.

BEVEL EXPOSED EDGES OF CONCRETE 1" UNLESS OTHERWISE NOTED.

BENDING DIMENSIONS FOR REINFORCING BARS ARE OUT TO OUT.

THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES BAR SIZE.

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

THE EXISTING GROUND LINE SHALL BE THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES BRIDGES".

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

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

JOINT FILLER SHALL CONFORM TO AASHTO DESIGNATION M153 TYPE I, II, OR III, OR AASHTO DESIGNATION M213.

THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION ON UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE.

THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATIONS AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGES.

CONTRACTOR SHALL CALL UPRR "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO COMMENCING WORK TO DETERMINE LOCATION OF FIBER OPTICS.

ALL RAILROAD SHORING SHALL CONFORM TO OSHA STANDARDS FOR EXCAVATION, AND MUST BE DESIGNED FOR RAILROAD LIVE LOAD SURCHARGE FOR COOPER E80. FINAL LOCATION AND TYPE OF SHORING SYSTEM TO BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL SUBMIT ALL DESIGN DRAWINGS AND CALCULATIONS DIRECTLY TO UNION PACIFIC RAILROAD.

TEMPORARY MINIMUM CLEARANCE OF 19'-6" SHALL BE MAINTAINED ABOVE RAILROAD TRACKS AT ALL TIMES.

THE CONTRACTOR MUST COORDINATE THE CONSTRUCTION OF BRIDGE B-40-846 AND RETAINING WALLS R-40-594, R-40-595, R-40-596, AND R-40-597.

PLANS FOR EXISTING 3-SPAN CONCRETE SLAB STRUCTURE, P-40-644, ON FILE IN THE CITY OF MILWAUKEE INFRASTRUCTURE SERVICES DIVISION'S STRUCTURAL DESIGN UNIT, ROOM 907
FRANK P. ZEIDLER MUNICIPAL BUILDING,
841 NORTH BROADWAY,
MILWAUKEE, WI., 53202.
PHONE (414) 286-3294

CONCRETE STAINING COLOR: TK COLORS-4035P GATEPOST

PAINT FOR STEEL RAILING TO MATCH FEDERAL STANDARD NO. 595C COLOR NO. 27038

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

CROSS SECTION

SHEET 3 OF 17

8

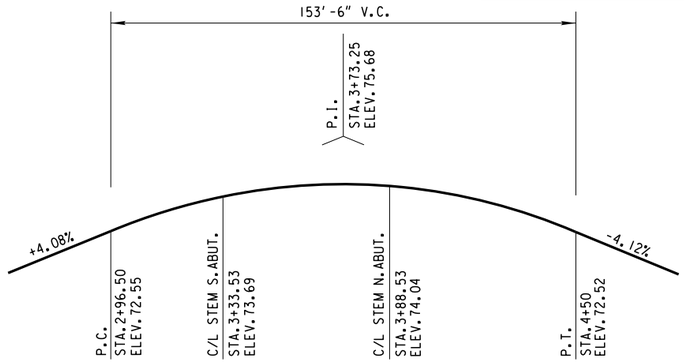
8

W:\STR\B0813\PLANS\ 04_QUAN.DGN 11-26-2014

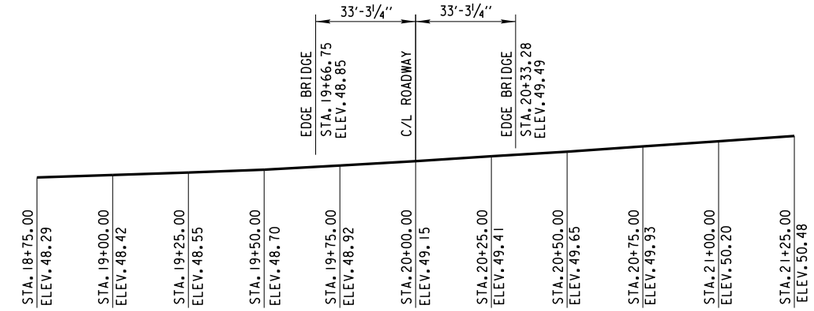
STATE PROJECT NUMBER
2660 - 05 - 70

ESTIMATE OF QUANTITIES

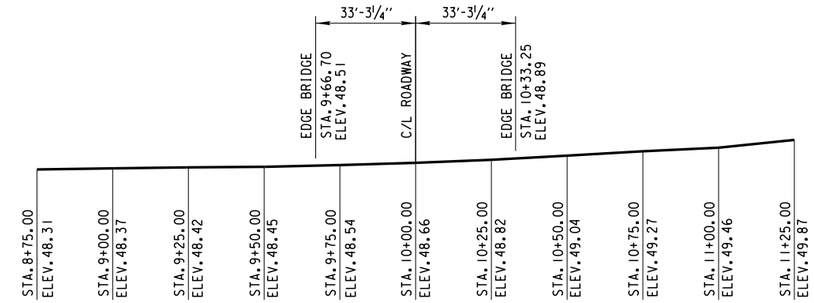
ITEM NO.	BID ITEM	UNIT	NORTH ABUTMENT	SOUTH ABUTMENT	SUPER-STRUCTURE	TOTAL
203.0200	REMOVING OLD STRUCTURE (3+61.03)	LS				1
203.0225.S	DEBRIS CONTAINMENT STRUCTURE B-40-846	LS				1
206.1000	EXCAVATION FOR STRUCTURES BRIDGES (B-40-846)	LS				1
210.0100	BACKFILL STRUCTURE	CY	1,990	1,990		3,980
502.0100	CONCRETE MASONRY BRIDGES	CY	250	250	365	865
502.3200	PROTECTIVE SURFACE TREATMENT	SY			422	422
505.0405	BAR STEEL REINFORCEMENT HS BRIDGES	LB	15,270	15,235		30,505
505.0605	BAR STEEL REINFORCEMENT HS COATED BRIDGES	LB	14,085	14,030	65,125	93,240
516.0100	DAMPPROOFING	SY	206	206		412
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	27	27		54
517.1010.S	CONCRETE STAINING (B-40-846)	SF			533	533
517.1015.S	CONCRETE STAINING MULTI-COLOR (B-40-846)	SF			498	498
517.1050.S	ARCHITECTURAL SURFACE TREATMENT (B-40-846)	SF			498	498
550.2124	PILING CIP CONCRETE 12¾x 0.25 - INCH	LF	3,120	3,120		6,240
612.0106	PIPE UNDERDRAIN 6-INCH	LF	144	144		288
612.0206	PIPE UNDERDRAIN UNPERFORATED 6-INCH	LF	10	10		20
645.0111	GEOTEXTILE FABRIC TYPE DF SCHEDULE A	SY	80	80		160
652.0230	CONDUIT RIGID NONMETALLIC SCHEDULE 40 2 1/2-INCH	LF			116	116
SPV.0090.02	REMOVING EXISTING TIMBER PILING	LF	380	380		760
SPV.0105.01	RAILING STEEL TYPE C2 GALVANIZED (B-40-846)	LS				1
SPV.0165.02	TEMPORARY SHORING RAILROAD	SF	455	455		910
	NON BID ITEMS					
	PREFORMED JOINT FILLER	SIZE				
	NON-BITUMINOUS JOINT FILLER	SIZE				
	NAME PLATE	EACH				



PROPOSED PROFILE GRADE LINE ALONG C/L OF S. WHITNALL AVE.



EXISTING PROFILE GRADE LINE ALONG NORTH TRACK, SOUTH RAIL, UPRR



EXISTING PROFILE GRADE LINE ALONG SOUTH TRACK, SOUTH RAIL, UPRR

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

ESTIMATE OF QUANTITIES

SHEET 4 OF 17

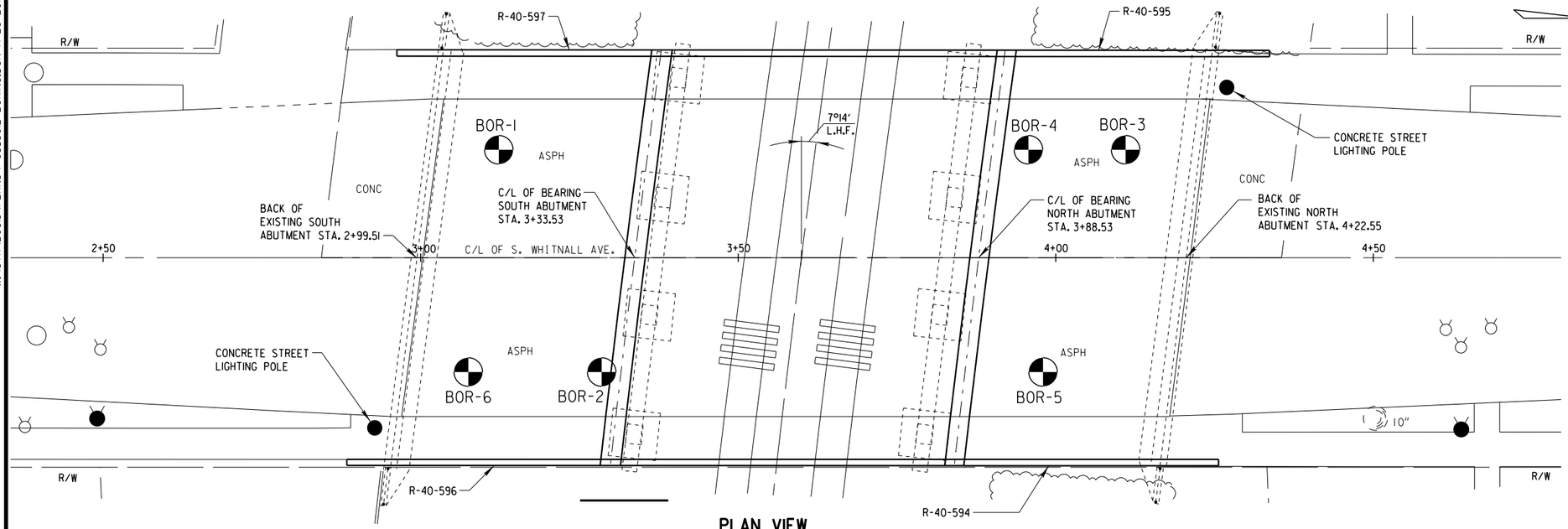
8

8

W:\STR\B0813\PLANS\ 05_SOIL BORING.DGN 11-26-2014

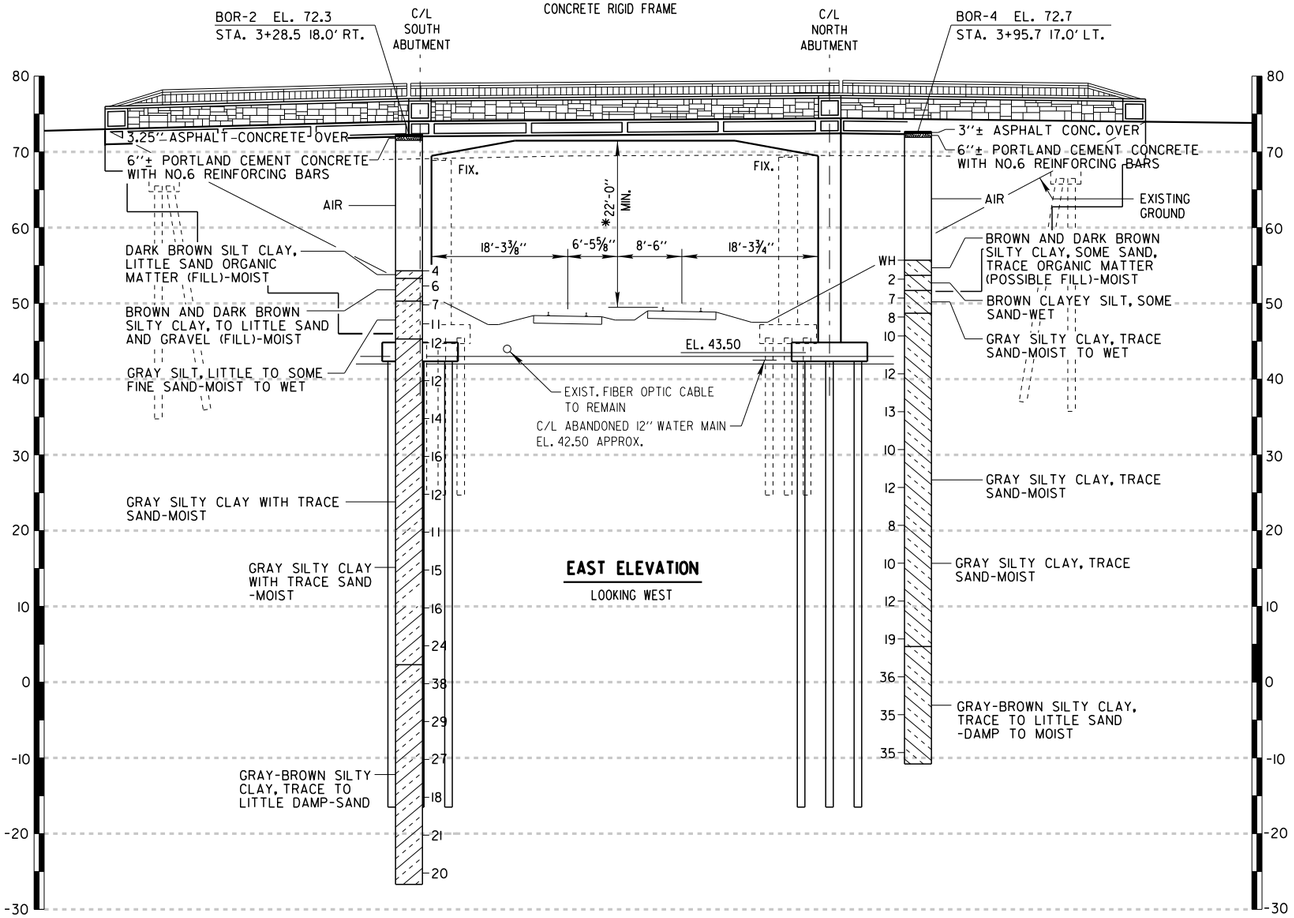
STATE PROJECT NUMBER

2660 - 05 - 70



PLAN VIEW

CONCRETE RIGID FRAME



EAST ELEVATION

LOOKING WEST

NOTE:

BORINGS 1, 3, 5 AND 6 SHOWN ON SEPERATE RETAINING WALL PLANS

THE SUBSURFACE INFORMATION PRESENTED HEREIN IS AN ABBREVIATED VERSION OF THE INFORMATION PRESENTED IN THE GEOTECHNICAL ENGINEERING REPORT.

REVIEW THE GEOTECHNICAL ENGINEERING REPORT AND SOIL BORING LOGS DATED JANUARY 22, 2013 AND ALL SUBSEQUENT REVISIONS FOR ADDITIONAL SUBSURFACE INFORMATION.

SOIL BORINGS COMPLETED BY GILES ENGINEERING

- DENOTES SOIL BORING

ABBREVIATIONS

F — FINE M — MEDIUM C — COARSE
WS — WEATHERED SO — SOUND

MATERIAL SYMBOLS

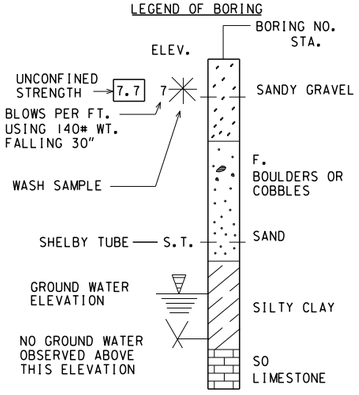
TOPSOIL, SILT, SANDSTONE, SAND, PEAT, LIMESTONE, GRAVEL, CLAY, IGNEOUS ROCK

LEGEND OF PROBING

95/6=95 BLOWS FOR 6" PENETRATION PROBING TAKEN WITH A 350# WT. FALLING 18" ON A 2" O.D. POINT.

PROBING NO.
STATION
ELEVATION
7 AVERAGE BLOWS PER FOOT
REFUSAL 95/6

LEGEND OF BORING



UNLESS OTHERWISE SPECIFIED, THE BLOWS PER FOOT AT THE LOCATIONS INDICATED ARE BASED ON DRIVING A 2" O.D. X 1.4" I.D. SPLIT SPOON SAMPLER WITH A 140# HAMMER HAVING A FREE FALL OF 30". THE BLOW COUNT IS TAKEN IN UNDISTURBED SOIL IMMEDIATELY BELOW A CASED OR OPEN HOLE ELIMINATING SIDE FRICTION ON THE DRIVE PIPE.

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

TO OBTAIN RELATIVE DATA CONCERNING THE CHARACTER OF MATERIAL IN AND UPON WHICH THE FOUNDATION MIGHT BE BUILT, BORINGS AND/OR SOUNDINGS WERE MADE AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING. THE DATA PRESENTED HEREIN REPRESENTS THE FINDINGS OF THE SUBSURFACE EXPLORATIONS MADE. HOWEVER, BECAUSE THE DEPTHS INVESTIGATED ARE LIMITED AND THE AREA OF THE BORINGS AND/OR SOUNDINGS IS VERY SMALL IN RELATION TO THE ENTIRE AREA, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT CONDITIONS BELOW THE DEPTHS INVESTIGATED OR THAT THE CLASSIFICATION OF MATERIAL ENCOUNTERED IN THESE INVESTIGATIONS IS NECESSARILY TYPICAL OF THE ENTIRE SITE.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

SUBSURFACE EXPLORATION

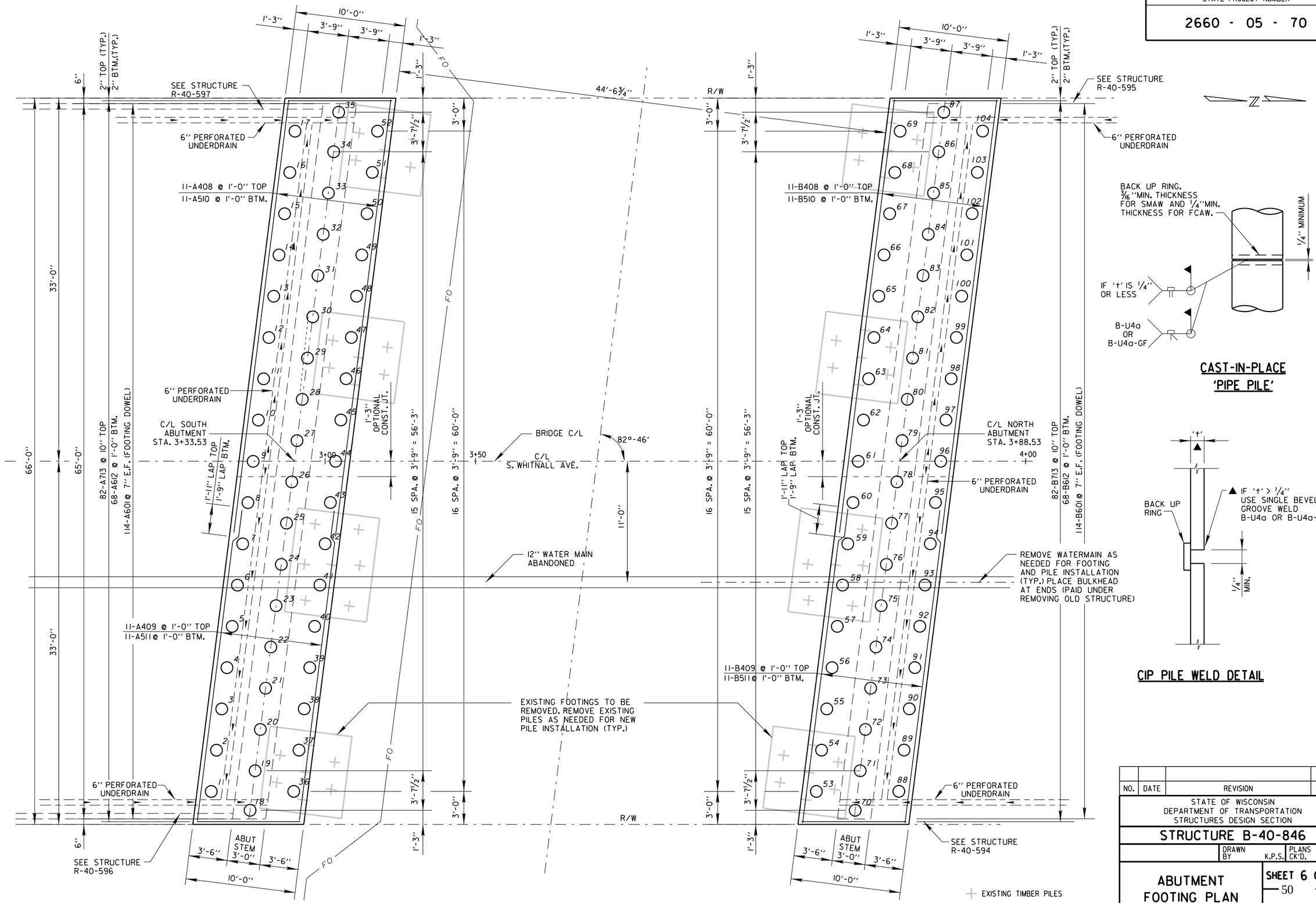
SHEET 5 OF 17
49

8

8

W:\STR\B0813\PLANS\ 06_ABUTFOOTING.DGN 11-26-2014

STATE PROJECT NUMBER
2660 - 05 - 70



CAST-IN-PLACE 'PIPE PILE'

CIP PILE WELD DETAIL

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

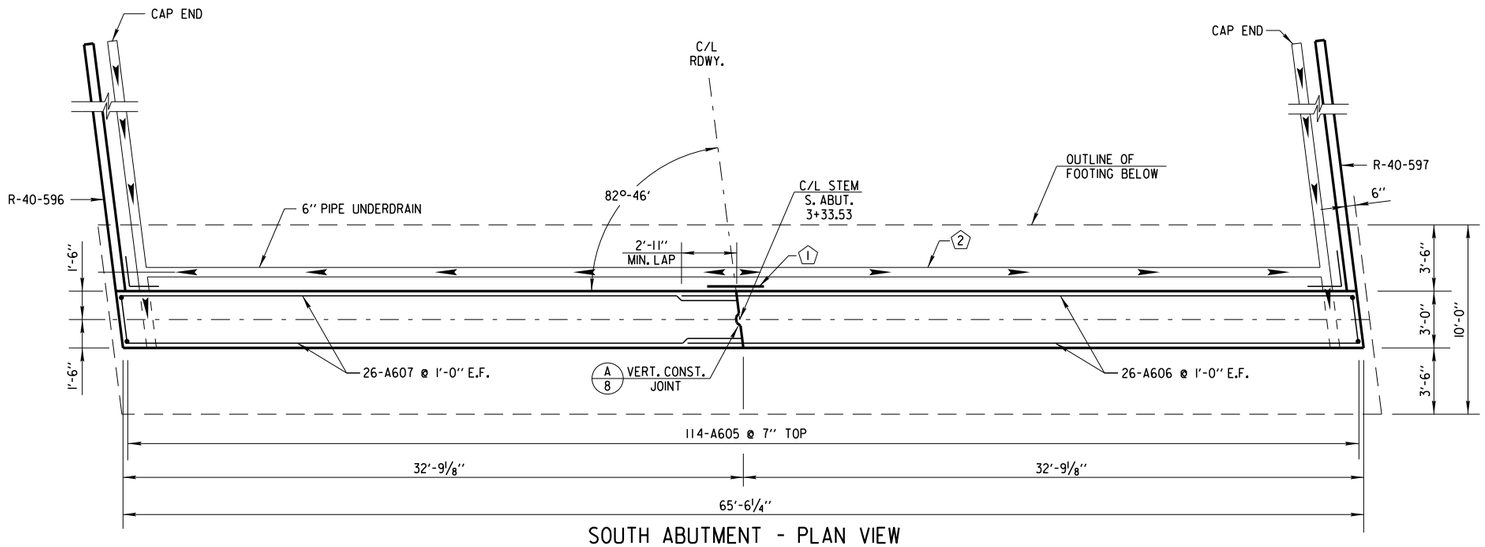
ABUTMENT FOOTING PLAN

SHEET 6 OF 17

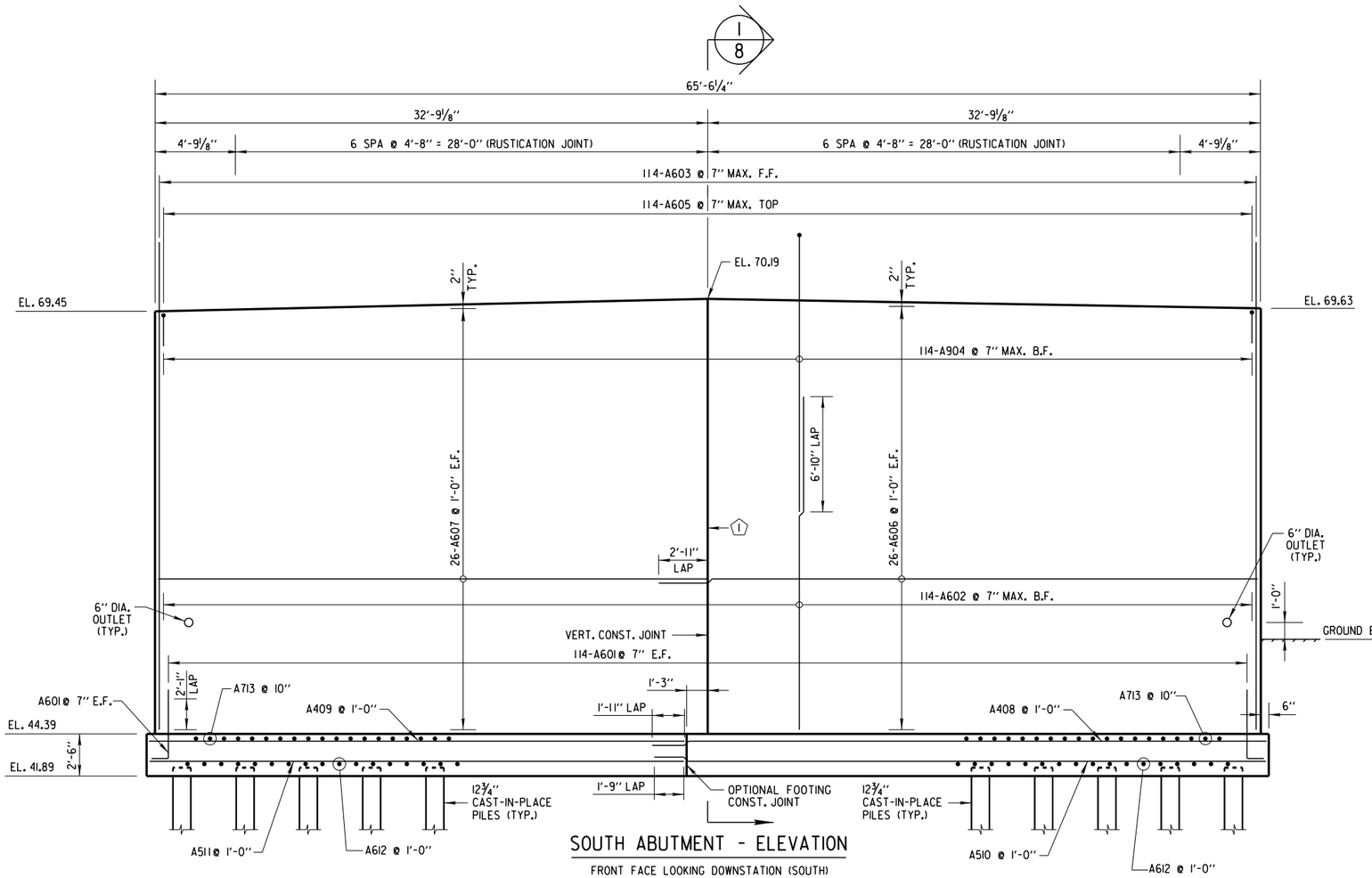
50

8

8

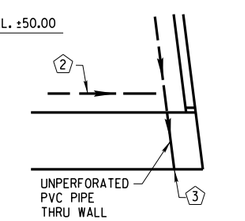


SOUTH ABUTMENT - PLAN VIEW



SOUTH ABUTMENT - ELEVATION

FRONT FACE LOOKING DOWNSTATION (SOUTH)



UNDERDRAIN DETAIL

ABUTMENT NOTES:

(1) 18-INCH RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE. VERTICAL WATERPROOFING TO EXTEND FROM TOP OF FOOTING TO TOP OF MSE WALLS.

(2) 6-INCH PERFORATED PIPE UNDERDRAIN ALONG BACKFACE OF ABUTMENT. TIE INTO DRAINAGE SYSTEM FOR MSE WALLS.

(3) ATTACH RODENT SHIELD PER DETAIL ON SHEET 10.

RUN BAR STEEL THRU CONSTRUCTION JOINT.

PLACE FULL HEIGHT VERTICAL RUSTICATION JOINTS AS SHOWN ON THE ELEVATIONS ALONG LENGTH OF FRONT FACE OF ABUTMENT. RUSTICATION JOINT SHOULD LINE UP WITH VERTICAL CONSTRUCTION JOINT ON ABUTMENT. SEE DETAIL SHEET 8.

PLACE FULL WIDTH HORIZONTAL RUSTICATION AT END FACE OF ABUTMENT TO MATCH MSE WALL PATTERN.

F.F. = FRONT FACE
B.F. = BACK FACE
E.F. = EACH FACE

BACKFILL EACH FACE OF ABUTMENT EQUALLY TO APPROXIMATELY EL. 50.00. DO NOT BACKFILL ABOVE EL. 50.00 AT BACKFACE UNTIL SUPERSTRUCTURE HAS ACHIEVED 3,500 PSI OR CONTRACTOR DESIGNED BRACING STRUTS ARE INSTALLED.

BACKFILL ABOVE EL. 50.00 MUST BE PLACED AT NORTH & SOUTH ABUTMENTS SIMULTANEOUSLY. ELEVATION OF BACKFILL AT BOTH ABUTMENTS SHALL VARY BY NO MORE THAN 5 FT DURING BACKFILL PLACEMENT. COORDINATE THIS WORK WITH ADJACENT RETAINING WALL STRUCTURES.

STAGGER TOP AND BOTTOM MAT LONGITUDINAL AND TRANSVERSE REINFORCEMENT IN FOOTING TO PREVENT CRACKING.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

SOUTH ABUTMENT PLAN AND ELEVATION

SHEET 7 OF 17
51

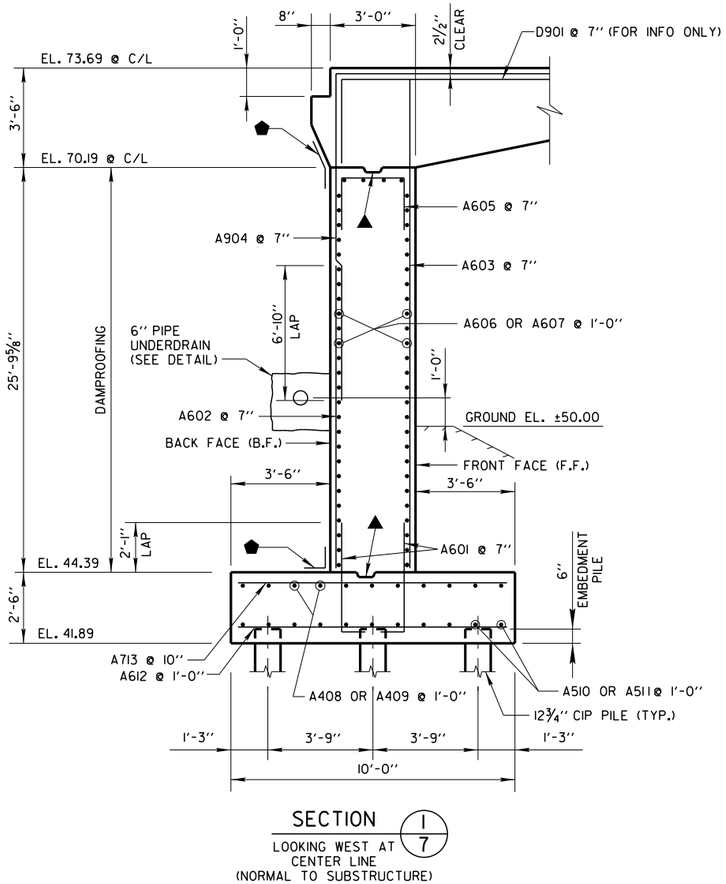
8

8

W:\STR\B0813\PLANS\ 8-SABUT.DGN 11-26-2014

STATE PROJECT NUMBER

2660 - 05 - 70



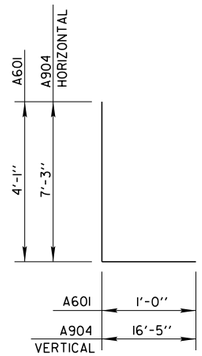
SECTION 1/7

LOOKING WEST AT CENTER LINE (NORMAL TO SUBSTRUCTURE)

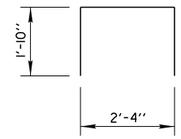
LEGEND:

⬟ — 18'' RUBBERIZED MEMBRANE WATERPROOFING

▲ — BEVELED KEY 2'' x 6''



A601, A904



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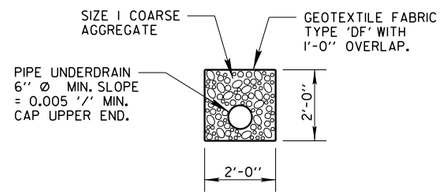
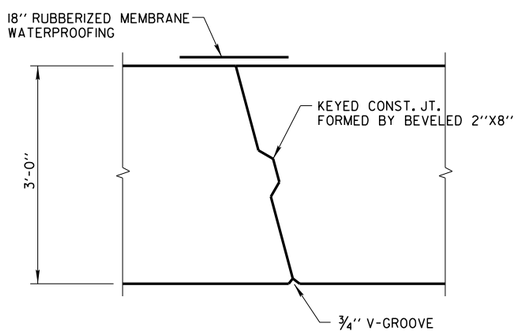
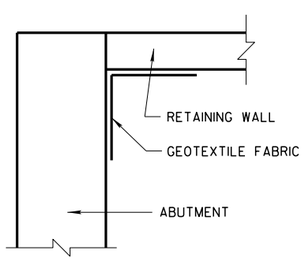


PIPE UNDERDRAIN DETAIL

PLACE CENTER LINE OF OUTFALL 1'-0'' ABOVE FINISHED GRADE



A 7,8,9 DETAIL PLAN VIEW ABUTMENT VERTICAL CONSTRUCTION JOINT

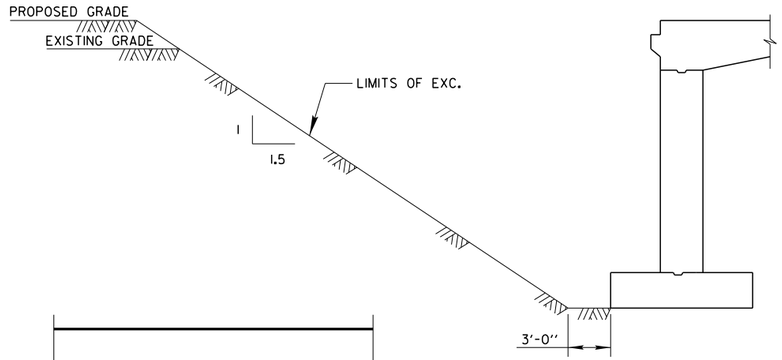


ABUTMENT - RETAINING WALL CORNER DETAIL

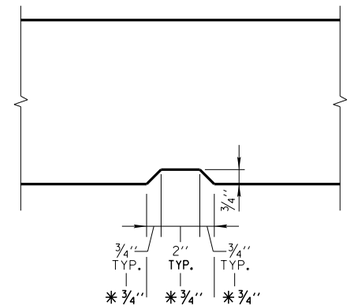
(SEE RETAINING WALL PLANS FOR ADDITIONAL DETAIL)

BILL OF BARS - SOUTH ABUTMENT

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	LOCATION
A601		228	4'-11''	×	SOUTH ABUTMENT - FOOTING DOWEL F.F. AND B.F.
A602		114	19'-9''		SOUTH ABUTMENT - VERTICAL B.F.
A603	×	114	28'-11''		SOUTH ABUTMENT - VERTICAL F.F.
A904	×	114	23'-5''	×	SOUTH ABUTMENT - VERTICAL B.F.
A605		114	5'-8''	×	SOUTH ABUTMENT - CAP STIRRUP
A606		54	35'-6''		SOUTH ABUTMENT - HORIZONTAL F.F., AND TOP
A607		54	32'-7''		SOUTH ABUTMENT - HORIZONTAL F.F., AND TOP
A408		11	36'-5''		FOOTING - LONGITUDINAL TOP
A409		11	31'-9''		FOOTING - LONGITUDINAL TOP
A510		11	36'-3''		FOOTING - LONGITUDINAL BOTTOM
A511		11	31'-8''		FOOTING - LONGITUDINAL BOTTOM
A612		68	9'-8''		FOOTING - TRANSVERSE BOTTOM
A713		82	9'-8''		FOOTING - TRANSVERSE TOP



LIMITS OF EXCAVATION



RUSTICATION DETAIL

NOTES: PLACE FULL HEIGHT VERTICAL RUSTICATION JOINT ALONG LENGTH OF FRONT FACE OF ABUTMENT. SPACING SHOWN ON SHEET 7 AND 9.

* PLACE FULL WIDTH HORIZONTAL RUSTICATION AT END FACE OF ABUTMENT TO MATCH MSE WALL PATTERN

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

SOUTH ABUTMENT BILL OF BARS AND DETAILS

SHEET 8 OF 17

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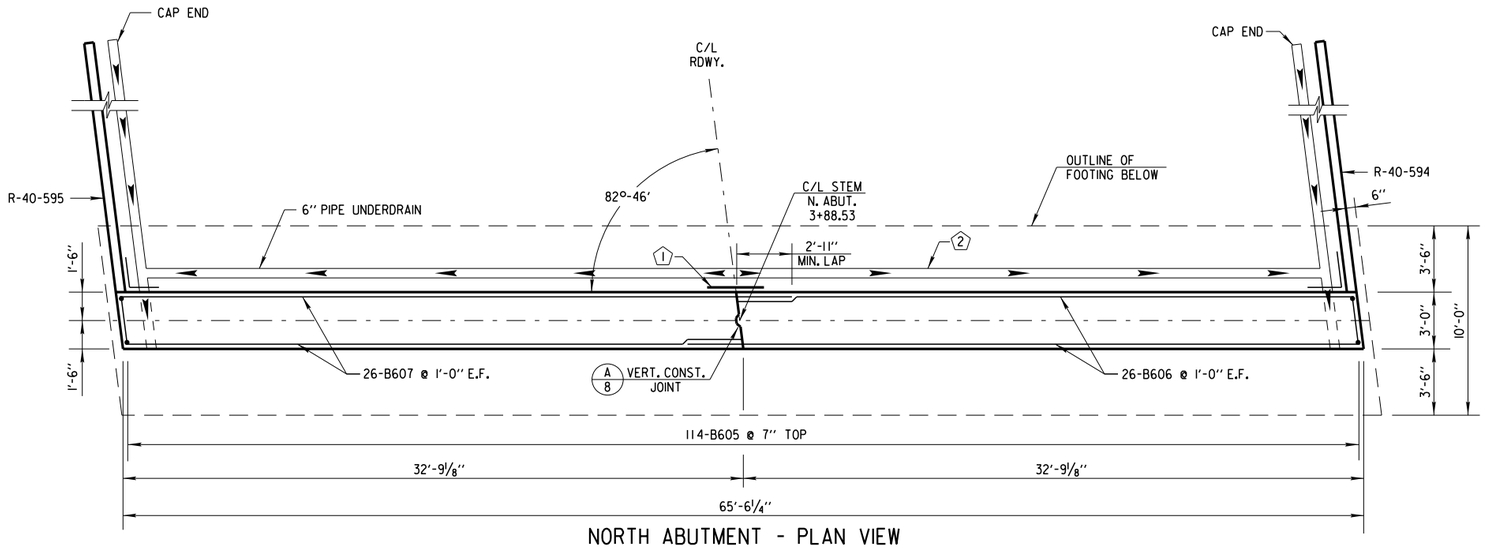
8

8

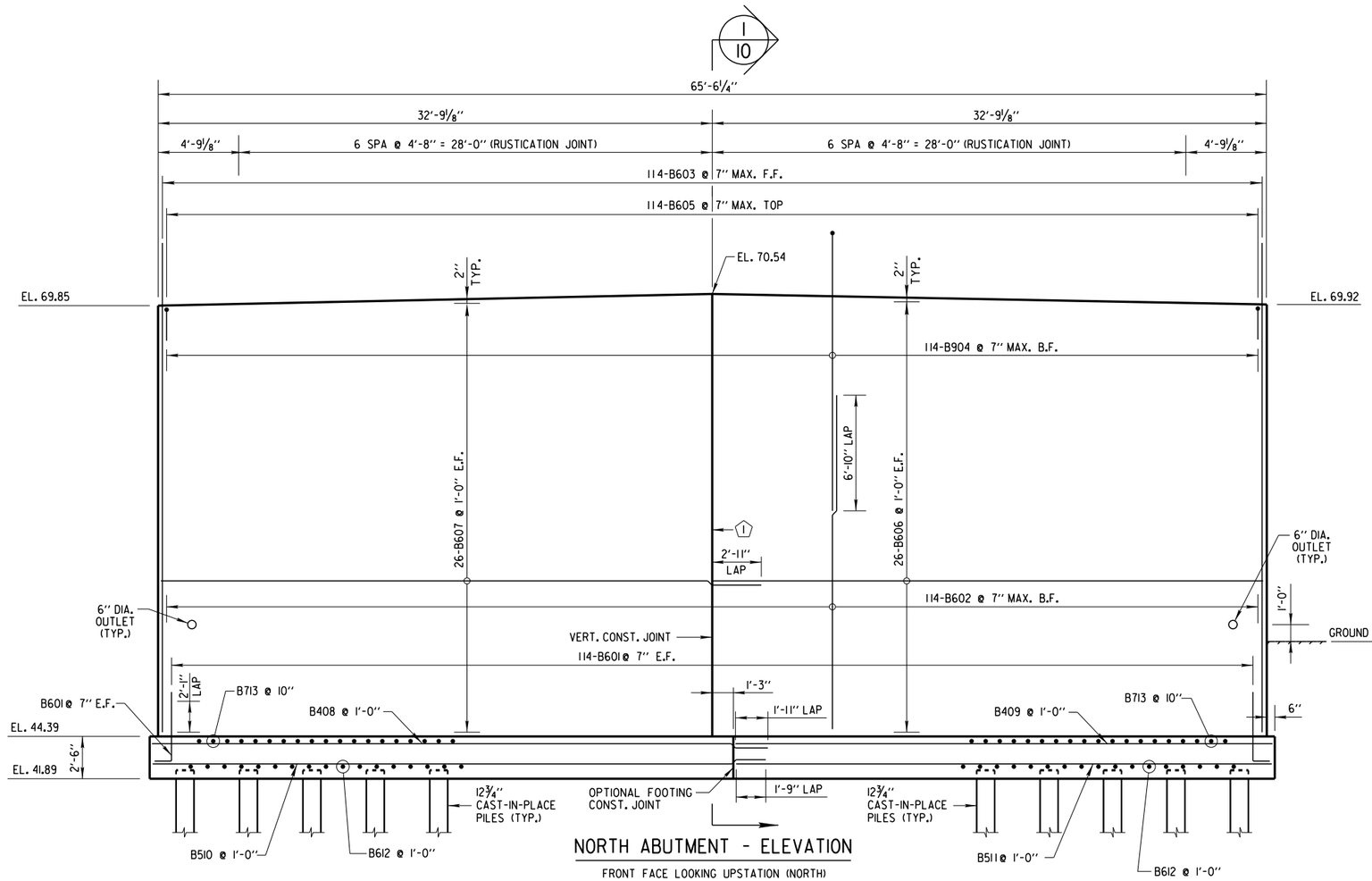
W:\STR\B0813\PLANS\ 09_NABUT.DGN 10-23-2014

STATE PROJECT NUMBER

2660 - 05 - 70

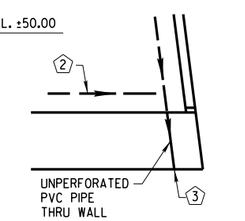


NORTH ABUTMENT - PLAN VIEW



NORTH ABUTMENT - ELEVATION

FRONT FACE LOOKING UPSTATION (NORTH)



UNDERDRAIN DETAIL

ABUTMENT NOTES:

(1) 18-INCH RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE. VERTICAL WATERPROOFING TO EXTEND FROM TOP OF FOOTING TO TOP OF MSE WALLS.

(2) 6-INCH PERFORATED PIPE UNDERDRAIN ALONG BACKFACE OF ABUTMENT. TIE INTO DRAINAGE SYSTEM FOR MSE WALLS.

(3) ATTACH RODENT SHIELD PER DETAIL ON SHEET 10.

RUN BAR STEEL THRU CONSTRUCTION JOINT.

PLACE FULL HEIGHT VERTICAL RUSTICATION JOINTS AS SHOWN ON THE ELEVATIONS ALONG LENGTH OF FRONT FACE OF ABUTMENT. RUSTICATION JOINT SHOULD LINE UP WITH VERTICAL CONSTRUCTION JOINT ON ABUTMENT. SEE DETAIL SHEET 8.

PLACE FULL WIDTH HORIZONTAL RUSTICATION AT END FACE OF ABUTMENT TO MATCH MSE WALL PATTERN.

F.F. = FRONT FACE
B.F. = BACK FACE
E.F. = EACH FACE

BACKFILL EACH FACE OF ABUTMENT EQUALLY TO APPROXIMATELY EL. 50.00. DO NOT BACKFILL ABOVE EL. 50.00 AT BACKFACE UNTIL SUPERSTRUCTURE HAS ACHIEVED 3,500 PSI OR CONTRACTOR DESIGNED BRACING STRUTS ARE INSTALLED.

BACKFILL ABOVE EL. 50.00 MUST BE PLACED AT NORTH & SOUTH ABUTMENTS SIMULTANEOUSLY. ELEVATION OF BACKFILL AT BOTH ABUTMENTS SHALL VARY BY NO MORE THAN 5 FT DURING BACKFILL PLACEMENT. COORDINATE THIS WORK WITH ADJACENT RETAINING WALL STRUCTURES.

STAGGER TOP AND BOTTOM MAT LONGITUDINAL AND TRANSVERSE REINFORCEMENT IN FOOTING TO PREVENT CRACKING.

8

8

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

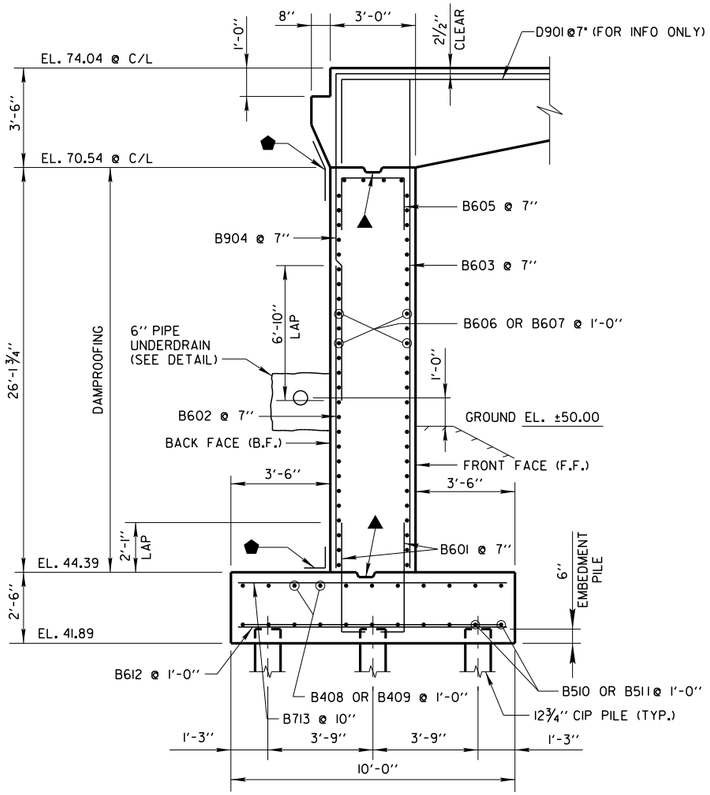
DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

NORTH ABUTMENT PLAN AND ELEVATION

SHEET 9 OF 17

STATE PROJECT NUMBER

2660 - 05 - 70



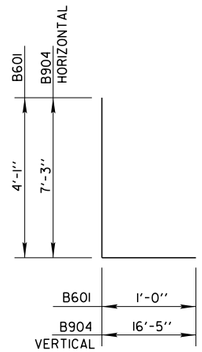
SECTION 1/9

LOOKING EAST AT CENTER LINE (NORMAL TO SUBSTRUCTURE)

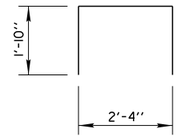
LEGEND:

⬟ — 18" RUBBERIZED MEMBRANE WATERPROOFING

▲ — BEVELED KEY 2" x 6"



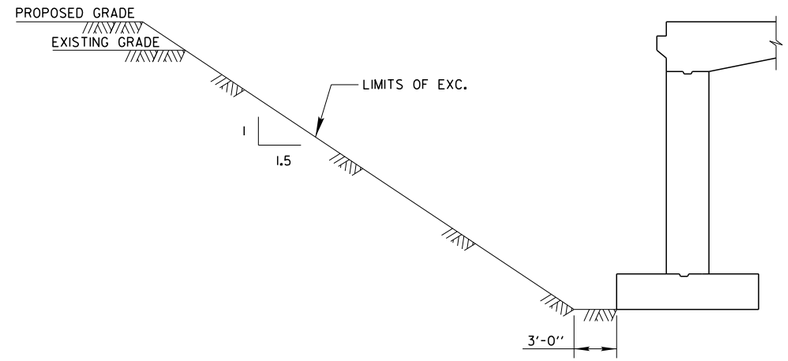
B601, B904



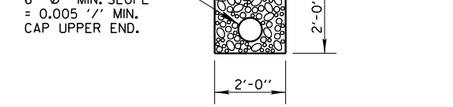
B605

BILL OF BARS - NORTH ABUTMENT

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	LOCATION
B601		228	4'-11"	×	NORTH ABUTMENT - FOOTING DOWEL F.F. AND B.F.
B602		114	19'-11"		NORTH ABUTMENT - VERTICAL B.F.
B603	×	114	29'-3"		NORTH ABUTMENT - VERTICAL F.F.
B904	×	114	23'-5"	×	NORTH ABUTMENT - VERTICAL B.F.
B605		114	5'-8"	×	NORTH ABUTMENT - CAP STIRRUP
B606		54	32'-7"		NORTH ABUTMENT - HORIZONTAL F.F., AND TOP
B607		54	35'-6"		NORTH ABUTMENT - HORIZONTAL F.F., AND TOP
B408		11	36'-3"		FOOTING - LONGITUDINAL TOP
B409		11	31'-8"		FOOTING - LONGITUDINAL TOP
B510		11	36'-3"		FOOTING - LONGITUDINAL BOTTOM
B511		11	31'-8"		FOOTING - LONGITUDINAL BOTTOM
B612		68	9'-8"		FOOTING - TRANSVERSE BOTTOM
B713		82	9'-8"		FOOTING - TRANSVERSE TOP

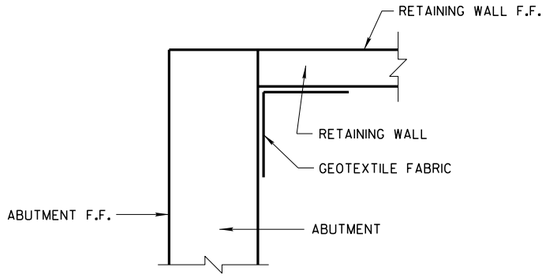


LIMITS OF EXCAVATION



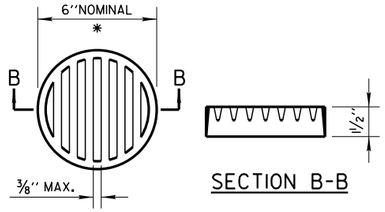
PIPE UNDERDRAIN DETAIL

PLACE CENTER LINE OF OUTFALL 1'-0" ABOVE FINISHED GRADE



ABUTMENT - RETAINING WALL CORNER DETAIL

PLAN VIEW
(SEE RETAINING WALL PLANS FOR ADDITIONAL DETAIL)



SECTION B-B

RODENT SHIELD DETAIL

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

THE RODENT SHIELD, PIPE COUPLING AND SCREWS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "PIPE UNDERDRAIN 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.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

NORTH ABUTMENT BILL OF BARS AND DETAILS

SHEET 10 OF 17

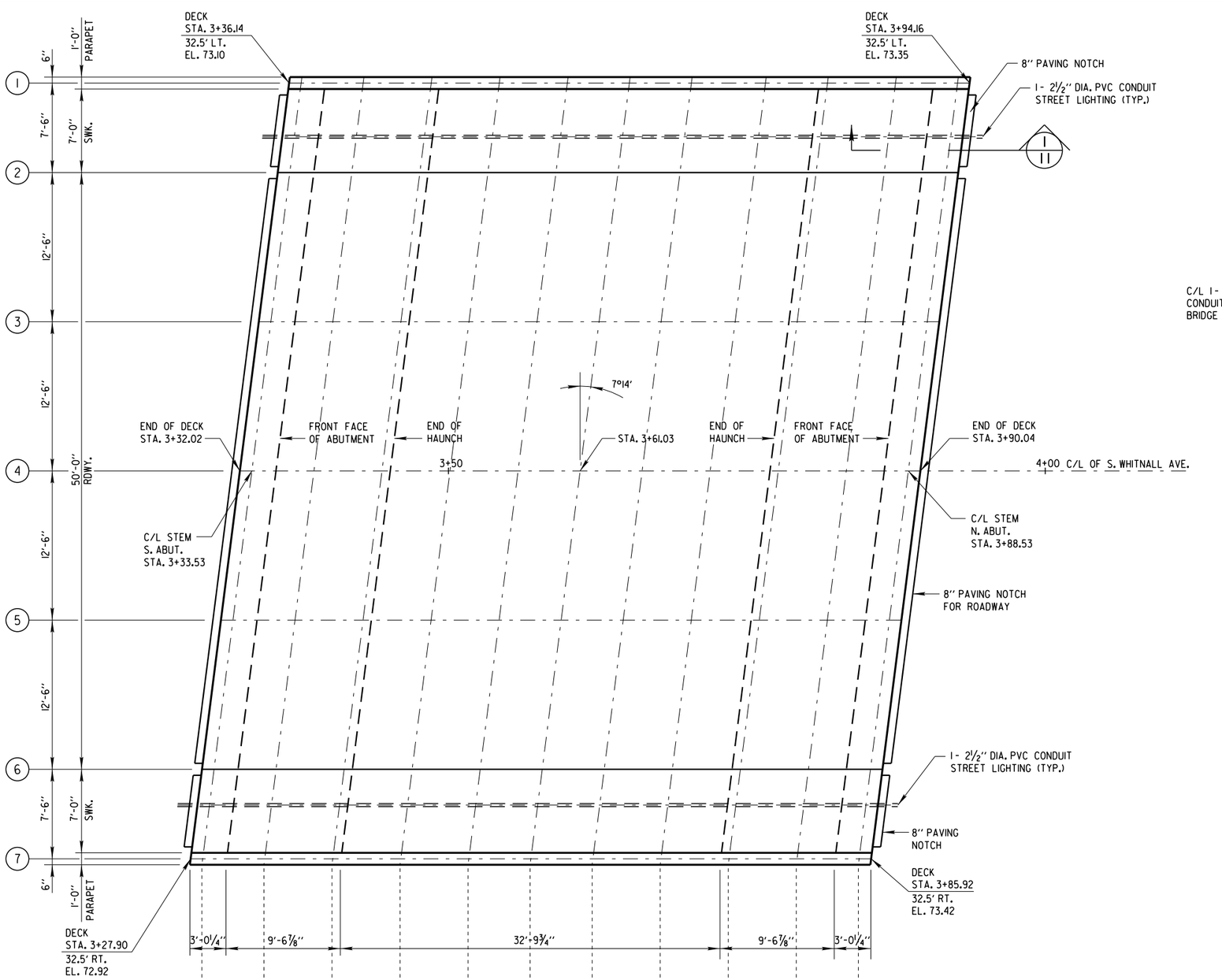
8

8

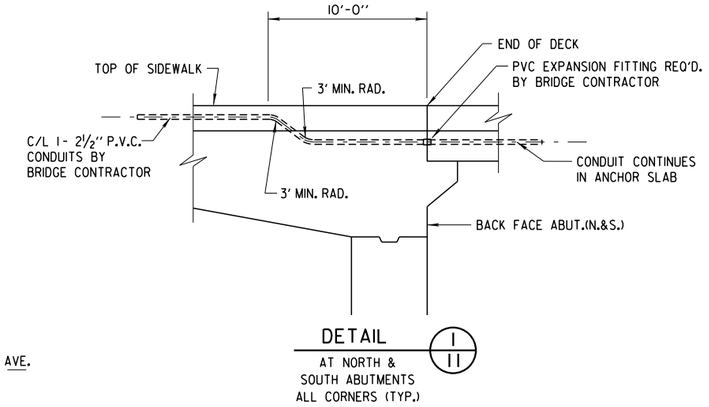
W:\STR\B0813\PLANS\11_DECK.DGN 09-03-2014

STATE PROJECT NUMBER

2660 - 05 - 70



DECK PLAN



DETAIL 1/11

AT NORTH & SOUTH ABUTMENTS ALL CORNERS (TYP.)

EXPANSION COUPLINGS ARE TO BE MADE FROM PVC (CLORION E945K OR EQUIVALENT). COUPLINGS SHALL NOT BE MADE OF METALLIC MATERIALS.

TOP OF DECK ELEVATIONS

SPAN LENGTH 'L'	DECK LOCATION	DESC.	C/L SOUTH ABUT.	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	C/L NORTH ABUT.
	CAMBER (IN.)		0.0	0.2	0.4	0.6	0.8	1.0	0.8	0.6	0.4	0.2	0.0
55'-0"	①	T.DECK	73.13	73.22	73.30	73.35	73.41	73.44	73.46	73.46	73.44	73.40	73.35
	②	T.DECK	73.26	73.36	73.44	73.50	73.55	73.59	73.61	73.61	73.59	73.56	73.50
	③	T.DECK	73.48	73.58	73.67	73.74	73.79	73.83	73.85	73.86	73.85	73.82	73.77
	④	T.DECK	73.69	73.80	73.89	73.97	74.03	74.07	74.10	74.11	74.10	74.08	74.04
	⑤	T.DECK	73.41	73.52	73.62	73.70	73.76	73.81	73.84	73.86	73.86	73.84	73.80
	⑥	T.DECK	73.13	73.24	73.34	73.43	73.50	73.55	73.58	73.60	73.61	73.60	73.56
	⑦	T.DECK	72.95	73.07	73.18	73.26	73.33	73.39	73.43	73.45	73.46	73.45	73.42

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

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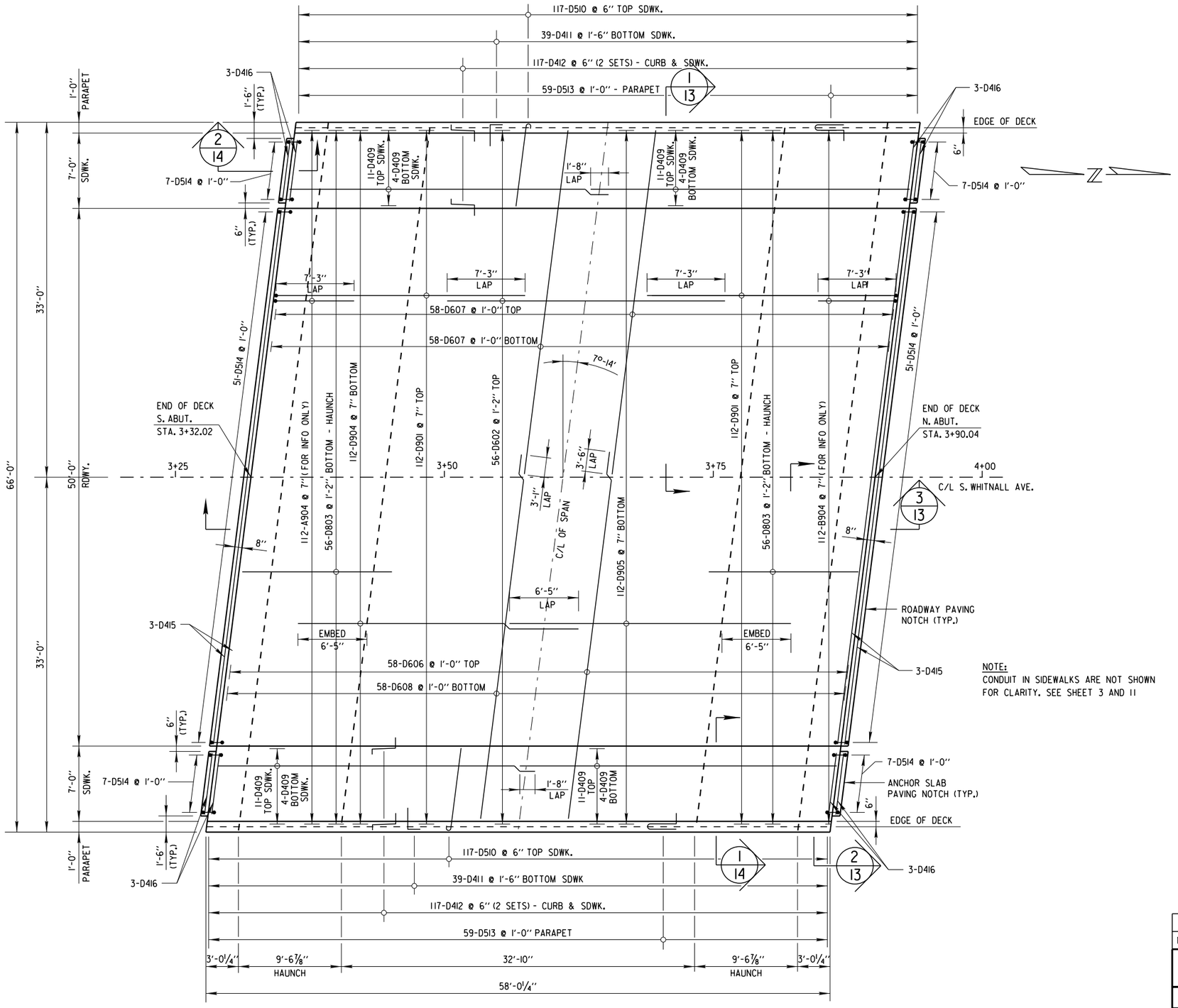
DECK GRADES

SHEET 11 OF 17

W:\STR\B0813\PLANS\12_DECK PLAN.DGN 09-10-2014

STATE PROJECT NUMBER
2660 - 05 - 70



NOTE:
CONDUIT IN SIDEWALKS ARE NOT SHOWN FOR CLARITY. SEE SHEET 3 AND 11

PLAN VIEW

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

DECK PLAN

SHEET 12 OF 17
56

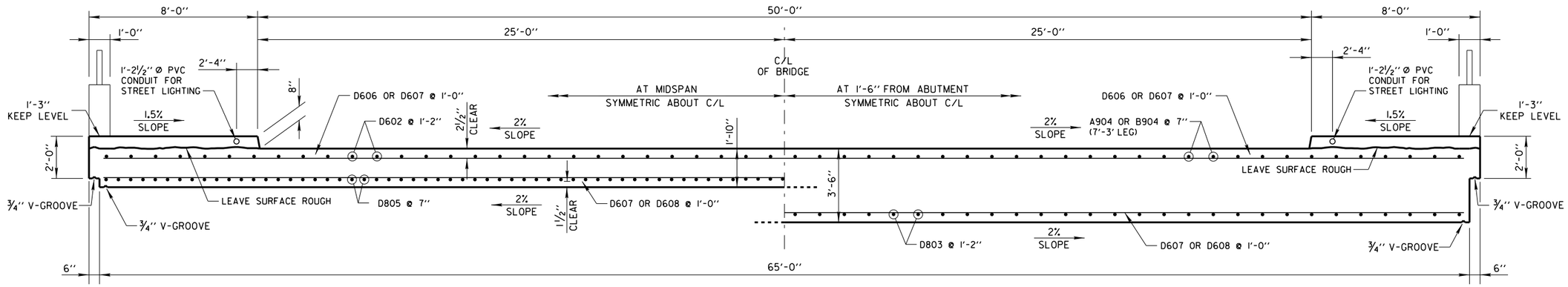
8

8

W:\STR\B0813\PLANS\13_DECKSEC.DGN 09-10-2014

STATE PROJECT NUMBER

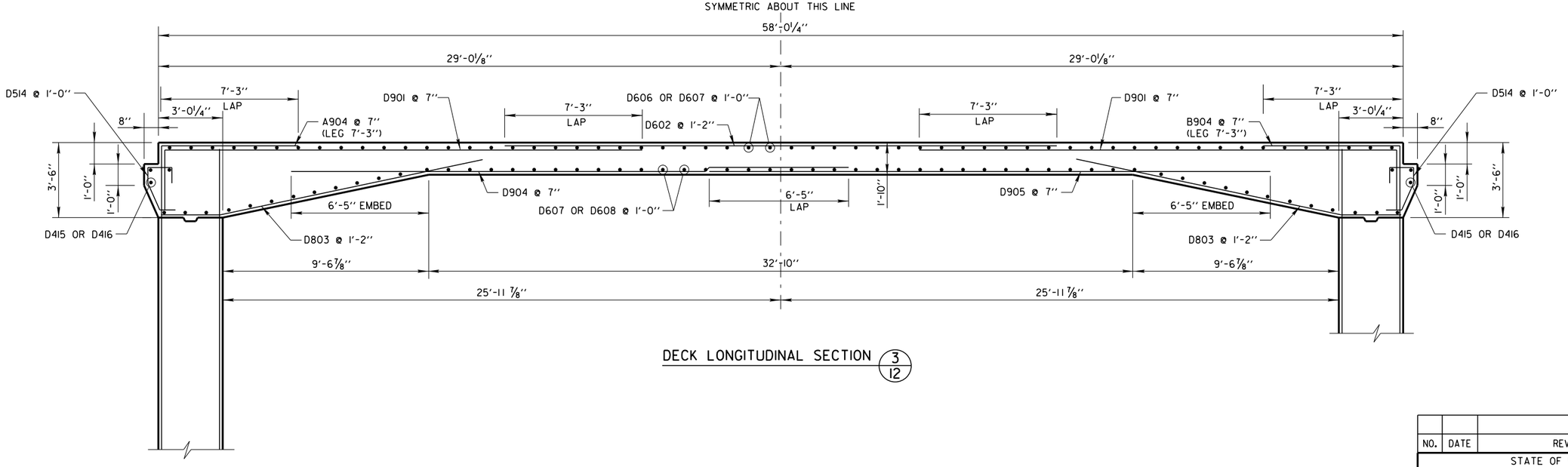
2660 - 05 - 70



DECK CROSS SECTION (1/12)
AT MIDSPAN
LOOKING NORTH

DECK CROSS SECTION (2/12)
AT 1'-6" FROM C/L ABUTMENT
LOOKING NORTH

NOTE:
WALK BARS AND EDGE BEAM BARS
NOT SHOWN FOR CLARITY SEE SHEET 14.



DECK LONGITUDINAL SECTION (3/12)

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

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DECK CROSS SECTIONS

SHEET 13 OF 17

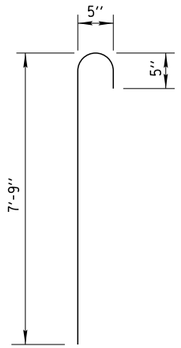
W:\STR\B0813\PLANS\ 14_DECKBAR.DGN 09-10-2014

STATE PROJECT NUMBER

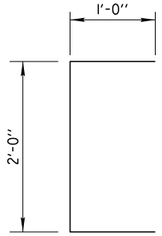
2660 - 05 - 70

BILL OF BARS - DECK

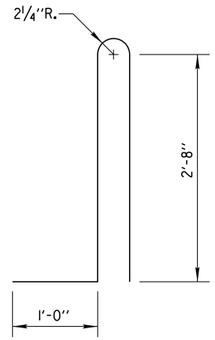
BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
D901	X	224	26'-1"	X		DECK - TOP LONGITUDINAL
D602	X	56	25'-10"			DECK - TOP LONGITUDINAL
D803	X	112	13'-11"	X		DECK - BOTTOM LONGITUDINAL
D904	X	112	26'-0"			DECK - BOTTOM LONGITUDINAL
D905	X	112	26'-2"			DECK - BOTTOM LONGITUDINAL
D606	X	58	36'-6"			DECK - TOP TRANSVERSE
D607	X	116	33'-1"			DECK - TOP & BOTTOM TRANSVERSE
D608	X	58	35'-8"			DECK - BOTTOM TRANSVERSE
D409	X	60	29'-8"			SIDEWALK - TOP & BOTTOM LONGITUDINAL
D510	X	234	8'-4"	X		SIDEWALK - TOP TRANSVERSE
D411	X	78	4'-6"	X		DECK - EDGE OF DECK
D412	X	468	3'-10"	X		SIDEWALK - DOWELS
D513	X	118	6'-11"	X		PARAPET DOWELS
D514	X	130	4'-10"	X		CORBEL - TRANSVERSE ROADWAY & ANCHOR SLAB
D415	X	12	26'-0"			CORBEL - ROADWAY
D416	X	12	5'-10"			CORBEL - ANCHOR SLAB



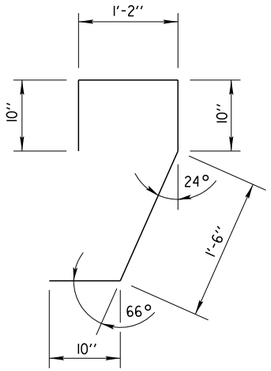
D510



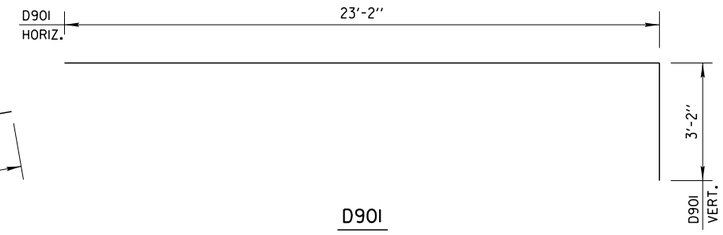
D412



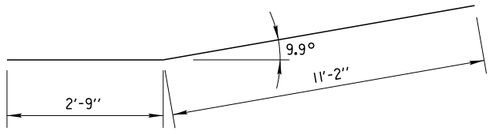
D513



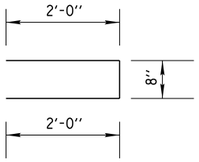
D514



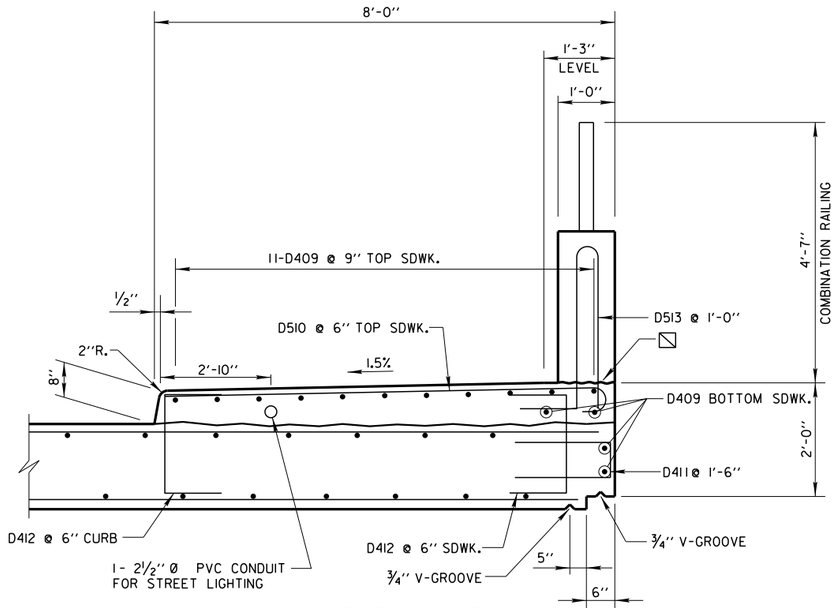
D901



D803



D411



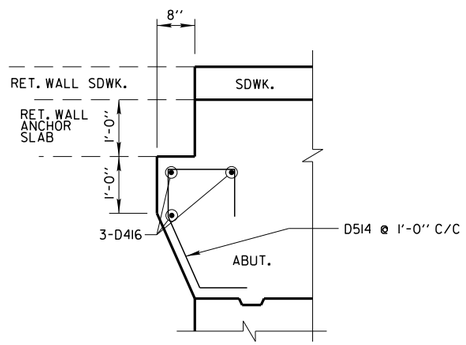
SECTION SIDEWALK (1/12)

NOTE:

FOR AESTHETIC TREATMENT TO PARAPET AND DECK FASCIA REFER TO SHEETS 15 & 16.

PARAPET REINFORCEMENT SHOWN ON SHEET 15 AND 16

⊠ CONST. JOINT-STRIKE OFF AS SHOWN AND LEAVE ROUGH. FOR DECK POUR. MATCH BRIDGE X-SLOPE



SECTION ANCHOR SLAB PAVING NOTCH (2/12)

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

DECK DETAILS AND BILL OF BARS

SHEET 14 OF 17

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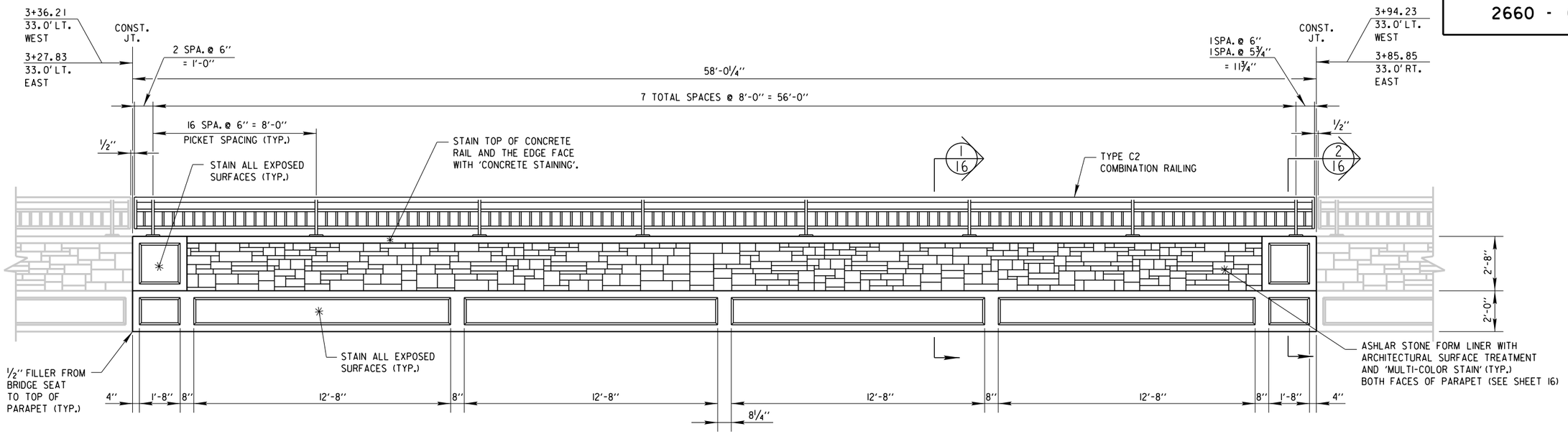
8

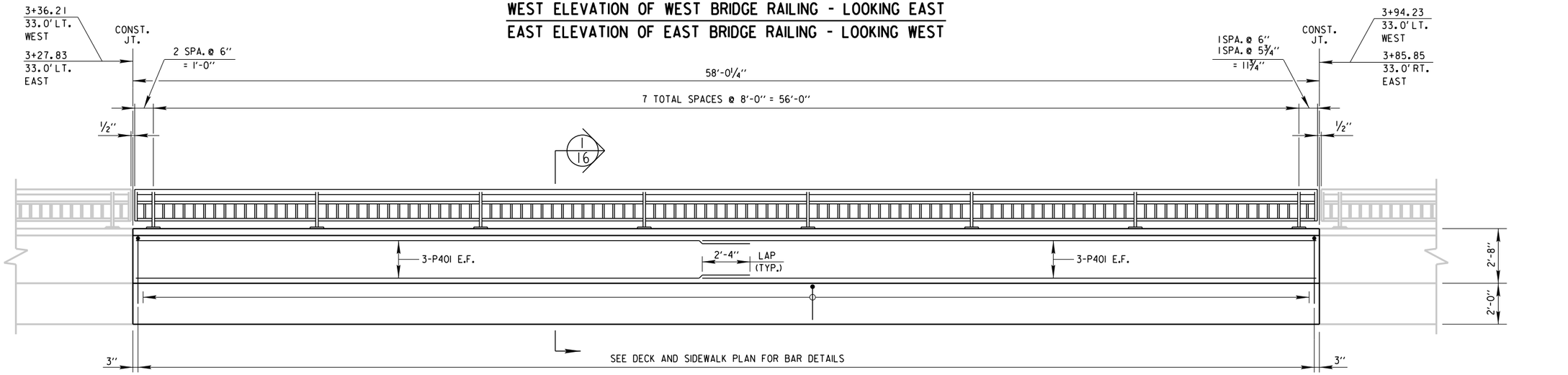
8

W:\STR\B0813\PLANS\ I5_RAILINGELEV.DGN 06-13-2014

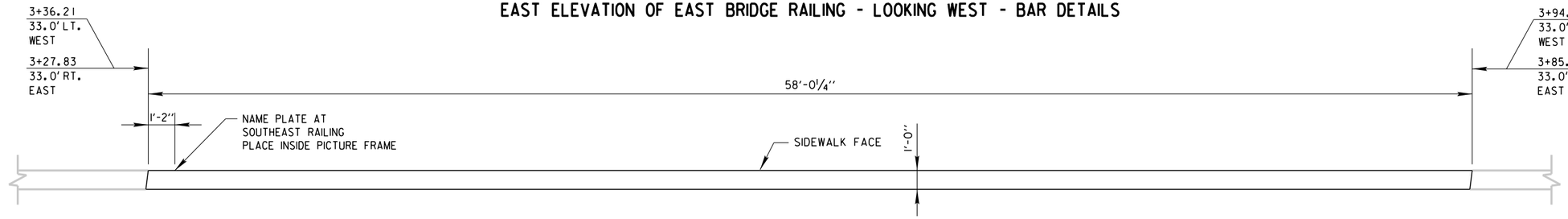
STATE PROJECT NUMBER
2660 - 05 - 70



WEST ELEVATION OF WEST BRIDGE RAILING - LOOKING EAST
EAST ELEVATION OF EAST BRIDGE RAILING - LOOKING WEST



WEST ELEVATION OF WEST BRIDGE RAILING - LOOKING EAST - BAR DETAILS
EAST ELEVATION OF EAST BRIDGE RAILING - LOOKING WEST - BAR DETAILS



PLAN VIEW OF BRIDGE RAILING

8

8

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

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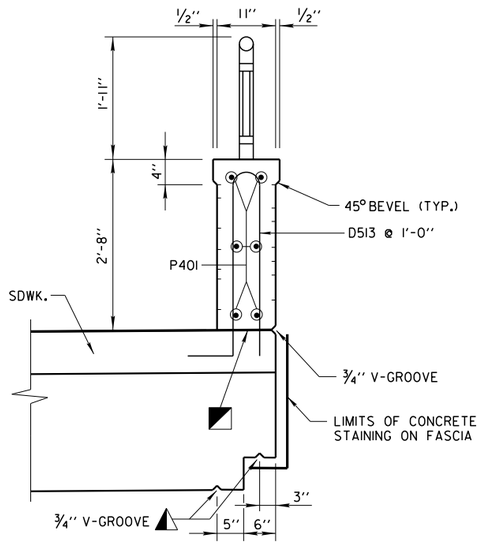
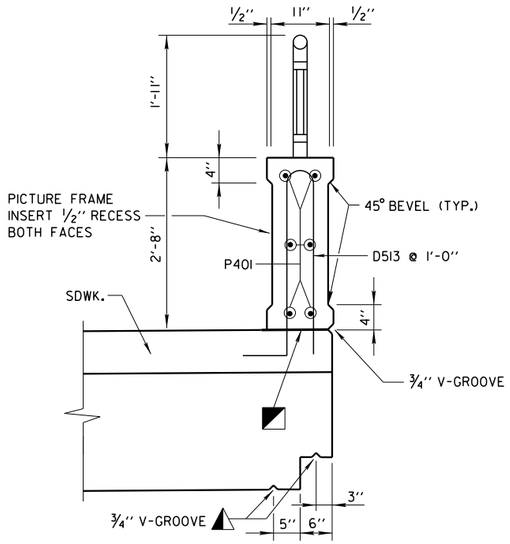
RAILING PLAN, ELEVATIONS AND BAR DETAILS

SHEET 15 OF 17

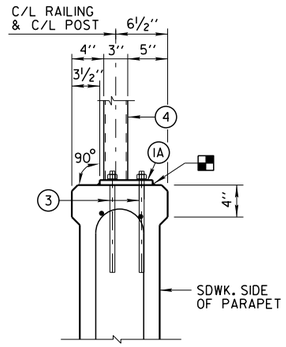
STATE PROJECT NUMBER
2660 - 05 - 70



SECTION 1/15

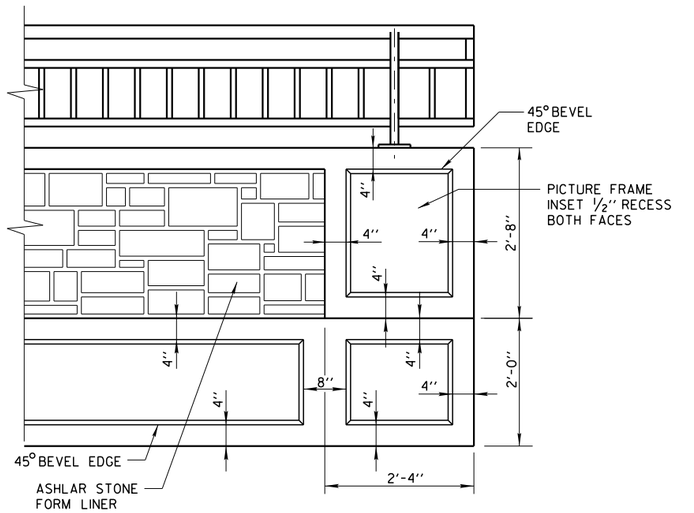


SECTION 2/15

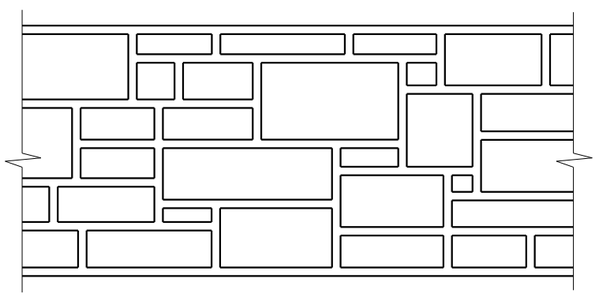


SECTION THRU PARAPET ON BRIDGE

NOTE: TYPE S ANCHORS SHOWN



RAILING PICTURE FRAME INSET ELEVATION



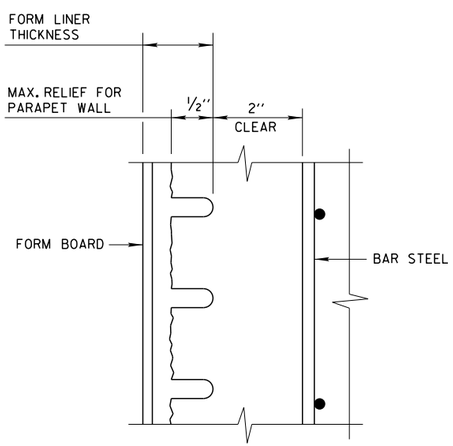
ASHLAR STONE FORM LINER

STONE SIZE = 8-INCH TO 16-INCH, MAX. RELIEF = ½-INCH

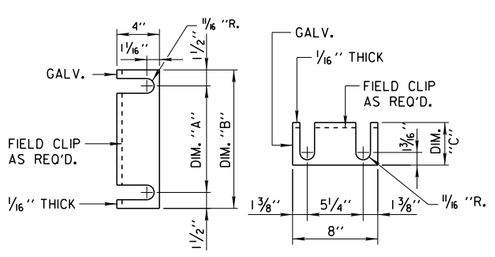
HORIZ. CONST. JOINT-STRIKE OFF AS SHOWN & LEAVE ROUGH.

END 2'-0'' AWAY FROM FACE OF ABUT.

CAULK AROUND PERIMETER OF BASE PLATES, NO. 1, AND FILL BOLT SLOT OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

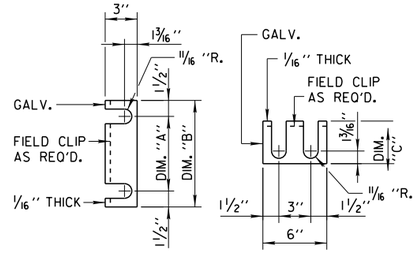


SECTION THRU FORM LINER



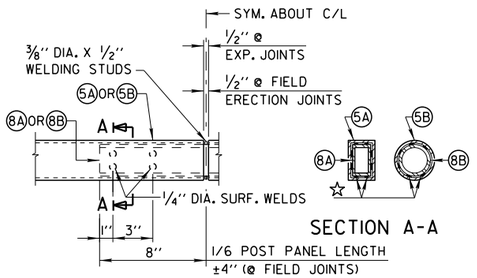
END RAIL SHIM DETAIL

8'' X 1'-1'' BASE PLATE (1B) DIM. ''A'' = 10'', DIM. ''B'' = 1'-1'', DIM. ''C'' = 6½''
8'' X 1'-6'' BASE PLATE (1C) DIM. ''A'' = 1'-3'', DIM. ''B'' = 1'-6'', DIM. ''C'' = 9''
(2 SETS PER POST)



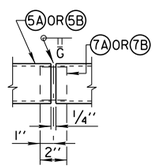
RAIL POST SHIM DETAIL

6'' X 8'' BASE PL (1A) DIM. ''A'' = 5'', DIM. ''B'' = 8'', DIM. ''C'' = 4''.
(2 SETS PER POST)



FIELD ERECTION JOINT DETAIL

☆ MIN. 5/8'' FLAT SURF. DIA. PUNCHINGS OR STUDS MAY BE USED AS AN ALT.



SHOP RAIL SPLICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)

NOTE:
SEE LEGEND & RAILING NOTES ON SHEET 17

BILL OF BARS - VERTICAL PARAPET WALL

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
P401	X	24	29'-11''			PARAPET WALL - HORIZ.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

PARAPET DETAILS AND BILL OF BARS

SHEET 16 OF 17
60

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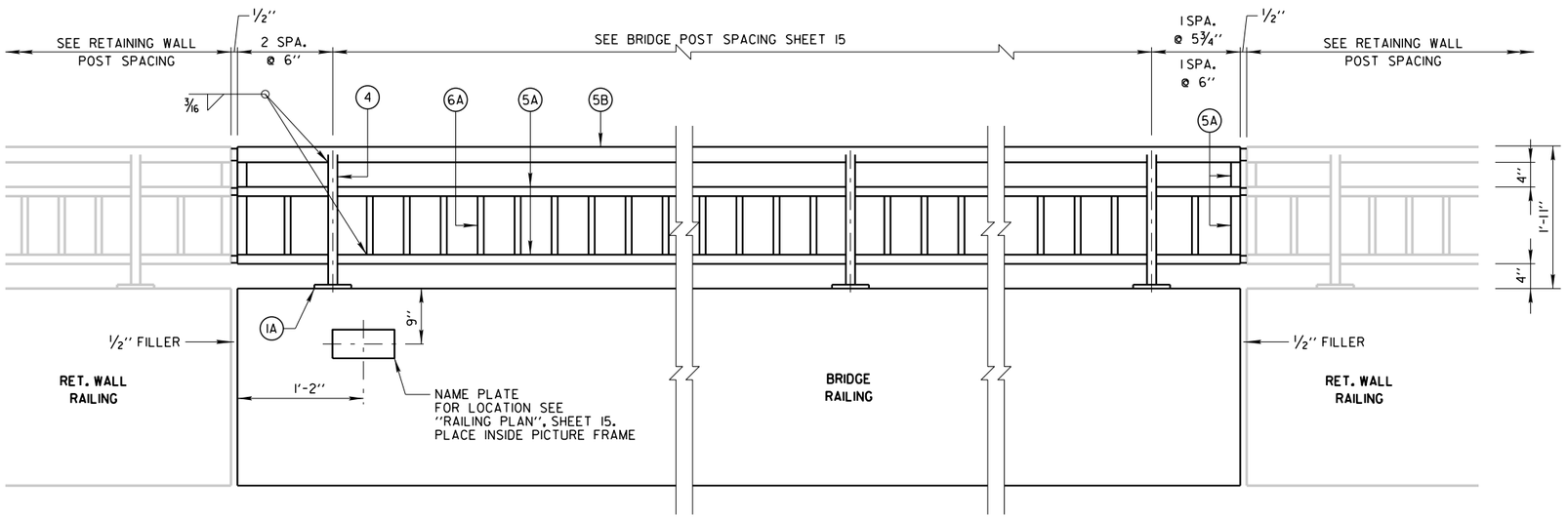
8

W:\STR\BOBI3\PLANS\ I7-STEELRAILINGDET.DGN 09-03-2014

STATE PROJECT NUMBER
2660 - 05 - 70



INSIDE ELEVATION OF PARAPET

LEGEND

(1A) PLATE 5/8" x 6" x 8" WITH 3/4" x 1 1/2" SLOTTED HOLES.

(2A) 1/4"x5"x7" ANCHOR PLATE WITH 11/16" Ø HOLES FOR THR'D. RODS NO.3

(3) 5/8" DIA. x 9" LONG. TYPE 316 STANLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. (ALTERNATE RAIL POST ANCHORAGE: 4 EQUIVALENT STAINLESS STEEL CONCRETE MASONRY ANCHORS TYPE S 5/8"-IN. EMBED 7" IN CONCRETE FOR RAIL POSTS. EMBED 5" IN CONCRETE FOR END RAILS)

(4) STRUCTURAL TUBING 3" x 1 1/2" x 3/16". PLACE VERTICAL. WELD TO NO. 1 & NO. 5.

(5A) STRUCTURAL TUBING 3" x 1 1/2" x 3/16" RAILS. WELD TO NO. 1 & NO. 4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.

(5B) STRUCTURAL TUBING 2 1/2" DIA. (STANDARD SIZE) (2.875" O.D.). WELD TO NO. 1 & NO. 4. INSIDE OF PIPE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.

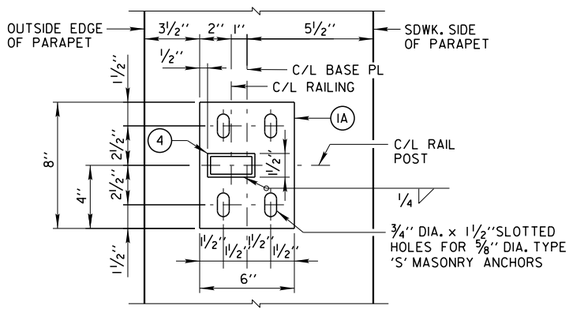
(6A) BAR 1" x 1" PICKETS. WELD TO NO. 5 (SPACE AT 6" MAX. C/L TO C/L SPACING). PLACE VERTICAL.

(7A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. PROVIDE "SLIDING FIT".

(7B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.).

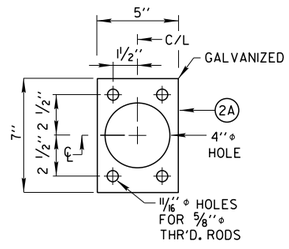
(8A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. (1'-4" AT FIELD ERECTION JOINTS.)

(8B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.). (1'-4" AT FIELD ERECTION JOINTS.)



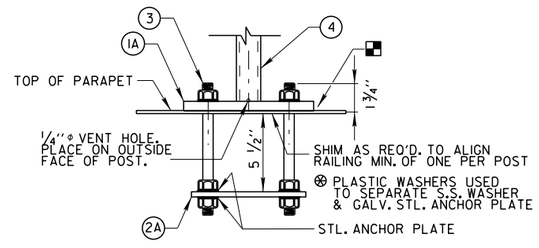
TYPICAL RAIL POST BASE PLATE

FOR 3" X 1 1/2" X 3/16" POSTS (4)



ANCHOR PLATE

FOR 3"x1 1/2"x3/16" POSTS (4A)



ANCHORAGE FOR RAIL POSTS

NOTE: ANCHOR PLATE NOT REQUIRED WHEN TYPE S ANCHORS ARE USED

RAILING NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE C2 GALVANIZED B-40-846", WHICH SHALL INCLUDE ALL WORK SHOWN ON THIS SHEET.

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 CUTS.

NO. 1, 2, 6, 7 AND 8 SHALL CONFORM TO ASTM A709 GRADE 36. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B (NO. 4 & NO. 5).

ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET NORMAL TO GRADE.

CUT BOTTOM OF POST TO MAKE POST VERTICAL IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTION.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED OR STAINLESS STEEL.

◪ CAULK AROUND PERIMETER OF BASE PLATES, NO. 1, AND FILL BOLT SLOT OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

ALL JOINTS AND RECESSES IN CONCRETE PARAPET ARE TO BE VERTICAL.

ALL MATERIAL (EXCEPT NO. 3) SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SSPC SPECIFICATIONS. PAINT OVER GALVANIZING WITH AN APPROVED TIE COAT AND TOP AS SPECIFIED IN THE "BRIDGE SPECIAL PROVISIONS". THE RAILING COLOR IS SPECIFIED IN THE SPECIAL PROVISIONS.

VENT HOLES SHALL BE DRILLED IN POST AND RAIL MEMBERS AS REQUIRED TO FACILITATE GALVANIZING AND DRAINAGE.

RAILING SHALL BE FABRICATED IN LENGTHS THAT INCLUDE 3 OR 4 POSTS.

TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-40-846

DRAWN BY	R.B.M.	PLANS CK'D.	J.D.T. J.J.K.

STEEL RAILING DETAILS

SHEET 17 OF 17

8

8

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GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

ALL STATIONS AND ALL ELEVATIONS ARE IN FEET.
ALL ELEVATIONS ARE REFERRED TO CITY OF MILWAUKEE DATUM.
CITY OF MILWAUKEE DATUM = (NGVD29) 580.60

ALL DIMENSIONS ALONG THE FRONT FACE OF WALL UNLESS OTHERWISE SHOWN.

THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES BAR SIZE.

BAR REINFORCEMENT SHALL HAVE 2" CLEAR COVER UNLESS SHOWN OTHERWISE.

THESE PLANS ARE FOR A PRECAST CONCRETE PANEL MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL LRFD.

THE CONTRACTOR MUST COORDINATE THE CONSTRUCTION OF WALLS R-40-594, R-40-595, R-40-596, R-40-597, AND BRIDGE B-40-846.

THE CONTRACTOR SHALL PROVIDE COMPLETE DESIGN, PLANS, DETAILS, SPECIFICATIONS, AND SHOP DRAWINGS FOR THE RETAINING WALLS IN ACCORDANCE WITH THE SPECIAL PROVISIONS. THE RETAINING WALL MANUFACTURER SHALL PROVIDE TECHNICAL ASSISTANCE TO THE CONTRACTOR DURING CONSTRUCTION. THE COST OF FURNISHING THESE ITEMS SHALL BE INCLUDED IN THE BID ITEM, "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/QMP".

THE COST OF FURNISHING AND PLACING BACKFILL WITHIN THE REINFORCED SOIL ZONES, UNREINFORCED CONCRETE LEVELING PAD UNDER THE MSE PRECAST WALL PANELS, AND REINFORCEMENT, GEOTEXTILE FABRIC, ENGINEERED BACKFILL, JOINT MATERIAL, AND OTHER MISCELLANEOUS ITEMS IS INCLUDED IN THE COST OF BID ITEM, "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/QMP".

BEVEL ALL EXPOSED EDGES OF CONCRETE ¾" UNLESS NOTED OTHERWISE.

THE PLAN QUANTITY FOR THE ITEM "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/QMP" IS BASED ON A WALL HEIGHT MEASURED FROM THE TOP OF THE LEVELING PAD TO THE TOP OF WALL AS SHOWN IN THE PLANS.

PLANS, ELEVATIONS AND DETAILS SHOWN ON THESE DRAWINGS ARE INTENDED TO INDICATE WALL LOCATIONS, LENGTHS HEIGHTS, AND DETAILS COMMON TO THE WALL SYSTEM SELECTED. THE CONTRACTOR SHALL VERIFY THAT THE WALL SYSTEM SELECTED WILL CONFORM TO THE REQUIRED ALIGNMENTS AND DETAILS.

THE MAXIMUM VALUE OF THE ANGLE OF INTERNAL FRICTION OF THE WALL BACKFILL MATERIAL IN THE REINFORCED ZONE SHALL BE ASSUMED TO BE 30° WITHOUT CERTIFIED TEST VALUES.

PLACE BACKFILL IN SPECIFIED LAYER THICKNESS STARTING AT BACK FACE OF WALL AND WORKING AWAY FROM WALL.

UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITES PRIOR TO EXCAVATING. DAMAGE TO EXISTING UTILITES SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.

THE RETAINING WALL IS TO BE DESIGNED USING THE ELEVATIONS GIVEN ON THIS SHEET.

CONCRETE LEVELING PAD INCIDENTAL TO BID ITEM "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/QMP."

SEE SPECIAL PROVISIONS FOR AESTHETIC TREATMENT TO PARAPET.

■ THE LENGTHS PROVIDED IN THE TABLE ARE THE MINIMUM REQUIRED REINFORCEMENT LENGTHS BASED UPON THE MINIMUM DESCRIBED IN THE WALL SYSTEM SPECIAL PROVISIONS OR EXTERNAL AND OVERALL STABILITY AT THE DESIGNATED LOCATIONS. THESE DESIGNATED LOCATIONS REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS, BUT SHALL NOT BE CONSIDERED ALL INCLUSIVE. THE CONTRACTOR DESIGN LENGTHS SHALL MEET OR EXCEED THE MINIMUM VALUES REPRESENTED IN THE TABLE AT THESE DESIGNATED LOCATIONS.

PAINT FOR STEEL RAILING TO MATCH FEDERAL STANDARD NO. 595C, COLOR NO. 27038.

CONCRETE STAINING COLOR: TK COLORS - 4035P GATEPOST.

DESIGN DATA

MATERIAL PROPERTIES:

CONCRETE MASONRY	f'c = 4,000 PSI
PRECAST CONCRETE WALL PANEL	f'c = 4,000 PSI
BAR STEEL REINFORCEMENT	fy = 60,000 PSI

LIVE LOAD:

LIVE LOAD SURCHARGE	240 PSF

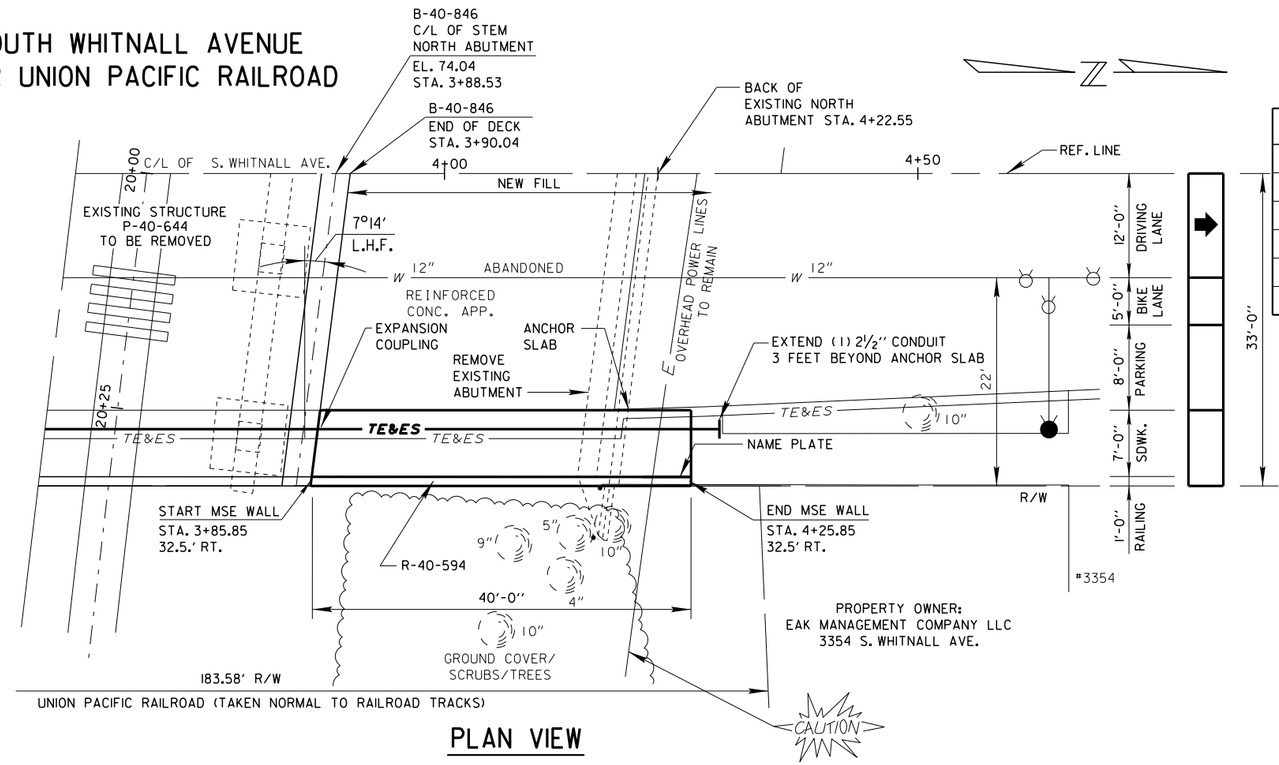
BRIDGE OFFICE CONTACT:

WILLIAM DREHER - PHONE: (608) 266-8489

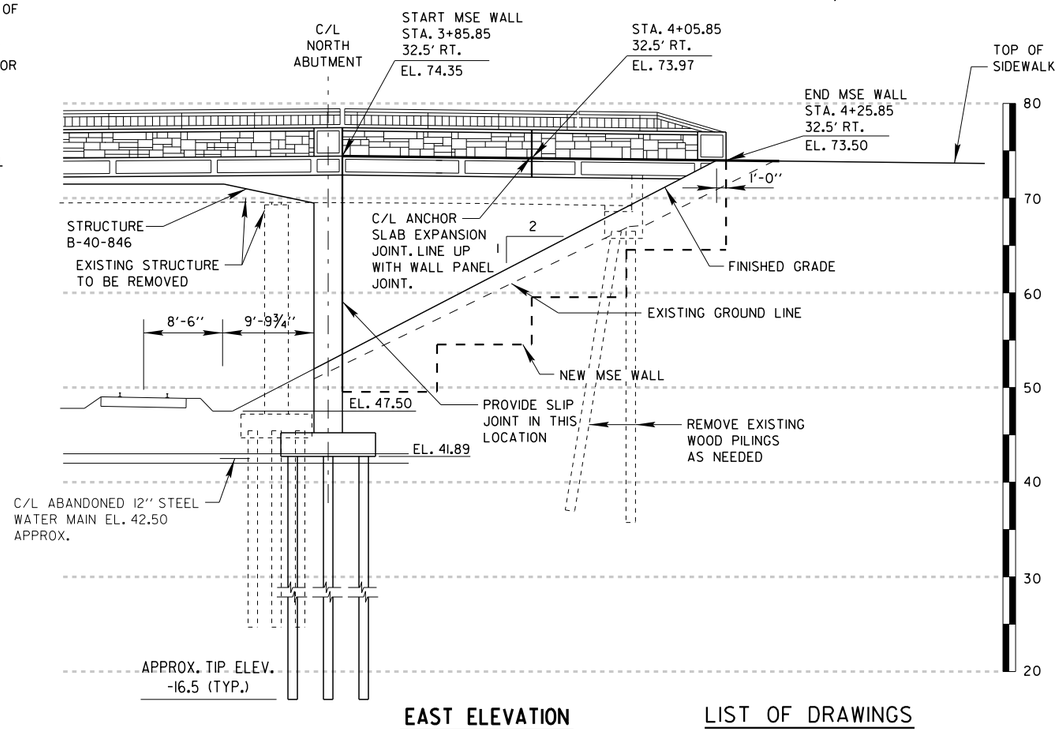
CITY OF MILWAUKEE CONTACT:

CRAIG LIBERTO - PHONE: (414) 286-3294

SOUTH WHITNALL AVENUE OVER UNION PACIFIC RAILROAD



PLAN VIEW



EAST ELEVATION

LOOKING WEST

LIST OF DRAWINGS

STATE PROJECT NUMBER

2660 - 05 - 70

WALL EXTERNAL STABILITY EVALUATION

WALL HEIGHT (FEET)	22'-5"
EXPOSED WALL HEIGHT (FEET)	20'-11"
■ MINIMUM LENGTH OF REINFORCEMENT (FEET)	14'-7"
LENGTH OF REINFORCEMENT / WALL HEIGHT	0.70
WALL STATION	3+85.85
TEST BORING USED	5

SOIL PARAMETERS

STRATUM LOCATION & SOIL DESCRIPTION	UNIT DENSITY (PCF)	FRICTION ANGLE (DEGREES)	COHESION (PSF)
FOUNDATION SOIL	135	28	400
RETAINED SOIL	135	28	0
WALL FILL	120	30	0

CAPACITY TO DEMAND RATIO (CDR)

SLIDING (CDR ≥ 1.0)	1.1
ECCENTRICITY (CDR > 1.0)	1.9
BEARING (CDR > 1.0)	2.1
GLOBAL STABILITY (CDR > 1.0)	1.6

GEOMETRY TABLE

STATION	OFFSET TO F.F. WALL	TOP OF WALL ELEV.	FINISHED GRADE ELEV.
3+85.85	33.0' RT.	74.35	54.15
4+05.85	33.0' RT.	73.97	64.15
4+25.85	33.0' RT.	73.50	73.50

BM: HYDRANT
3354 S. WHITNALL AVE.
STA. 4+63.85, 27.0'RT.
ELEV: 73.75

WISCONSIN
CRAIG S. LIBERTO
E-23746
MILWAUKEE
WIS.
PROFESSIONAL ENGINEER
Craig S. Liberto 12/3/2014

NO.	DATE	REVISION	BY

ORIGINAL PLANS PREPARED BY
CITY OF MILWAUKEE
DEPARTMENT OF PUBLIC WORKS
INFRASTRUCTURE SERVICES DIVISION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

ACCEPTED William C. Dreher KAR 12/04/14
CHIEF STRUCTURES DESIGN ENGINEER DATE

STRUCTURE R-40-594

S. WHITNALL AVE. OVER U.P.R.R.

COUNTY	MILWAUKEE	~~TOWN~~/CITY/~~VILLAGE~~	MILWAUKEE

DESIGN SPEC. AASHTO LRFD SPECIFICATION

DESIGNED BY	DESIGN CK'D.	DRAWN BY	PLANS CK'D.
JDT	JJK	KPS	JJK

GENERAL PLAN AND ELEVATION

SHEET 1 OF 6

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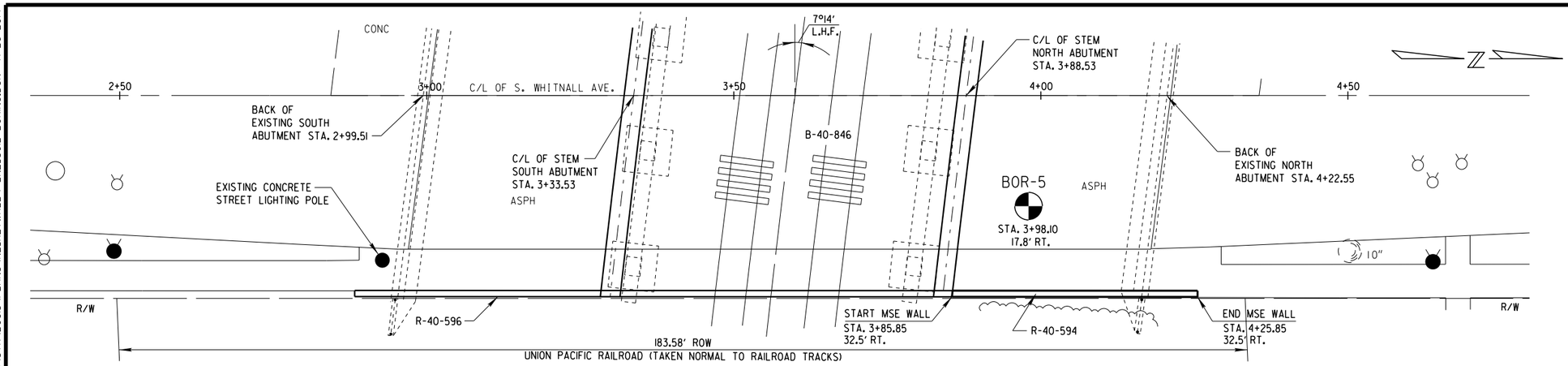
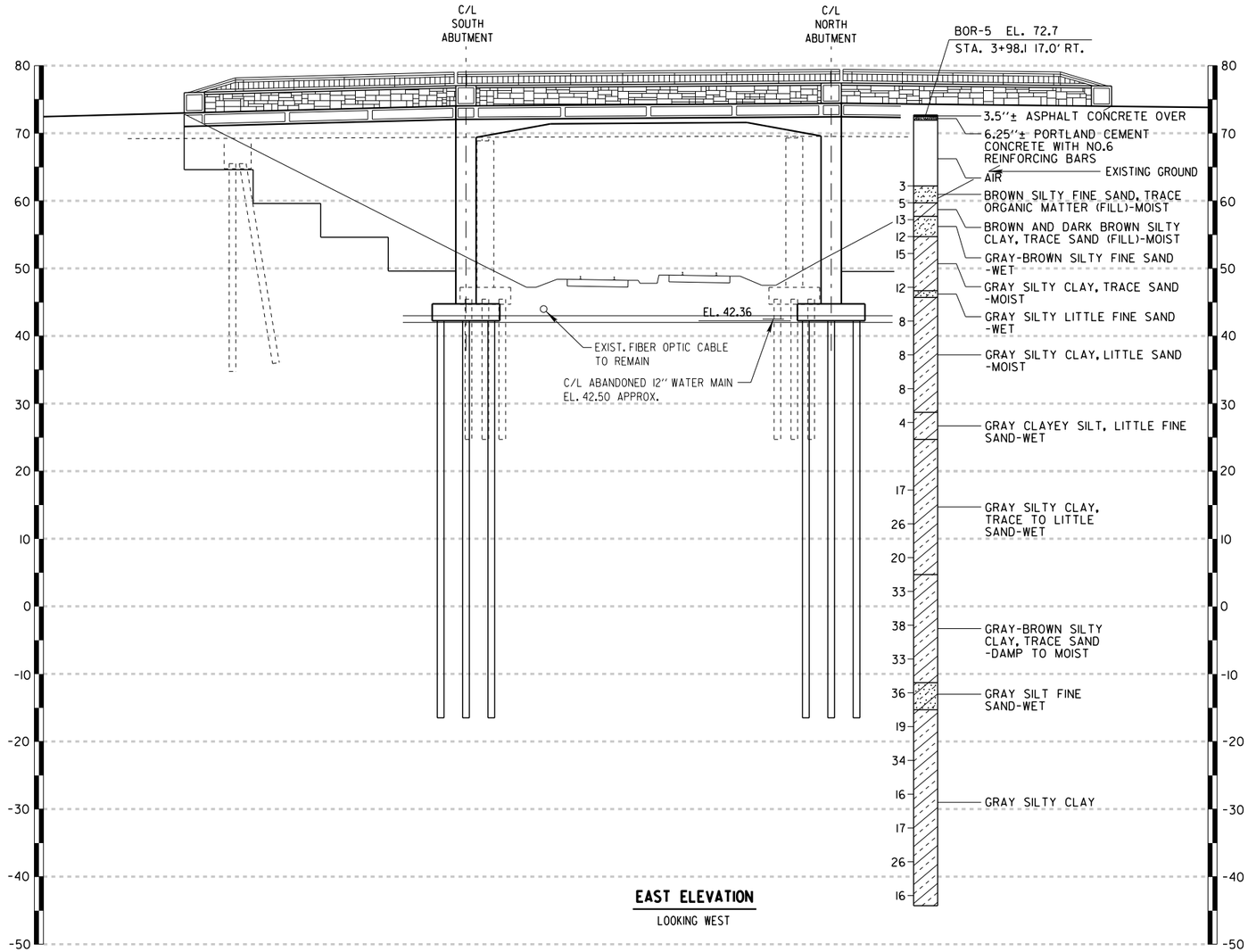
W:\STR\B0813\PLANS\NE_RETWALL\ 2NE_SOIL BORING.DGN 11-26-2014



PLAN VIEW



EAST ELEVATION

LOOKING WEST

NOTE:

THE SUBSURFACE INFORMATION PRESENTED HEREIN IS AN ABBREVIATED VERSION OF THE INFORMATION PRESENTED IN THE GEOTECHNICAL ENGINEERING REPORT.

REVIEW THE GEOTECHNICAL ENGINEERING REPORT AND SOIL BORING LOGS DATED JANUARY 22, 2013 AND ALL SUBSEQUENT REVISIONS FOR ADDITIONAL SUBSURFACE INFORMATION.

SOIL BORINGS COMPLETED BY GILES ENGINEERING

- DENOTES SOIL BORING

STATE PROJECT NUMBER

2660 - 05 - 70

ABBREVIATIONS

F — FINE M — MEDIUM C — COARSE
WS — WEATHERED SO — SOUND

MATERIAL SYMBOLS

TOPSOIL, SILT, SANDSTONE, SAND, PEAT, LIMESTONE, GRAVEL, CLAY, IGNEOUS ROCK

LEGEND OF PROBING

95/6=95 BLOWS FOR 6" PENETRATION
PROBING TAKEN WITH A 350# WT. FALLING 18" ON A 2" O.D. POINT.

PROBING NO.
STATION
ELEVATION
7 AVERAGE BLOWS PER FOOT
REFUSAL 95/6

LEGEND OF BORING

BORING NO.
STA.
ELEV.
UNCONFINED STRENGTH → 7.7
BLOWS PER FT. USING 140# WT. FALLING 30"
WASH SAMPLE
SHELBY TUBE — S.T.
GROUND WATER ELEVATION
NO GROUND WATER OBSERVED ABOVE THIS ELEVATION
7
SANDY GRAVEL
F. BOULDERS OR COBBLES
SAND
SILTY CLAY
SO LIMESTONE

UNLESS OTHERWISE SPECIFIED, THE BLOWS PER FOOT AT THE LOCATIONS INDICATED ARE BASED ON DRIVING A 2" O.D. X 1.4" I.D. SPLIT SPOON SAMPLER WITH A 140# HAMMER HAVING A FREE FALL OF 30". THE BLOW COUNT IS TAKEN IN UNDISTURBED SOIL IMMEDIATELY BELOW A CASED OR OPEN HOLE ELIMINATING SIDE FRICTION ON THE DRIVE PIPE.

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

TO OBTAIN RELATIVE DATA CONCERNING THE CHARACTER OF MATERIAL IN AND UPON WHICH THE FOUNDATION MIGHT BE BUILT, BORINGS AND/OR SOUNDINGS WERE MADE AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING. THE DATA PRESENTED HEREIN REPRESENTS THE FINDINGS OF THE SUBSURFACE EXPLORATIONS MADE. HOWEVER, BECAUSE THE DEPTHS INVESTIGATED ARE LIMITED AND THE AREA OF THE BORINGS AND/OR SOUNDINGS IS VERY SMALL IN RELATION TO THE ENTIRE AREA, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT CONDITIONS BELOW THE DEPTHS INVESTIGATED OR THAT THE CLASSIFICATION OF MATERIAL ENCOUNTERED IN THESE INVESTIGATIONS IS NECESSARILY TYPICAL OF THE ENTIRE SITE.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-594

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

SUBSURFACE EXPLORATION

SHEET 2 OF 6
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STATE PROJECT NUMBER

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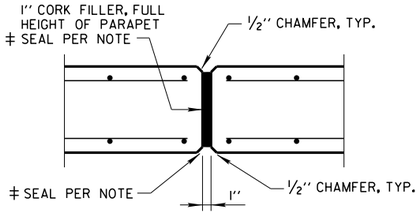
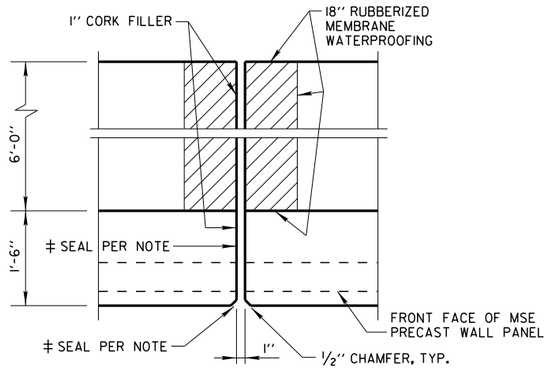
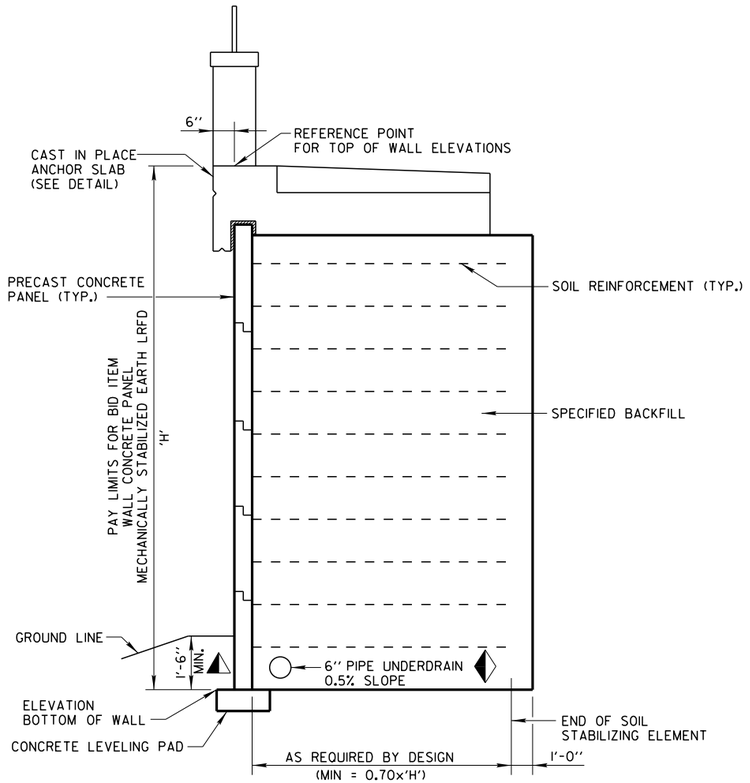


COMBINATION RAILING EXPANSION JOINT DETAIL

‡ NOTE: SEAL ALL EXPOSED HORIZ. AND VERT. SURFACES OF FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONC.)





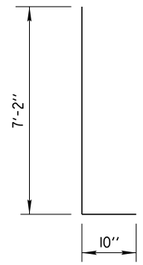
BILL OF BARS - R-40-594

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
G401	×	12	19'-3" *		△	LONGITUDINAL
G402	×	12	19'-8" *			LONGITUDINAL
G403	×	34	6'-2"			TRANSVERSE - BOTTOM
G504	×	62	7'-11"	×		TRANSVERSE - TOP
G405	×	34	4'-3"	×		EDGE CAP
G506	×	45	7'-2"	×		RAILING DOWEL
G407	×	2	19'-8" *			EDGE CAP LONGITUDINAL
G408	×	2	19'-8" *			EDGE CAP LONGITUDINAL

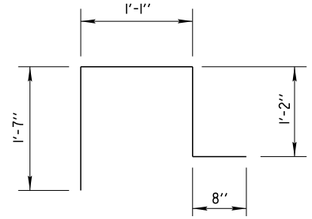
△

BAR MARK	NO. REQUIRED	LENGTH
G401	2 SERIES OF 6	18'-9" TO 19'-8"

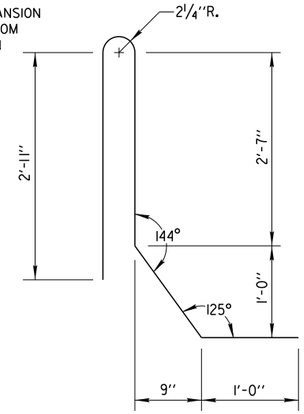
* BAR LENGTH TO BE DETERMINED BY WALL MANUFACTURER. EXPANSION JOINT TO BE SPACED A MINIMUM 20' AND A MAXIMUM OF 30' FROM END OF WALL. DO NOT RUN BAR STEEL THRU JOINT. EXPANSION JOINT SHALL LINE UP WITH WALL PANEL JOINT.



G504



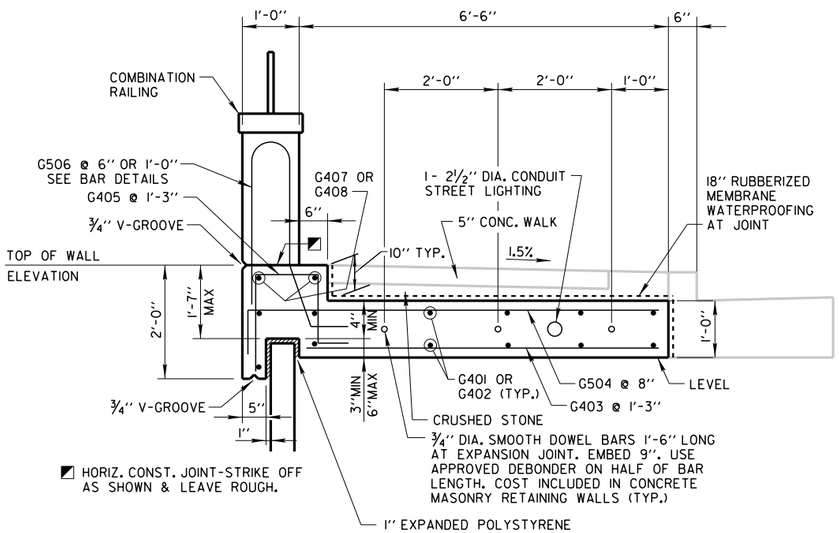
G405



G506

* ANCHOR SLAB EXPANSION JOINT DETAIL

PLAN VIEW



◩ HORIZ. CONST. JOINT-STRIKE OFF AS SHOWN & LEAVE ROUGH.

CAST IN PLACE ANCHOR SLAB DETAIL

NOTE: SEE ROADWAY PLAN FOR 5" CONC. WALK AND CRUSHED STONE DETAILS.

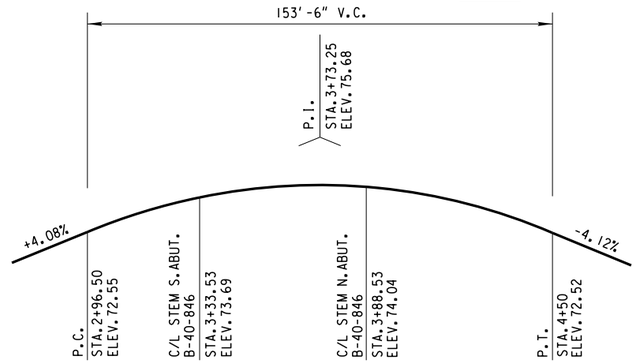
TYPICAL CROSS SECTION

◭ MINIMUM EMBEDMENT BASED ON SITE SPECIFIC PARAMETERS (1'-6" MINIMUM FOR ALL WALLS ON LEVEL GROUND). FIELD EMBEDMENTS SHALL MEET OR EXCEED THE MINIMUM EMBEDMENT. FIELD EMBEDMENTS BELOW MINIMUM EMBEDMENT SHALL NOT BE INCLUDED IN THE PAY LIMITS.

◆ SEE STRUCTURE B-40-846 FOR PIPE UNDERDRAIN DETAILS AND BID ITEM

ESTIMATE OF QUANTITIES

ITEM NO.	BID ITEMS	UNIT	TOTAL
504.0500	CONCRETE MASONRY RETAINING WALLS	CY	17
505.0615	BAR STEEL REINFORCEMENT HS COATED RETAINING WALLS	LB	1,585
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	2
517.1010.S	CONCRETE STAINING (R-40-594)	SF	181
517.1015.S	CONCRETE STAINING MULTI-COLOR (R-40-594)	SF	176
517.1050.S	ARCHITECTURAL SURFACE TREATMENT (R-40-594)	SF	176
652.0230	CONDUIT RIGID NONMETALLIC SCHEDULE 40 2½-INCH	LF	43
SPV.0105.02	RAILING STEEL TYPE C2 GALVANIZED (R-40-594)	LS	1
SPV.0165.01	WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/QMP	SF	550
	NON-BID ITEMS		
	PREFORMED JOINT FILLER	SIZE	
	NON-BITUMINOUS JOINT FILLER	SIZE	
	NAME PLATE	EACH	



PROFILE GRADE LINE ALONG C/L OF S. WHITNALL AVE.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-594

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

WALL DETAILS AND QUANTITIES

SHEET 3 OF 6
64

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8

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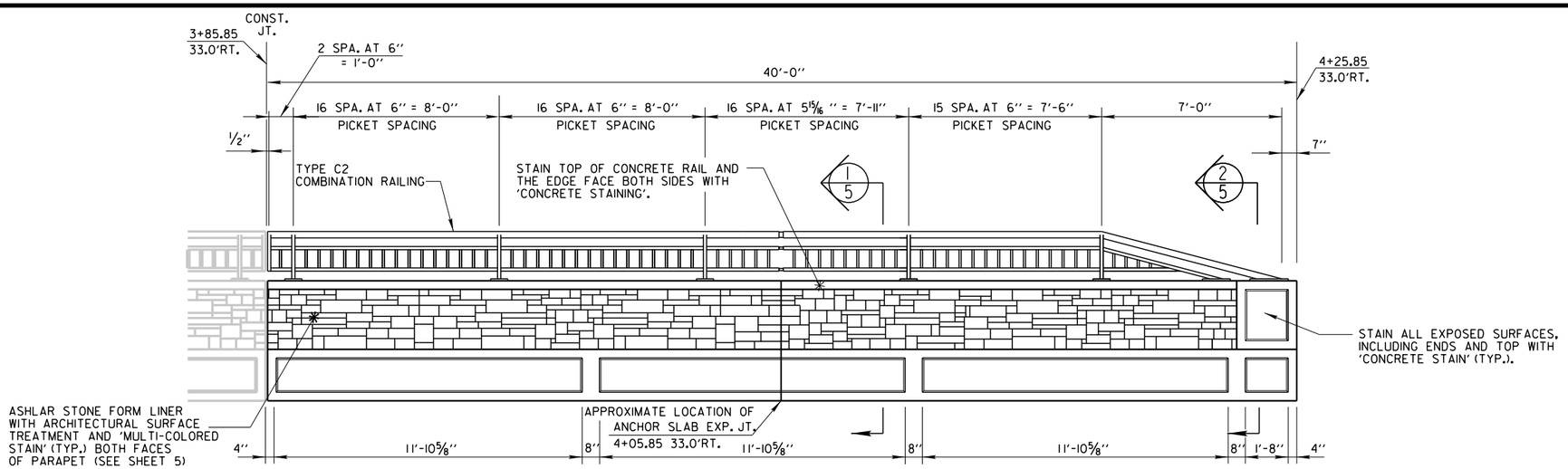
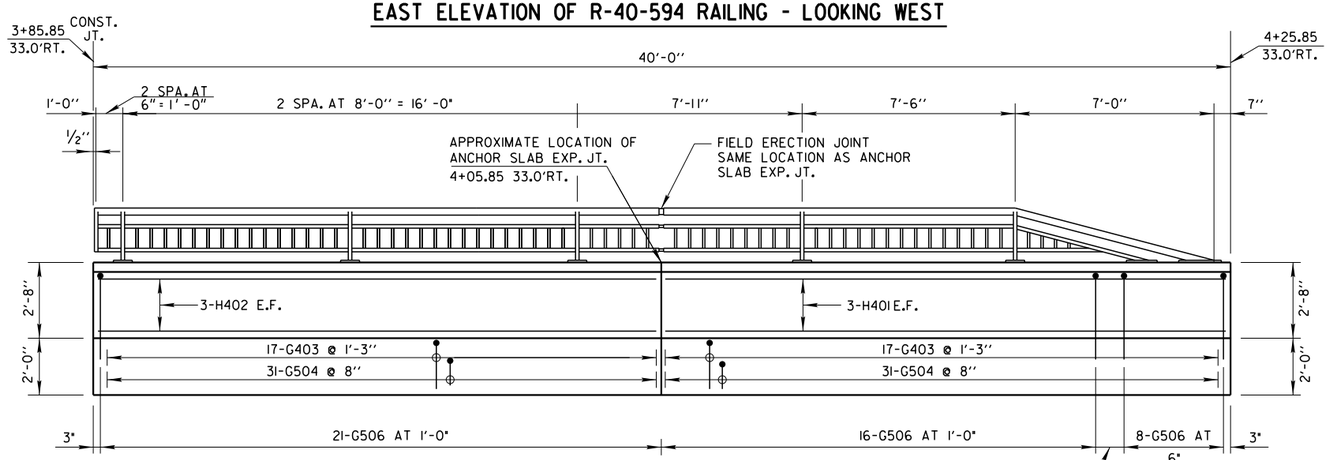
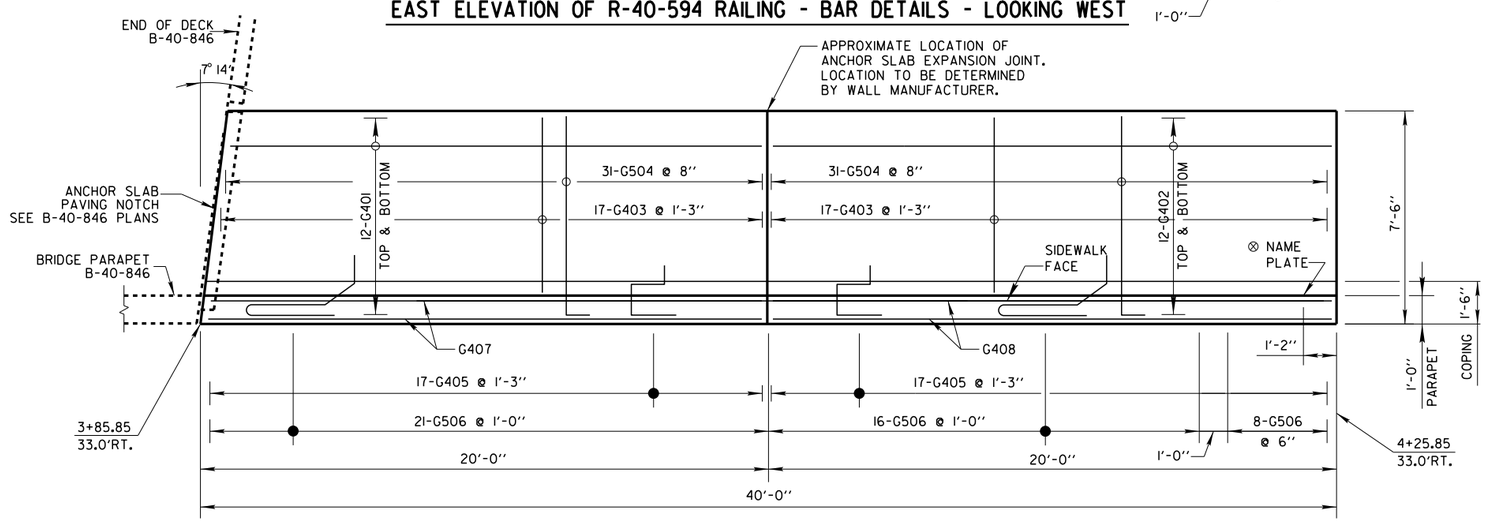
STATE PROJECT NUMBER
2660 - 05 - 70



EAST ELEVATION OF R-40-594 RAILING - LOOKING WEST



EAST ELEVATION OF R-40-594 RAILING - BAR DETAILS - LOOKING WEST



PLAN VIEW OF CAST-IN-PLACE ANCHOR SLAB - BAR DETAILS

⊗ NAME PLATE TO BE LOCATED TOP CENTER OF RECESSED PICTURE FRAME

NO.	DATE	REVISION	BY

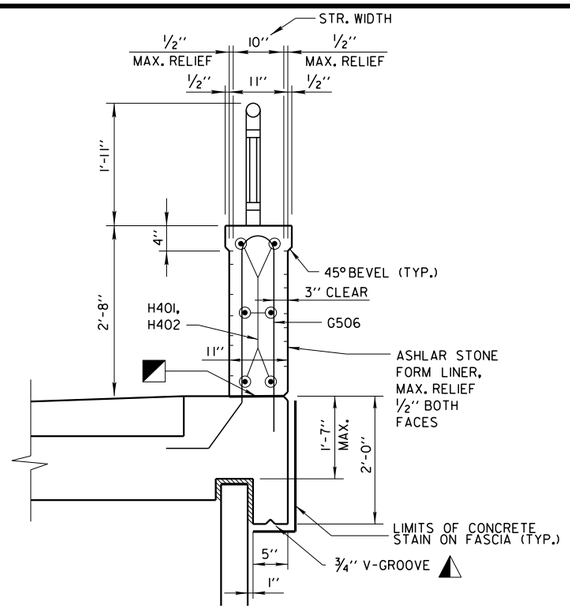
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-594

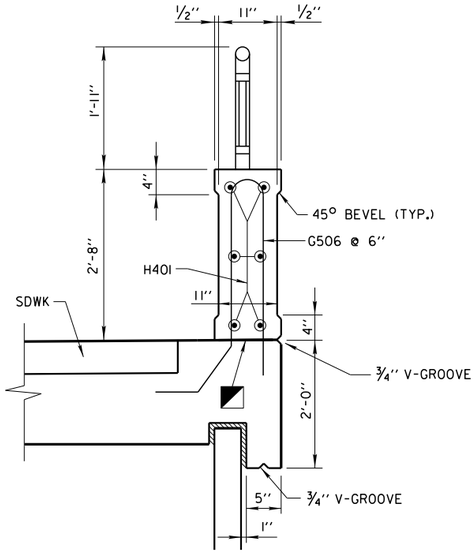
DRAWN BY	K.P.S.	PLANS CK'D.	J.D.T. J.J.K.

RAILING ELEVATIONS, BAR DETAILS & RAILING PLAN

SHEET 4 OF 6



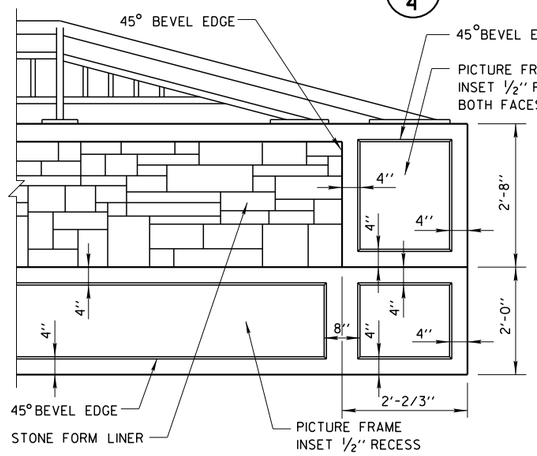
SECTION 1/4



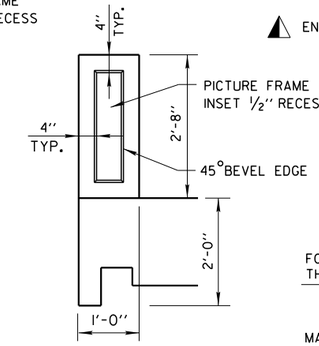
SECTION 2/4

▀ HORIZ. CONST. JOINT-STRIKE OFF AS SHOWN & LEAVE ROUGH.

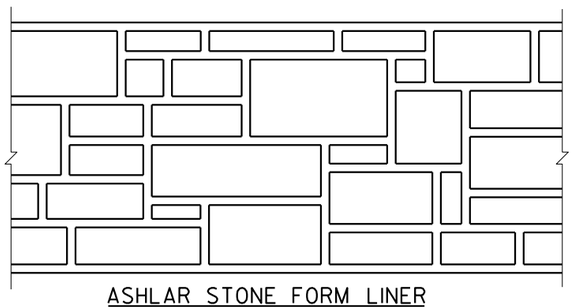
◭ END 2'-0" AWAY FROM FACE OF ABUT.



RAILING PICTURE FRAME INSET ELEVATION

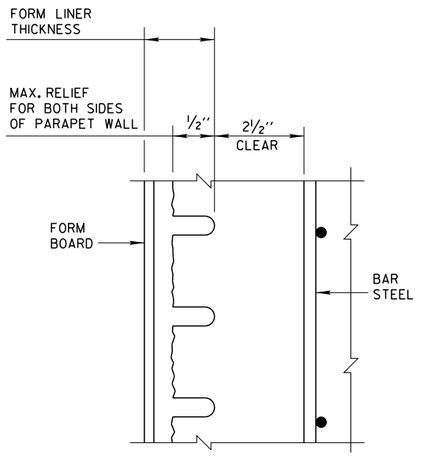


END RAILING PICTURE FRAME INSET ELEVATION

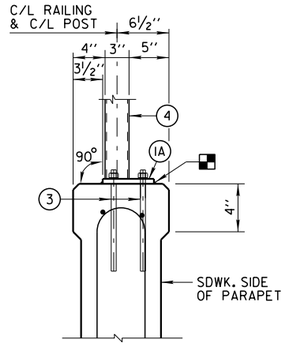


ASHLAR STONE FORM LINER

STONE SIZE = 8-INCH TO 16-INCH, RELIEF = ½-INCH

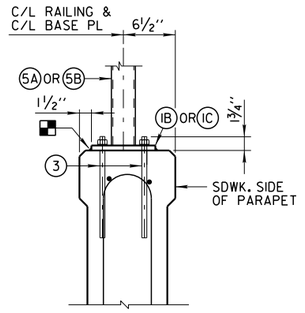


SECTION THRU FORM LINER



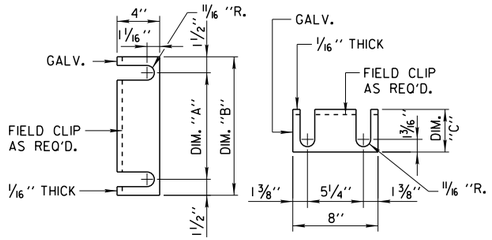
SECTION THRU PARAPET ON ANCHOR SLAB

NOTE: TYPE S ANCHOR SHOWN



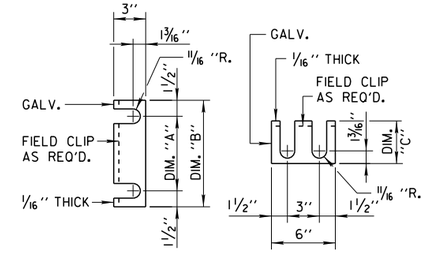
ANCHORAGE FOR END RAIL

NOTE: TYPE S ANCHOR SHOWN



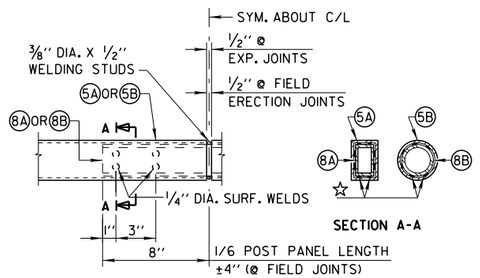
END RAIL SHIM DETAIL

8" X 1'-1" BASE PLATE (IB) DIM. "A" = 10", DIM. "B" = 1'-1", DIM. "C" = 6½"
8" X 1'-6" BASE PLATE (IC) DIM. "A" = 1'-3", DIM. "B" = 1'-6", DIM. "C" = 9"
(2 SETS PER POST)



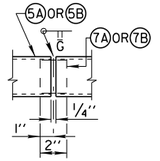
RAIL POST SHIM DETAIL

6" X 8" BASE PL (IA) DIM. "A" = 5", DIM. "B" = 8", DIM. "C" = 4".
(2 SETS PER POST)



FIELD ERECTION JOINT DETAIL

☆ MIN. ⅝" FLAT SURF. DIA. PUNCHINGS OR STUDS MAY BE USED AS AN ALT.



SHOP RAIL SPLICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)

NOTE:
SEE LEGEND & RAILING NOTES ON SHEET 6

BILL OF BARS - VERTICAL PARAPET WALL

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
H401	X	6	19'-8" •			PARAPET WALL - HORIZ.
H402	X	6	19'-8" •			PARAPET WALL - HORIZ.

• BAR LENGTH TO BE DETERMINED BY WALL MANUFACTURER. EXPANSION JOINT TO BE SPACED A MINIMUM 20' AND A MAXIMUM OF 30' FROM END OF WALL. DO NOT RUN BAR STEEL THRU JOINT. EXPANSION JOINT SHALL LINE UP WITH WALL PANEL JOINT.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-594

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

PARAPET DETAILS AND BILL OF BARS

SHEET 5 OF 6
66

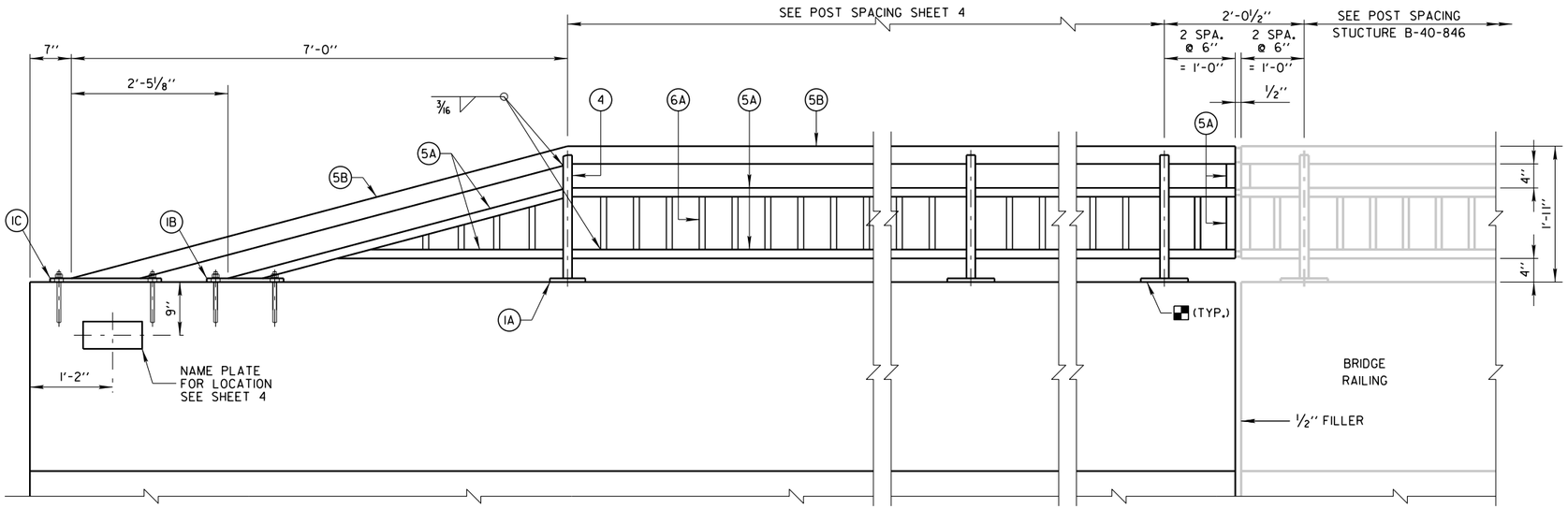
8

8

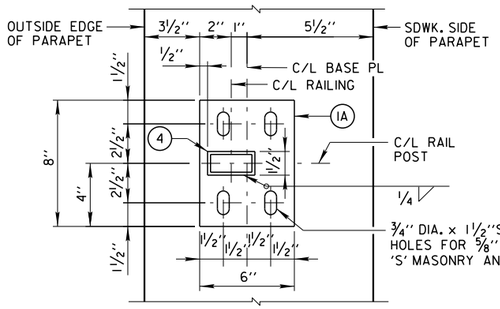
W:\STR\B0813\PLANS\NE_RETWALL\ 6NE_STEELRAILINGDET.DGN 09-03-2014

STATE PROJECT NUMBER

2660 - 05 - 70

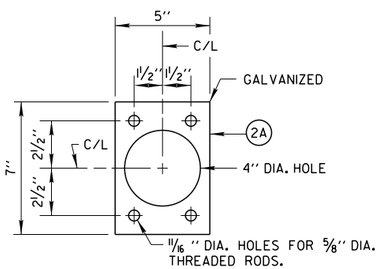


INSIDE ELEVATION OF PARAPET



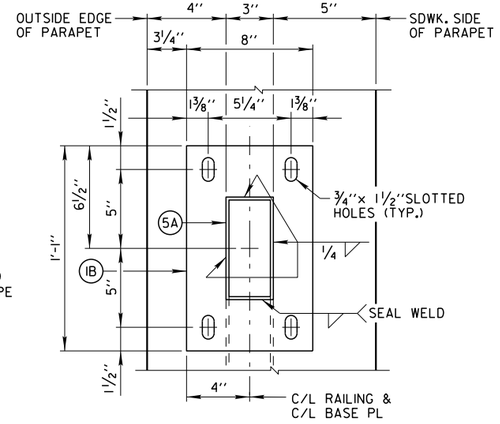
TYPICAL RAIL POST BASE PLATE

FOR 3'' X 1½'' X 3/16'' POSTS (4)



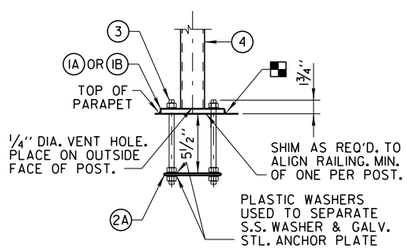
ANCHOR PLATE

FOR 3'' x 1½'' x 3/16'' POSTS (4)



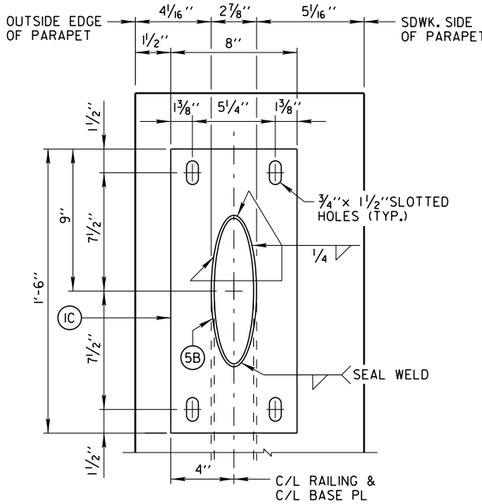
END RAIL BASE PLATE

FOR 3''x1½''x3/16'' POSTS (5A)



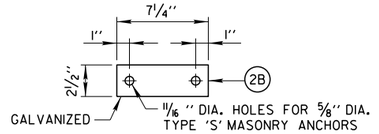
ANCHORAGE FOR RAIL POSTS

NOTE: ANCHOR PLATE NOT REQUIRED WHEN TYPE S ANCHORS ARE USED.



END RAIL BASE PLATE

FOR 2½'' DIA. STD. PIPE RAIL (5B)



END RAIL ANCHOR PLATE

FOR END RAIL BASE PLATES (1B) (1C)

2 REQ'D PER END RAIL BASE PL

LEGEND

(1A) PLATE ⅝'' x 6'' x 8'' WITH ¾'' x 1½'' SLOTTED HOLES.

(1B) PLATE ⅝'' x 8'' x 1'-1'' WITH ¾'' x 1½'' SLOTTED HOLES.

(1C) PLATE ⅝'' x 8'' x 1'-6'' WITH ¾'' x 1½'' SLOTTED HOLES.

(2A) ¼'' x 5'' x 7'' ANCHOR PLATE WITH 11/16 '' DIA. HOLES FOR THREADED RODS NO. 3.

(2B) ¼'' x 2½'' x 7¼'' ANCHOR PLATE WITH 11/16 '' DIA. HOLES FOR THREADED RODS NO. 3.

(3) ⅝'' DIA. x 9'' LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70 KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. (ALTERNATE RAIL POST ANCHORAGE: 4 EQUIVALENT STAINLESS STELL CONCRETE MASONRY ANCHORS TYPE S ⅝-INCH, EMBED 7'' IN CONCRETE FOR RAIL POSTS. EMBED 5'' IN CONCRETE FOR END RAILS.)

(4) STRUCTURAL TUBING 3'' x 1½'' x 3/16''. PLACE VERTICAL. WELD TO NO. 1 & NO. 5.

(5A) STRUCTURAL TUBING 3'' x 1½'' x 3/16'' RAILS. WELD TO NO. 1 & NO. 4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.

(5B) STRUCTURAL TUBING 2½'' DIA. (STANDARD SIZE) (2.875'' O.D.). WELD TO NO. 1 & NO. 4. INSIDE OF PIPE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.

(6A) BAR 1'' x 1'' PICKETS. WELD TO NO. 5 (SPACE AT 6'' MAX. C/L TO C/L SPACING). PLACE VERTICAL.

(7A) RECTANGULAR SLEEVE FABRICATED FROM 3/16'' PLATES. PROVIDE ''SLIDING FIT''.

(7B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2'' DIA. (STANDARD SIZE) (2.375'' O.D.).

(8A) RECTANGULAR SLEEVE FABRICATED FROM 3/16'' PLATES. (1'-4'' AT FIELD ERECTION JOINTS)

(8B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2'' DIA. (STANDARD SIZE) (2.375'' O.D.). (1'-4'' AT FIELD ERECTION JOINTS)

RAILING NOTES

BID ITEM SHALL BE ''RAILING STEEL TYPE C2 GALVANIZED R-40-594'', WHICH SHALL INCLUDE ALL WORK SHOWN ON THIS SHEET.

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 CUTS.

NO. 1, 2, 6, 7 AND 8 SHALL CONFORM TO ASTM A709 GRADE 36. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B (NO. 4 & NO. 5).

ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET NORMAL TO GRADE.

CUT BOTTOM OF POST TO MAKE POST VERTICAL IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTION.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED OR STAINLESS STEEL.

⅝'' DIA. CONCRETE MASONRY ANCHORS TYPE 'S' : MINIMUM PULLOUT STRENGTH 13 KIPS, EMBED 7'' MIN. FOR RAIL POSTS AND 5'' MIN. FOR END RAILS STAINLESS STEEL.

■ CAULK AROUND PERIMETER OF BASE PLATES, NO. 1, AND FILL BOLT SLOT OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

ALL JOINTS AND RECESSES IN CONCRETE PARAPET ARE TO BE VERTICAL.

ALL MATERIAL (EXCEPT NO. 3) SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SPECIFICATIONS. PAINT OVER GALVANIZING WITH AN APPROVED TIE COAT AND TOP AS SPECIFIED IN THE ''BRIDGE SPECIAL PROVISIONS''.

VENT HOLES SHALL BE DRILLED IN POST AND RAIL MEMBERS AS REQUIRED TO FACILITATE GALVANIZING AND DRAINAGE.

RAILING SHALL BE FABRICATED IN LENGTHS THAT INCLUDE 3 OR 4 POSTS.

PAINT POSTS, RAILS, SHIMS AND EXPOSED PORTIONS OF ANCHOR BOLTS.

TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-594

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

STEEL RAILING DETAILS

SHEET 6 OF 6

8

8

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GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

ALL STATIONS AND ALL ELEVATIONS ARE IN FEET.
ALL ELEVATIONS ARE REFERRED TO CITY OF MILWAUKEE DATUM.
CITY OF MILWAUKEE DATUM = (NGVD29) 580.60

ALL DIMENSIONS ALONG THE FRONT FACE OF WALL UNLESS OTHERWISE SHOWN.

THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES BAR SIZE.

BAR REINFORCEMENT SHALL HAVE 2" CLEAR COVER UNLESS SHOWN OTHERWISE.

THESE PLANS ARE FOR A PRECAST CONCRETE PANEL MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL LRFD.

THE CONTRACTOR MUST COORDINATE THE CONSTRUCTION OF WALLS R-40-594, R-40-595, R-40-596, R-40-597, AND BRIDGE B-40-846.

THE CONTRACTOR SHALL PROVIDE COMPLETE DESIGN, PLANS, DETAILS, SPECIFICATIONS, AND SHOP DRAWINGS FOR THE RETAINING WALLS IN ACCORDANCE WITH THE SPECIAL PROVISIONS. THE RETAINING WALL MANUFACTURER SHALL PROVIDE TECHNICAL ASSISTANCE TO THE CONTRACTOR DURING CONSTRUCTION. THE COST OF FURNISHING THESE ITEMS SHALL BE INCLUDED IN THE BID ITEM, "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP".

THE COST OF FURNISHING AND PLACING BACKFILL WITHIN THE REINFORCED SOIL ZONES, UNREINFORCED CONCRETE LEVELING PAD UNDER THE MSE PRECAST WALL PANELS, AND REINFORCEMENT, GEOTEXTILE FABRIC, ENGINEERED BACKFILL, JOINT MATERIAL, AND OTHER MISCELLANEOUS ITEMS IS INCLUDED IN THE COST OF BID ITEM "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP".

BEVEL ALL EXPOSED EDGES OF CONCRETE 3/4" UNLESS NOTED OTHERWISE.

THE PLAN QUANTITY FOR THE ITEM "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP" IS BASED ON A WALL HEIGHT MEASURED FROM THE TOP OF THE LEVELING PAD TO THE TOP OF WALL AS SHOWN IN THE PLANS.

PLANS, ELEVATIONS AND DETAILS SHOWN ON THESE DRAWINGS ARE INTENDED TO INDICATE WALL LOCATIONS, LENGTHS HEIGHTS, AND DETAILS COMMON TO THE WALL SYSTEM SELECTED. THE CONTRACTOR SHALL VERIFY THAT THE WALL SYSTEM SELECTED WILL CONFORM TO THE REQUIRED ALIGNMENTS AND DETAILS.

THE MAXIMUM VALUE OF THE ANGLE OF INTERNAL FRICTION OF THE WALL BACKFILL MATERIAL IN THE REINFORCED ZONE SHALL BE ASSUMED TO BE 30° WITHOUT CERTIFIED TEST VALUES.

PLACE BACKFILL IN SPECIFIED LAYER THICKNESS STARTING AT BACK FACE OF WALL AND WORKING AWAY FROM WALL.

UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITIES PRIOR TO EXCAVATING. DAMAGE TO EXISTING UTILITES SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.

THE RETAINING WALL IS TO BE DESIGNED USING THE ELEVATIONS GIVEN ON THIS SHEET.

CONCRETE LEVELING PAD INCIDENTAL TO BID ITEM "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP."

SEE SPECIAL PROVISIONS FOR AESTHETIC TREATMENT TO PARAPET.

■ THE LENGTHS PROVIDED IN THE TABLE ARE THE MINIMUM REQUIRED REINFORCEMENT LENGTHS BASED UPON THE MINIMUM DESCRIBED IN THE WALL SYSTEM SPECIAL PROVISIONS OR EXTERNAL AND OVERALL STABILITY AT THE DESIGNATED LOCATIONS. THESE DESIGNATED LOCATIONS REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS, BUT SHALL NOT BE CONSIDERED ALL INCLUSIVE. THE CONTRACTOR DESIGN LENGTHS SHALL MEET OR EXCEED THE MINIMUM VALUES REPRESENTED IN THE TABLE AT THESE DESIGNATED LOCATIONS.

PAINT FOR STEEL RAILING TO MATCH FEDERAL STANDARD NO. 595C COLOR NO. 27038

CONCRETE STAINING COLOR: TK COLORS-4035P GATEPOST

DESIGN DATA

MATERIAL PROPERTIES:

CONCRETE MASONRY	f'c = 4,000 PSI
PRECAST CONCRETE WALL PANEL	f'c = 4,000 PSI
BAR STEEL REINFORCEMENT	fy = 60,000 PSI

LIVE LOAD:

LIVE LOAD SURCHARGE	240 PSF

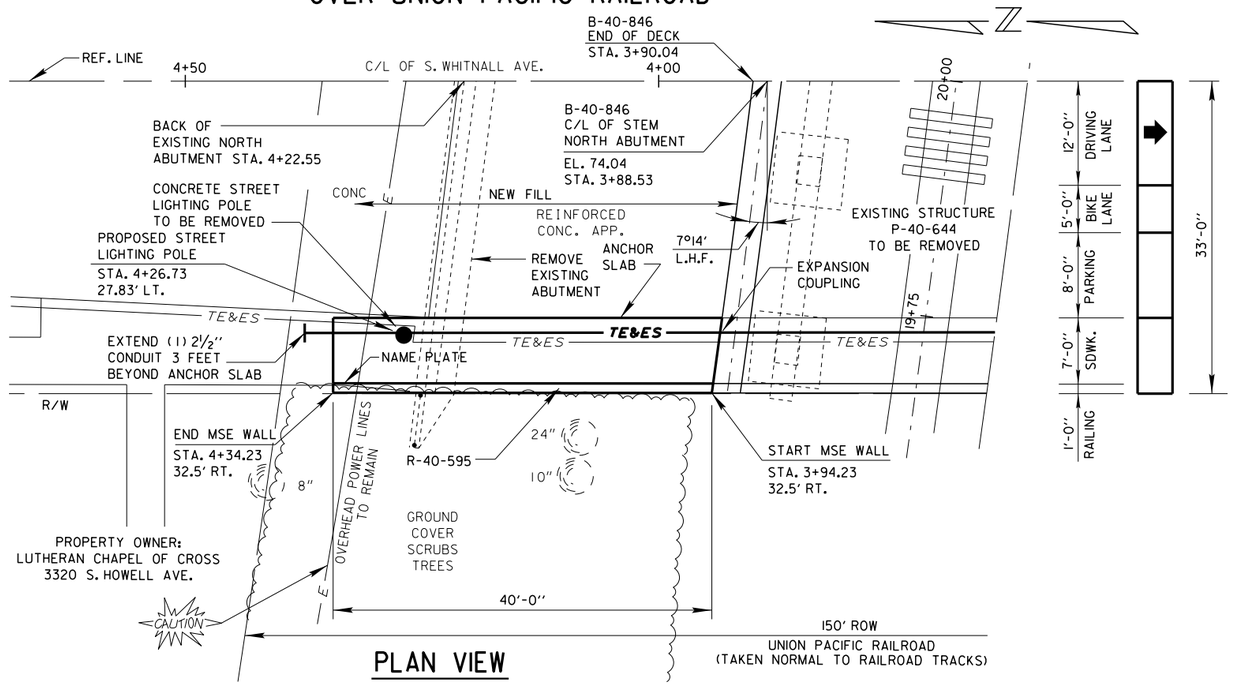
BRIDGE OFFICE CONTACT:

WILLIAM DREHER - PHONE: (608) 266-8489

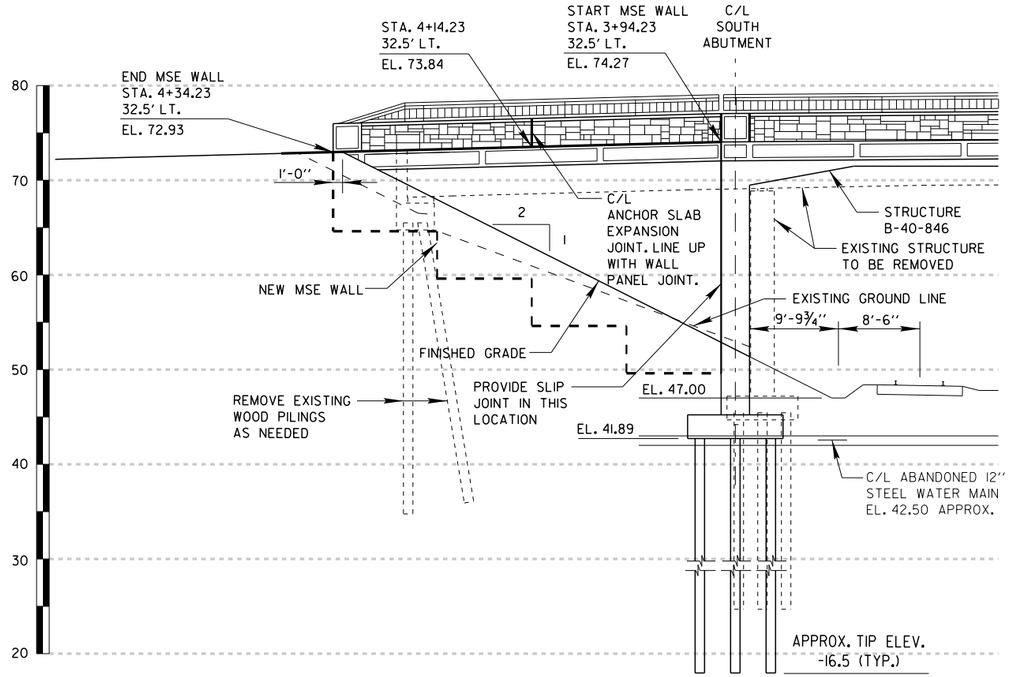
CITY OF MILWAUKEE CONTACT:

CRAIG LIBERTO - PHONE: (414) 286-3294

SOUTH WHITNALL AVENUE OVER UNION PACIFIC RAILROAD



PLAN VIEW



WEST ELEVATION

LOOKING EAST

LIST OF DRAWINGS

STATE PROJECT NUMBER

2660 - 05 - 70

WALL EXTERNAL STABILITY EVALUATION

WALL HEIGHT (FEET)	22'-5"
EXPOSED WALL HEIGHT (FEET)	20'-11"
■ MINIMUM LENGTH OF REINFORCEMENT (FEET)	14'-7"
LENGTH OF REINFORCEMENT / WALL HEIGHT	0.70
WALL STATION	3+94.23
TEST BORING USED	3, 4

SOIL PARAMETERS

STRATUM LOCATION & SOIL DESCRIPTION	UNIT DENSITY (PCF)	FRICTION ANGLE (DEGREES)	COHESION (PSF)
FOUNDATION SOIL	135	28	400
RETAINED SOIL	135	28	0
WALL FILL	120	30	0

CAPACITY TO DEMAND RATIO (CDR)

SLIDING (CDR ≥ 1.0)	1.1
ECCENTRICITY (CDR > 1.0)	1.9
BEARING (CDR > 1.0)	2.1
GLOBAL STABILITY (CDR > 1.0)	1.6

GEOMETRY TABLE

STATION	OFFSET TO F.F. WALL	TOP OF WALL ELEV.	FINISHED GRADE ELEV.
3+94.23	33.0' LT.	74.27	53.79
4+14.23	33.0' LT.	73.84	63.79
4+34.23	33.0' LT.	72.93	72.93

B.M. HYDRANT
3386 S. WHITNALL AVE.
STA. 2+49.06, 25.3' RT.
ELEV. 71.36

WISCONSIN
CRAIG S. LIBERTO
E-23746
MILWAUKEE
WIS.
PROFESSIONAL ENGINEER
Craig S. Liberto 12/3/2014

NO.	DATE	REVISION	BY

ORIGINAL PLANS PREPARED BY
CITY OF MILWAUKEE
DEPARTMENT OF PUBLIC WORKS
INFRASTRUCTURE SERVICES DIVISION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
ACCEPTED William C. Dreher KAR 12/05/14
CHIEF STRUCTURES DESIGN ENGINEER DATE

STRUCTURE R-40-595

S. WHITNALL AVE. OVER U.P.R.R.

COUNTY	MILWAUKEE	~~TOWN~~/CITY/~~VILLAGE~~	MILWAUKEE
DESIGN SPEC.	AASHTO LRFD SPECIFICATION		
DESIGNED BY JDT	DESIGN CK'D. JJK	DRAWN BY KPS	PLANS CK'D. JJK

GENERAL PLAN AND ELEVATION

SHEET 1 OF 7
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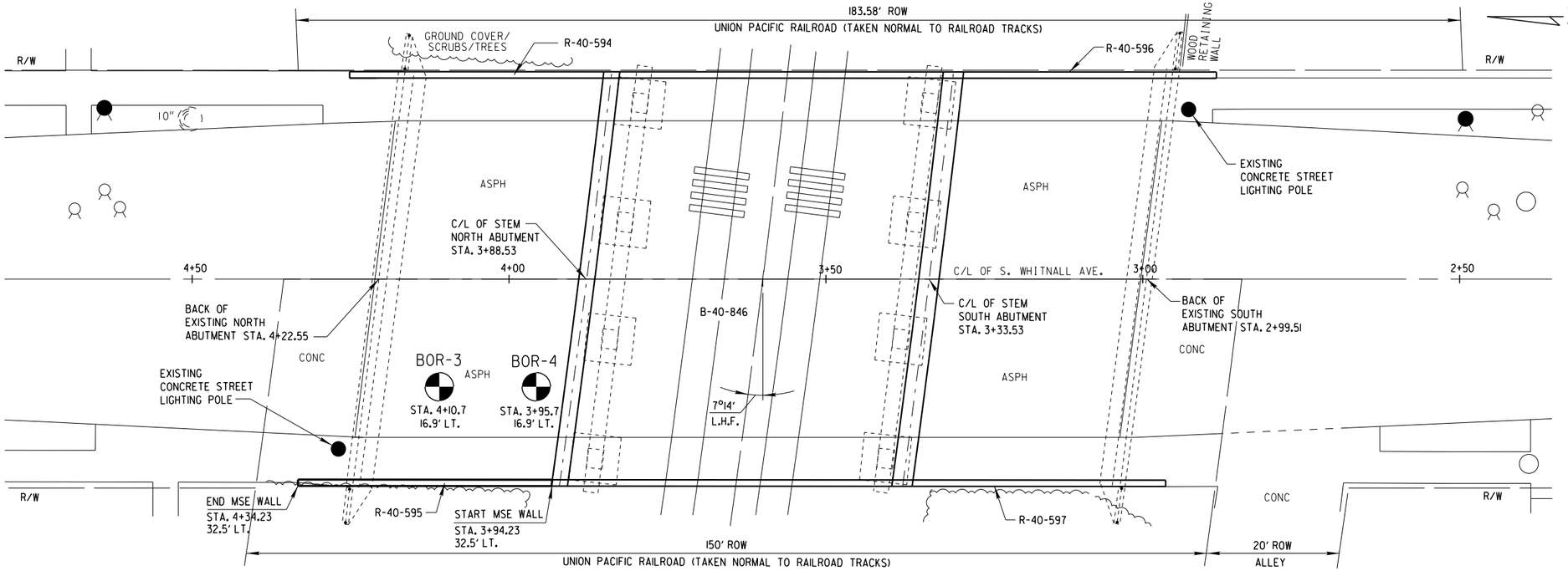
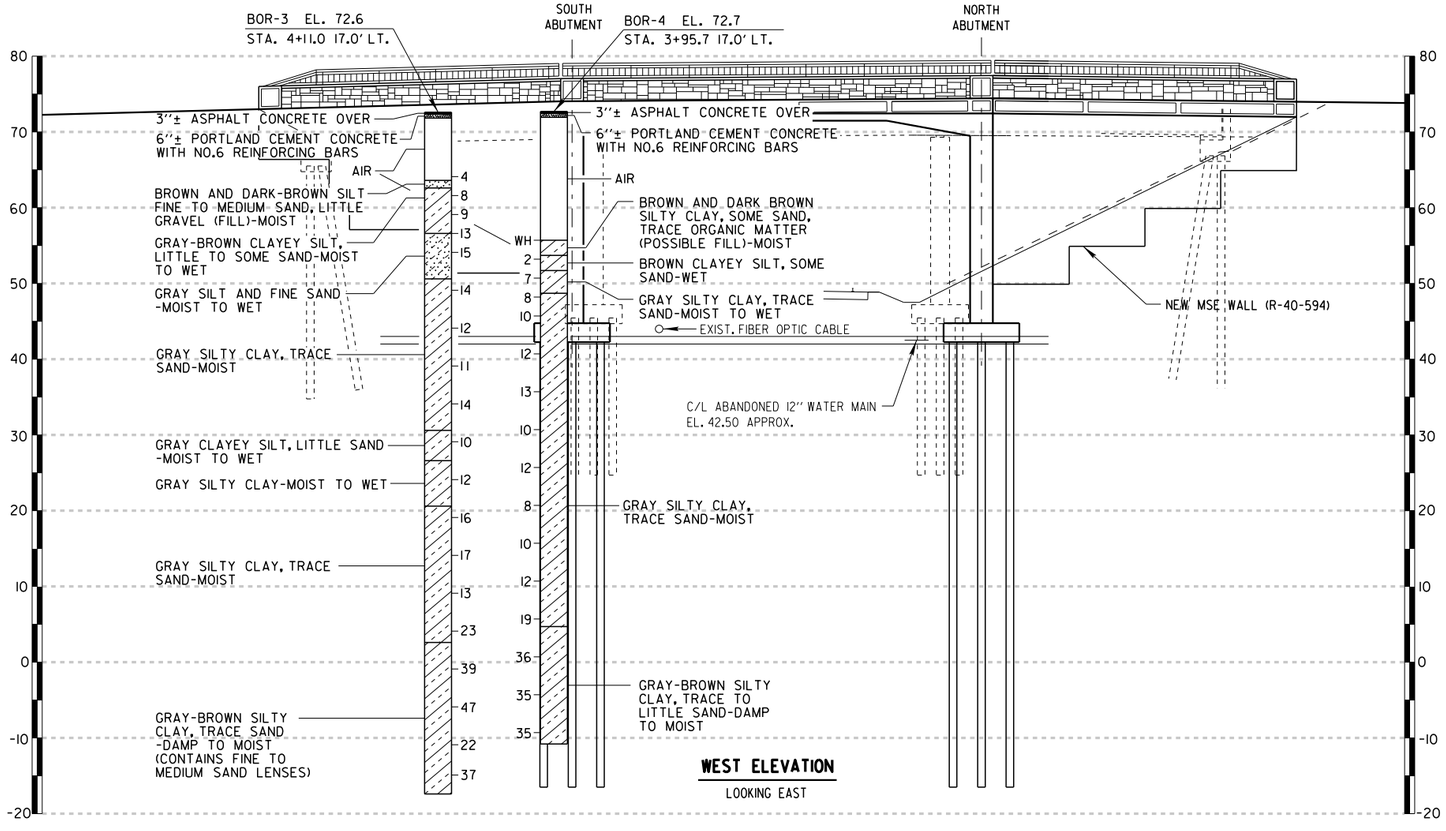
W:\STR\BOBI3\PLANS\NW_RETWALL\ 2NW_SOIL BORING.DGN 12-02-2014



PLAN VIEW



WEST ELEVATION

LOOKING EAST

NOTE:

THE SUBSURFACE INFORMATION PRESENTED HEREIN IS AN ABBREVIATED VERSION OF THE INFORMATION PRESENTED IN THE GEOTECHNICAL ENGINEERING REPORT.

REVIEW THE GEOTECHNICAL ENGINEERING REPORT AND SOIL BORING LOGS DATED JANUARY 22, 2013 AND ALL SUBSEQUENT REVISIONS FOR ADDITIONAL SUBSURFACE INFORMATION.

SOIL BORINGS COMPLETED BY GILES ENGINEERING

- DENOTES SOIL BORING

STATE PROJECT NUMBER

2660 - 05 - 70

ABBREVIATIONS

F — FINE M — MEDIUM C — COARSE
WS — WEATHERED SO — SOUND

MATERIAL SYMBOLS

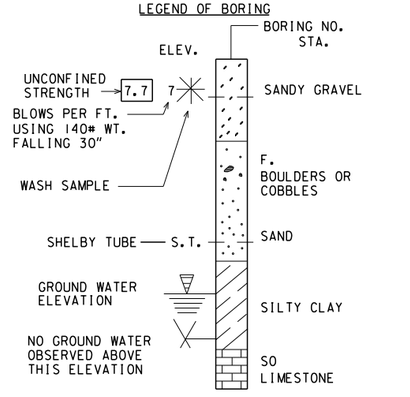
TOPSOIL, SILT, SANDSTONE
SAND, PEAT, LIMESTONE
GRAVEL, CLAY, IGNEOUS ROCK

LEGEND OF PROBING

95/6=95 BLOWS FOR 6" PENETRATION
PROBING TAKEN WITH A 350# WT. FALLING 18" ON A 2" O.D. POINT.

PROBING NO.
STATION
ELEVATION
7 AVERAGE BLOWS PER FOOT
REFUSAL 95/6

LEGEND OF BORING



UNLESS OTHERWISE SPECIFIED, THE BLOWS PER FOOT AT THE LOCATIONS INDICATED ARE BASED ON DRIVING A 2" O.D. X 1.4" I.D. SPLIT SPOON SAMPLER WITH A 140# HAMMER HAVING A FREE FALL OF 30". THE BLOW COUNT IS TAKEN IN UNDISTURBED SOIL IMMEDIATELY BELOW A CASED OR OPEN HOLE ELIMINATING SIDE FRICTION ON THE DRIVE PIPE.

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

TO OBTAIN RELATIVE DATA CONCERNING THE CHARACTER OF MATERIAL IN AND UPON WHICH THE FOUNDATION MIGHT BE BUILT, BORINGS AND/OR SOUNDINGS WERE MADE AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING. THE DATA PRESENTED HEREIN REPRESENTS THE FINDINGS OF THE SUBSURFACE EXPLORATIONS MADE. HOWEVER, BECAUSE THE DEPTHS INVESTIGATED ARE LIMITED AND THE AREA OF THE BORINGS AND/OR SOUNDINGS IS VERY SMALL IN RELATION TO THE ENTIRE AREA, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT CONDITIONS BELOW THE DEPTHS INVESTIGATED OR THAT THE CLASSIFICATION OF MATERIAL ENCOUNTERED IN THESE INVESTIGATIONS IS NECESSARILY TYPICAL OF THE ENTIRE SITE.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-595

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

SUBSURFACE EXPLORATION

SHEET 2 OF 7
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8

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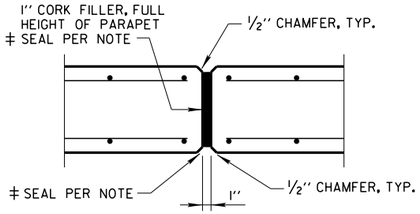
W:\STR\B0813\PLANS\NW_RETWALL\ 3NW_DETAILS.DGN 11-10-2014

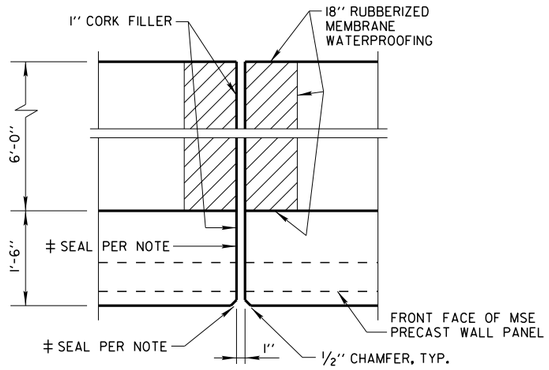
STATE PROJECT NUMBER

2660 - 05 - 70



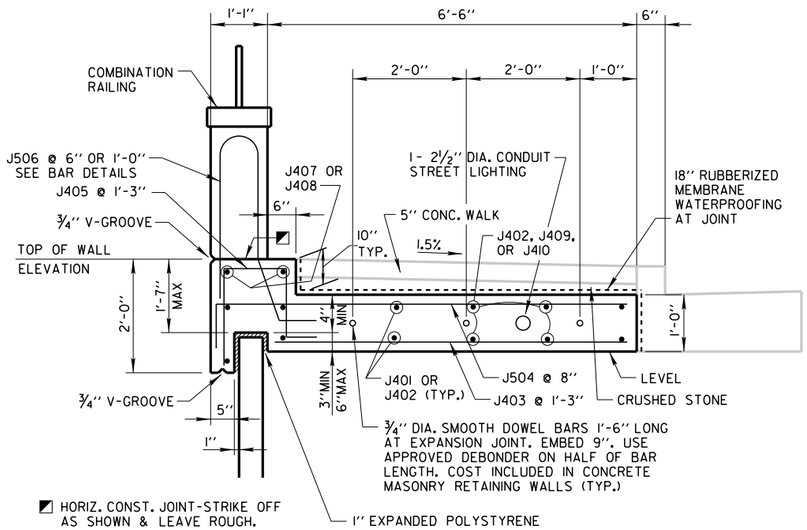
COMBINATION RAILING EXPANSION JOINT DETAIL

‡ NOTE: SEAL ALL EXPOSED HORIZ. AND VERT. SURFACES OF FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONC.)



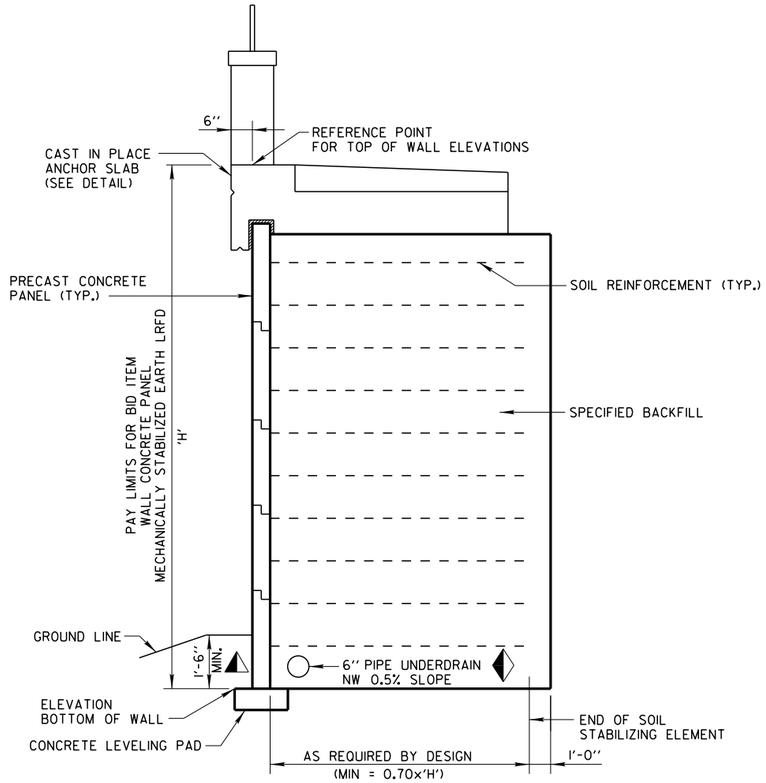
* ANCHOR SLAB EXPANSION JOINT DETAIL

PLAN VIEW



CAST IN PLACE ANCHOR SLAB DETAIL

NOTE: SEE ROADWAY PLAN FOR 5" CONC. WALK AND CRUSHED STONE DETAILS.



TYPICAL CROSS SECTION

▲ MINIMUM EMBEDMENT BASED ON SITE SPECIFIC PARAMETERS (1'-6" MINIMUM FOR ALL WALLS ON LEVEL GROUND). FIELD EMBEDMENTS SHALL MEET OR EXCEED THE MINIMUM EMBEDMENT. FIELD EMBEDMENTS BELOW MINIMUM EMBEDMENT SHALL NOT BE INCLUDED IN THE PAY LIMITS.

◆ SEE STRUCTURE B-40-846 FOR PIPE UNDERDRAIN DETAILS AND BID ITEM

ESTIMATE OF QUANTITIES

ITEM NO.	BID ITEMS	UNIT	TOTAL
504.0500	CONCRETE MASONRY RETAINING WALLS	CY	17
505.0615	BAR STEEL REINFORCEMENT HS COATED RETAINING WALLS	LB	1,645
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	2
517.1010.S	CONCRETE STAINING (R-40-595)	SF	181
517.1015.S	CONCRETE STAINING MULTI-COLOR (R-40-595)	SF	176
517.1050.S	ARCHITECTURAL SURFACE TREATMENT (R-40-595)	SF	176
652.0230	CONDUIT RIGID NONMETALLIC SCHEDULE 40 2½-INCH	LF	43
SPV.0060.01	CONCRETE BASES	EACH	1
SPV.0105.05	RAILING STEEL TYPE C2 GALVANIZED (R-40-597)	LS	1
SPV.0165.01	WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP	SF	550
	NON-BID ITEMS		
	PREFORMED JOINT FILLER	SIZE	
	NON-BITUMINOUS JOINT FILLER	SIZE	
	NAME PLATE	EACH	

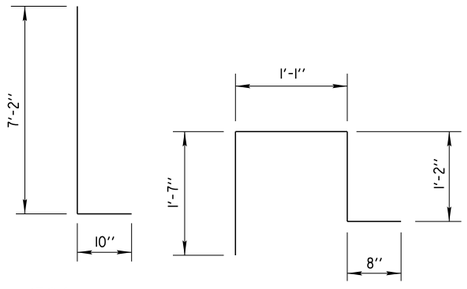
BILL OF BARS - R-40-595

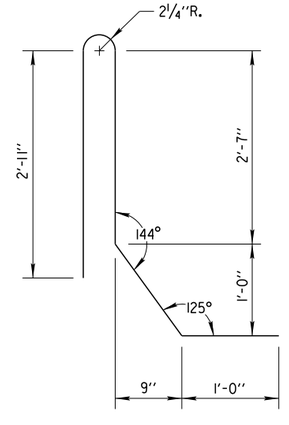
BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
J401	X	8	19'-8"*			LONGITUDINAL
J402	X	12	19'-3"*		△	LONGITUDINAL
J403	X	34	6'-2"			TRANSVERSE - BOTTOM
J504	X	62	7'-11"	X		TRANSVERSE - TOP
J405	X	34	4'-3"	X		EDGE CAP
J506	X	45	7'-2"	X		RAILING DOWEL
J407	X	2	19'-8"*	X		EDGE CAP LONGITUDINAL
J408	X	2	19'-8"*	X		EDGE CAP LONGITUDINAL
J409	X	4	11'-3"*			LONGITUDINAL
J410	X	4	6'-3"*			LONGITUDINAL
J411	X	16	4'-0"			DIAGONAL AT POLE BASE

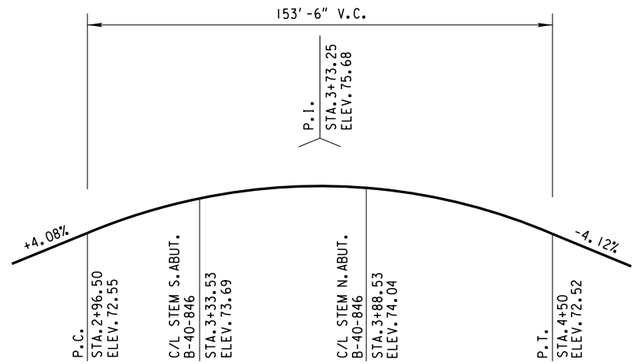
△

BAR MARK	NO. REQUIRED	LENGTH
J402	2 SERIES OF 6	18'-9" TO 19'-8"

* BAR LENGTH TO BE DETERMINED BY WALL MANUFACTURER. EXPANSION JOINT TO BE SPACED A MINIMUM 20' AND A MAXIMUM OF 30' FROM END OF WALL. DO NOT RUN BAR STEEL THRU JOINT. EXPANSION JOINT SHALL LINE UP WITH WALL PANEL JOINT.







PROFILE GRADE LINE ALONG C/L OF S. WHITNALL AVE.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-595

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

WALL DETAILS AND QUANTITIES

SHEET 3 OF 7
70

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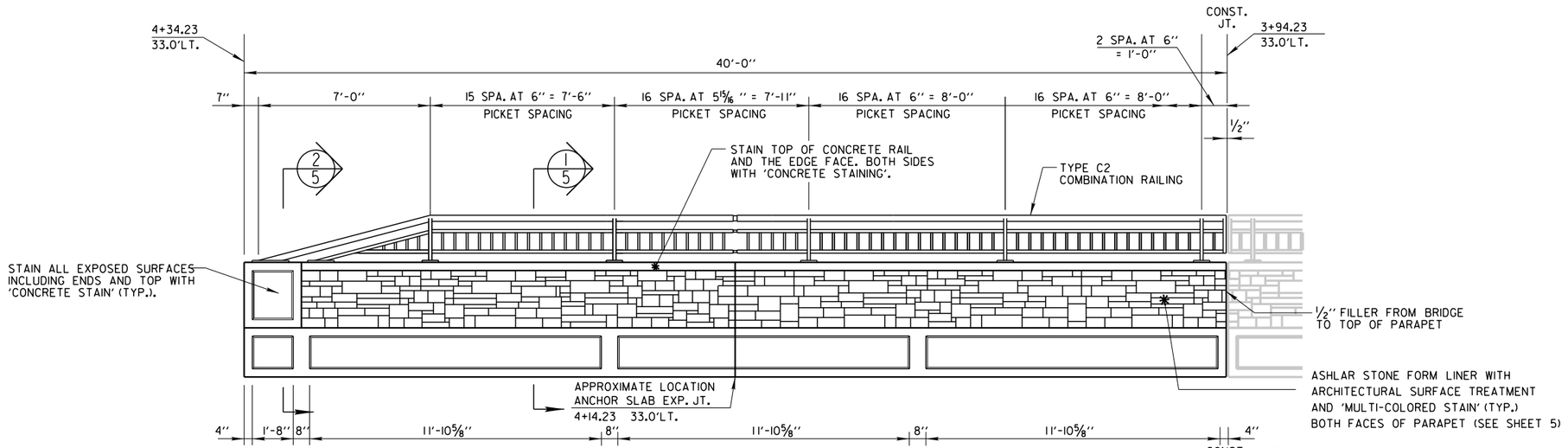
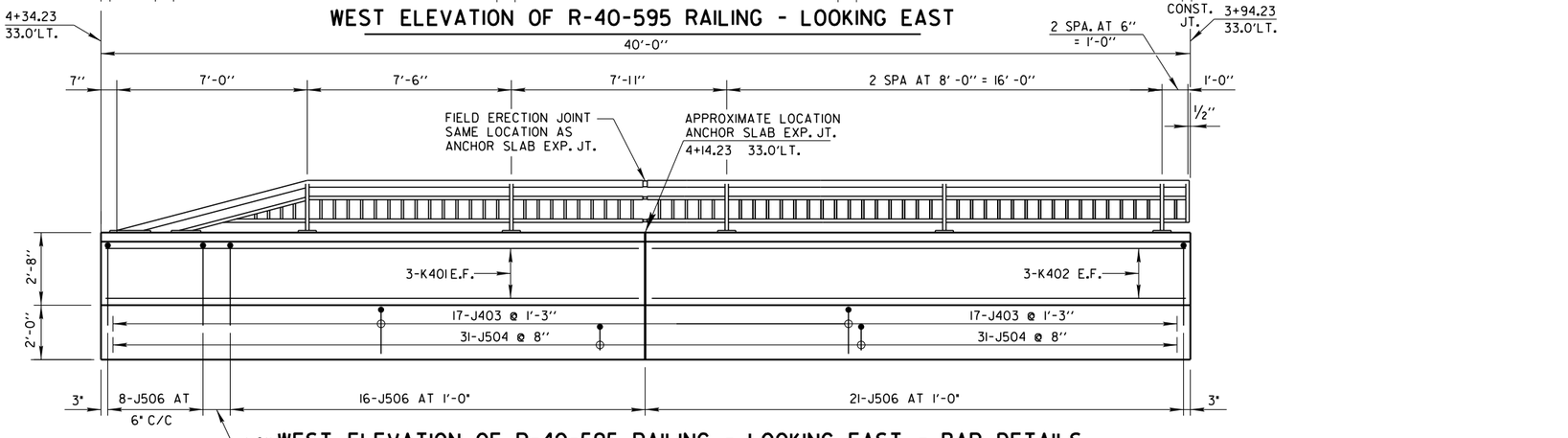
W:\STR\80813\PLANS\NW_RETWALL\ 4NW_RAILINGELEV.DGN 06-16-2014

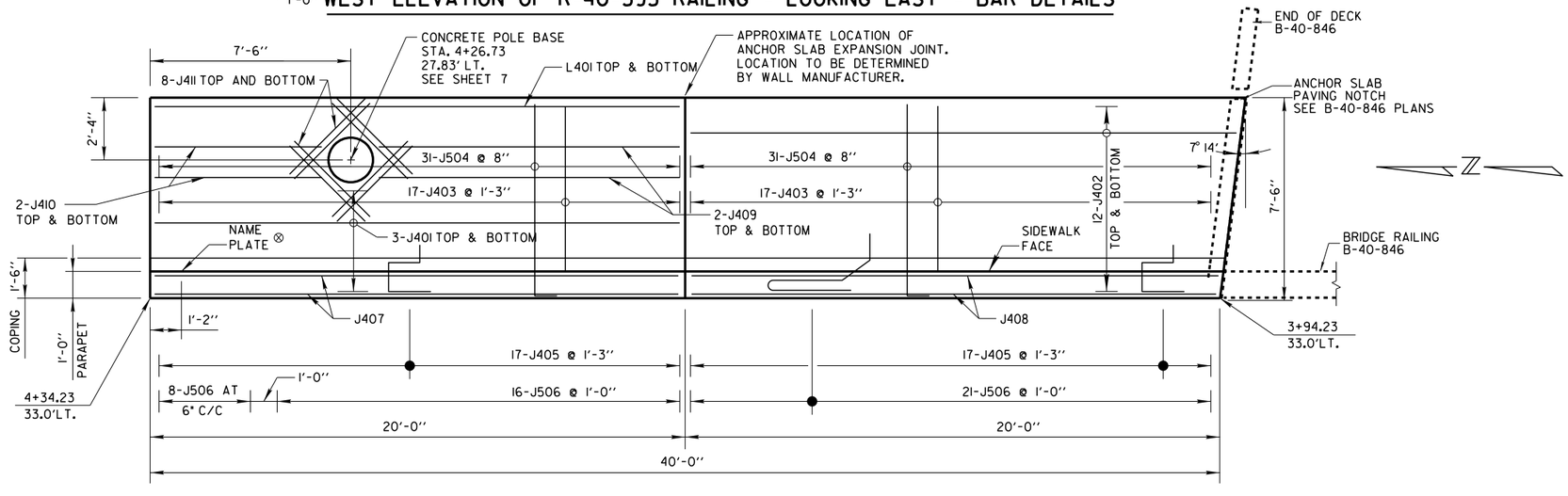
STATE PROJECT NUMBER
2660 - 05 - 70



WEST ELEVATION OF R-40-595 RAILING - LOOKING EAST



WEST ELEVATION OF R-40-595 RAILING - LOOKING EAST - BAR DETAILS



PLAN VIEW OF CAST-IN-PLACE ANCHOR SLAB BAR DETAILS

⊗ NAME PLATE TO BE LOCATED TOP CENTER OF RECESSED PICTURE FRAME

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-595

DRAWN BY	K.P.S.	PLANS CK'D.	J.D.T. J.J.K.

RAILING ELEVATIONS, BAR DETAILS & RAILING PLAN

SHEET 4 OF 7

8

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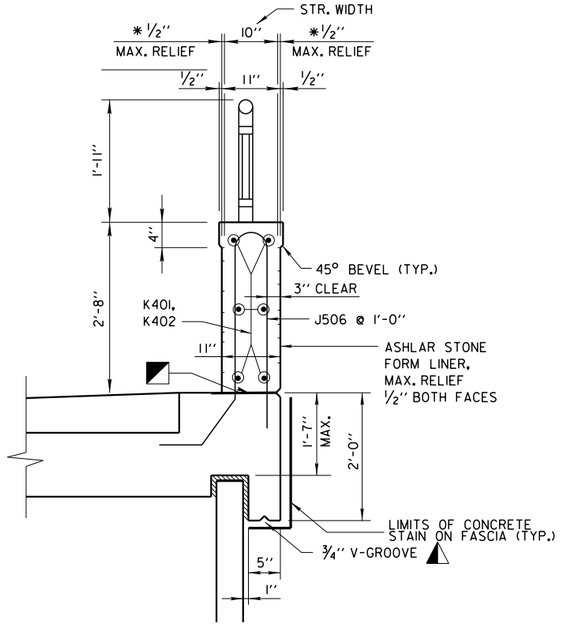
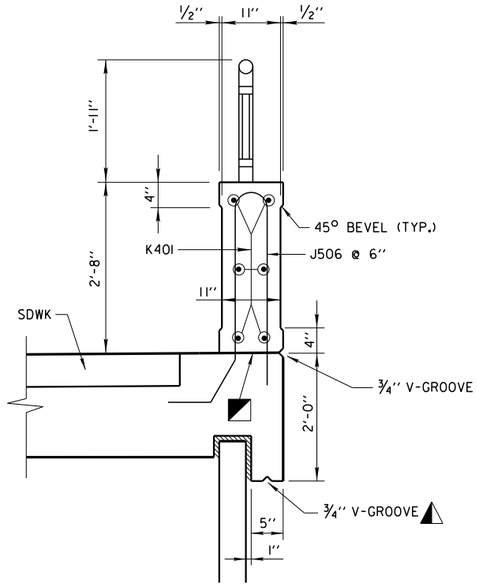


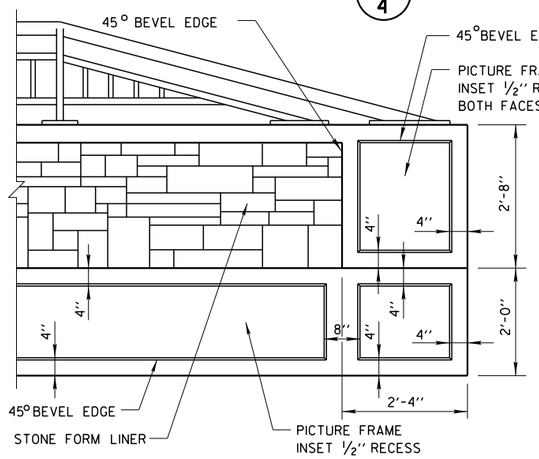
SECTION 1/4



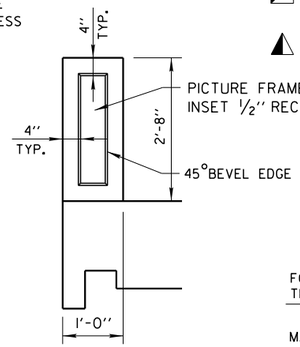
SECTION 2/4

HORIZ. CONST. JOINT-STRIKE OFF AS SHOWN AND LEAVE ROUGH.

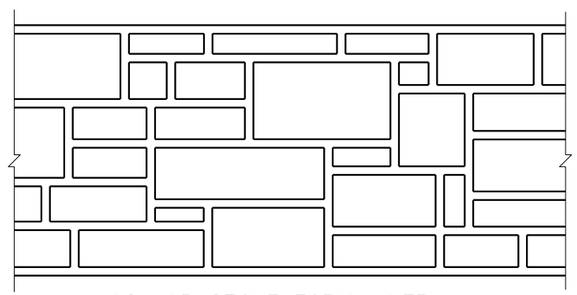
END 2'-0" AWAY FROM FACE OF ABUT.



RAILING PICTURE FRAME INSET ELEVATION

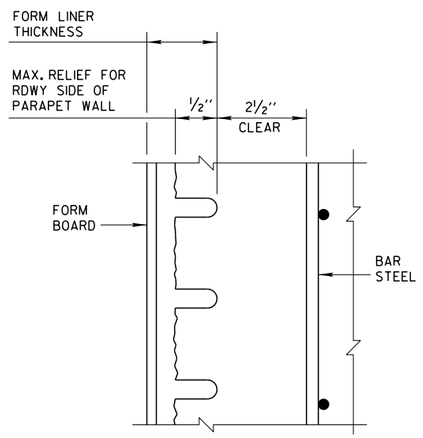


END RAILING PICTURE FRAME INSET ELEVATION

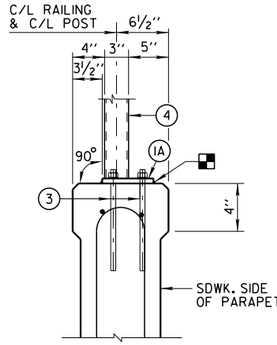


ASHLAR STONE FORM LINER

STONE SIZE = 8-INCH TO 16-INCH, RELIEF = ½-INCH

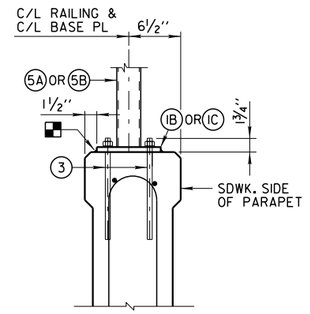


SECTION THRU FORM LINER



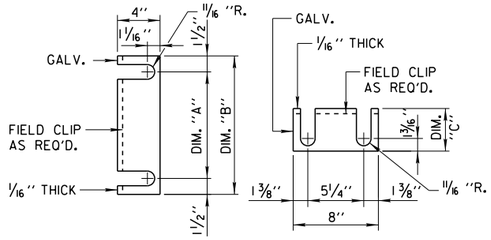
SECTION THRU PARAPET ON ANCHOR SLAB

NOTE: TYPE S ANCHOR SHOWN



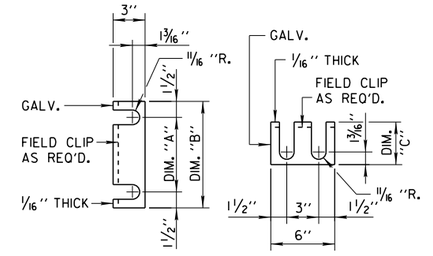
ANCHORAGE FOR END RAIL

NOTE: TYPE S ANCHOR SHOWN



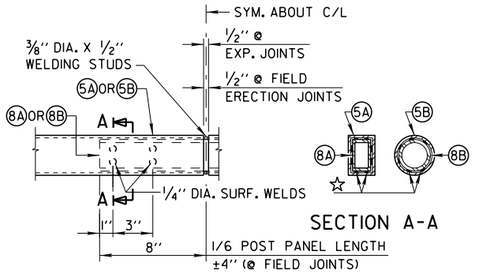
END RAIL SHIM DETAIL

8" X 1'-1" BASE PLATE (1B) DIM. "A" = 10", DIM. "B" = 1'-1", DIM. "C" = 6½"
8" X 1'-6" BASE PLATE (1C) DIM. "A" = 1'-3", DIM. "B" = 1'-6", DIM. "C" = 9"
(2 SETS PER POST)



RAIL POST SHIM DETAIL

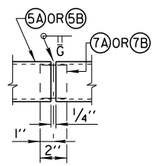
6" X 8" BASE PL (1A) DIM. "A" = 5", DIM. "B" = 8", DIM. "C" = 4".
(2 SETS PER POST)



SECTION A-A

FIELD ERECTION JOINT DETAIL

☆ MIN. ⅝" FLAT SURF. DIA. PUNCHINGS OR STUDS MAY BE USED AS AN ALT.



SHOP RAIL SPLICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)

NOTE:
SEE LEGEND & RAILING NOTES ON SHEET 6

BILL OF BARS - VERTICAL PARAPET WALL

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
K401	X	6	19'-8" *			PARAPET WALL - HORIZ.
K402	X	6	19'-8" *			PARAPET WALL - HORIZ.

* BAR LENGTH TO BE DETERMINED BY WALL MANUFACTURER. EXPANSION JOINT TO BE SPACED A MINIMUM 20' AND A MAXIMUM OF 30' FROM END OF WALL. DO NOT RUN BAR STEEL THRU JOINT. EXPANSION JOINT SHALL LINE UP WITH WALL PANEL JOINT.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-595

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

PARAPET DETAILS AND BILL OF BARS

SHEET 5 OF 7
72

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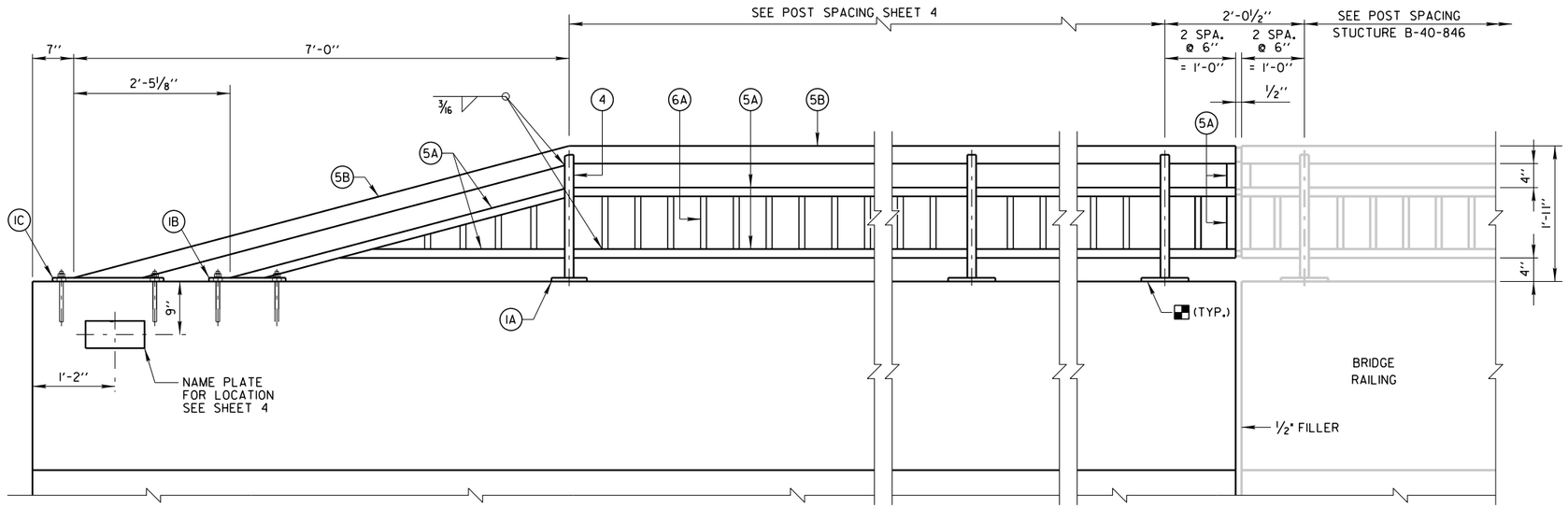
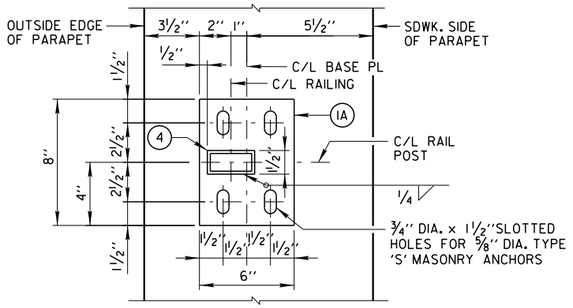
W:\STR\B0813\PLANS\NW RETWALL\ 6NW_STEELRAILINGDET.DGN 09-03-2014

STATE PROJECT NUMBER

2660 - 05 - 70

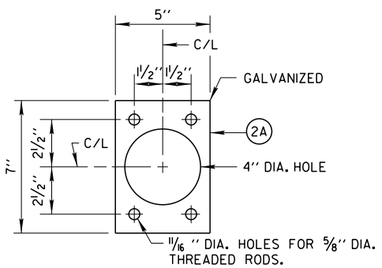


INSIDE ELEVATION OF PARAPET



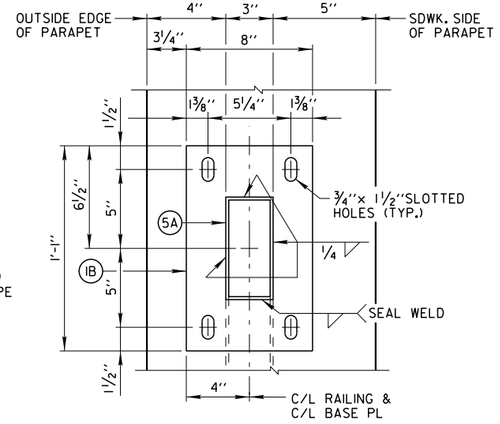
TYPICAL RAIL POST BASE PLATE

FOR 3" X 1½" X 3/16" POSTS (4)



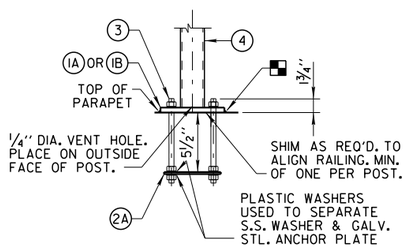
ANCHOR PLATE

FOR 3" x 1½" x 3/16" POSTS (4)



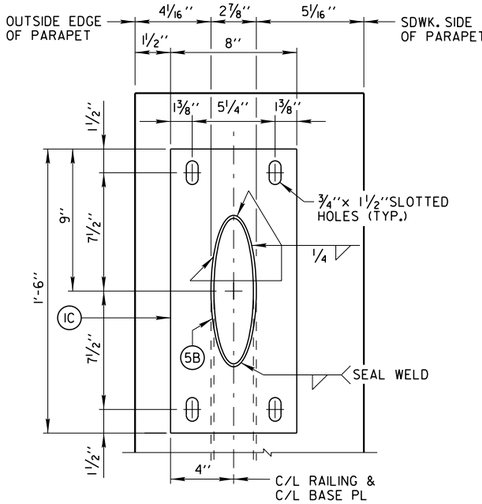
END RAIL BASE PLATE

FOR 3"x1½"x3/16" POSTS (5A)



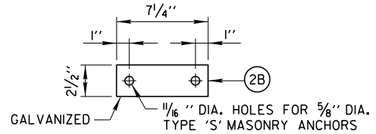
ANCHORAGE FOR RAIL POSTS

NOTE: ANCHOR PLATE NOT REQUIRED WHEN TYPE S ANCHORS ARE USED.



END RAIL BASE PLATE

FOR 2½" DIA. STD. PIPE RAIL (5B)



END RAIL ANCHOR PLATE

FOR END RAIL BASE PLATES (IB) (IC)

2 REQ'D PER END RAIL BASE PL

LEGEND

(1A) PLATE ⅝" x 6" x 8" WITH ¾" x 1½" SLOTTED HOLES.

(1B) PLATE ⅝" x 8" x 1'-1" WITH ¾" x 1½" SLOTTED HOLES.

(1C) PLATE ⅝" x 8" x 1'-6" WITH ¾" x 1½" SLOTTED HOLES.

(2A) ¼" x 5" x 7" ANCHOR PLATE WITH 11/16" DIA. HOLES FOR THREADED RODS NO. 3.

(2B) ¼" x 2½" x 7¼" ANCHOR PLATE WITH 11/16" DIA. HOLES FOR THREADED RODS NO. 3.

(3) ⅝" DIA. x 9" LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70 KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. (ALTERNATE RAIL POST ANCHORAGE: 4 EQUIVALENT STAINLESS STELL CONCRETE MASONRY ANCHORS TYPE S ⅝-INCH, EMBED 7" IN CONCRETE FOR RAIL POSTS. EMBED 5" IN CONCRETE FOR END RAILS.)

(4) STRUCTURAL TUBING 3" x 1½" x 3/16". PLACE VERTICAL. WELD TO NO. 1 & NO. 5.

(5A) STRUCTURAL TUBING 3" x 1½" x 3/16" RAILS. WELD TO NO. 1 & NO. 4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.

(5B) STRUCTURAL TUBING 2½" DIA. (STANDARD SIZE) (2.875" O.D.). WELD TO NO. 1 & NO. 4. INSIDE OF PIPE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.

(6A) BAR 1" x 1" PICKETS. WELD TO NO. 5 (SPACE AT 6" MAX. C/L TO C/L SPACING). PLACE VERTICAL.

(7A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. PROVIDE "SLIDING FIT".

(7B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.).

(8A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. (1'-4" AT FIELD ERECTION JOINTS)

(8B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.). (1'-4" AT FIELD ERECTION JOINTS)

RAILING NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE C2 GALVANIZED R-40-594", WHICH SHALL INCLUDE ALL WORK SHOWN ON THIS SHEET.

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 CUTS.

NO. 1, 2, 6, 7 AND 8 SHALL CONFORM TO ASTM A709 GRADE 36. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B (NO. 4 & NO. 5).

ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET NORMAL TO GRADE.

CUT BOTTOM OF POST TO MAKE POST VERTICAL IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTION.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED OR STAINLESS STEEL.

⅝" DIA. CONCRETE MASONRY ANCHORS TYPE 'S' : MINIMUM PULLOUT STRENGTH 13 KIPS, EMBED 7" MIN. FOR RAIL POSTS AND 5" MIN. FOR END RAILS STAINLESS STEEL.

■ CAULK AROUND PERIMETER OF BASE PLATES, NO. 1, AND FILL BOLT SLOT OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

ALL JOINTS AND RECESSES IN CONCRETE PARAPET ARE TO BE VERTICAL.

ALL MATERIAL (EXCEPT NO. 3) SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SPECIFICATIONS. PAINT OVER GALVANIZING WITH AN APPROVED TIE COAT AND TOP AS SPECIFIED IN THE "BRIDGE SPECIAL PROVISIONS".

VENT HOLES SHALL BE DRILLED IN POST AND RAIL MEMBERS AS REQUIRED TO FACILITATE GALVANIZING AND DRAINAGE.

RAILING SHALL BE FABRICATED IN LENGTHS THAT INCLUDE 3 OR 4 POSTS.

PAINT POSTS, RAILS, SHIMS AND EXPOSED PORTIONS OF ANCHOR BOLTS.

TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-595

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

STEEL RAILING DETAILS

SHEET 6 OF 7

8

8

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRWAING SHALL CONFORM TO THE PERTINENT REQUIEREMENTS OF THE CONTRACT.

BASES SHALL BE INSTALLED WITHIN STRUCTURAL BACKFILL. COORDINATION WITH MSE WALL INSTALLATION IS REQUIRED.

TOP SURFACES OF CONCRETE BASES SHALL BE TROWEL FINISHED SMOOTH AND LEVEL.

CONDUIT SIZES AND LOCATIONS SHALL BE AS SHOWN ON THE PLANS.

MINIMUM BENDING RADIUS OF CONDUIT IS EQUAL TO 5 X THE DIAMETER.

CONDUIT HEIGHT ABOVE CONCRETE BASES SHALL BE 2.5-INCH. ALL METALLIC CONDUIT ENDS SHALL BE REAMED AND THREADED.

ALL CONDUIT ENDS AT THE TOP ON CONCRETE BASES SHALL BE CAPPED IF METALLIC OR PLUGGED IF NONMETALLIC IMMEDIATELY AFTER PLACEMENT AND BEFORE CONCRETE IS POURED. CONDUITS IN WHICH WIRE OR CABLE IS NOT INSTALLED SHALL REMAIN CAPPED OR PLUGGED.

BELL ENDS SHALL BE INSTALLED ON ALL PVC CONDUIT EXPOSED AT THE TOP OF CONCRETE BASES BEFORE INSTALLATION OF CABLE OR WIRE.

ENDS OF CONDUIT INSTALLED BELOW GRADE FOR FUTURE USE SHALL BE CAPPED IF METALLIC OR PLUGGED IF NONMETALLIC.

WHEN REQUIRED TO CONNECT NONMETALLIC CONDUIT TO METALLIC CONDUIT, ONLY ADAPTER FITTINGS, U.L. LISTED FOR ELECTRICAL USE, SHALL BE USED.

IF A BASE REQUIRES A DEEP FORM BECAUSE OF LOOSE DIRT OR FILL, THE FORM SHALL BE REMOVED BEFORE BACKFILLING AROUND THE BASE. BACKFILL SHALL BE TAMPED TIGHT AGAINST THE BARE CONCRETE BASE IN LAYERS OF 1FOOT OR LESS.

A NO. 4 AWG, STRANDED COPPER EQUIPMENT GROUNDING CONDUCTOR SHALL BE EXOTHERMICALLY WELDED TO THE EQUIPMENT GROUNDING ELECTRODE (GROUND ROD).

THE EQUIPMENT GROUNDING CONDUCTOR SHALL ENTER THE BASE THROUGH A 1INCH CONDUIT INSTALLED FOR GROUNDING PURPOSES, LEAVING A 4 FOOT COIL OF WIRE ABOVE THE CONCRETE BASE. THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE NEATLY COILED AND THE COILS TIED TOGETHER.

ANCHOR RODS SHALL BE 1'' X 3'-6''.

ANCHOR RODS SHALL BE THREADED 12'' IN LENGTH ON EACH END OF THE ROD. ANCHOR RODS SHALL BE MANUFACTURED IN ACCORDANCE WITH SECTION 654.2.1 AND 641.2.2 OF THE STANDARD SPECIFICATIONS.

WHEN ANCHOR RODS USING THE ALTERNATE ''L'' BEND ARE FURNISHED, THE 4'' ''L'' BEND SHALL BE IN ADDITION TO THE SPECIFIED ANCHOR ROD BAR LENGTH. THE ''L'' BEND END SHALL NOT BE THREADED.

WELDING OF THE ANCHOR RODS TO THE CAGE IS UNACCEPTABLE. TIE WIRES SHALL BE USED.

ANCHOR RODS SHALL BE INSTALLED WITH MISALIGNMENTS OF LESS THAN 1:40 FROM VERTICAL.

BAR STEEL REINFORCEMENT SHALL BE COATED WITH POWDERED EPOXY RESIN IN ACCORDANCE WITH SECTION 505 OF THE STANDARD SPECIFICATIONS (LATEST EDITION).

GROUNDING ELECTRODE SHALL BE A MINIMUM OF 6'' FROM ADJACENT MSE WALL SOIL REINFORCEMENT.

CONCRETE BASE SHALL BE A MINIMUM OF 3'' FROM ADJACENT MSE SOIL REINFORCEMENT.

INSTALL 1/2'' FILLER BETWEEN CONCRETE BASE AND ANCHOR SLAB.

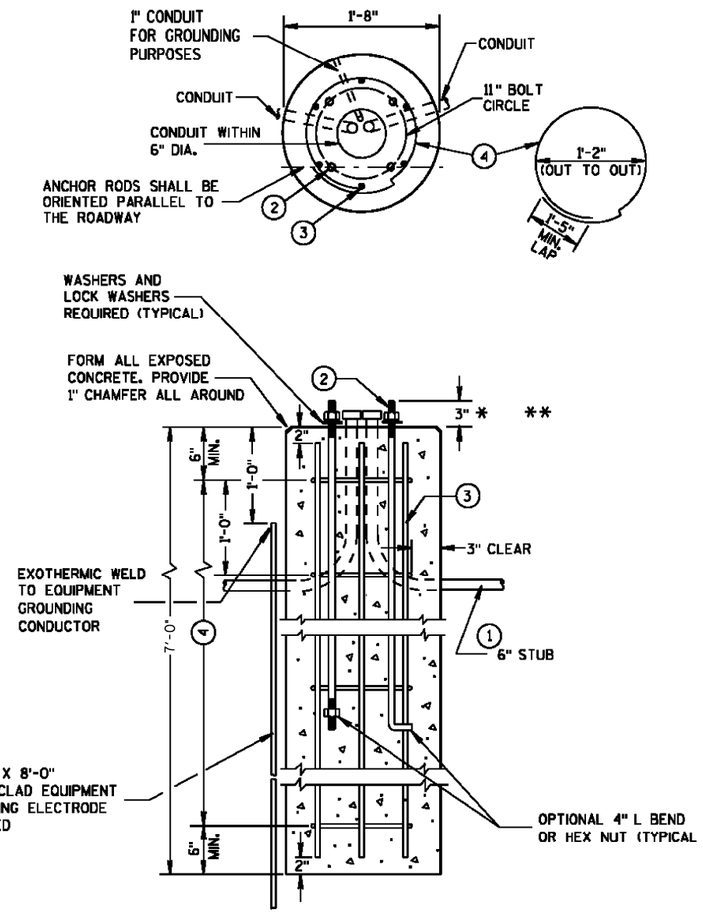
USE OF CIRCULAR AUGER IS PROHIBITED.

(1) CONDUIT SHALL EXIT CONCRETE BASE AT THE ELEVATION OF THE CONDUIT IN THE ADJACENT ANCHOR SLAB. CONNECT CONDUIT EXITING BASE TO CONDUIT IN ANCHOR SLAB.

(2) (4) 1'' DIA. X 3'-6'' ANCHOR RODS.

(3) (6) NO. 4 X 6'-8'' BAR STEEL REINFORCEMENT.

(4) (5) NO. 4 X 5'-1'' BAR STEEL REINFORCEMENT @ 1'-0'' C-C.



CONCRETE BASE, TYPE 6
(FOR 25' ALUMINUM LIGHT POLES)

* ANY ANCHOR ROD PROJECTION SHORTER THAN 2 3/4'' OR LONGER THAN 3 1/4'' SHALL REQUIRE THE BASE TO BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE.

** FOR NONBREAKAWAY INSTALLATIONS, 4 1/2'' ± ANCHOR ROD PROJECTION WITH THE USE OF LEVELING NUTS, RODENT SCREEN REQUIRED.

BASE TO SIT 2'' ABOVE HIGH SIDE OF WALK.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-595

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

CONCRETE BASE DETAILS

8

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GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

ALL STATIONS AND ALL ELEVATIONS ARE IN FEET.
ALL ELEVATIONS ARE REFERRED TO CITY OF MILWAUKEE DATUM.
CITY OF MILWAUKEE DATUM = (NGVD29) 580.60

ALL DIMENSIONS ALONG THE FRONT FACE OF WALL UNLESS OTHERWISE SHOWN.

THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFY BAR SIZE.

BAR REINFORCEMENT SHALL HAVE 2" CLEAR COVER UNLESS SHOWN OTHERWISE.

THESE PLANS ARE FOR A PRECAST CONCRETE PANEL MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL LRFD.

THE CONTRACTOR MUST COORDINATE THE CONSTRUCTION OF WALLS R-40-594, R-40-595, R-40-596, R-40-597, AND BRIDGE B-40-846.

THE CONTRACTOR SHALL PROVIDE COMPLETE DESIGN, PLANS, DETAILS, SPECIFICATIONS, AND SHOP DRAWINGS FOR THE RETAINING WALLS IN ACCORDANCE WITH THE SPECIAL PROVISIONS. THE RETAINING WALL MANUFACTURER SHALL PROVIDE TECHNICAL ASSISTANCE TO THE CONTRACTOR DURING CONSTRUCTION. THE COST OF FURNISHING THESE ITEMS SHALL BE INCLUDED IN THE BID ITEM, "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP".

THE COST OF FURNISHING AND PLACING BACKFILL WITHIN THE REINFORCED SOIL ZONES, UNREINFORCED CONCRETE LEVELING PAD UNDER THE MSE PRECAST WALL PANELS, AND REINFORCEMENT, GEOTEXTILE FABRIC, ENGINEERED BACKFILL, JOINT MATERIAL, AND OTHER MISCELLANEOUS ITEMS IS INCLUDED IN THE COST OF BID ITEM "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP".

BEVEL ALL EXPOSED EDGES OF CONCRETE ¾" UNLESS NOTED OTHERWISE.

THE PLAN QUANTITY FOR THE ITEM "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP" IS BASED ON A WALL HEIGHT MEASURED FROM THE TOP OF THE LEVELING PAD TO THE TOP OF WALL AS SHOWN IN THE PLANS.

PLANS, ELEVATIONS AND DETAILS SHOWN ON THESE DRAWINGS ARE INTENDED TO INDICATE WALL LOCATIONS, LENGTHS HEIGHTS, AND DETAILS COMMON TO THE WALL SYSTEM SELECTED. THE CONTRACTOR SHALL VERIFY THAT THE WALL SYSTEM SELECTED WILL CONFORM TO THE REQUIRED ALIGNMENTS AND DETAILS.

THE MAXIMUM VALUE OF THE ANGLE OF INTERNAL FRICTION OF THE WALL BACKFILL MATERIAL IN THE REINFORCED ZONE SHALL BE ASSUMED TO BE 30° WITHOUT CERTIFIED TEST VALUES.

PLACE BACKFILL IN SPECIFIED LAYER THICKNESS STARTING AT BACK FACE OF WALL AND WORKING AWAY FROM WALL.

UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITIES PRIOR TO EXCAVATING. DAMAGE TO EXISTING UTILITES SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.

THE RETAINING WALL IS TO BE DESIGNED USING THE ELEVATIONS GIVEN ON THIS SHEET.

CONCRETE LEVELING PAD INCIDENTAL TO BID ITEM "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP."

SEE SPECIAL PROVISIONS FOR AESTHETIC TREATMENT TO PARAPET.

■ THE LENGTHS PROVIDED IN THE TABLE ARE THE MINIMUM REQUIRED REINFORCEMENT LENGTHS BASED UPON THE MINIMUM DESCRIBED IN THE WALL SYSTEM SPECIAL PROVISIONS OR EXTERNAL AND OVERALL STABILITY AT THE DESIGNATED LOCATIONS. THESE DESIGNATED LOCATIONS REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS, BUT SHALL NOT BE CONSIDERED ALL INCLUSIVE. THE CONTRACTOR DESIGN LENGTHS SHALL MEET OR EXCEED THE MINIMUM VALUES REPRESENTED IN THE TABLE AT THESE DESIGNATED LOCATIONS.

PAINT FOR STEEL RAILING TO MATCH FEDERAL STANDARD COLOR NO. 595C COLOR NO. 27038

CONCRETE STAINING COLOR : TK COLORS- 4035P GATEPOST.

DESIGN DATA

MATERIAL PROPERTIES:

CONCRETE MASONRY	f'c = 4,000 PSI
PRECAST CONCRETE WALL PANEL	f'c = 4,000 PSI
BAR STEEL REINFORCEMENT	fy = 60,000 PSI

LIVE LOAD:

LIVE LOAD SURCHARGE	240 PSF

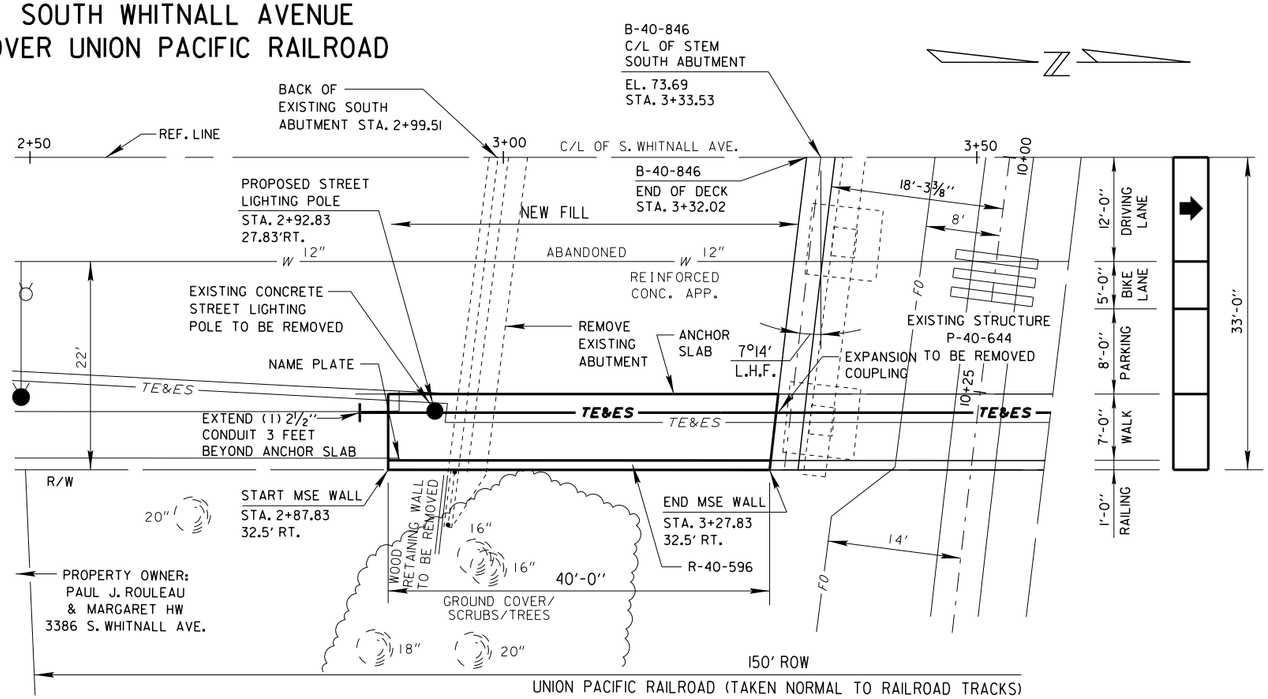
BRIDGE OFFICE CONTACT:

WILLIAM DREHER - PHONE: (608) 266-8489

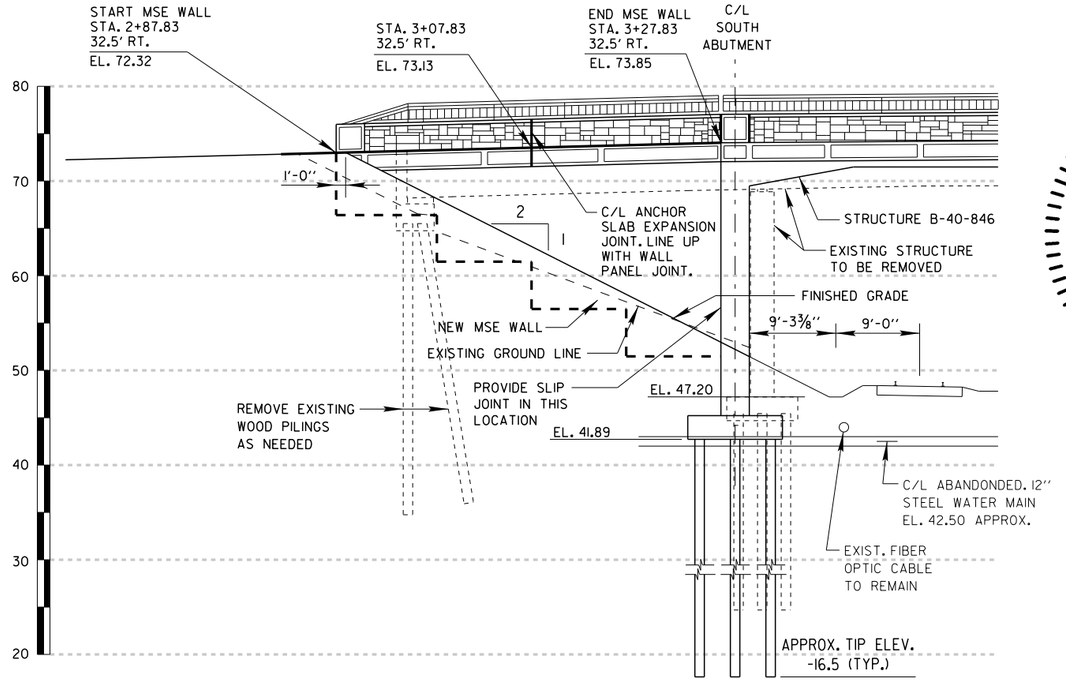
CITY OF MILWAUKEE CONTACT:

CRAIG LIBERTO - PHONE: (414) 286-3294

SOUTH WHITNALL AVENUE OVER UNION PACIFIC RAILROAD



PLAN VIEW



EAST ELEVATION

LOOKING WEST

STATE PROJECT NUMBER

2660 - 05 - 70

WALL EXTERNAL STABILITY EVALUATION

WALL HEIGHT (FEET)	22'-5"
EXPOSED WALL HEIGHT (FEET)	20'-11"
MINIMUM LENGTH OF REINFORCEMENT (FEET) ■	14'-7"
LENGTH OF REINFORCEMENT / WALL HEIGHT	0.70
WALL STATION	3+27.83
TEST BORING USED	2.6

SOIL PARAMETERS

STRATUM LOCATION & SOIL DESCRIPTION	UNIT DENSITY (PCF)	FRICTION ANGLE (DEGREES)	COHESION (PSF)
FOUNDATION SOIL	135	28	400
RETAINED SOIL	135	28	0
WALL FILL	120	30	0

CAPACITY TO DEMAND RATIO (CDR)

SLIDING (CDR ≥ 1.0)	1.1
ECCENTRICITY (CDR > 1.0)	1.9
BEARING (CDR > 1.0)	2.1
GLOBAL STABILITY (CDR > 1.0)	1.6

GEOMETRY TABLE

STATION	OFFSET TO F.F. WALL	TOP OF WALL ELEV.	FINISHED GRADE ELEV.
2+87.83	33.0' RT.	72.32	72.32
3+07.83	33.0' RT.	73.13	62.98
3+27.83	33.0' RT.	73.85	52.98

BM: HYDRANT
3386 S. WHITNALL AVE.
STA. 2+49.06, 25.3'RT.
ELEV: 71.36

WISCONSIN
CRAIG S. LIBERTO
E-23746
MILWAUKEE
WIS.
PROFESSIONAL ENGINEER
Craig S. Liberto 12/3/2014

LIST OF DRAWINGS

NO.	DATE	REVISION	BY

ORIGINAL PLANS PREPARED BY
CITY OF MILWAUKEE
DEPARTMENT OF PUBLIC WORKS
INFRASTRUCTURE SERVICES DIVISION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

ACCEPTED William C. Dreher KAR 12/05/14
CHIEF STRUCTURES DESIGN ENGINEER DATE

STRUCTURE R-40-596

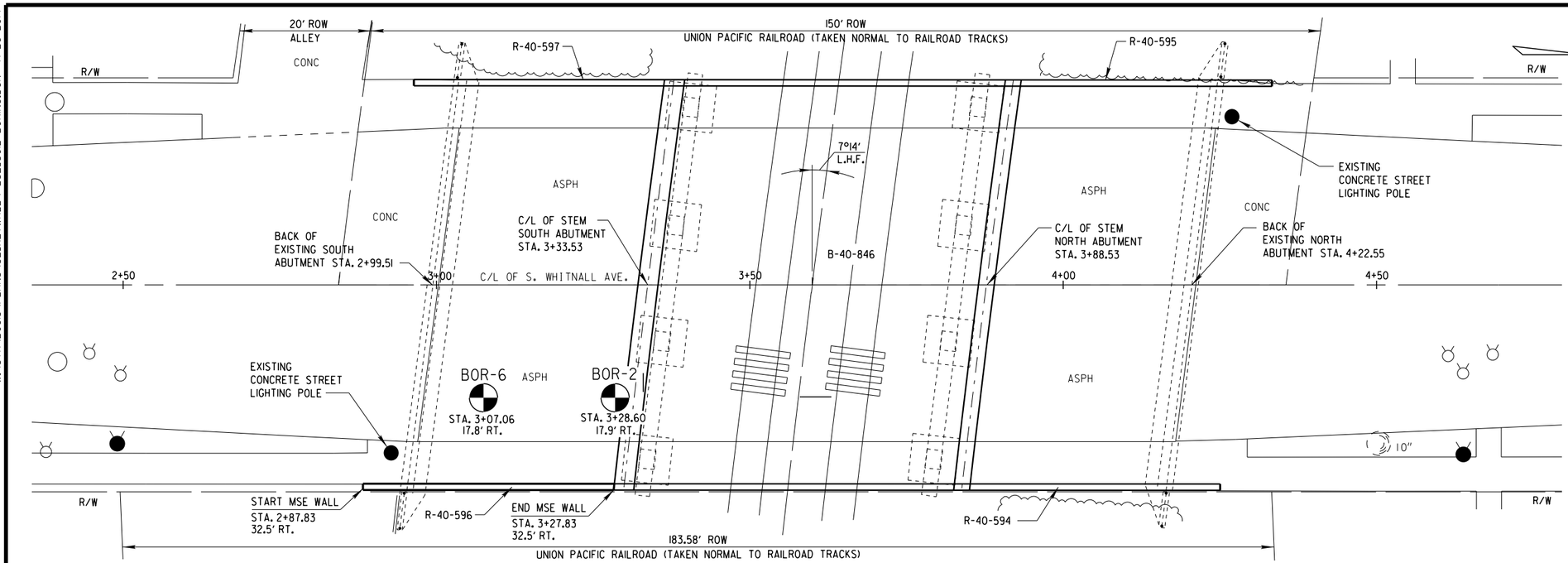
S. WHITNALL AVE. OVER U.P.R.R.

COUNTY	MILWAUKEE	~~TOWN~~/CITY/ ~~VILLAGE~~	MILWAUKEE
DESIGN SPEC.	AASHTO LRFD SPECIFICATION		
DESIGNED BY JDT	DESIGN CK'D. JJK	DRAWN BY KPS	PLANS CK'D. JJK

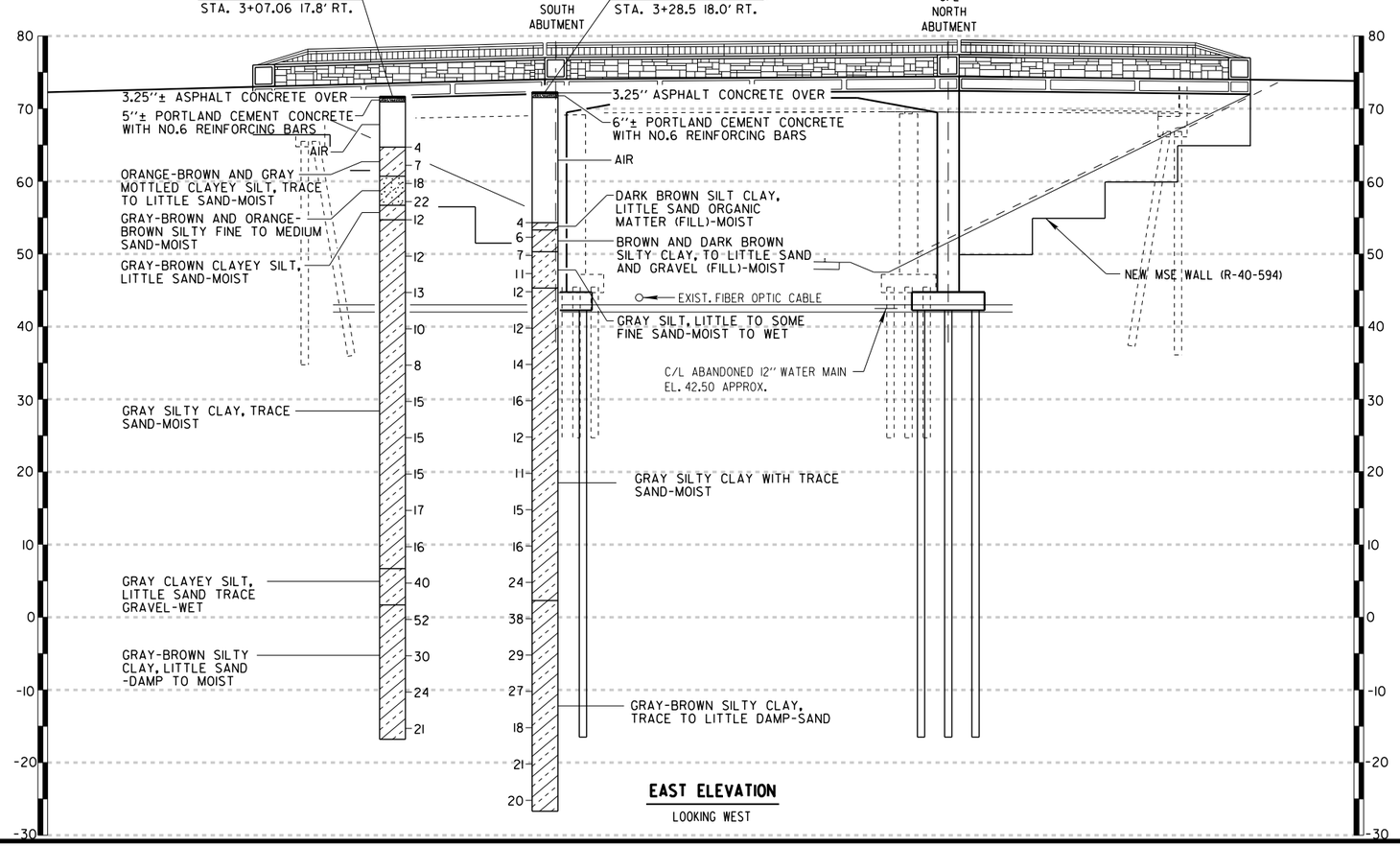
GENERAL PLAN AND ELEVATION

SHEET 1 OF 7
75

W:\STR\B0813\PLANS\SE_RETWALL\ 2SE_SOIL BORING.DGN 11-26-2014



PLAN VIEW



EAST ELEVATION

LOOKING WEST

NOTE:

THE SUBSURFACE INFORMATION PRESENTED HEREIN IS AN ABBREVIATED VERSION OF THE INFORMATION PRESENTED IN THE GEOTECHNICAL ENGINEERING REPORT.

REVIEW THE GEOTECHNICAL ENGINEERING REPORT AND SOIL BORING LOGS DATED JANUARY 22, 2013 AND ALL SUBSEQUENT REVISIONS FOR ADDITIONAL SUBSURFACE INFORMATION.

SOIL BORINGS COMPLETED BY GILES ENGINEERING

⊕ - DENOTES SOIL BORING

STATE PROJECT NUMBER

2660 - 05 - 70

ABBREVIATIONS

F — FINE M — MEDIUM C — COARSE
WS — WEATHERED SO — SOUND

MATERIAL SYMBOLS

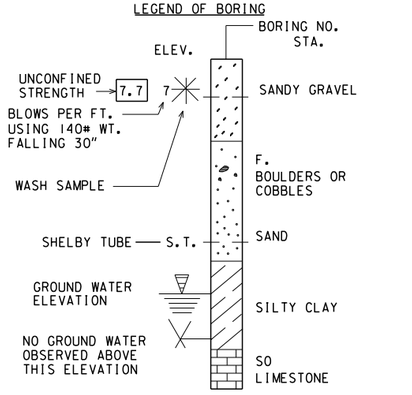
TOPSOIL, SILT, SANDSTONE
SAND, PEAT, LIMESTONE
GRAVEL, CLAY, IGNEOUS ROCK

LEGEND OF PROBING

95/6=95 BLOWS FOR 6" PENETRATION
PROBING TAKEN WITH A 350# WT. FALLING 18" ON A 2" O.D. POINT.

PROBING NO.
STATION
ELEVATION
7 AVERAGE BLOWS PER FOOT
REFUSAL 95/6

LEGEND OF BORING



UNLESS OTHERWISE SPECIFIED, THE BLOWS PER FOOT AT THE LOCATIONS INDICATED ARE BASED ON DRIVING A 2" O.D. X 1.4" I.D. SPLIT SPOON SAMPLER WITH A 140# HAMMER HAVING A FREE FALL OF 30". THE BLOW COUNT IS TAKEN IN UNDISTURBED SOIL IMMEDIATELY BELOW A CASED OR OPEN HOLE ELIMINATING SIDE FRICTION ON THE DRIVE PIPE.

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

TO OBTAIN RELATIVE DATA CONCERNING THE CHARACTER OF MATERIAL IN AND UPON WHICH THE FOUNDATION MIGHT BE BUILT, BORINGS AND/OR SOUNDINGS WERE MADE AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING. THE DATA PRESENTED HEREIN REPRESENTS THE FINDINGS OF THE SUBSURFACE EXPLORATIONS MADE. HOWEVER, BECAUSE THE DEPTHS INVESTIGATED ARE LIMITED AND THE AREA OF THE BORINGS AND/OR SOUNDINGS IS VERY SMALL IN RELATION TO THE ENTIRE AREA, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT CONDITIONS BELOW THE DEPTHS INVESTIGATED OR THAT THE CLASSIFICATION OF MATERIAL ENCOUNTERED IN THESE INVESTIGATIONS IS NECESSARILY TYPICAL OF THE ENTIRE SITE.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-596

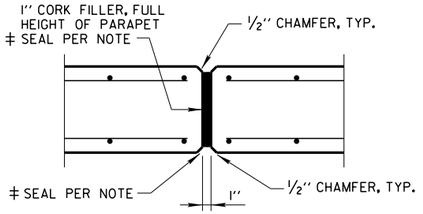
DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

SUBSURFACE EXPLORATION

SHEET 2 OF 7

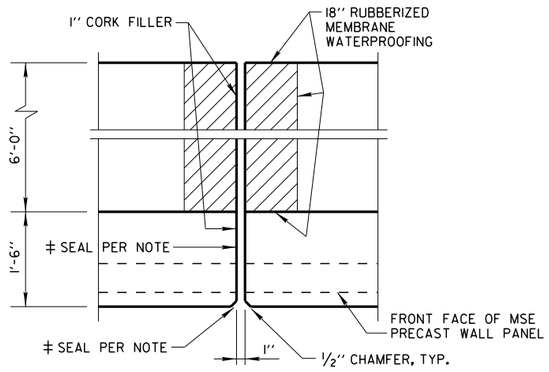
8

8



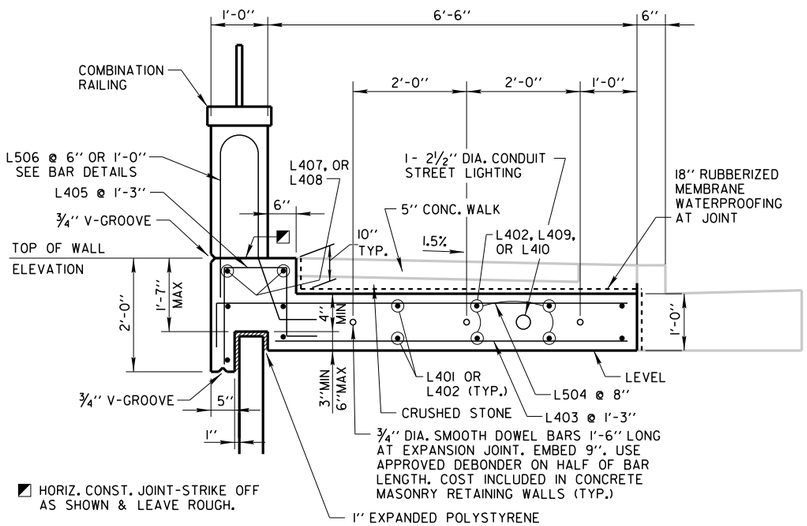
COMBINATION RAILING EXPANSION JOINT DETAIL

‡ NOTE: SEAL ALL EXPOSED HORIZ. AND VERT. SURFACES OF FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONC.)



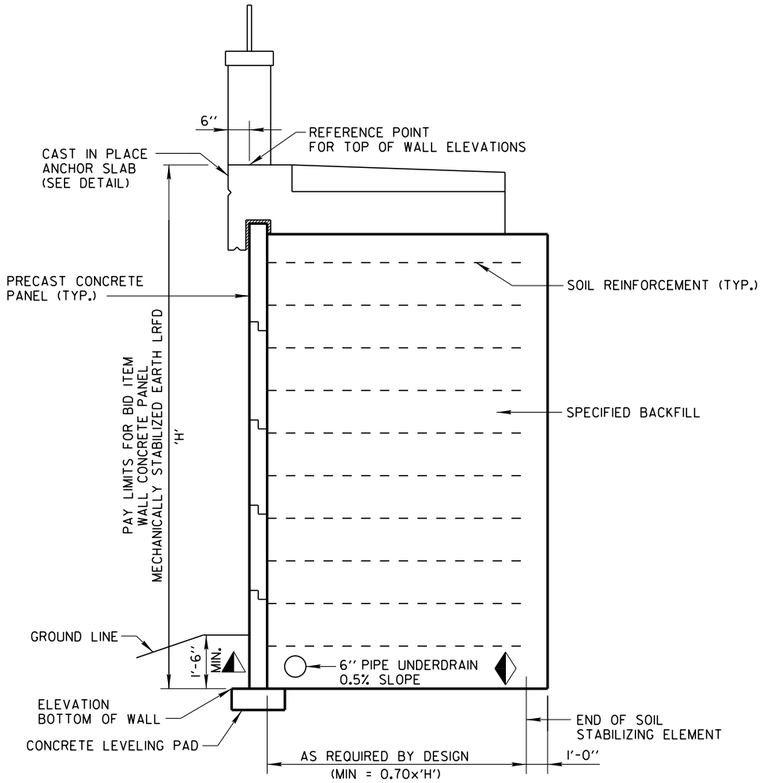
* ANCHOR SLAB EXPANSION JOINT DETAIL

PLAN VIEW



CAST IN PLACE ANCHOR SLAB DETAIL

NOTE: SEE ROADWAY PLAN FOR 5" CONC. WALK AND CRUSHED STONE DETAILS.



TYPICAL CROSS SECTION

▲ MINIMUM EMBEDMENT BASED ON SITE SPECIFIC PARAMETERS (1'-6" MINIMUM FOR ALL WALLS ON LEVEL GROUND). FIELD EMBEDMENTS SHALL MEET OR EXCEED THE MINIMUM EMBEDMENT. FIELD EMBEDMENTS BELOW MINIMUM EMBEDMENT SHALL NOT BE INCLUDED IN THE PAY LIMITS.

◆ SEE STRUCTURE B-40-846 FOR PIPE UNDERDRAIN DETAILS AND BID ITEM

ESTIMATE OF QUANTITIES

ITEM NO.	BID ITEMS	UNIT	TOTAL
504.0500	CONCRETE MASONRY RETAINING WALLS	CY	17
505.0615	BAR STEEL REINFORCEMENT HS COATED RETAINING WALLS	LB	1,645
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	2
517.1010.S	CONCRETE STAINING (R-40-596)	SF	181
517.1015.S	CONCRETE STAINING MULTI-COLOR (R-40-596)	SF	176
517.1050.S	ARCHITECTURAL SURFACE TREATMENT (R-40-596)	SF	176
652.0230	CONDUIT RIGID NONMETALLIC SCHEDULE 40 2½-INCH	LF	43
SPV.0060.01	CONCRETE BASES	EACH	1
SPV.0105.04	RAILING STEEL TYPE C2 GALVANIZED (R-40-596)	LS	1
SPV.0165.01	WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP	SF	550
	NON-BID ITEMS		
	PREFORMED JOINT FILLER	SIZE	
	NON-BITUMINOUS JOINT FILLER	SIZE	
	NAME PLATE	EACH	

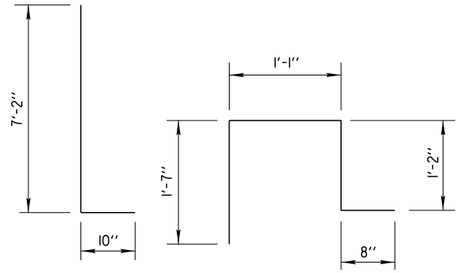
BILL OF BARS - R-40-596

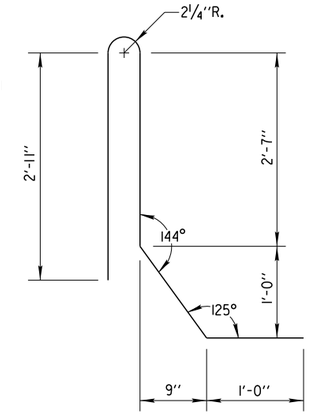
BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
L401	×	8	19'-8" *			LONGITUDINAL
L402	×	12	19'-3" *		△	LONGITUDINAL
L403	×	34	6'-2"			TRANSVERSE - BOTTOM
L504	×	62	7'-11"	×		TRANSVERSE - TOP
L405	×	34	4'-3"	×		EDGE CAP
L506	×	45	7'-2"	×		RAILING DOWEL
L407	×	2	19'-8" *			EDGE CAP LONGITUDINAL
L408	×	2	19'-8" *			EDGE CAP LONGITUDINAL
L409	×	4	3'-9"			LONGITUDINAL
L410	×	4	13'-11"			LONGITUDINAL
L411	×	16	4'-0"			DIAGONAL AT POLE BASE

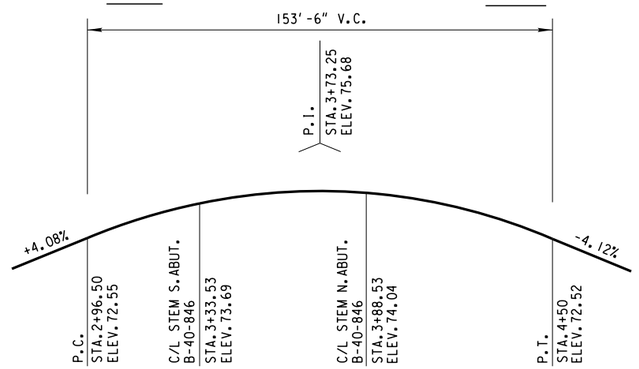
△

BAR MARK	NO. REQUIRED	LENGTH
L402	2 SERIES OF 6	18'-9" TO 19'-8"

* BAR LENGTH TO BE DETERMINED BY WALL MANUFACTURER. EXPANSION JOINT TO BE SPACED A MINIMUM 20' AND A MAXIMUM OF 30' FROM END OF WALL. DO NOT RUN BAR STEEL THRU JOINT. EXPANSION JOINT SHALL LINE UP WITH WALL PANEL JOINT.







PROFILE GRADE LINE ALONG C/L OF S. WHITNALL AVE.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-596

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

WALL DETAILS AND QUANTITIES

SHEET 3 OF 7
77

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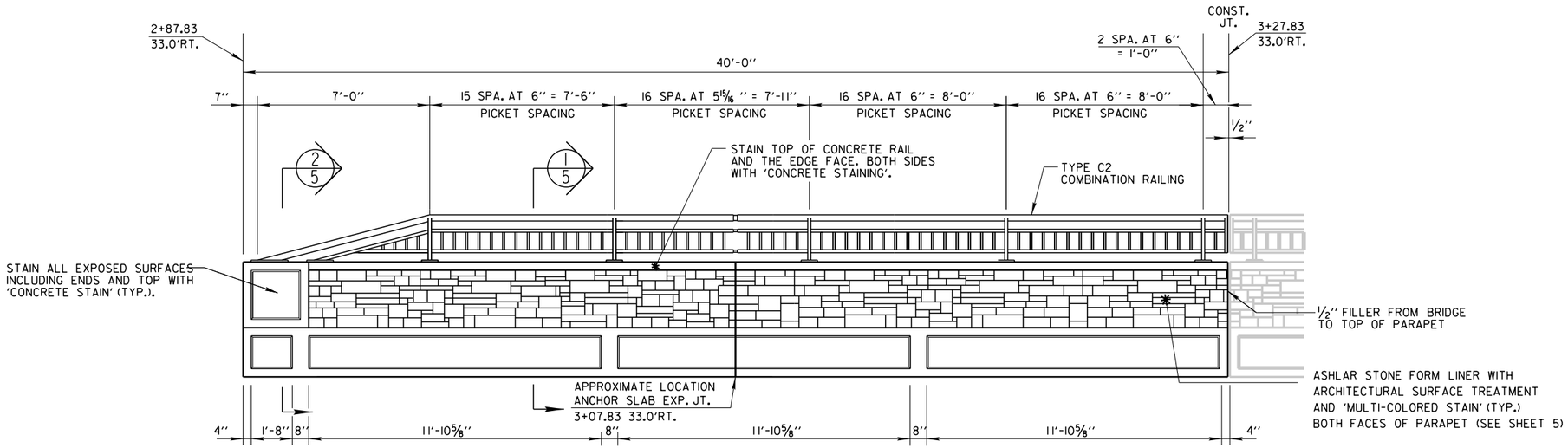
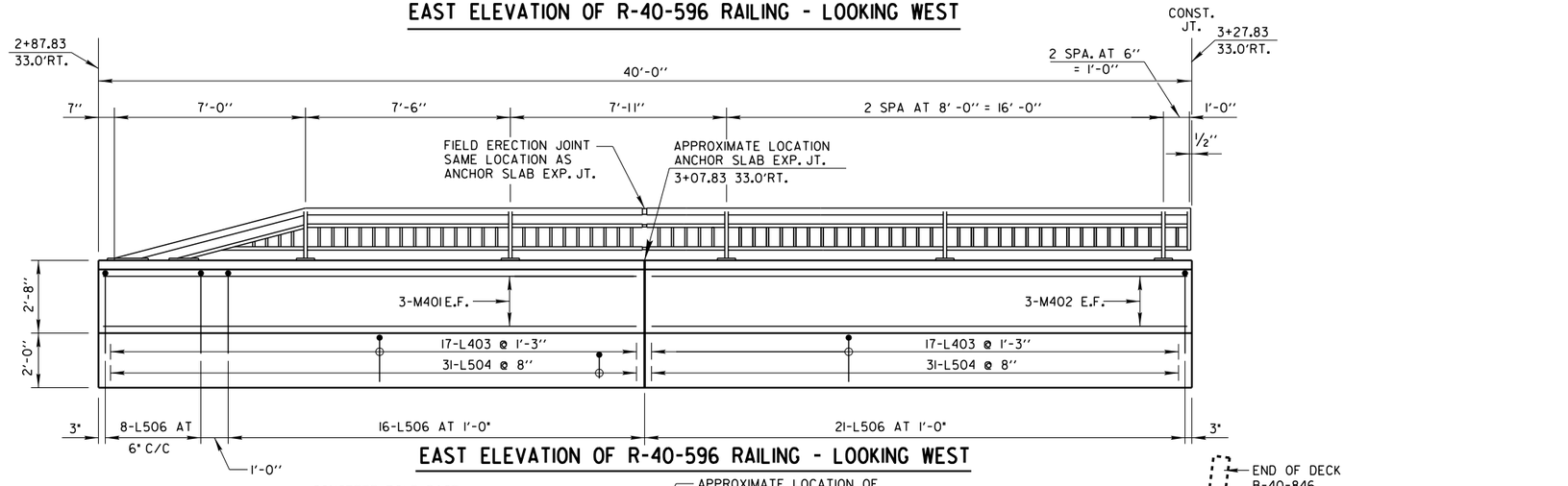
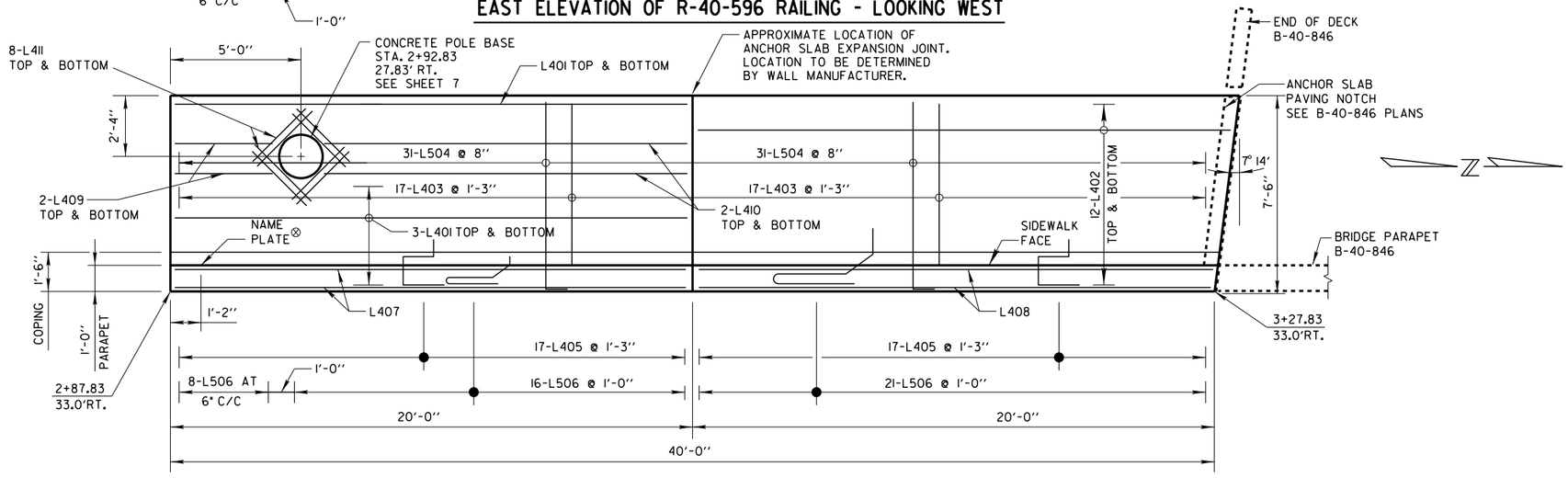
STATE PROJECT NUMBER
2660 - 05 - 70



EAST ELEVATION OF R-40-596 RAILING - LOOKING WEST



EAST ELEVATION OF R-40-596 RAILING - LOOKING WEST



PLAN VIEW OF CAST-IN-PLACE ANCHOR SLAB BAR DETAILS

⊗ NAME PLATE TO BE LOCATED TOP CENTER OF RECESSED PICTURE FRAME

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-596

DRAWN BY	K.P.S.	PLANS CK'D.	J.D.T. J.J.K.

RAILING ELEVATIONS, BAR DETAILS & RAILING PLAN

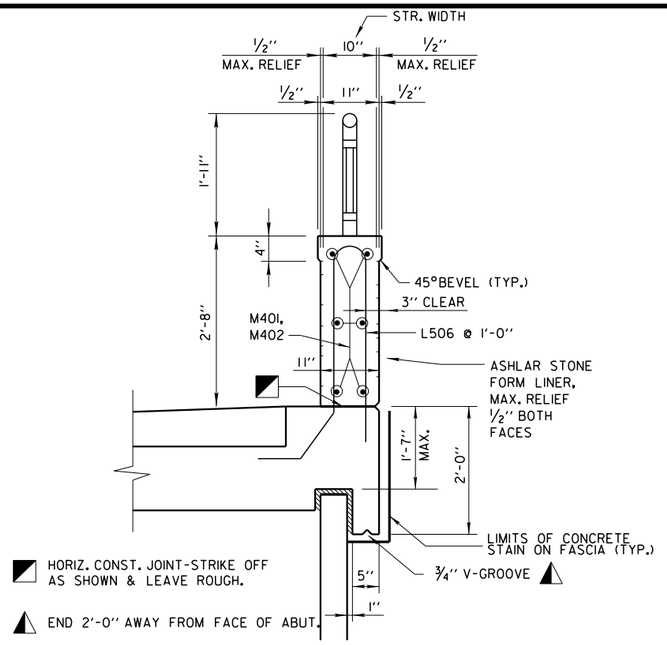
SHEET 4 OF 7

8

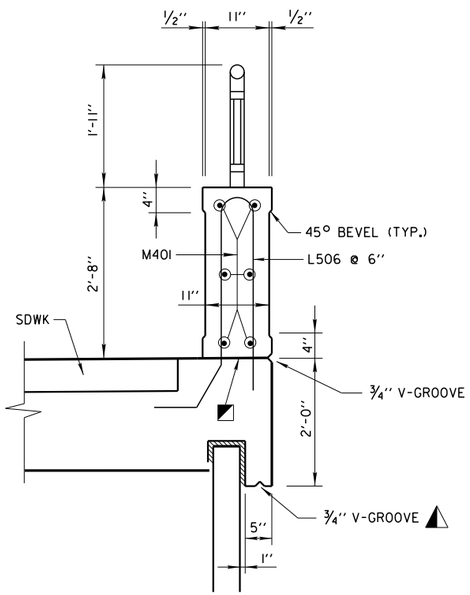
8

STATE PROJECT NUMBER

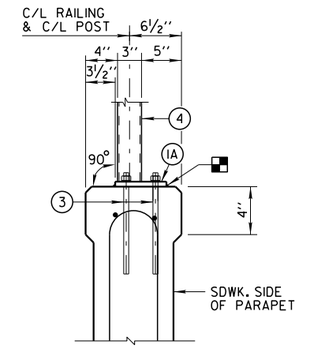
2660 - 05 - 70



SECTION 1/4

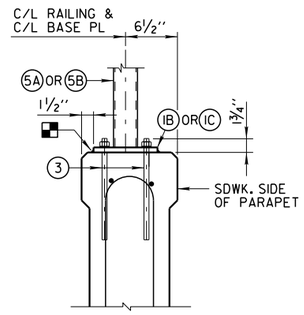


SECTION 2/4



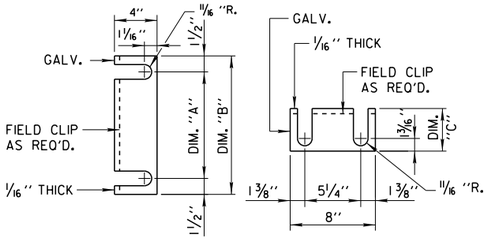
SECTION THRU PARAPET ON ANCHOR SLAB

NOTE: TYPE S ANCHORS SHOWN



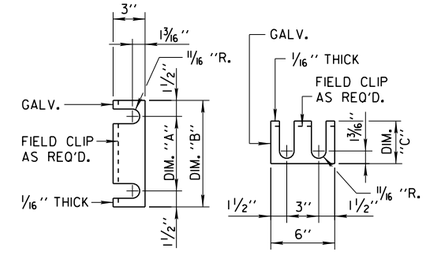
ANCHORAGE FOR END RAIL

NOTE: TYPE S ANCHORS SHOWN



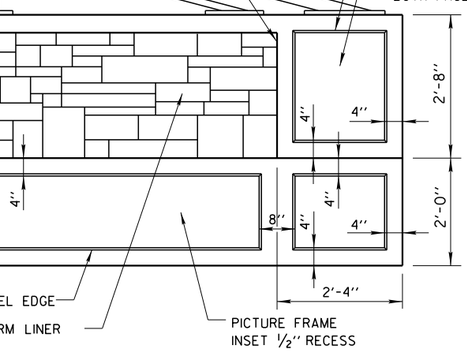
END RAIL SHIM DETAIL

8" X 1'-1" BASE PLATE (1B) DIM. "A" = 10", DIM. "B" = 1'-1", DIM. "C" = 6 1/2"
8" X 1'-6" BASE PLATE (1C) DIM. "A" = 1'-3", DIM. "B" = 1'-6", DIM. "C" = 9"
(2 SETS PER POST)

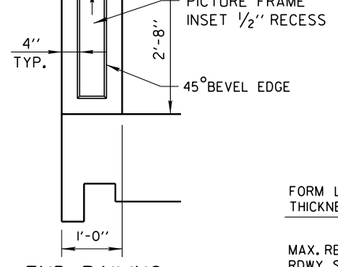


RAIL POST SHIM DETAIL

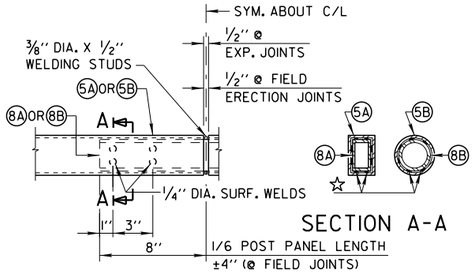
6" X 8" BASE PL (1A) DIM. "A" = 5", DIM. "B" = 8", DIM. "C" = 4".
(2 SETS PER POST)



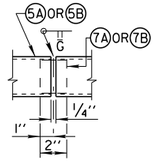
RAILING PICTURE FRAME INSET ELEVATION



END RAILING PICTURE FRAME INSET ELEVATION

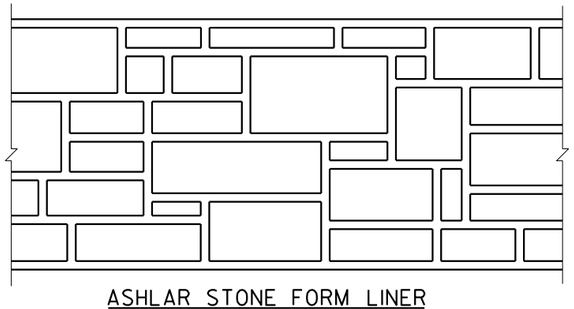


SECTION A-A



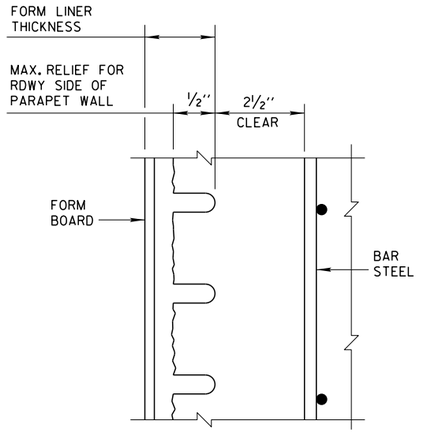
SHOP RAIL SPLICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)



ASHLAR STONE FORM LINER

STONE SIZE = 8-INCH TO 16-INCH, RELIEF = 1/2-INCH



SECTION THRU FORM LINER

FIELD ERECTION JOINT DETAIL

☆ MIN. 5/8" FLAT SURF. DIA. PUNCHINGS OR STUDS MAY BE USED AS AN ALT.

NOTE:
SEE LEGEND & RAILING NOTES ON SHEET 6

BILL OF BARS - VERTICAL PARAPET WALL

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
M401	X	6	19'-8"			PARAPET WALL - HORIZ.
M402	X	6	19'-8"			PARAPET WALL - HORIZ.

* BAR LENGTH TO BE DETERMINED BY WALL MANUFACTURER. EXPANSION JOINT TO BE SPACED A MINIMUM 20' AND A MAXIMUM OF 30' FROM END OF WALL. DO NOT RUN BAR STEEL THRU JOINT. EXPANSION JOINT SHALL LINE UP WITH WALL PANEL JOINT.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-596

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

PARAPET DETAILS AND BILL OF BARS

SHEET 5 OF 7

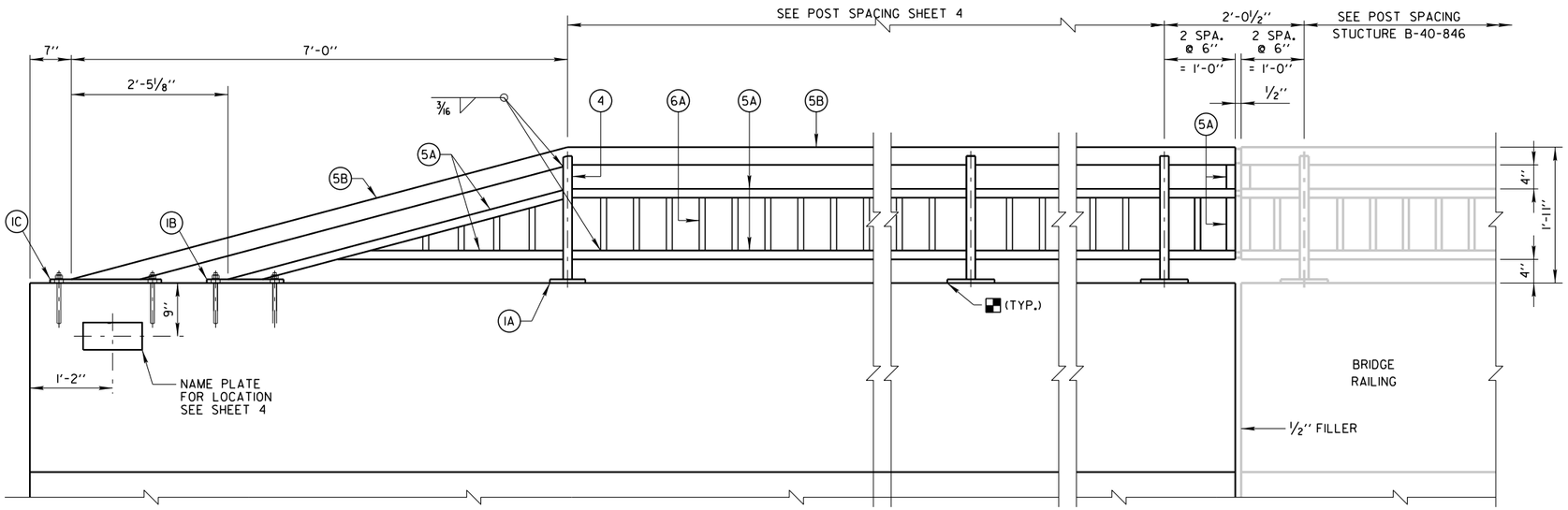
8

8

W:\STR\B0813\PLANS\SE_RETWALL\ GSE_STEELRAILINGDET.DGN 09-03-2014

STATE PROJECT NUMBER

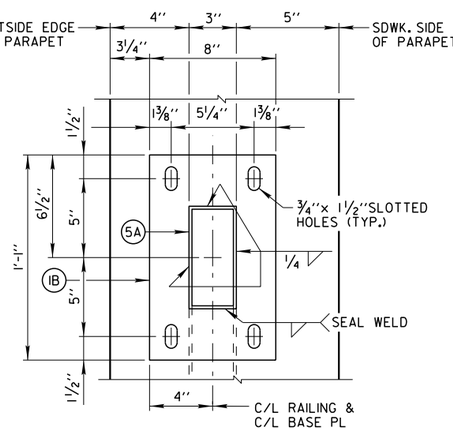
2660 - 05 - 70



INSIDE ELEVATION OF PARAPET

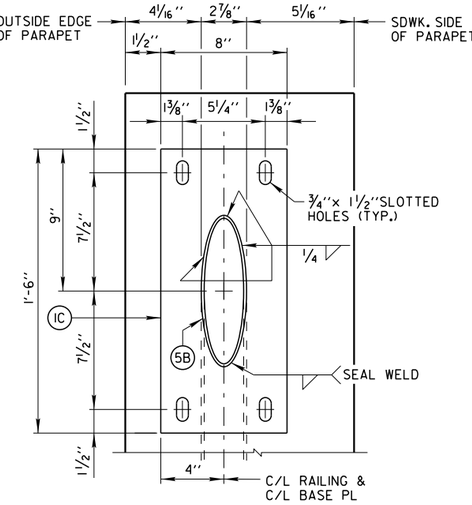
TYPICAL RAIL POST BASE PLATE

FOR 3" X 1½" X 3/16" POSTS (4)



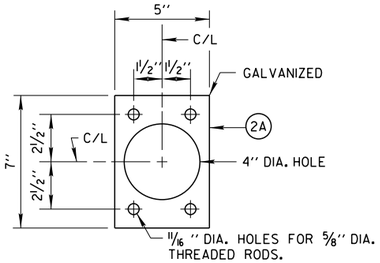
END RAIL BASE PLATE

FOR 3"x1½"x3/16" POSTS (5A)



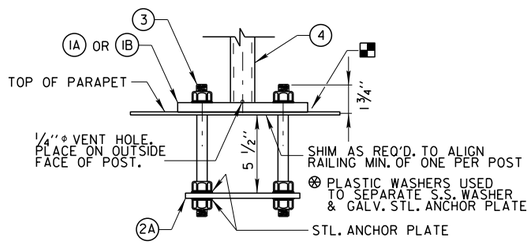
END RAIL BASE PLATE

FOR 2½" DIA. STD. PIPE RAIL (5B)



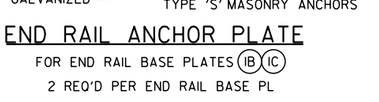
ANCHOR PLATE

FOR 3" x 1½" x 3/16" POSTS (4)



ANCHORAGE FOR RAIL POSTS

NOTE: ANCHOR PLATE NOT REQUIRED WHEN TYPE S ANCHORS ARE USED



END RAIL ANCHOR PLATE

FOR END RAIL BASE PLATES (IB) (IC)

2 REQ'D PER END RAIL BASE PL

LEGEND

(1A) PLATE ⅝" x 6" x 8" WITH ¾" x 1½" SLOTTED HOLES.

(1B) PLATE ⅝" x 8" x 1'-1" WITH ¾" x 1½" SLOTTED HOLES.

(1C) PLATE ⅝" x 8" x 1'-6" WITH ¾" x 1½" SLOTTED HOLES.

(2A) ¼"x5"x7" ANCHOR PLATE WITH 11/16" Ø HOLES FOR THR'D. RODS NO.3

(2B) ¼" x 2½" x 7¼" ANCHOR PLATE WITH 11/16" DIA. HOLES FOR THREADED RODS NO. 3.

(3) ⅝" DIA. x 9" LONG. TYPE 316 STANLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. (ALTERNATE RAIL POST ANCHORAGE: 4 EQUIVALENT STAINLESS STEEL CONCRETE MASONRY ANCHORS TYPE S ⅝"-IN. EMBED 7" IN CONCRETE FOR RAIL POSTS. EMBED 5" IN CONCRETE FOR END RAILS)

(4) STRUCTURAL TUBING 3" x 1½" x 3/16". PLACE VERTICAL. WELD TO NO. 1 & NO. 5.

(5A) STRUCTURAL TUBING 3" x 1½" x 3/16" RAILS. WELD TO NO. 1 & NO. 4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.

(5B) STRUCTURAL TUBING 2½" DIA. (STANDARD SIZE) (2.875" O.D.). WELD TO NO. 1 & NO. 4. INSIDE OF PIPE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.

(6A) BAR 1" x 1" PICKETS. WELD TO NO. 5 (SPACE AT 6" MAX. C/L TO C/L SPACING). PLACE VERTICAL.

(7A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. PROVIDE "SLIDING FIT".

(7B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.).

(8A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. (1'-4" AT FIELD ERECTION JOINTS.)

(8B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.). (1'-4" AT FIELD ERECTION JOINTS.)

RAILING NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE C2 GALVANIZED R-40-596", WHICH SHALL INCLUDE ALL WORK SHOWN ON THIS SHEET.

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 CUTS.

NO. 1, 2, 6, 7 AND 8 SHALL CONFORM TO ASTM A709 GRADE 36. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B (NO. 4 & NO. 5).

ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET NORMAL TO GRADE.

CUT BOTTOM OF POST TO MAKE POST VERTICAL IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTION.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED OR STAINLESS STEEL.

⅝" DIA. CONCRETE MASONRY ANCHORS TYPE 'S' : MINIMUM PULLOUT STRENGTH 13 KIPS, EMBED 7" MIN. FOR RAIL POSTS AND 5" MIN. FOR END RAILS STAINLESS STEEL.

■ CAULK AROUND PERIMETER OF BASE PLATES, NO. 1, AND FILL BOLT SLOT OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

ALL JOINTS AND RECESSES IN CONCRETE PARAPET ARE TO BE VERTICAL.

ALL MATERIAL (EXCEPT NO. 3) SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SPECIFICATIONS. PAINT OVER GALVANIZING WITH AN APPROVED TIE COAT AND TOP AS SPECIFIED IN THE "BRIDGE SPECIAL PROVISIONS".

VENT HOLES SHALL BE DRILLED IN POST AND RAIL MEMBERS AS REQUIRED TO FACILITATE GALVANIZING AND DRAINAGE.

RAILING SHALL BE FABRICATED IN LENGTHS THAT INCLUDE 3 OR 4 POSTS.

PAINT POSTS, RAILS, SHIMS AND EXPOSED PORTIONS OF ANCHOR BOLTS.

TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-596

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

STEEL RAILING DETAILS

SHEET 6 OF 7

80

8

8

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIEREMENTS OF THE CONTRACT.

BASES SHALL BE INSTALLED WITHIN STRUCTURAL BACKFILL. COORDINATION WITH MSE WALL INSTALLATION IS REQUIRED.

TOP SURFACES OF CONCRETE BASES SHALL BE TROWEL FINISHED SMOOTH AND LEVEL.

CONDUIT SIZES AND LOCATIONS SHALL BE AS SHOWN ON THE PLANS.

MINIMUM BENDING RADIUS OF CONDUIT IS EQUAL TO 5 X THE DIAMETER.

CONDUIT HEIGHT ABOVE CONCRETE BASES SHALL BE 2.5-INCH. ALL METALLIC CONDUIT ENDS SHALL BE REAMED AND THREADED.

ALL CONDUIT ENDS AT THE TOP ON CONCRETE BASES SHALL BE CAPPED IF METALLIC OR PLUGGED IF NONMETALLIC IMMEDIATELY AFTER PLACEMENT AND BEFORE CONCRETE IS POURED. CONDUITS IN WHICH WIRE OR CABLE IS NOT INSTALLED SHALL REMAIN CAPPED OR PLUGGED.

BELL ENDS SHALL BE INSTALLED ON ALL PVC CONDUIT EXPOSED AT THE TOP OF CONCRETE BASES BEFORE INSTALLATION OF CABLE OR WIRE.

ENDS OF CONDUIT INSTALLED BELOW GRADE FOR FUTURE USE SHALL BE CAPPED IF METALLIC OR PLUGGED IF NONMETALLIC.

WHEN REQUIRED TO CONNECT NONMETALLIC CONDUIT TO METALLIC CONDUIT, ONLY ADAPTER FITTINGS, U.L. LISTED FOR ELECTRICAL USE, SHALL BE USED.

IF A BASE REQUIRES A DEEP FORM BECAUSE OF LOOSE DIRT OR FILL, THE FORM SHALL BE REMOVED BEFORE BACKFILLING AROUND THE BASE. BACKFILL SHALL BE TAMPED TIGHT AGAINST THE BARE CONCRETE BASE IN LAYERS OF 1FOOT OR LESS.

A NO. 4 AWG, STRANDED COPPER EQUIPMENT GROUNDING CONDUCTOR SHALL BE EXOTHERMICALLY WELDED TO THE EQUIPMENT GROUNDING ELECTRODE (GROUND ROD).

THE EQUIPMENT GROUNDING CONDUCTOR SHALL ENTER THE BASE THROUGH A 1INCH CONDUIT INSTALLED FOR GROUNDING PURPOSES, LEAVING A 4 FOOT COIL OF WIRE ABOVE THE CONCRETE BASE. THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE NEATLY COILED AND THE COILS TIED TOGETHER.

ANCHOR RODS SHALL BE 1'' X 3'-6''.

ANCHOR RODS SHALL BE THREADED 12'' IN LENGTH ON EACH END OF THE ROD. ANCHOR RODS SHALL BE MANUFACTURED IN ACCORDANCE WITH SECTION 654.2.1 AND 641.2.2 OF THE STANDARD SPECIFICATIONS.

WHEN ANCHOR RODS USING THE ALTERNATE ''L'' BEND ARE FURNISHED, THE 4'' ''L'' BEND SHALL BE IN ADDITION TO THE SPECIFIED ANCHOR ROD BAR LENGTH. THE ''L'' BEND END SHALL NOT BE THREADED.

WELDING OF THE ANCHOR RODS TO THE CAGE IS UNACCEPTABLE. TIE WIRES SHALL BE USED.

ANCHOR RODS SHALL BE INSTALLED WITH MISALIGNMENTS OF LESS THAN 1:40 FROM VERTICAL.

BAR STEEL REINFORCEMENT SHALL BE COATED WITH POWDERED EPOXY RESIN IN ACCORDANCE WITH SECTION 505 OF THE STANDARD SPECIFICATIONS (LATEST EDITION).

GROUNDING ELECTRODE SHALL BE A MINIMUM OF 6'' FROM ADJACENT MSE WALL SOIL REINFORCEMENT.

CONCRETE BASE SHALL BE A MINIMUM OF 3'' FROM ADJACENT MSE WALL SOIL REINFORCEMENT.

INSTALL ½" FILLER BETWEEN CONCRETE BASE AND ANCHOR SLAB.

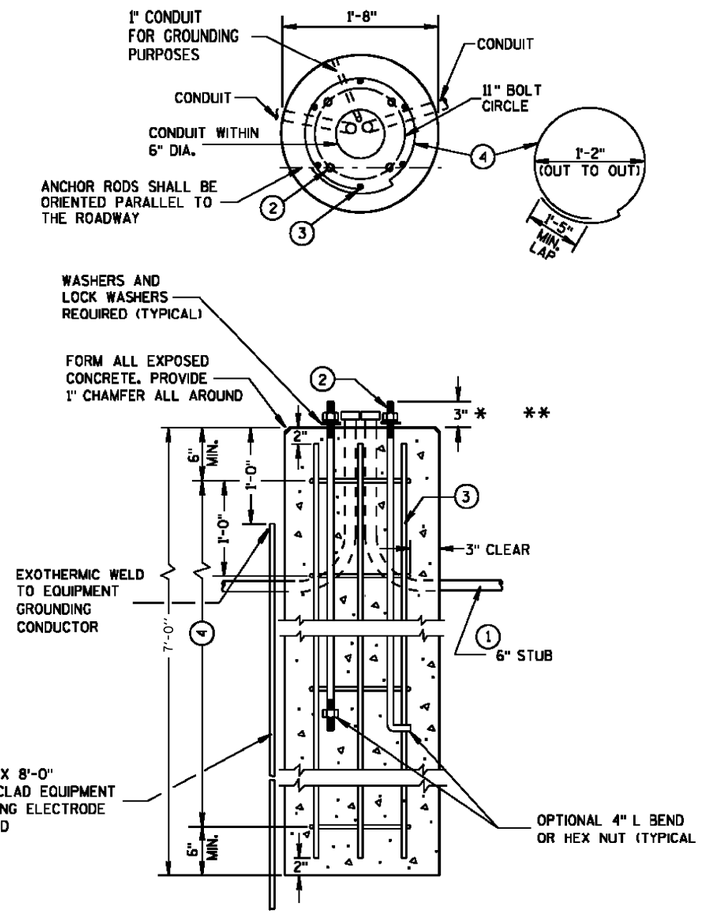
USE OF CIRCULAR AUGER IS PROHIBITED.

(1) CONDUIT SHALL EXIT CONCRETE BASE AT THE ELEVATION OF THE CONDUIT IN THE ADJACENT ANCHOR SLAB. CONNECT CONDUIT EXITING BASE TO CONDUIT IN ANCHOR SLAB.

(2) (4) 1'' DIA. X 3'-6'' ANCHOR RODS.

(3) (6) NO. 4 X 6'-8'' BAR STEEL REINFORCEMENT.

(4) (5) NO. 4 X 5'-1'' BAR STEEL REINFORCEMENT @ 1'-0'' C-C.



CONCRETE BASE
(FOR 25' ALUMINUM LIGHT POLES)

* ANY ANCHOR ROD PROJECTION SHORTER THAN 2¾'' OR LONGER THAN 3¼'' SHALL REQUIRE THE BASE TO BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE.

** FOR NONBREAKAWAY INSTALLATIONS, 4½''± ANCHOR ROD PROJECTION WITH THE USE OF LEVELING NUTS, RODENT SCREEN REQUIRED.

BASE TO SIT 2'' ABOVE HIGH SIDE OF WALK.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-596

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

CONCRETE BASE DETAILS

SHEET 7 OF 7

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W:\STR\BOB13\PLANS\SW_RETWALL\ ISW_VIEW.DGN 11-26-2014

SOUTH WHITNALL AVENUE OVER UNION PACIFIC RAILROAD

STATE PROJECT NUMBER

2660 - 05 - 70

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

ALL STATIONS AND ALL ELEVATIONS ARE IN FEET.
ALL ELEVATIONS ARE REFERRED TO CITY OF MILWAUKEE DATUM.
CITY OF MILWAUKEE DATUM = (NGVD29) 580.60

ALL DIMENSIONS ALONG THE FRONT FACE OF WALL UNLESS OTHERWISE SHOWN.

THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFY BAR SIZE.

BAR REINFORCEMENT SHALL HAVE 2" CLEAR COVER UNLESS SHOWN OTHERWISE.

THESE PLANS ARE FOR A PRECAST CONCRETE PANEL MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL LRFD.

THE CONTRACTOR MUST COORDINATE THE CONSTRUCTION OF WALLS R-40-594, R-40-595, R-40-596, R-40-597, AND BRIDGE B-40-846.

THE CONTRACTOR SHALL PROVIDE COMPLETE DESIGN, PLANS, DETAILS, SPECIFICATIONS, AND SHOP DRAWINGS FOR THE RETAINING WALLS IN ACCORDANCE WITH THE SPECIAL PROVISIONS. THE RETAINING WALL MANUFACTURER SHALL PROVIDE TECHNICAL ASSISTANCE TO THE CONTRACTOR DURING CONSTRUCTION. THE COST OF FURNISHING THESE ITEMS SHALL BE INCLUDED IN THE BID ITEM, "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP".

THE COST OF FURNISHING AND PLACING BACKFILL WITHIN THE REINFORCED SOIL ZONES, UNREINFORCED CONCRETE LEVELING PAD UNDER THE MSE PRECAST WALL PANELS, AND REINFORCEMENT, GEOTEXTILE FABRIC, ENGINEERED BACKFILL, JOINT MATERIAL, AND OTHER MISCELLANEOUS ITEMS IS INCLUDED IN THE COST OF BID ITEM "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP".

BEVEL ALL EXPOSED EDGES OF CONCRETE ¾" UNLESS NOTED OTHERWISE.

THE PLAN QUANTITY FOR THE ITEM "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP" IS BASED ON A WALL HEIGHT MEASURED FROM THE TOP OF THE LEVELING PAD TO THE TOP OF WALL AS SHOWN IN THE PLANS.

PLANS, ELEVATIONS AND DETAILS SHOWN ON THESE DRAWINGS ARE INTENDED TO INDICATE WALL LOCATIONS, LENGTHS HEIGHTS, AND DETAILS COMMON TO THE WALL SYSTEM SELECTED. THE CONTRACTOR SHALL VERIFY THAT THE WALL SYSTEM SELECTED WILL CONFORM TO THE REQUIRED ALIGNMENTS AND DETAILS.

THE MAXIMUM VALUE OF THE ANGLE OF INTERNAL FRICTION OF THE WALL BACKFILL MATERIAL IN THE REINFORCED ZONE SHALL BE ASSUMED TO BE 30° WITHOUT CERTIFIED TEST VALUES.

PLACE BACKFILL IN SPECIFIED LAYER THICKNESS STARTING AT BACK FACE OF WALL AND WORKING AWAY FROM WALL.

UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITIES PRIOR TO EXCAVATING. DAMAGE TO EXISTING UTILITES SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.

THE RETAINING WALL IS TO BE DESIGNED USING THE ELEVATIONS GIVEN ON THIS SHEET.

CONCRETE LEVELING PAD INCIDENTAL TO BID ITEM "WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/OMP."

SEE SPECIAL PROVISIONS FOR AESTHETIC TREATMENT TO PARAPET.

■ THE LENGTHS PROVIDED IN THE TABLE ARE THE MINIMUM REQUIRED REINFORCEMENT LENGTHS BASED UPON THE MINIMUM DESCRIBED IN THE WALL SYSTEM SPECIAL PROVISIONS OR EXTERNAL AND OVERALL STABILITY AT THE DESIGNATED LOCATIONS. THESE DESIGNATED LOCATIONS REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS, BUT SHALL NOT BE CONSIDERED ALL INCLUSIVE. THE CONTRACTOR DESIGN LENGTHS SHALL MEET OR EXCEED THE MINIMUM VALUES REPRESENTED IN THE TABLE AT THESE DESIGNATED LOCATIONS.

PAINT FOR STEEL RAILING TO MATCH FEDERAL STANDARD NO. 595C COLOR NO. 27038

CONCRETE STAINING COLOR: TK COLORS- 4035P GATEPOST

DESIGN DATA

MATERIAL PROPERTIES:

CONCRETE MASONRY	f'c = 4,000 PSI
PRECAST CONCRETE WALL PANEL	f'c = 4,000 PSI
BAR STEEL REINFORCEMENT	fy = 60,000 PSI

LIVE LOAD:

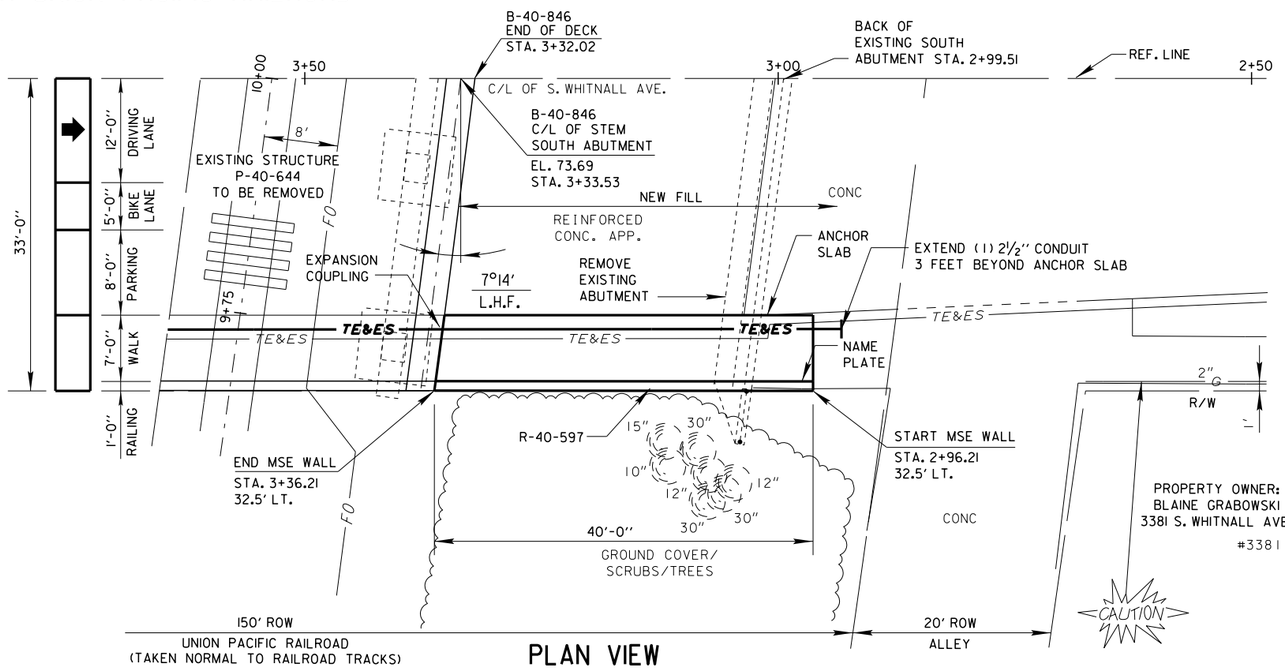
LIVE LOAD SURCHARGE	240 PSF

BRIDGE OFFICE CONTACT:

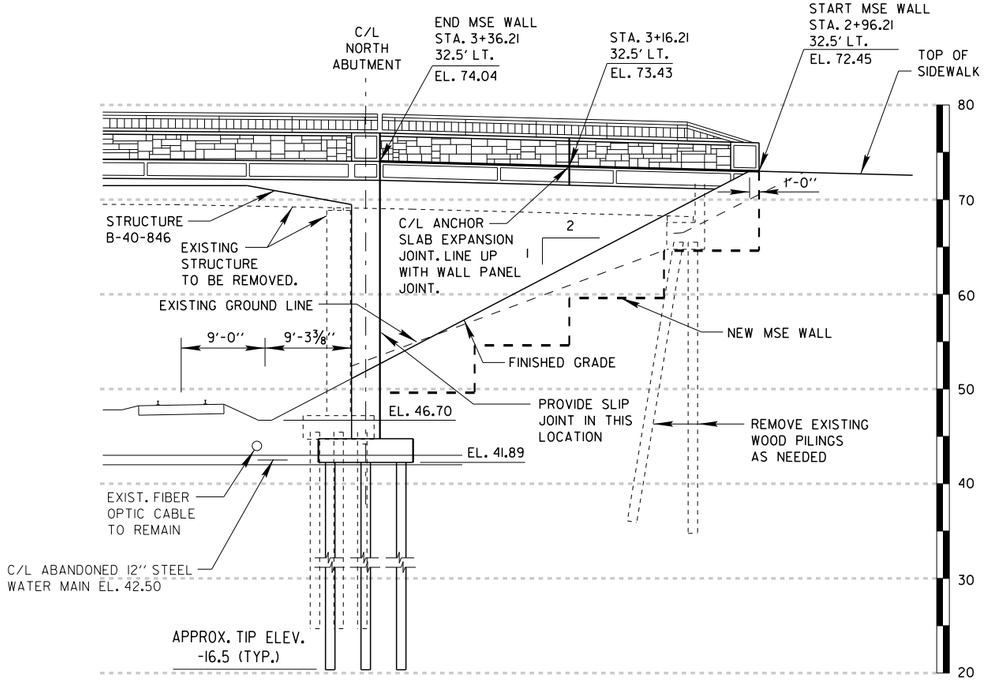
WILLIAM DREHER - PHONE: (608) 266-8489

CITY OF MILWAUKEE CONTACT:

CRAIG LIBERTO - PHONE: (414) 286-3294



PLAN VIEW



WEST ELEVATION

LOOKING EAST

WALL EXTERNAL STABILITY EVALUATION

WALL HEIGHT (FEET)	22'-5"
EXPOSED WALL HEIGHT (FEET)	20'-11"
■ MINIMUM LENGTH OF REINFORCEMENT (FEET)	14'-7"
LENGTH OF REINFORCEMENT / WALL HEIGHT	0.70
WALL STATION	3+36.21
TEST BORING USED	1

SOIL PARAMETERS

STRATUM LOCATION & SOIL DESCRIPTION	UNIT DENSITY (PCF)	FRICTION ANGLE (DEGREES)	COHESION (PSF)
FOUNDATION SOIL	135	28	400
RETAINED SOIL	135	28	0
WALL FILL	120	30	0

CAPACITY TO DEMAND RATIO (CDR)

SLIDING (CDR ≥ 1.0)	1.1
ECCENTRICITY (CDR > 1.0)	1.9
BEARING (CDR > 1.0)	2.1
GLOBAL STABILITY (CDR > 1.0)	1.6

GEOMETRY TABLE

STATION	OFFSET TO F.F. WALL	TOP OF WALL ELEV.	FINISHED GRADE ELEV.
2+96.21	33.0' LT.	72.45	72.45
3+16.21	33.0' LT.	73.43	63.32
3+36.21	33.0' LT.	74.04	53.32

BM: HYDRANT
3354 S. WHITNALL AVE.
STA. 4+63.85, 27.0'RT.
ELEV: 73.75

LIST OF DRAWINGS

WISCONSIN
CRAIG S. LIBERTO
E-23746
MILWAUKEE
WIS.
PROFESSIONAL ENGINEER

Craig S. Liberto 12/3/2014

NO.	DATE	REVISION	BY

ORIGINAL PLANS PREPARED BY
CITY OF MILWAUKEE
DEPARTMENT OF PUBLIC WORKS
INFRASTRUCTURE SERVICES DIVISION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

ACCEPTED William C. Dreher FOR 12/05/14
CHIEF STRUCTURES DESIGN ENGINEER DATE

STRUCTURE R-40-597

S. WHITNALL AVE. OVER U.P.R.R.

COUNTY	MILWAUKEE	~~TOWN~~/CITY/ ~~VILLAGE~~	MILWAUKEE
DESIGN SPEC.	AASHTO LRFD SPECIFICATION		
DESIGNED BY JDT	DESIGN CK'D. JJK	DRAWN BY KPS	PLANS CK'D. JJK

GENERAL PLAN AND ELEVATION

SHEET 1 OF 6

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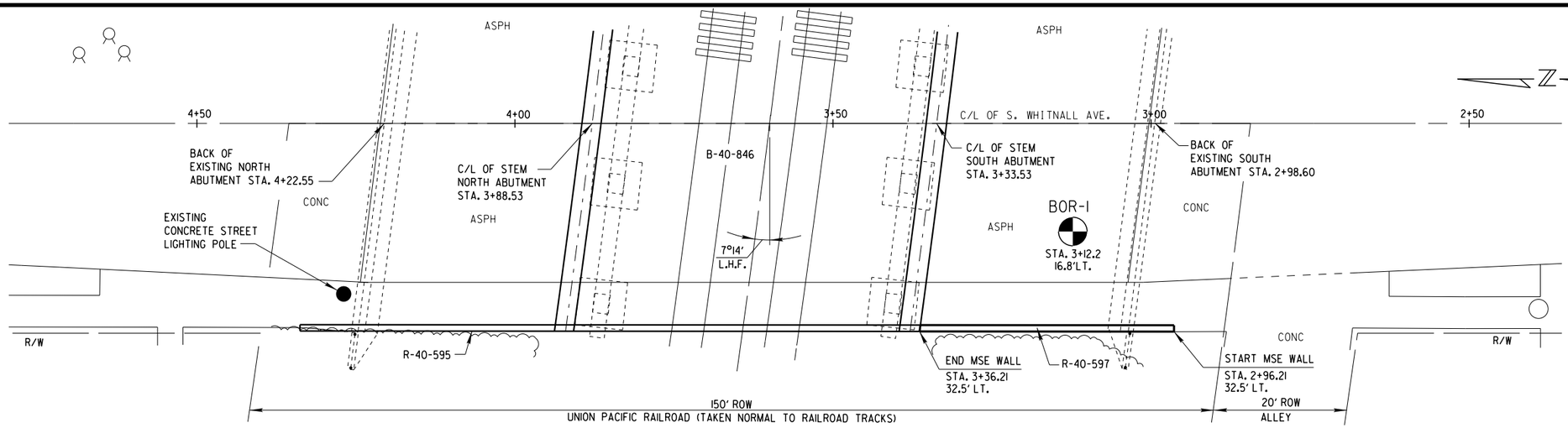
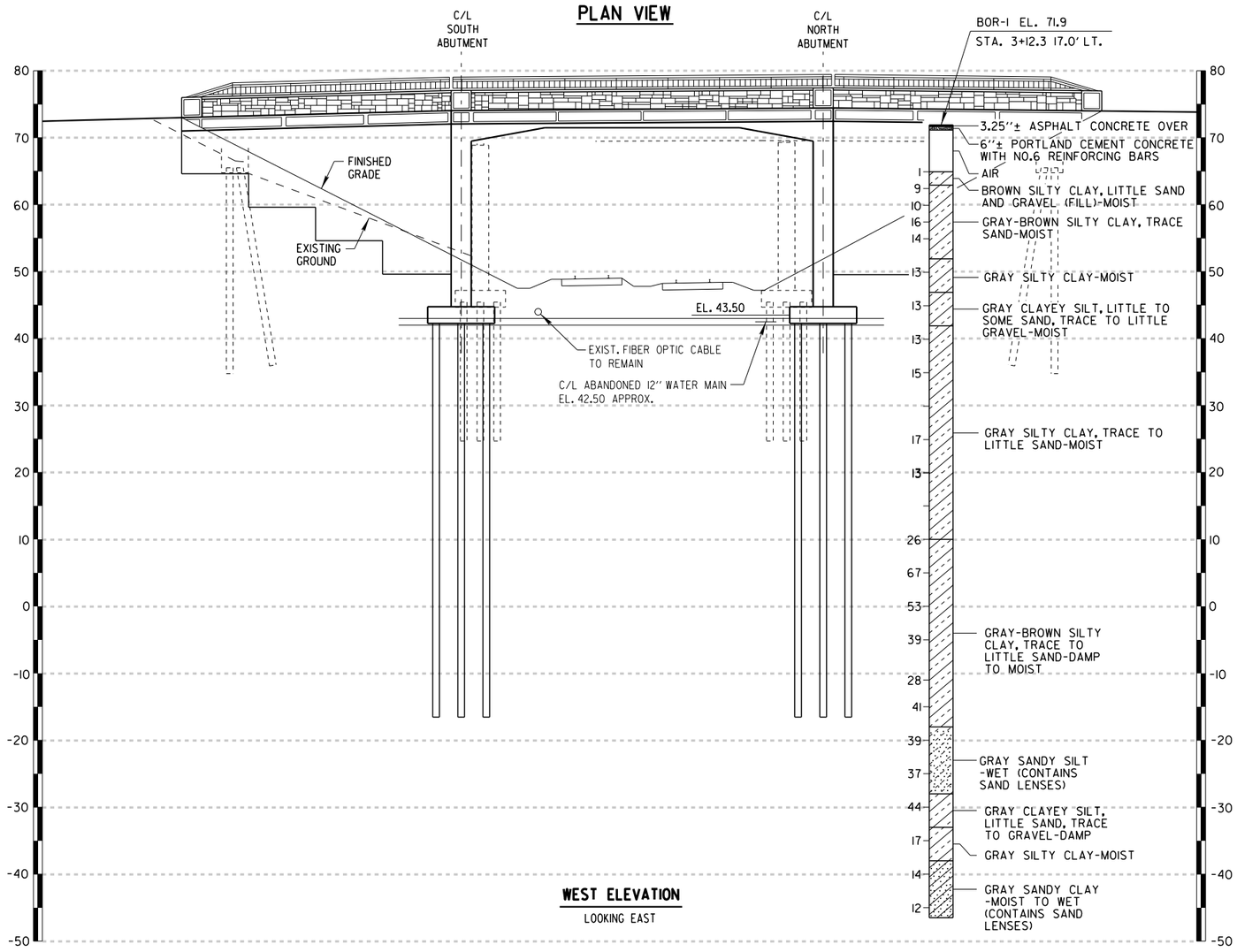
W:\STR\B0813\PLANS\SW-RETWALL\ 2SW_SOIL BORING.DGN 11-26-2014



PLAN VIEW



WEST ELEVATION

LOOKING EAST

NOTE:

THE SUBSURFACE INFORMATION PRESENTED HEREIN IS AN ABBREVIATED VERSION OF THE INFORMATION PRESENTED IN THE GEOTECHNICAL ENGINEERING REPORT.

REVIEW THE GEOTECHNICAL ENGINEERING REPORT AND SOIL BORING LOGS DATED JANUARY 22, 2013 AND ALL SUBSEQUENT REVISIONS FOR ADDITIONAL SUBSURFACE INFORMATION.

SOIL BORINGS COMPLETED BY GILES ENGINEERING

- DENOTES SOIL BORING

STATE PROJECT NUMBER

2660 - 05 - 70

ABBREVIATIONS

F — FINE M — MEDIUM C — COARSE
WS — WEATHERED SO — SOUND

MATERIAL SYMBOLS

TOPSOIL, SILT, SANDSTONE
SAND, PEAT, LIMESTONE
GRAVEL, CLAY, IGNEOUS ROCK

LEGEND OF PROBING

95/6=95 BLOWS FOR 6" PENETRATION
PROBING TAKEN WITH A 350# WT. FALLING 18" ON A 2" O.D. POINT.

PROBING NO.
STATION
ELEVATION
7 AVERAGE BLOWS PER FOOT
REFUSAL 95/6

LEGEND OF BORING

BORING NO.
STA.
ELEV.
UNCONFINED STRENGTH → 7.7
BLOWS PER FT. USING 140# WT. FALLING 30"
WASH SAMPLE
SHELBY TUBE — S.T.
GROUND WATER ELEVATION
NO GROUND WATER OBSERVED ABOVE THIS ELEVATION
SANDY GRAVEL
F. BOULDERS OR COBBLES
SAND
SILTY CLAY
SO LIMESTONE

UNLESS OTHERWISE SPECIFIED, THE BLOWS PER FOOT AT THE LOCATIONS INDICATED ARE BASED ON DRIVING A 2" O.D. X 1.4" I.D. SPLIT SPOON SAMPLER WITH A 140# HAMMER HAVING A FREE FALL OF 30". THE BLOW COUNT IS TAKEN IN UNDISTURBED SOIL IMMEDIATELY BELOW A CASED OR OPEN HOLE ELIMINATING SIDE FRICTION ON THE DRIVE PIPE.

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

TO OBTAIN RELATIVE DATA CONCERNING THE CHARACTER OF MATERIAL IN AND UPON WHICH THE FOUNDATION MIGHT BE BUILT, BORINGS AND/OR SOUNDINGS WERE MADE AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING. THE DATA PRESENTED HEREIN REPRESENTS THE FINDINGS OF THE SUBSURFACE EXPLORATIONS MADE. HOWEVER, BECAUSE THE DEPTHS INVESTIGATED ARE LIMITED AND THE AREA OF THE BORINGS AND/OR SOUNDINGS IS VERY SMALL IN RELATION TO THE ENTIRE AREA, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT CONDITIONS BELOW THE DEPTHS INVESTIGATED OR THAT THE CLASSIFICATION OF MATERIAL ENCOUNTERED IN THESE INVESTIGATIONS IS NECESSARILY TYPICAL OF THE ENTIRE SITE.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-597

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

SUBSURFACE EXPLORATION

SHEET 2 OF 6
83

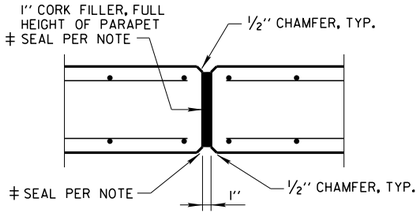
8

8

W:\STR\BOB13\PLANS\SW_RETWALL\ 3SW_DETAILS.DGN 11-26-2014

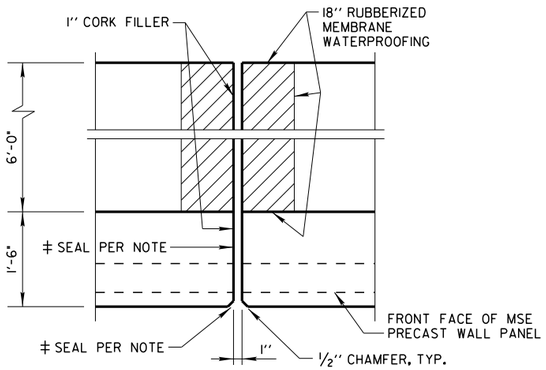
STATE PROJECT NUMBER

2660 - 05 - 70



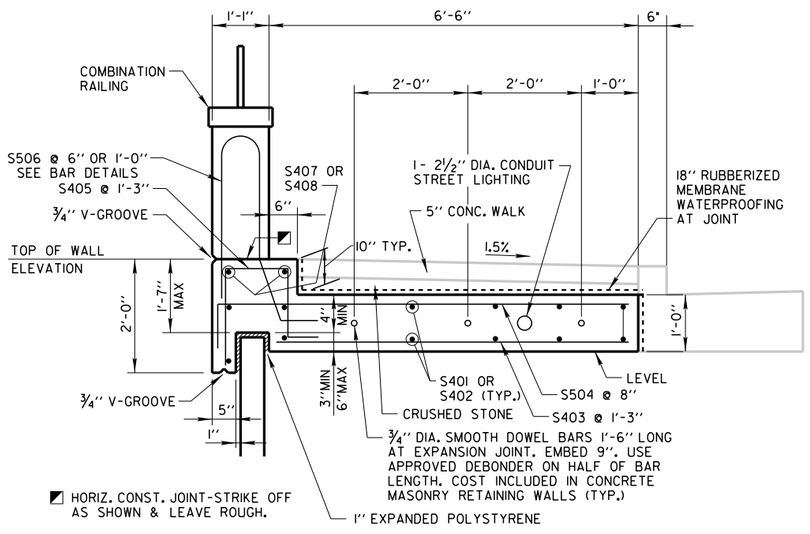
COMBINATION RAILING EXPANSION JOINT DETAIL

‡ NOTE: SEAL ALL EXPOSED HORIZ. AND VERT. SURFACES OF FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONC.)



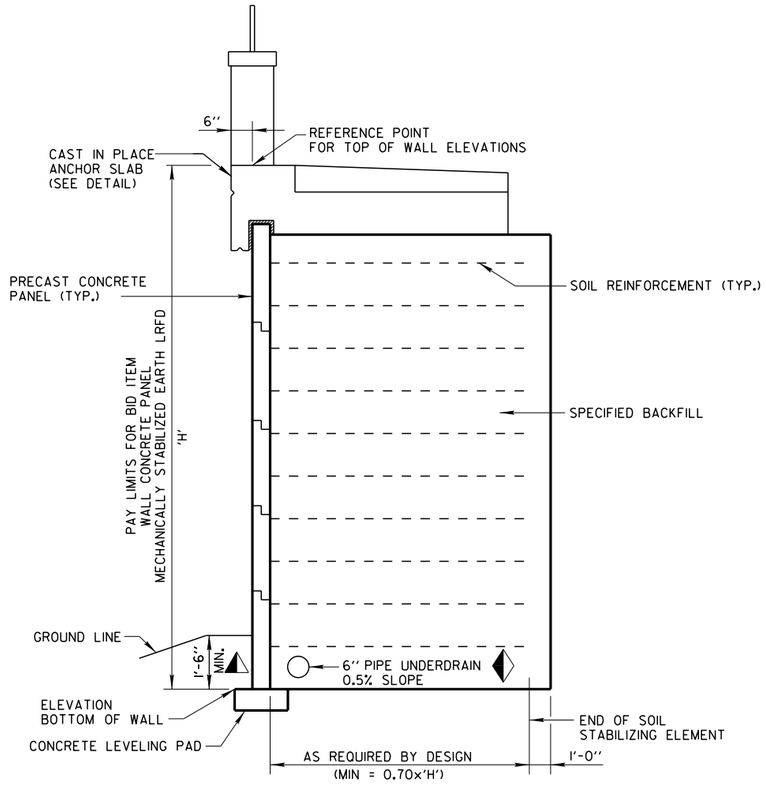
* ANCHOR SLAB EXPANSION JOINT DETAIL

PLAN VIEW



CAST IN PLACE ANCHOR SLAB DETAIL

NOTE: SEE ROADWAY PLAN FOR 5" CONC. WALK AND CRUSHED STONE DETAILS.



TYPICAL CROSS SECTION

▲ MINIMUM EMBEDMENT BASED ON SITE SPECIFIC PARAMETERS (1'-6" MINIMUM FOR ALL WALLS ON LEVEL GROUND). FIELD EMBEDMENTS SHALL MEET OR EXCEED THE MINIMUM EMBEDMENT. FIELD EMBEDMENTS BELOW MINIMUM EMBEDMENT SHALL NOT BE INCLUDED IN THE PAY LIMITS.

◆ SEE STRUCTURE B-40-846 FOR PIPE UNDERDRAIN DETAILS AND BID ITEM

ESTIMATE OF QUANTITIES

ITEM NO.	BID ITEMS	UNIT	TOTAL
504.0500	CONCRETE MASONRY RETAINING WALLS	CY	17
505.0615	BAR STEEL REINFORCEMENT HS COATED RETAINING WALLS	LB	1,585
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	2
517.1010.S	CONCRETE STAINING (R-40-597)	SF	181
517.1015.S	CONCRETE STAINING MULTI-COLOR (R-40-597)	SF	176
517.1050.S	ARCHITECTURAL SURFACE TREATMENT (R-40-597)	SF	176
652.0230	CONDUIT RIGID NONMETALLIC SCHEDULE 40 2½-INCH	LF	43
SPV.0105.05	RAILING STEEL TYPE C2 GALVANIZED (R-40-597)	LS	1
SPV.0165.01	WALL CONCRETE PANEL MECHANICALLY STABILIZED EARTH LRFD/QMP	SF	550
	NON-BID ITEMS		
	PREFORMED JOINT FILLER	SIZE	
	NON-BITUMINOUS JOINT FILLER	SIZE	
	NAME PLATE	EACH	

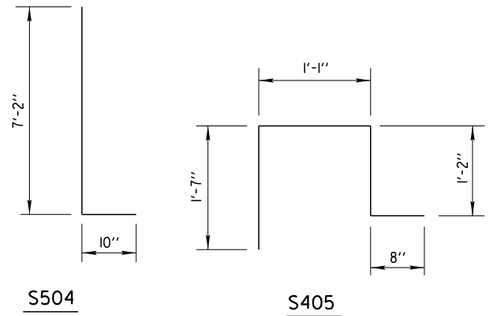
BILL OF BARS - R-40-597

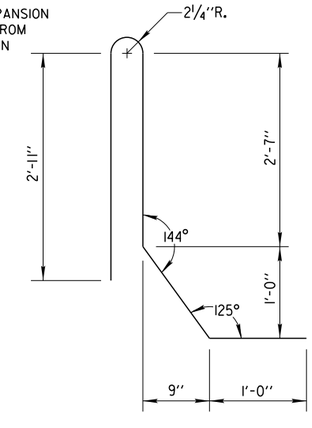
BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
S401	×	12	19'-3" *		△	LONGITUDINAL
S402	×	12	19'-8" *			LONGITUDINAL
S403	×	34	6'-2"			TRANSVERSE - BOTTOM
S504	×	62	7'-11"	×		TRANSVERSE - TOP
S405	×	34	4'-3"	×		EDGE CAP
S506	×	45	7'-2"	×		RAILING DOWEL
S407	×	2	19'-8" *			EDGE CAP LONGITUDINAL
S408	×	2	19'-8" *			EDGE CAP LONGITUDINAL

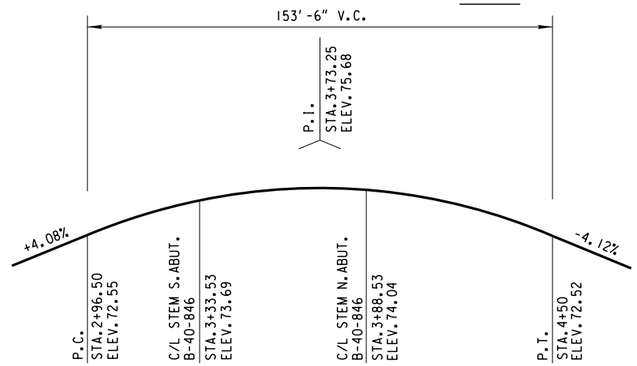
△

BAR MARK	NO. REQUIRED	LENGTH
S401	2 SERIES OF 6	18'-9" TO 19'-8" •

* BAR LENGTH TO BE DETERMINED BY WALL MANUFACTURER. EXPANSION JOINT TO BE SPACED A MINIMUM 20' AND A MAXIMUM OF 30' FROM END OF WALL. DO NOT RUN BAR STEEL THRU JOINT. EXPANSION JOINT SHALL LINE UP WITH WALL PANEL JOINT.







PROFILE GRADE LINE ALONG C/L OF S. WHITNALL AVE.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-597

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

WALL DETAILS AND QUANTITIES

SHEET 3 OF 6

84

8

8

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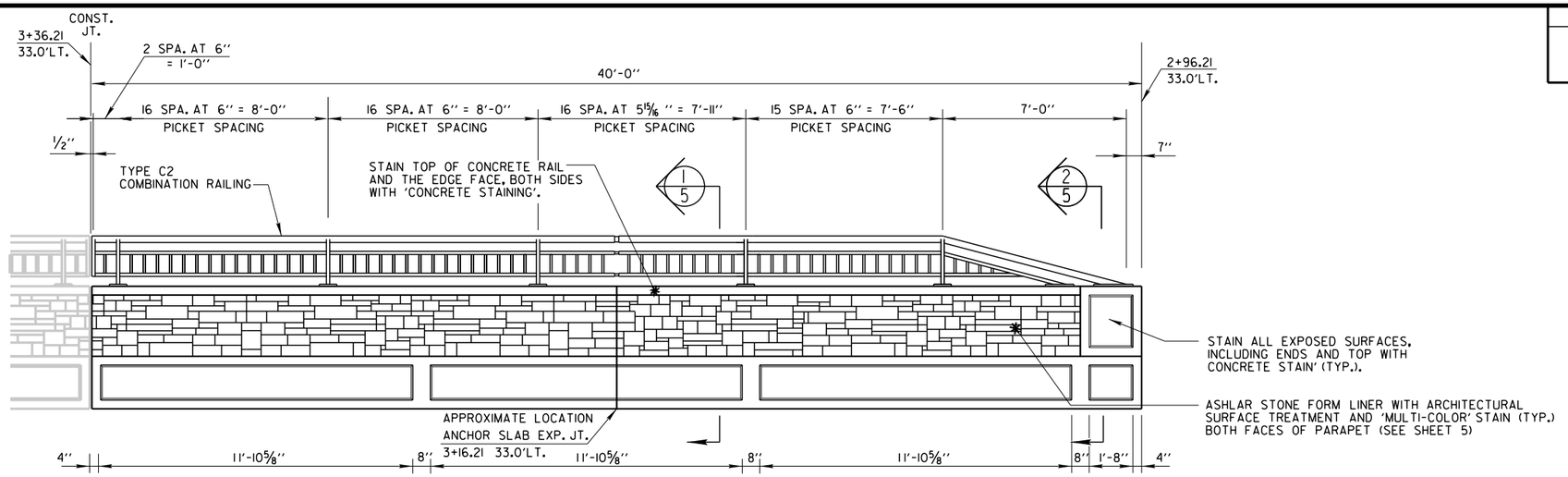
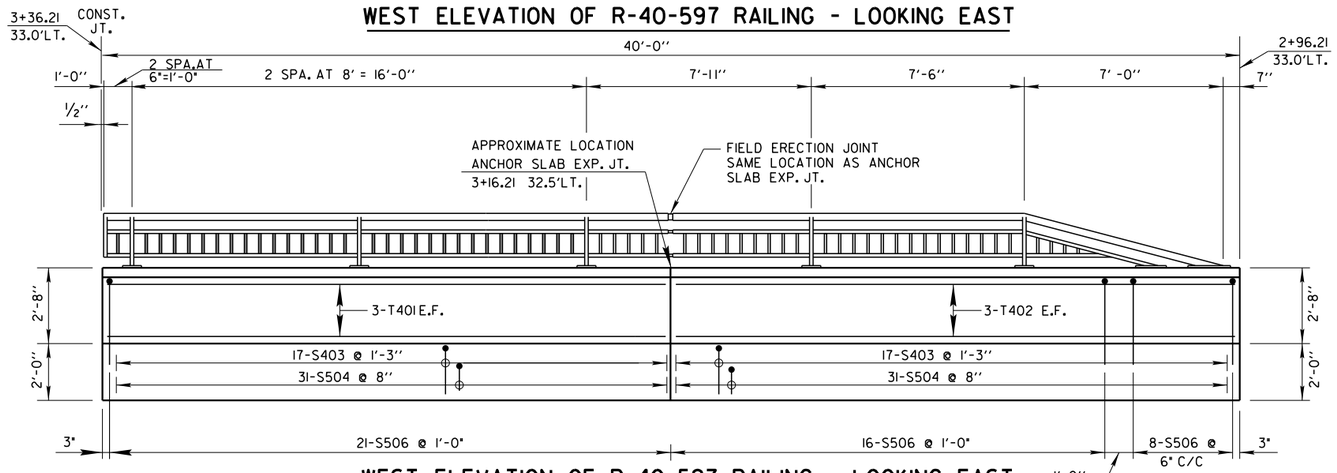
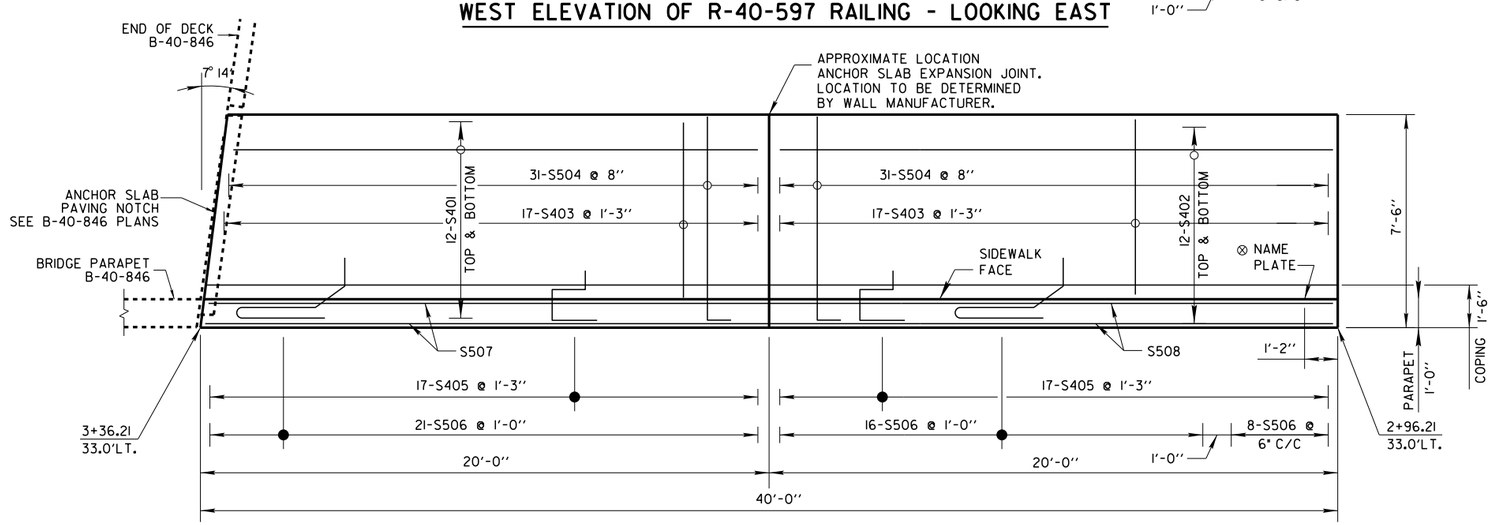
STATE PROJECT NUMBER
2660 - 05 - 70



WEST ELEVATION OF R-40-597 RAILING - LOOKING EAST



WEST ELEVATION OF R-40-597 RAILING - LOOKING EAST



PLAN VIEW OF CAST-IN-PLACE ANCHOR SLAB - BAR DETAILS

⊗ NAME PLATE TO BE LOCATED TOP CENTER OF RECESSED PICTURE FRAME

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-597

DRAWN BY K.P.S. | PLANS CK'D. J.D.T. J.J.K.

RAILING ELEVATIONS, BAR DETAILS & RAILING PLAN

SHEET 4 OF 6

8

8

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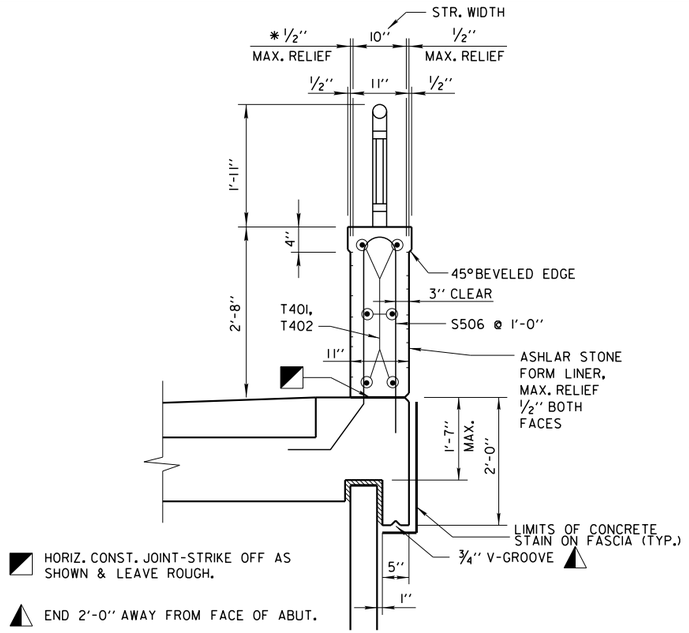
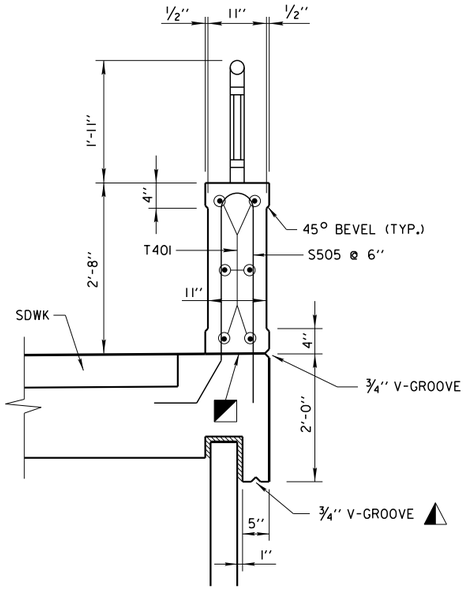
STATE PROJECT NUMBER

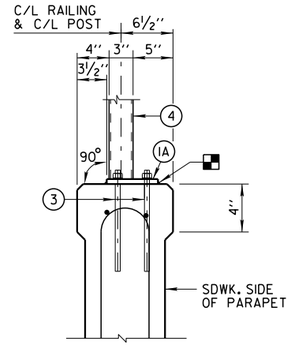
2660 - 05 - 70



SECTION 1/4

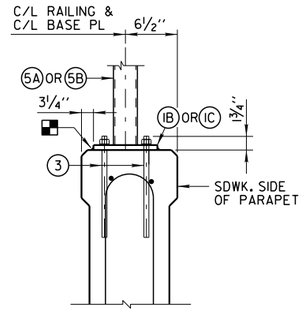


SECTION 2/4



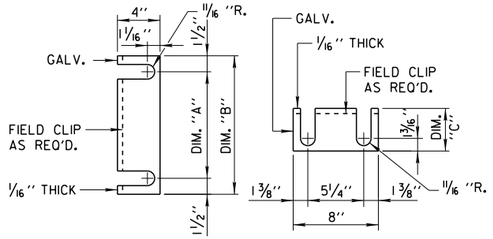
SECTION THRU PARAPET ON ANCHOR SLAB

NOTE: TYPE S ANCHOR SHOWN



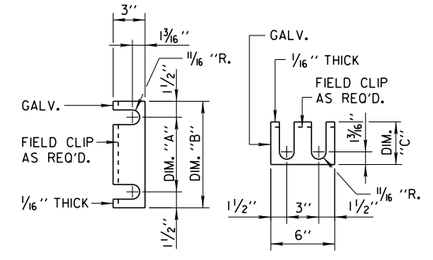
ANCHORAGE FOR END RAIL

NOTE: TYPE S ANCHOR SHOWN



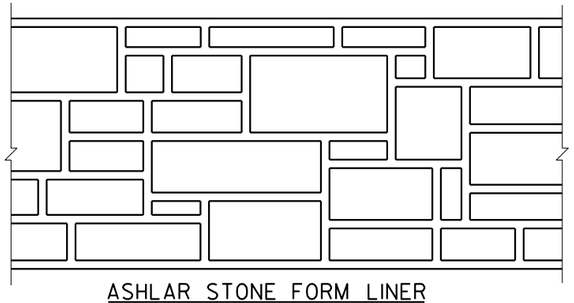
END RAIL SHIM DETAIL

8'' X 1'-1'' BASE PLATE (1B) DIM. ''A'' = 10'', DIM. ''B'' = 1'-1'', DIM. ''C'' = 6 1/2''
8'' X 1'-6'' BASE PLATE (1C) DIM. ''A'' = 1'-3'', DIM. ''B'' = 1'-6'', DIM. ''C'' = 9''
(2 SETS PER POST)



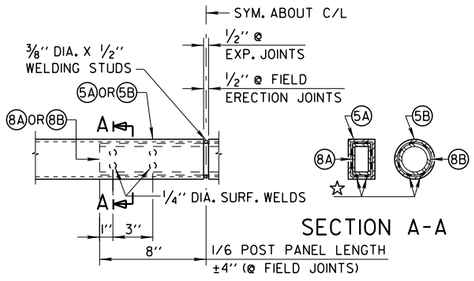
RAIL POST SHIM DETAIL

6'' X 8'' BASE PL (1A) DIM. ''A'' = 5'', DIM. ''B'' = 8'', DIM. ''C'' = 4''.
(2 SETS PER POST)



RAILING PICTURE FRAME INSET ELEVATION

END RAILING PICTURE FRAME INSET ELEVATION

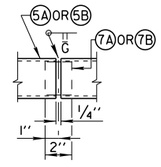


SECTION A-A

FIELD ERECTION JOINT DETAIL

☆ MIN. 5/8'' FLAT SURF. DIA. PUNCHINGS OR STUDS MAY BE USED AS AN ALT.

NOTE:
SEE LEGEND & RAILING NOTES ON SHEET 6

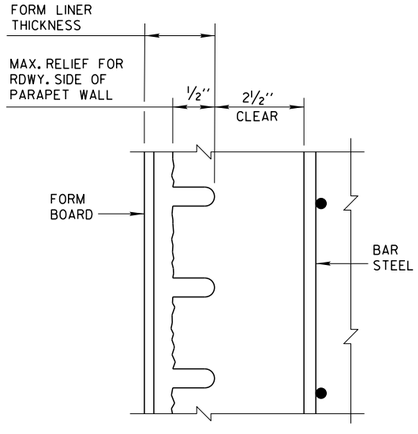


SHOP RAIL SPLICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)

ASHLAR STONE FORM LINER

STONE SIZE = 8-INCH TO 16-INCH, RELIEF = 1/2-INCH



SECTION THRU FORM LINER

BILL OF BARS - VERTICAL PARAPET WALL

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
T401	X	6	19'-8'' *			PARAPET WALL - HORIZ.
T402	X	6	19'-8'' *			PARAPET WALL - HORIZ.

* BAR LENGTH TO BE DETERMINED BY WALL MANUFACTURER. EXPANSION JOINT TO BE SPACED A MINIMUM 20' AND A MAXIMUM OF 30' FROM END OF WALL. DO NOT RUN BAR STEEL THRU JOINT. EXPANSION JOINT SHALL LINE UP WITH WALL PANEL JOINT.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-597

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

PARAPET DETAILS AND BILL OF BARS

SHEET 5 OF 6
86

8

8

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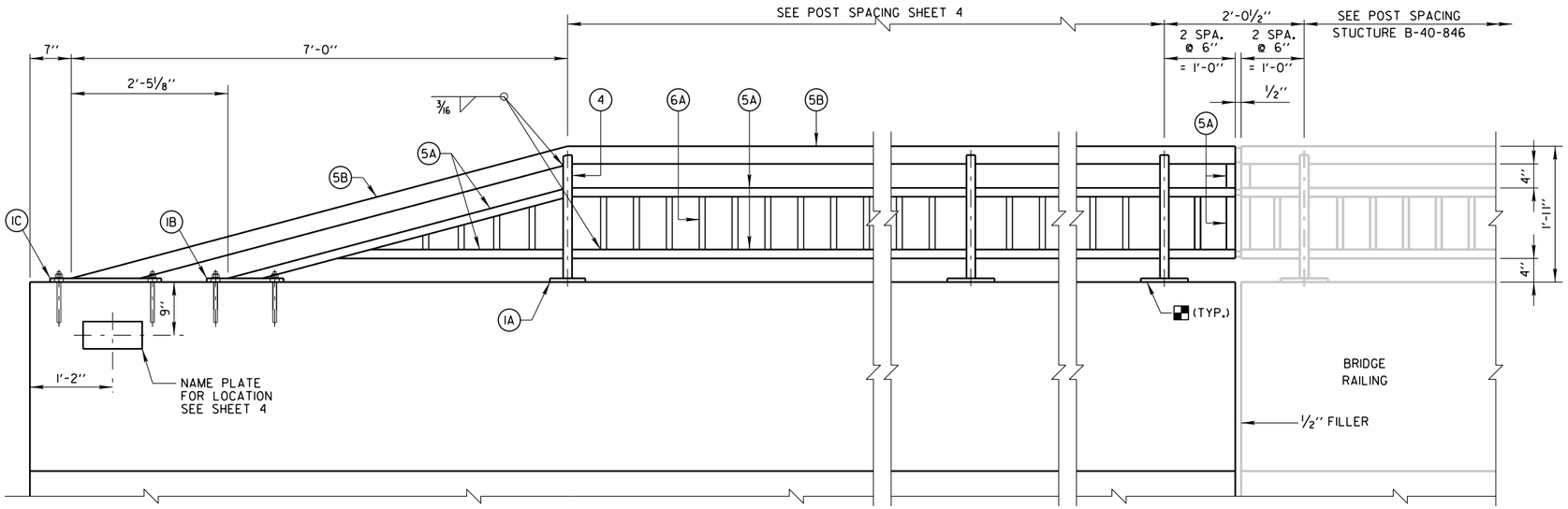
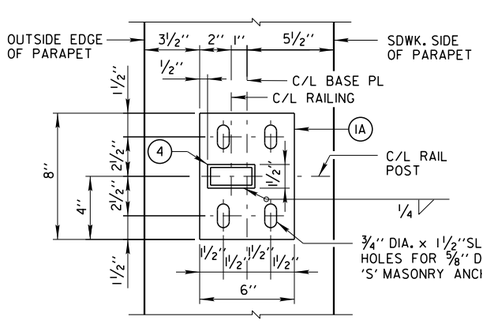
STATE PROJECT NUMBER

2660 - 05 - 70

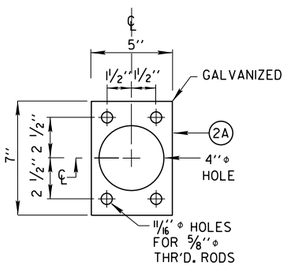


INSIDE ELEVATION OF PARAPET



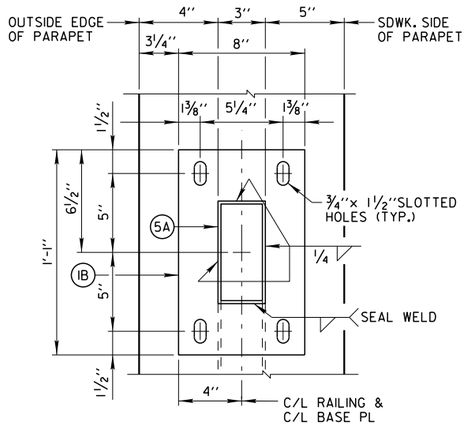
TYPICAL RAIL POST BASE PLATE

FOR 3" X 1½" X 3/16" POSTS (4)



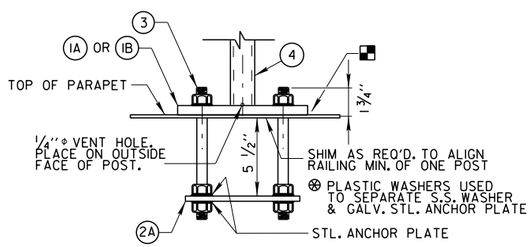
ANCHOR PLATE

FOR 3"x1½"x3/16" POSTS (4A)



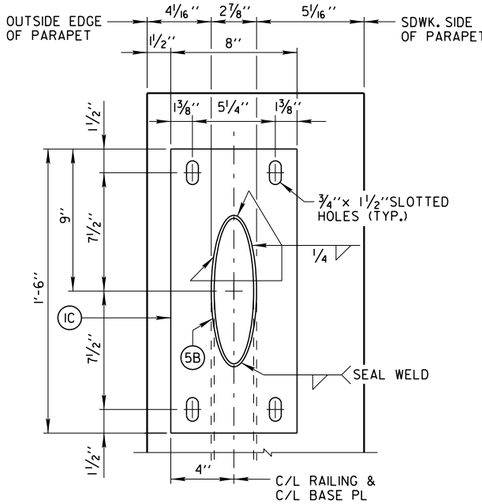
END RAIL BASE PLATE

FOR 3"x1½"x3/16" POSTS (5A)



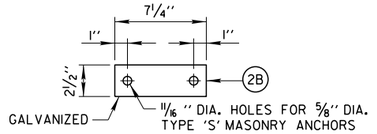
ANCHORAGE FOR RAIL POSTS

NOTE: ANCHOR PLATE NOT REQUIRED WHEN TYPE S ANCHORS ARE USED



END RAIL BASE PLATE

FOR 2½" DIA. STD. PIPE RAIL (5B)



END RAIL ANCHOR PLATE

FOR END RAIL BASE PLATES (1B) (1C)

2 REQ'D PER END RAIL BASE PL

LEGEND

(1A) PLATE ⅝" x 6" x 8" WITH ¾" x 1½" SLOTTED HOLES.

(1B) PLATE ⅝" x 8" x 1'-1" WITH ¾" x 1½" SLOTTED HOLES.

(1C) PLATE ⅝" x 8" x 1'-6" WITH ¾" x 1½" SLOTTED HOLES.

(2A) ¼"x5"x7" ANCHOR PLATE WITH 11/16" Ø HOLES FOR THR'D. RODS NO.3

(2B) ¼" x 2½" x 7¼" ANCHOR PLATE WITH 11/16" DIA. HOLES FOR THREADED RODS NO. 3.

(3) ⅝" DIA. x 9" LONG. TYPE 316 STANLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. (ALTERNATE RAIL POST ANCHORAGE: 4 EQUIVALENT STAINLESS STEEL CONCRETE MASONRY ANCHORS TYPE S ⅝"-IN. EMBED 7" IN CONCRETE FOR RAIL POSTS. EMBED 5" IN CONCRETE FOR END RAILS)

(4) STRUCTURAL TUBING 3" x 1½" x 3/16". PLACE VERTICAL. WELD TO NO. 1 & NO. 5.

(5A) STRUCTURAL TUBING 3" x 1½" x 3/16" RAILS. WELD TO NO. 1 & NO. 4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.

(5B) STRUCTURAL TUBING 2½" DIA. (STANDARD SIZE) (2.875" O.D.). WELD TO NO. 1 & NO. 4. INSIDE OF PIPE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.

(6A) BAR 1" x 1" PICKETS. WELD TO NO. 5 (SPACE AT 6" MAX. C/L TO C/L SPACING). PLACE VERTICAL.

(7A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. PROVIDE "SLIDING FIT".

(7B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.).

(8A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. (1'-4" AT FIELD ERECTION JOINTS.)

(8B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.). (1'-4" AT FIELD ERECTION JOINTS.)

RAILING NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE C2 GALVANIZED R-40-597", WHICH SHALL INCLUDE ALL WORK SHOWN ON THIS SHEET.

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 CUTS.

NO. 1, 2, 6, 7 AND 8 SHALL CONFORM TO ASTM A709 GRADE 36. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B (NO. 4 & NO. 5).

ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET NORMAL TO GRADE.

CUT BOTTOM OF POST TO MAKE POST VERTICAL IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTION.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED OR STAINLESS STEEL.

⅝" DIA. CONCRETE MASONRY ANCHORS TYPE 'S': MINIMUM PULLOUT STRENGTH 13 KIPS, EMBED 7" MIN. FOR RAIL POSTS AND 5" MIN. FOR END RAILS STAINLESS STEEL.

■ CAULK AROUND PERIMETER OF BASE PLATES, NO. 1, AND FILL BOLT SLOT OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

ALL JOINTS AND RECESSES IN CONCRETE PARAPET ARE TO BE VERTICAL.

ALL MATERIAL (EXCEPT NO. 3) SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SPECIFICATIONS. PAINT OVER GALVANIZING WITH AN APPROVED TIE COAT AND TOP AS SPECIFIED IN THE "BRIDGE SPECIAL PROVISIONS".

VENT HOLES SHALL BE DRILLED IN POST AND RAIL MEMBERS AS REQUIRED TO FACILITATE GALVANIZING AND DRAINAGE.

RAILING SHALL BE FABRICATED IN LENGTHS THAT INCLUDE 3 OR 4 POSTS.

PAINT POSTS, RAILS, SHIMS AND EXPOSED PORTIONS OF ANCHOR BOLTS.

TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-40-597

DRAWN BY R.B.M. | PLANS CK'D. J.D.T. J.J.K.

STEEL RAILING DETAILS

SHEET 6 OF 6

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STATION	CUT (CY)	LARGEST CUT (FT)	FILL (CY)	LARGEST FILL (FT)
2+00	34	0.33	0	0
2+50	32	0.33	0	0
3+00	0	0	0	0
3+50	0	0	0	0
4+00	0	0	0	0
4+50	25	0.33	0	0
5+00	45	0.33	0	0
5+50	47	0.33	0	0

Earthwork Summary	
Common Excavation (205.0100)	710 CY
(Includes 528 CY Pav't Removal)	
Fill (Including 20% Shrinkage)	0 CY
Waste	710 CY

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PROJECT NO: 2660-05-70	HWY: LOCAL STREET	COUNTY: MILWAUKEE	CUT AND FILL QUANTITIES	SHEET: 88	E

PLOT DATE : _____ PLOT BY : _____ PLOT NAME : _____ PLOT SCALE : 1:1

Notes

Wisconsin Department of Transportation

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