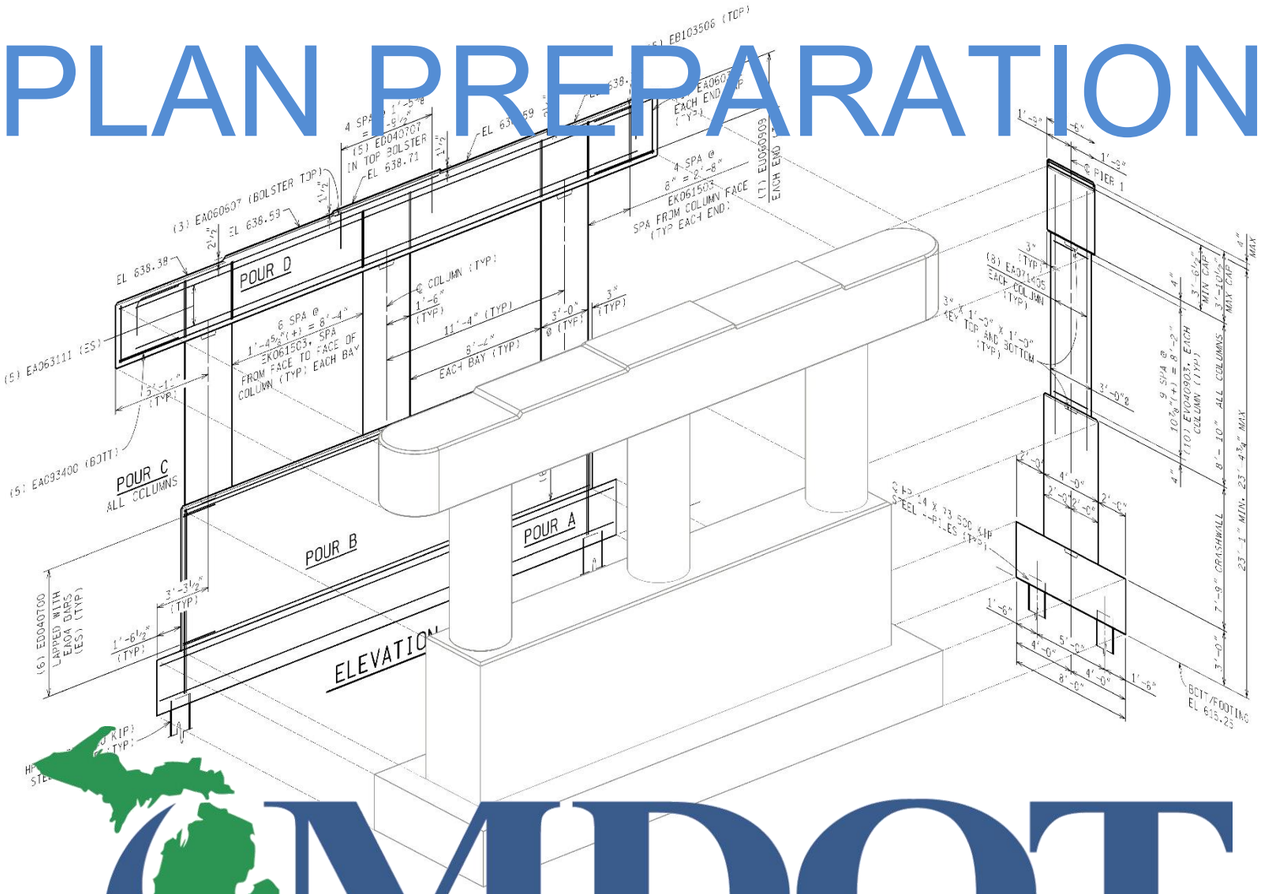
GUIDELINES FOR BRIDGE PLAN PREPARATION



MDOT
Michigan Department of Transportation

PLAN REVISIONS																
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION		MDOT Michigan Department of Transportation	NO SCALE	DRAWN BY:	DATE:	CS:		DRAWING	SHEET
											CHK'D BY:	DESIGN UNIT:	JN:			SECT 2 1
											FILE:	TSC:				

PURPOSE AND APPLICATION

This set of sample plans is intended for use as a guideline for preparing a set of bridge construction plans for the Michigan Department of Transportation. The examples of various sheets illustrate preferred techniques to ensure the uniformity, quality, and continuity of plans, but the examples do not necessarily represent a preferred design. Examples of the various plan sheets have been provided, based on the most commonly occurring situations. However, it is recognized that some projects will have unusual circumstances that may allow for some variations from the preferred techniques contained herein.

This set is not to be considered or used as a single, coordinated plan, but as a collection of individual sheet types. In many cases, copies of actual plan sheets have been used to develop the sheets contained herein. Since modifications have been made to these sheets to develop an appropriate sample, they are not to be considered an official record of the plans from which they were taken.

The guidelines and examples included are not intended to provide policies on the design or construction of bridges. Where the information shown on the sample plan sheets is in conflict with the design standards or practices of the Michigan Department of Transportation as contained in its Standard Specifications for Construction, design manuals or design standards, the standards and practices supersede any sample plan sheet information.

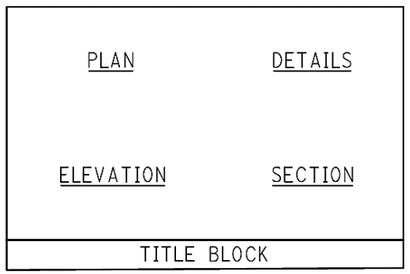
Boxed numbers refer to the plan guidelines located on the Plan Guidelines Sheet at the beginning of each section.

Errors and omissions can be reported to MDOT-CADDSupport@michigan.gov

GENERAL GUIDES

SHEET LAYOUT

Plan views showing superstructures should be oriented from left to right in the direction of increasing station. Plan views showing substructure should be aligned with the elevation view. Place north arrows on each plan view. Related details shall be grouped together in an orderly arrangement and drawn to the same scale.



When possible, draw plan views on the same coordinate system as the road or survey alignment. Maintaining the same coordinate system will help with cross discipline checking.

Staging or large-scale projects may require more than one sheet to properly detail plan items. Suggested scales below may be adjusted to individual project needs or individual details.

Site Sheet	1" = 40' to 1" = 80'
General Plan	1" = 20' to 1" = 30'
Substructure	
Plan and Elevation	1/8" = 1'
Sections & Details	1/4" = 1' (or larger)
Superstructure	
Deck Plan	1" = 10' to 1" = 20'
Deck Sections	1/8" = 1'
Details	1/4" = 1' (or larger)

Except for the General Plan of Site, scales are not to be shown on the drawings and the title block should indicate "NO SCALE". Contract plans should be drawn using scales that can be found on a standard architectural or engineering scale. Care should be taken that all structural elements are accurately drawn to scale. The number of different scales used on a sheet should be kept to a minimum.

These drawings include fields for Drawn By, Chk'd by, and Corr by. These fields are part of MDOT's internal QA/QC checking process. If they are not part of your firm's QA/QC process those parts in the title block should be left empty.

The date field should show the date of the plan submittal.

TEXT AND DIMENSIONS

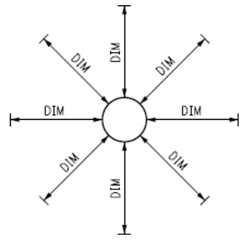
Accuracy of dimensions shown on the plans should be based on the degree of accuracy of the data on which the dimensions are based. For instance, construction dimensions should have the same accuracy as the survey data supplied. In general the degree of accuracy for the following items should be as shown:

Concrete Elevations	0.01 ft.
Concrete Detail Dimensions	1/8"
Steel Detail Dimensions	1/8"
Angles	1 sec.
Screed Elevations	0.01 ft.
Ground Elevations	0.01 ft.
Reinforcing Steel Spacing	1/4"

Standard sheet format is 11" x 17". For lettering and dimensions, use the MDOT PR text styles. MDOT PR x 2.0 should be used for view titles and table headers. MDOT PR x 1.5 should be used for all subtitles, pour designations, and cutting plane letters. Underline view titles, subtitles, and pour designations.

Provide consistent labeling for all bridge elements. Common examples of inconsistent labels include callouts for barrier vs. railing, deck vs. concrete slab, and edge of curb vs. toe of sidewalk.

Notes shall be readable only from the lower edge of the drawing. Dimensions shall be readable from either the lower edge or the right edge of the sheet as shown below. Quantities for a detailed unit (such as substructure concrete, superstructure concrete, or structural steel weight) should, if possible, be placed on the same sheet as the general notes. Concrete volumes for individual pours should be grouped together by substructure unit and given on the sheet where the pour designations are detailed.



TEXT ORIENTATION

Pay item names shown in Miscellaneous Quantity boxes must match the specification, matching uppercase, lowercase, and punctuation. When naming quantities in notes and call-outs, use all capital letters. When identifying a pay item specification in a note, place quotes around that pay item. For example, direction to remove existing superstructure is often included in the bid item "STRUCTURES, REM PORTIONS (Structure No.)".

Designations for NS (near side), FS (far side), and ES (each side) are best used with elevation views. If these designations are used on section or plan views provide a label for the near side and far side of the structure.

PLAN NOTES

Notes shown on these plans reflect current notes at the time of production. Consult Chapter 8 of the MDOT Bridge Design Manual for up-to-date notes for each plan sheet. Changes to standard notes should be made only if absolutely necessary. Add project specific notes as required.

Avoid adding work items to specifications (other work/pay items) without a special provision. Simply noting that an item of work should be paid for with another specification is not acceptable.

When placing notes on drawings, they shall be grouped in an area on the right-hand side of the sheet immediately above the title block.

The detailer shall avoid placing notations and dimensions close to the left side of the drawing. When the plans have been bound together, it may be difficult to read information placed in that location.

Notes shall be grouped by subject matter.

LINE WORK

Unless a given centerline serves a dual purpose, it should have only one designation throughout the plans. To label the line "Centerline of Bridge" on the Abutment Details and "Const. Centerline" on the Superstructure Details implies there are two separate lines.

Outlines of structural elements that are detailed on other sheets, but are shown for reference on the detail sheet, shall be shown with sufficient line contrast to distinguish them from the items detailed on the sheet.

The detailer shall use different weights of lines for easier interpretation of the drawing. See example plan sheets for illustrations.

All details shown must be in agreement with design guides if such guides are available. Examples are Railing Details, Structural Steel Details, and Bearing Details. It is recognized that these Guides cannot always be up to date nor apply to all situations and that judgment must be used at times.

REBAR DETAILING

In most cases reinforcement lines shall be wt. 1 and broken. Where a detail's scale is extremely large (1"=2' or larger), reinforcement may be shown as a double line.

Each bar shall be identified by a letter followed by six digits. The letter identifies the shape, as shown on the Steel Reinforcement Detail Sheet. The first two digits designate the bar size; the last four are the length in feet and inches. (For example, a #5 B bar, 3'-6" total length is designated B050306.) Epoxy coated bars will be preceded by the letter E; e.g., EB050306.

When the full bar designation is given, the word "bars" is not needed in a callout. For example (11) EA062410 (TOP & BOTT) is preferred to (11) EA062410 BARS (TOP & BOTT).

In general, the complete bar number should be shown in plan views and elevation views. Elsewhere the bar should be identified by shape and size only. Use sections to dimension rebar spacing.

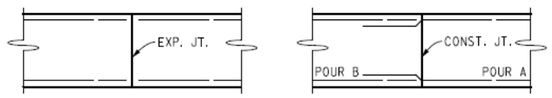
Reinforcement spacing callouts shall include a distance. If the distance is an unusual number, give a maximum spacing. Do not use "equal spaces" as in "23 equal spaces = 18'-9" ". Also, never use "approx." or "about" as in "23 spaces @ about 10" = 18'-9" ". Instead these should read "23 spaces @ 10" max = 18'-9".

When reinforcement callouts apply to multiple locations include number of locations in the callout. For example: "Typ, 5 locations" is preferable to "Typ each bay".

It is possible that bent bars may have the same total length but different bend dimensions. To avoid confusion, add 1" to one of the bars.

To avoid confusion for the reinforcement installers, attempt to detail reinforcing steel in groups of equal length bars rather than have many bars of only slightly different lengths. This can be done by varying lap lengths, varying development lengths, and using deck bar cutting diagrams on skewed bridges where required.

The reinforcing steel at expansion joints or passing through construction joints shall be detailed as shown below. Provide a lap near construction joints, show the lap on the side of the construction joint that will be poured last. An exception to this rule is made when laps are intentionally placed in areas of low stress.



REINFORCING STEEL THRU JOINTS

Detailers should consider the actual radii of bent bars when locating reinforcement.

Dimensions for concrete cover should be given to the center of the bar, unless "clear cover" is specified.

For additional information on steel reinforcement, see Subsection 7.04 of the Bridge Design Manual

DELIVERABLES

Final plan sheets shall be prepared in CAD format and converted to Adobe Acrobat "PDF" format when submitting to MDOT Specifications & Estimates Section and MDOT Project Manager.

Scanned copies of existing plan sheets and other information submitted "for information only" should be submitted as Reference Information Documents (RID). See Chapter 5 of the MDOT Development Guide.

File Names for CADD sheets can be found in Section 3.3 of the MDOT Development Guide.

COMMON ABBREVIATIONS

Avoid using abbreviations that may be misunderstood. Any unusual abbreviations should be identified in the plan notes of the sheet on which they appear.

If using initial letters to represent words periods are not normally used (e.g. HPJS), if abbreviations consist only of the first part of a word, then a period is put at the end.

ABUT.	Abutment
ALI.	Alignment
ALUM.	Aluminum
APPR.	Approach
AVG.	Average
BM	Bench Mark
B/O	By others
BOTT.	Bottom
BR.	Bridge
BRG.	Bearing
CB	Catch Basin
CTR.	Center
C TO C	Center to Center
C&G	Curb and Gutter
CI	Cast Iron
CIP	Compacted in Place, Cast in Place
℄	Centerline (special symbol)
CMP	Corrugated Metal Pipe
CO.	County or Company
COL.	Column
CONC.	Concrete
CONST.	Construct, Construction
CP	Crown Point/Control Point
CS	Curve to Spiral
CYD	Cubic Yards
DIA.	Diameter
DIAPH.	Diaphragm
DWG	Drawing
EB	Eastbound
ES	Each Side
EA	Each
EJWP	Expansion Joint Waterproofing
ELEC.	Electric
ELEV. or EL.	Elevation
EPS	Expanded Polystyrene
EXCAV.	Excavate or Excavation
EXIST. or EX.	Existing
EXP.	Expansion
FIX	Fixed
FL	Flow Line
FS	Far Side
FDN.	Foundation
FLG.	Flange
FT	Linear Feet
FTG.	Footing
GDR.	Girder
GRAV.	Gravel
HMA	Hot Mix Asphalt
HPJS	Hot Poured Joint Sealant
HS	High Strength
HW	High Water
HORIZ.	Horizontal
HWY.	Highway
INV.	Invert
JT.	Joint
JWP	Joint Waterproofing
LA	Limited Access
LW	Low Water
MAT'L	Material
MAX.	Maximum
MI.	Mile, Miles
MIN.	Minimum
MSE	Mechanically Stabilized Earth
NB	Northbound
NS	Near Side
OHWM	Ordinary High Water Mark
O-O	Out to Out
PC	Point of Curve
PCI	Prestressed Concrete I (i.e. PCI beam)
PG	Plan Grade
PI	Point of Intersection
POC	Point on Curve
POT	Point on Tangent
POR	Point of Rotation
PREST.	Prestressed
PSI	Pounds per Square Inch
PSF	Pounds per Square Foot
PT	Point of Tangency, Point
PVI	Point of Vertical Intersection
PVC	Polyvinyl Chloride
℄	Plate (special symbol)
PROJ.	Project
PROP.	Proposed
PAVT	Pavement
ROW	Right-of-Way
RAD. or R.	Radius
REINF.	Reinforcing, Reinforcement, Reinforced
RDWY.	Roadway
REF.	Reference
RELOC.	Relocate
RET. WALL	Retaining Wall
REV.	Revised, Revision
SB	Southbound
SC	Spiral to Curve
SDWK or SW.	Sidewalk
SVC. RD.	Service Road
SHT.	Sheet
SHLDR.	Shoulder
SPA.	Spaces, Spacing
SFT	Square Foot, Square Feet
ST	Spiral to Tangent
STA.	Station
STD.	Standard
STIFF.	Stiffener
STR.	Structure or Structural
SYD	Square Yards
SYM.	Symmetrical
T & B	Top and Bottom
TAN.	Tangent
TEMP.	Temporary
TS	Tangent to Spiral
TYP.	Typical
UNDCL.	Underclearance
VC	Vertical Curve
VERT.	Vertical
WB	Westbound
WP	Working Point
WS	Water Surface
XING	Crossing

MICHIGAN DEPARTMENT OF TRANSPORTATION

ROUTE: M-89
CITY OF PLAINWELL
ALLEGAN COUNTY

ROAD	YEAR	TRAFFIC DATA ADT	DHV	COMM	SPEED DATA DESIGN	POSTED	LIMITS
M-89	2012	21,300	11,100	3.5%	40	35	M-89 OVER KALAMAZOO RIVER
	2032	24,750	12,900	4.0%	40	**	
M-89	2012	26,700	13,900	5.0%	50	45	EB & WB M-89 OVER US-131
	2032	31,000	16,100	6.0%	50		

1

SECTION	CONTROL SEC	JOB NO.	FEDERAL PROJECT	FEDERAL ITEM
2	03023	100217A		
2	03111	89306A		

3

COUNTY KEY

4

PROJECT LET WITH ROAD PROJECT JN 90028A, 112213A & 113363A

5

GENERAL NOTES

THE DESIGN OF B04 OF 03023 IS BASED ON 1.2 TIMES THE CURRENT AASHTO LRFD BRIDGE DESIGN SPECIFICATION HL-93 LOADING WITH THE EXCEPTION THAT THE DESIGN TANDEM PORTION OF THE HL-93 LOAD DEFINITION SHALL BE REPLACED BY A SINGLE 60 KIP AXLE LOAD BEFORE APPLICATION OF THIS 1.2 FACTOR. THE RESULTING LOAD IS DESIGNATED HL-93 MOD. LIVE LOAD PLUS DYNAMIC LOAD ALLOWANCE DEFLECTION DOES NOT EXCEED 1/1000 OF SPAN LENGTH.

THE REHABILITATION DESIGN OF S02-3 & S02-4 OF 03111 IS BASED ON THE 17TH EDITION OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES HS25 LOADING. LIVE LOAD PLUS IMPACT DEFLECTION DOES NOT EXCEED 1/1000 OF SPAN LENGTH. THE ORIGINAL STRUCTURES WERE DESIGNED FOR HS20 LOADING BASED ON AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.

EXCEPT WHERE OTHERWISE INDICATED ON THESE PLANS, OR IN THE PROPOSAL AND SUPPLEMENTAL SPECIFICATIONS CONTAINED HEREIN, ALL MATERIALS AND WORKMANSHIP SHALL BE ACCORDING TO THE MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION 2012 EDITION.

THE DESIGN OF THE STRUCTURAL MEMBERS IS BASED ON MATERIAL OF THE FOLLOWING GRADES AND STRESSES:

CONCRETE: GRADE S2	f'c	=	3,000 psi
CONCRETE: GRADE D	f'c	=	4,000 psi
STEEL REINFORCEMENT	fy	=	60,000 psi
STEEL REINFORCEMENT: STIRRUPS FOR PRESTRESSED BEAMS	fy	=	40,000 psi
STRUCTURAL STEEL: AASHTO M270 GRADE 36	Fy	=	36,000 psi
STRUCTURAL STEEL: AASHTO M270 GRADE 50	Fy	=	50,000 psi
STRUCTURAL STEEL: AASHTO M270 GRADE 50W	Fy	=	50,000 psi
PRESTRESSED CONCRETE	f'c	=	6,000 psi
PRESTRESSED CONCRETE COMPRESSIVE STRENGTH AT RELEASE	f'ci	=	5,000 psi
PRESTRESSING STRANDS	f's	=	270,000 psi

ALL EXPOSED CONCRETE CORNERS SHOWN SQUARE ON THE PLANS SHALL BE BEVELED WITH $\frac{1}{2}$" TRIANGULAR MOLDINGS EXCEPT AS OTHERWISE NOTED.

BIDDERS WILL BE FURNISHED WITH SCANNED IMAGES OF PLAN SHEETS OF THE EXISTING STRUCTURES IF REQUESTED.

THE BRIDGE PAINT FOR S02-3 & S02-4 OF 03111 MAY CONTAIN LEAD.

THE DESIGN OF THE FOUNDATION PILING IS BASED ON MATERIAL OF THE FOLLOWING GRADES AND STRESSES:

FOUNDATION PILING (STEEL H-PILING): AASHTO M270 GRADE 50	Fy	=	50,000 psi
FOUNDATION PILING (STEEL H-PILING): AASHTO M270 GRADE 50W	Fy	=	50,000 psi

UNLESS OTHERWISE SHOWN ON THE PLANS PROVIDE MINIMUM CONCRETE CLEAR COVER FOR REINFORCEMENT ACCORDING TO THE FOLLOWING:

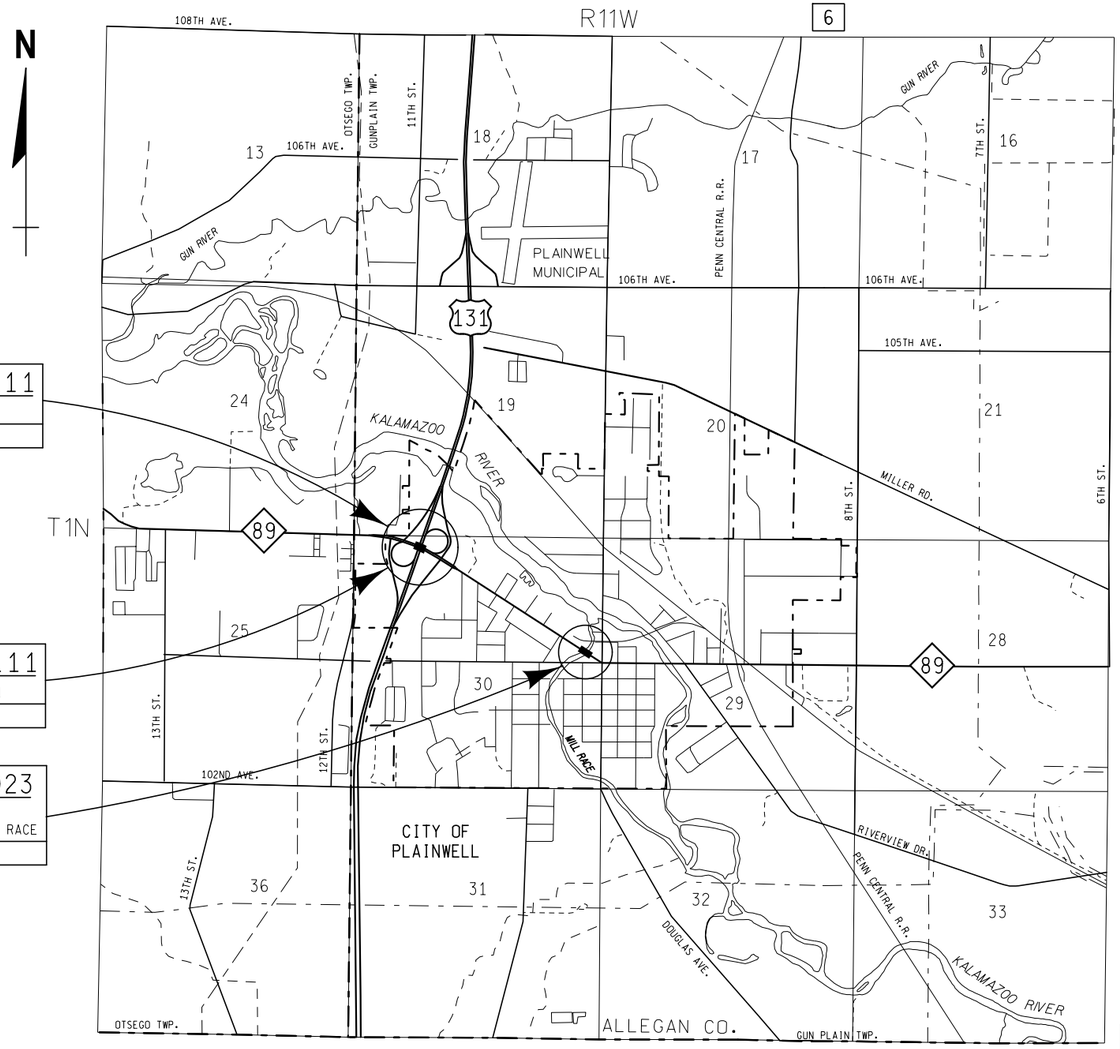
CONCRETE CAST AGAINST EARTH:	3 IN.
PRESTRESSED BEAMS:	1 IN.
ALL OTHER UNLESS SHOWN ON PLANS:	2 IN.

THE BRIDGE DECK SURFACES OF S02-3 & S02-4 OF 03111 HAVE HMA PATCHES. REMOVAL OF HMA AS A RESULT OF REMOVAL OF OTHER SUPERSTRUCTURE ITEMS SHALL BE INCLUDED IN THE REMOVAL OF THOSE ITEMS.

THE REGULATED WASTE ACTIVITY IDENTIFICATION NUMBER FOR THIS PROJECT IS AS FOLLOWS:

CONTROL SECTION	NUMBER
S02-3 & S02-4 OF 03111	MIK984555114

7



S02-4 OF 03111
WB M-89 OVER US-131
JN 89306A

2

S02-3 OF 03111
EB M-89 OVER US-131
JN 89306A

B04 OF 03023
M-89 OVER
KALAMAZOO RIVER MILL RACE
JN 100217A

6

THESE PLANS WERE PREPARED FOR THE MICHIGAN DEPARTMENT OF TRANSPORTATION BY

9

NAME, P.E. - TITLE — DATE

COMPANY
ADDRESS 1
ADDRESS 2
PHONE

APPROVALS

RECOMMENDED FOR APPROVAL BY:

, P.E. - PROJECT MANAGER — DATE

, P.E. - CONSTRUCTION ENGINEER — DATE

MICHIGAN DEPARTMENT OF TRANSPORTATION
KIRK T. STEUDLE, P.E. - DIRECTOR

APPROVED BY: BRADLEY C. WIEFERICH, P.E. - ENGINEER OF DEVELOPMENT — DATE

8

CONTRACT FOR:
B04: BRIDGE REPLACEMENT, APPROACH WORK & MAINTAINING TRAFFIC.
S02-3 & S02-4: DEEP OVERLAY, DECK JOINT REPLACEMENT, PARTIAL DECK & RAILING REPLACEMENT, CLEANING & COATING STRUCTURAL STEEL, STRUCTURAL STEEL REPAIR, SUBSTRUCTURE REPAIR, APPROACH WORK & MAINTAINING TRAFFIC.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

9

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT
FILE: B0112345 title.dgn	TSC:

CS: B04 OF 03023, S02-3 & S02-4 OF 03111
JN: 100217A & 89306A

TITLE SHEET	DRAWING	SHEET
		SECT 2 4

PUBLIC UTILITIES

The existing utilities listed below and shown on these plans represent the best information available as obtained on our surveys. This information does not relieve the contractor of the responsibility to be satisfied as to its accuracy and the location of existing utilities.

Name of Owner	Type of Utility
AT & T (NATIONAL) Attention: Mike Diederich Senior Tech, AT&T Network Services Outside Plant Engineering & Construction 4500 Johnston Pkwy, Room 7 Cleveland, OH 44128 Phone: 216-587-6267 Fax: 281-664-3094	Communication
AT & T (LNS) Attention: Dale DeFever 1000 Town Center, Suite 150 Southfield, MI 48075 Phone: 248-204-0126 Fax: 248-204-0329 Cell: 586-242-2671 e-mail: daledefever@att.com	Communication
AT&T Attention: Sean Muhlenkamp 100 S. Main Mt. Clemens, MI 48403 Phone: (586) 466-1054 Fax: (586)466-1056 Email: sm8164@att.com	Telephone
City of Detroit Public Lighting Department Attention: Denise Williams 9449 Grinnell Ave. Detroit, MI 48213 Phone: (313) 267-7216 Fax: (313) 267-8153	Electric
City of Detroit Detroit Water and Sewerage Department Attention: Andrew Dix 3501 Chene St. Detroit, MI 48207 Phone: (313) 999-5648	Water & Sewer
Comcast Cablevision of Detroit Attention Daryl Wood 25626 Telegraph Road Southfield, MI 48034 Phone: 248-809-2749 Fax: 248-809-2721	Communication
Detroit Edison Co. Attention: Anjanette Borawski One Energy Plaza, Room 577SB Detroit, MI 48226-1221 Phone: 313-235-9284 Fax: 313-235-6457	Electric
Detroit Thermal, LLC Attention: Tom Munro 3575 East Palmer Detroit, MI 48211-3151 Phone: 313-921-1922 Fax: 313-921-1972	Steam
DTE Energy/MichCon Gas Attention: Laura Forrester 17150 Allen Road Melvindale, MI 48122 Phone: (313) 389-7261 Fax: (313) 382-7771	Gas
ITC Transmission Attention: Erin M. Keeler 27175 Energy Way Novi, MI 48377 Phone: 248-946-3298 Fax: 248-946-3229	Electric
Level (3) Metro Networks Services Attention: Scott Antone Senior Network Technician 19675 W. 10 Mile Rd Southfield, MI 48075 Phone: 517-206-8644 Fax: 720-567-1316	Communication
MCI WorldCom Attention: Brian Smith 366 Dublin Road Columbus, OH 43125 Phone: 614-921-8634	Communication
SEMTOC Attention: Stanley Quinney 1060 W. Fort Street Detroit, MI 48226 Cell: (248) 867-7899 Fax: (313) 256-9036	MITS
Nextel Communications Erickson Services, Inc. Post On-Air Support Team Attention: Chadwick Perry 4717 Broadmoor, Suite H Kentwood, MI 49512 Phone: 616-656-5154 Fax: 616-554-6484	Communication
Sprint/Nextel Attention: Gerry Crain East Region, Great Lakes District 5600 N. River Road, Suite 300 Rosemont, Illinois 60018 Phone: 847-737-1279 Fax: 847-737-1377	Communication
Rogers Telecom, Inc. Attention: Richard Austria 8200 Dixie Road, East Building Brampton, ON L6T 0C1 Mailstop 15E (Oasis 15) Phone: 647-747-2967 Fax: 647-747-4140	Communication

NOTES APPLYING TO STANDARD PLANS

Where the following items are called for on plans, they are to be constructed according to the standard plan given below opposite each item unless otherwise indicated.

Title	Plan No.
ROAD	
ISOLATION JOINT DETAILS	R-37-B
GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS	R-80-E
BRIDGE	
FENCING FOR BRIDGE RAILING, AESTHETIC PARAPET TUBE	B-41-C
MOLDING, BEVEL, LIGHT STANDARD ANCHOR BOLT ASSEMBLY AND NAME PLATE DETAILS	B-103-E
PAVEMENT MARKINGS	
WORK ZONE DEVICES	
TRAFFIC SIGNALS	
SIGNING	

SHEET INDEX

FUNDING CATEGORIES

JN 107474A I-94 under M-3 (Gratiot Ave)
JN 107474, Category 0001 = Fed / State / City of Detroit (Act 51 participating items) – ROADWAY ITEMS

JN 107474, Category 0002 = Fed / State / City of Detroit (Act 51 participating items) – BRIDGE ITEMS

JN 108061, Category 0003 = Fed / State (Act 51 non-participating items) – ROADWAY ITEMS

JN 107474, Category 0004 = 100% AT&T – BRIDGE UTILITY ITEMS

JN 107474, Category 0005 = 100% MichCon – ROADWAY UTILITY ITEMS

TITLE SHEET

1. Note for PR and Milepost data is not needed if title sheet map does not reference this data.
2. Show job numbers if multiple jobs are included with the plan set. If scope of work varies significantly, from bridge to bridge, the work description can be placed under the bridge callouts (see #8).
3. Show Section 2 (bridge) if Section 1 (road) has its own title sheet. Otherwise show 1&2
4. Indicate if project is let with separate road job numbers.
5. Obtain notes from the MDOT Bridge Design Manual, Chapter 8. Include any project specific notes.
6. Map should contain major road names, railroad names, river names, municipalities, section numbers, township numbers, range numbers, and county names. Label state, U.S. and interstate routes with appropriate badges. Scale the map appropriately for the project.
7. Design criteria notes should be modified as little as possible. For cases where different AASHTO codes are used in a single project, use 2 separate notes.
8. List work items for each structure in the plan set. Add as many as needed.
    a. Bridge replacement
    b. Superstructure replacement
    c. Deck replacement
    d. Bridge widening
    e. Deep/shallow/HMA overlay/Epoxy overlay
    f. Railing replacement
    g. Joint replacement
    h. Cleaning and coating structural steel
    i. Structural steel repair
    j. Substructure repair
    k. Approach work
    l. Maintaining traffic
    m. Scour countermeasures
    n. [add project specific work items if required]
9. Consultant Jobs Only
    a. Use consultant box on the Title sheet for Prime consultant only. Place consultant logo in the title block at bottom of sheet.
    b. Sub-consultant work must have their title block or logo on the sheets they are responsible for, no signature required.
    c. If consultants do a portion of an MDOT designed project, the consultant must sign the first sheet of work and state “Responsible for sheet #__ through sheet #__.”

PROJECT INFORMATION SHEET

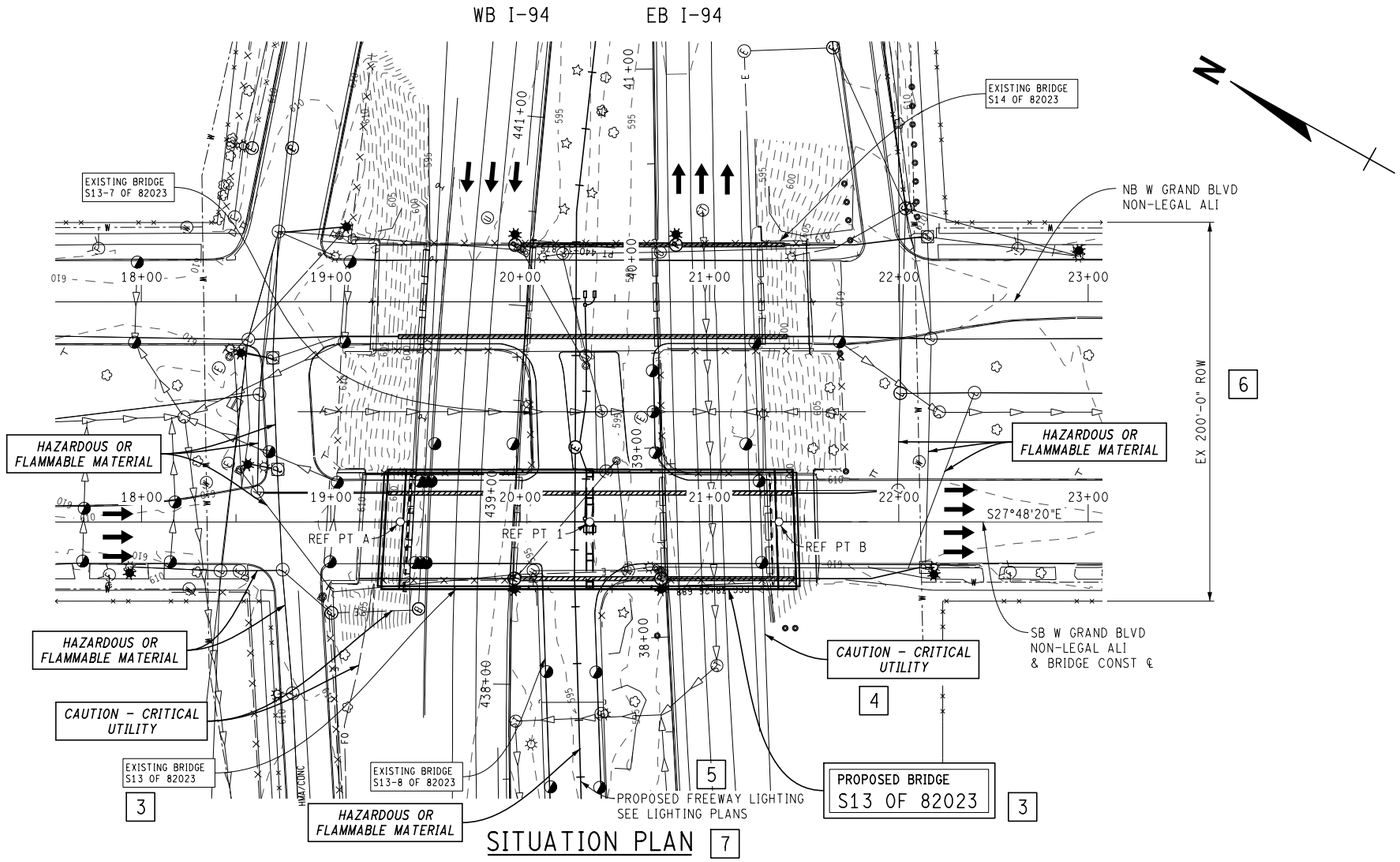
This sheet is available for download at MDOT’s website.

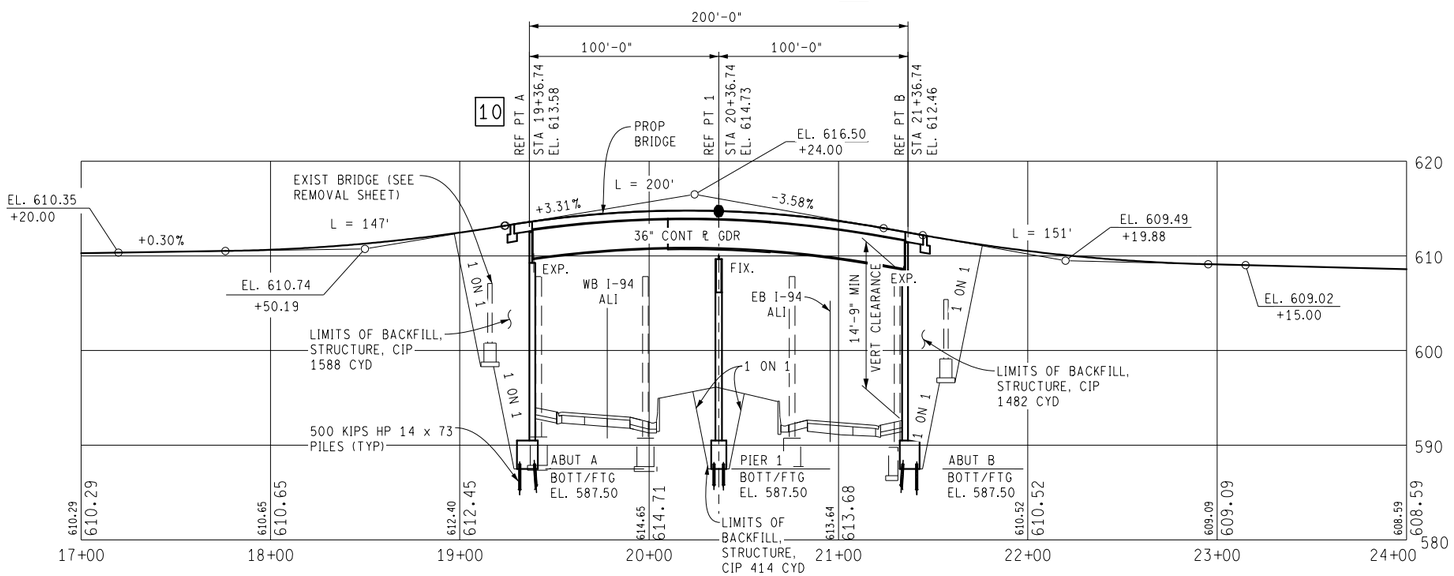
Contact TSC utility engineer for utility contact information.

Remove unused headings not used in the table for Standard Plans.

The plan index should be placed in the right-most column.

Don’t show percentages for funding categories because changes in funding could cause those to become incorrect.





PROFILE ALONG SB W GRAND BLVD NON-LEGAL ALIGNMENT 9

VERTICAL SCALE 1"=16'

EXISTING STRUCTURE

THE EXISTING STRUCTURE IS A 5 SPAN MULTI STRINGER PLATE GIRDER SUPERSTRUCTURE ON SPREAD FOUNDATIONS AND WAS BUILT IN 1953. IT HAS AND OVERALL LENGTH OF 242.8' WITH A CLEAR ROADWAY WIDTH OF 44' AND WAS DESIGNED FOR HS 20 (MS18) LIVE LOAD. 2

1

SURVEY CONTROL & BENCHMARKS

SEE SECT 1 SURVEY INFORMATION SHEET FOR SURVEY CONTROL & BENCHMARKS

UTILITIES

SEE SECT 1 PROJECT INFORMATION SHEET FOR UTILITIES

COORDINATES

REF PT	NORTH	EAST	ELEV
PR A	311212.59	13463132.10	613.58
PR 1	311125.26	13463180.81	614.73
PR B	311037.92	13463229.54	612.46

COORDINATES PROVIDED ARE TO ESTABLISH THE GEOGRAPHIC LOCATION OF THE STRUCTURE, HOWEVER SHALL NOT TAKE PRECEDENCE OVER STRUCTURAL DIMENSIONS. 14

8

NOTES:

THE WORK COVERED BY THESE PLANS INCLUDES REMOVAL OF THE EXISTING BRIDGE, CONSTRUCTION OF THE PROPOSED BRIDGE AND PLACING SLOPE PROTECTION TO THE LIMITS SHOWN. ALL OTHER WORK IS INCLUDED IN SECT 1 PLANS WHICH ARE A PART OF THIS CONTRACT.

SB WEST GRAND BLVD. TRAFFIC IS TO BE DETOURED OVER OTHER EXISTING ROADS. I-94 TRAFFIC IS TO BE MAINTAINED BY PART-WIDTH CONSTRUCTION.

17 THE CONTRACTOR SHALL LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK AND SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.

MEASURES SHALL BE TAKEN TO PREVENT DEBRIS FROM FALLING FROM THE STRUCTURE.

PLAN ELEVATIONS REFER TO NAVD88 DATUM.

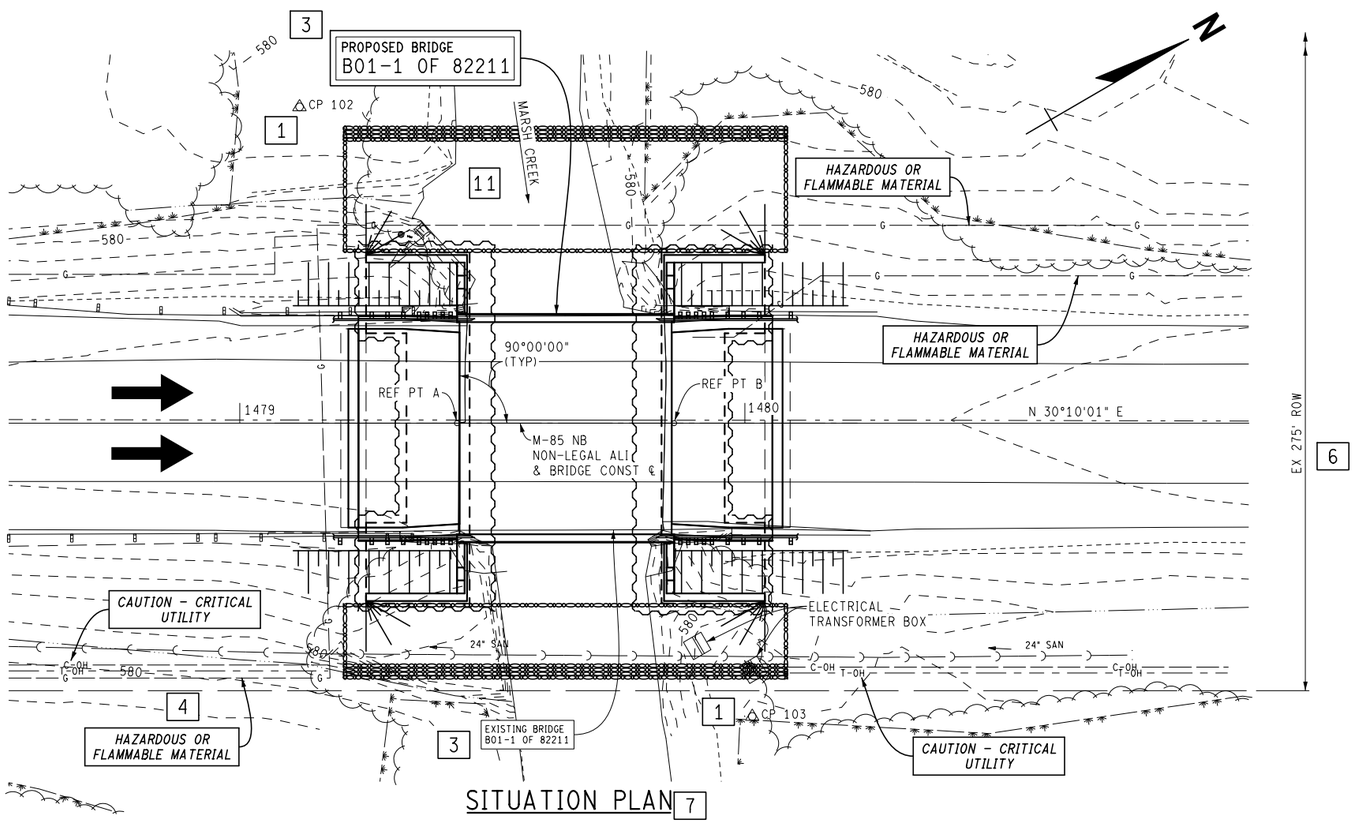
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

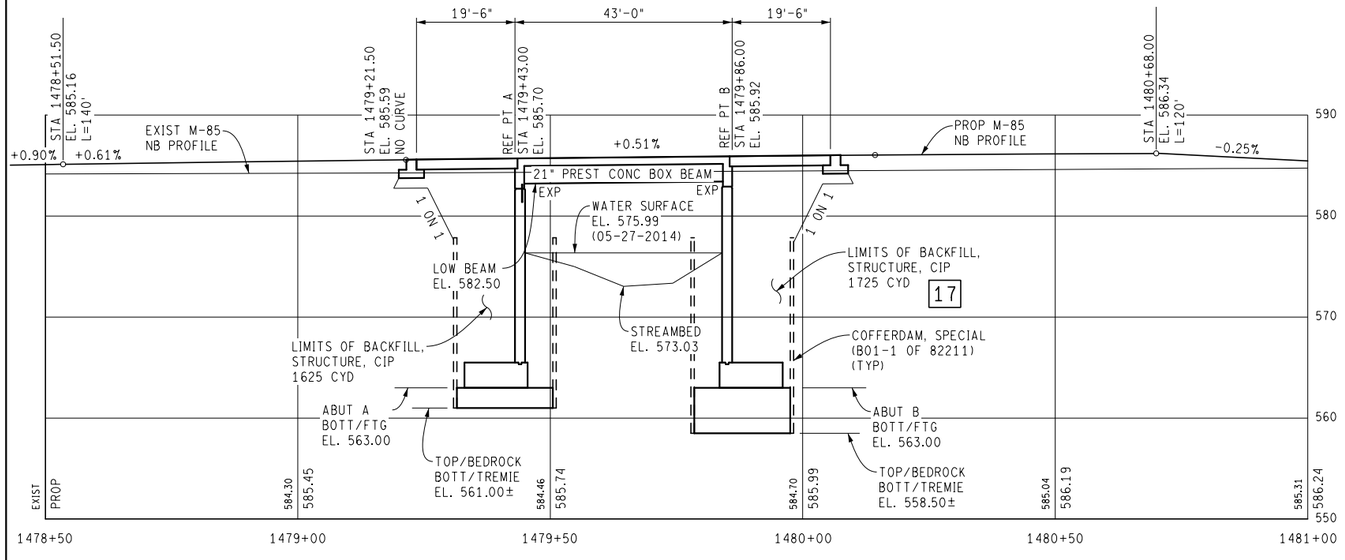
15 0 HORZ. (FT) 80

DRAWN BY: C TECH	DATE:	CS: S13 OF 82023	GENERAL PLAN OF SITE
CHK'D BY: B ENGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A	12 I-94 UNDER SB W. GRAND BLVD IN DETROIT
FILE: S13 82023 SITE.DGN	TSC:		

DRAWING	SHEET
S01 SITE 001	SECT 2 7



SITUATION PLAN 7



PROFILE ALONG M-85 NB NON-LEGAL ALIGNMENT

VERTICAL SCALE: 1" = 10'

2

EXISTING STRUCTURE

THE EXISTING STRUCTURE IS A SINGLE SPAN, SIDE-BY-SIDE BOX BEAM SUPERSTRUCTURE WITH SPREAD FOUNDATIONS BUILT IN 1958. THE SUPERSTRUCTURE WAS REPLACED IN 1982, DESIGNED FOR HS25 LOADING, PROVIDES A CLEAR RDWY OF 42.83 FT, AND HAS A CLEAR SPAN OF 34.90 FT.

SURVEY CONTROL & BENCHMARKS

SEE SECT 1 SURVEY INFORMATION SHEET FOR SURVEY CONTROL & BENCHMARKS

UTILITIES

SEE SECT 1 PROJECT INFORMATION SHEET FOR UTILITIES

14

COORDINATES

REF PT	NORTH	EAST	ELEV
PR A	223082.55	13434784.41	585.70
PR B	223119.73	13434806.02	585.92

COORDINATES PROVIDED ARE TO ESTABLISH THE GEOGRAPHIC LOCATION OF THE STRUCTURE, HOWEVER, SHALL NOT TAKE PRECEDENCE OVER STRUCTURAL DIMENSIONS.

NOTES:

THE WORK COVERED BY THESE PLANS INCLUDES REMOVAL OF THE EXISTING BRIDGE, CONSTRUCTION OF THE PROPOSED BRIDGE, PLACING SLOPE AND SCOUR PROTECTION TO THE LIMITS SHOWN AND ROADWAY APPROACH RECONSTRUCTION.

THE CONTRACTOR SHALL LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK AND SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.

M-85 NB TRAFFIC IS TO BE MAINTAINED UTILIZING TEMPORARY CROSS OVERS.

PLAN ELEVATIONS REFER TO NAVD 88 DATUM.

WATER LEVEL IS SUBJECT TO CHANGE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING A DETERMINATION OF WATER LEVELS THAT MAY EXIST DURING CONSTRUCTION.

MEASURES SHALL BE TAKEN TO PREVENT DEBRIS FROM FALLING FROM THE STRUCTURE. IF DEBRIS FALLS INTO THE WATERWAY, IT SHALL BE REMOVED WITHIN 24 HOURS. SINCE DISTURBANCE OF THE WATERWAY BOTTOM MAY BE AS HARMFUL AS THE DEBRIS ITSELF, THE PREVENTIVE MEASURES MUST BE EFFECTIVE.

IMMEDIATELY AFTER THE CONSTRUCTION OF AN ABUTMENT IS COMPLETED, SLOPE PROTECTION AND SEEDING OR SODDING SHALL BE PLACED ON THE ADJACENT EMBANKMENT SLOPES.

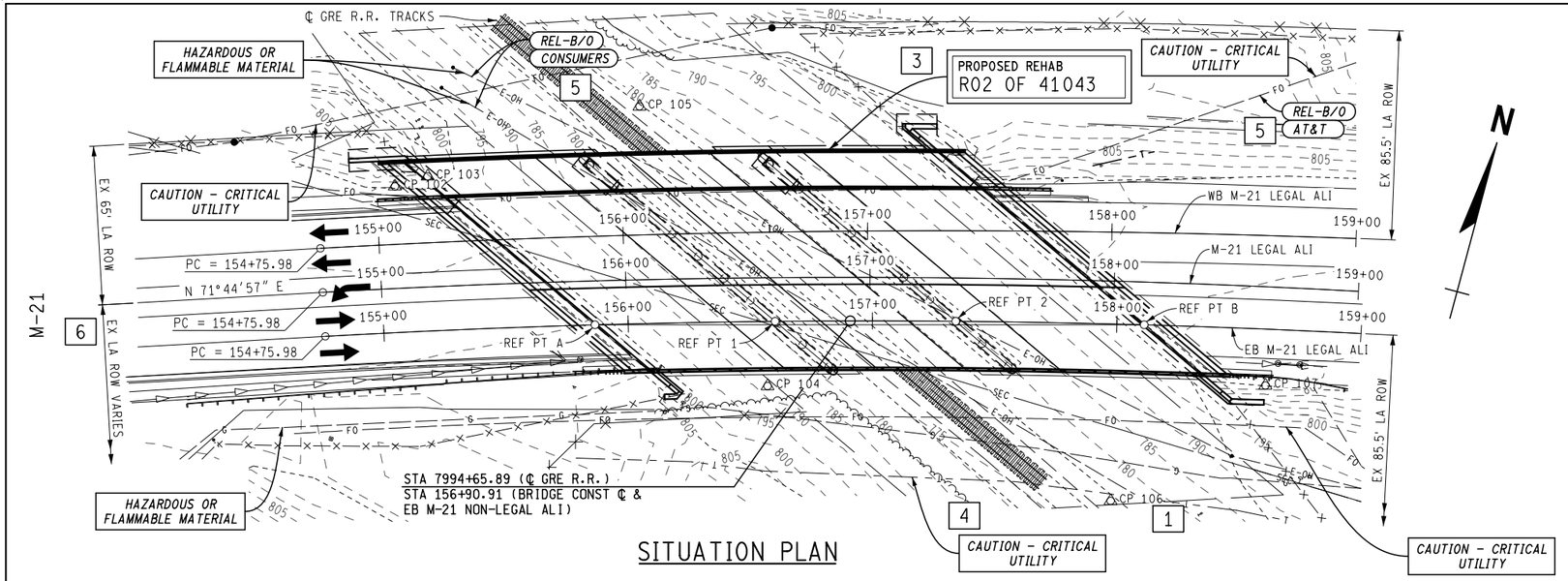
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

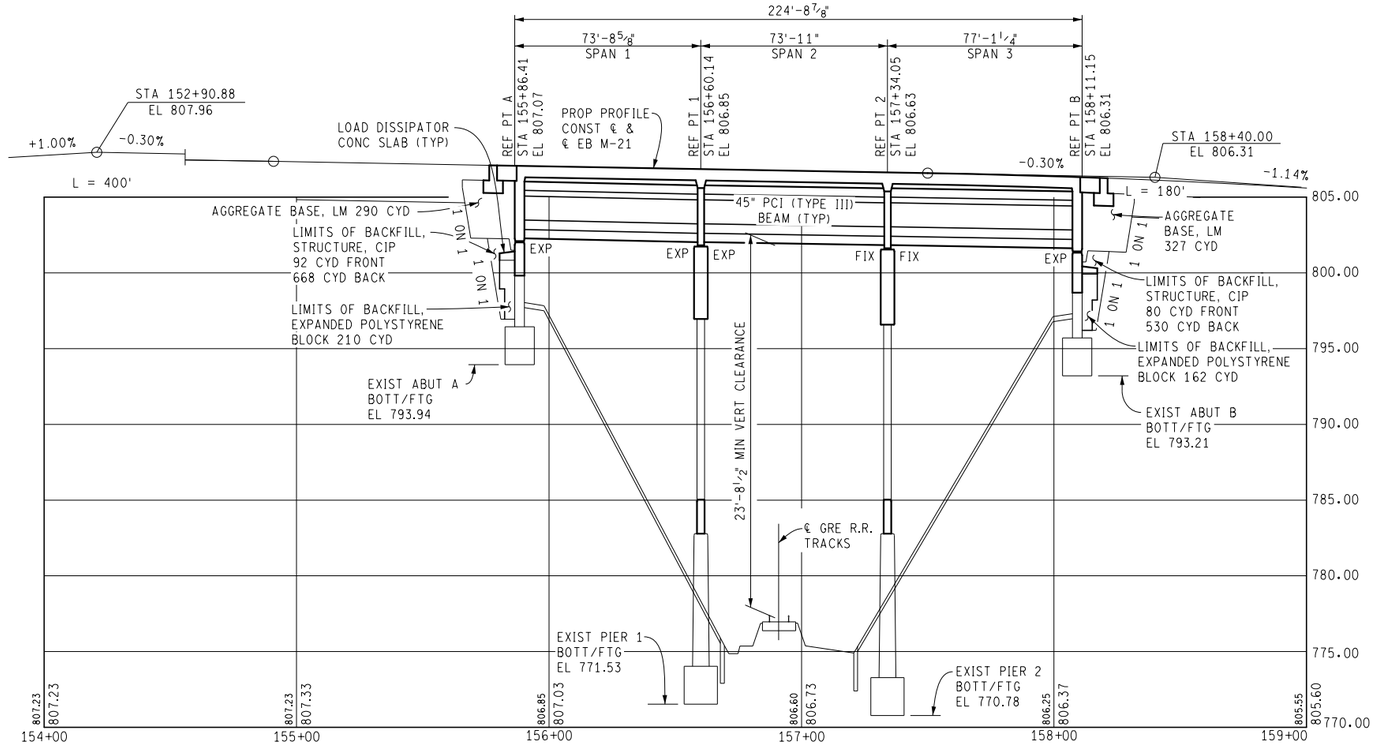
15
0 HORZ. (FT) 30

DRAWN BY: C TECH	DATE:	CS: B01-1 OF 82211	12 GENERAL PLAN OF SITE
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 120062A	M-85 NB OVER MARSH CREEK
FILE:b01-1 82211 site.dgn	TSC:		3.0 MI N OF N HURON RI DR

DRAWING	SHEET
B01-1 SITE 001	SECT 2 8



SITUATION PLAN



PROFILE ALONG EB M-21 LEGAL ALIGNMENT

VERTICAL SCALE 1" = 10'

EXISTING STRUCTURE

THE EXISTING BRIDGE IS A THREE SPAN STEEL GIRDER SUPERSTRUCTURE WITH SPREAD FOOTINGS ON A SLIGHT CURVE WITH AN OVERALL LENGTH OF 224'-9". THE OVERALL WIDTH VARIES FROM 76'-5" TO 78'-2 3/8" AND THE CLEAR ROADWAY WIDTH VARIES FROM 64'-0" TO 65'-9 3/8". THIS BRIDGE WAS ORIGINALLY BUILT IN 1977 AND WAS DESIGNED FOR HS25 LOADING.

SURVEY CONTROL & BENCHMARKS

SEE SECT 1 SURVEY INFORMATION SHEET FOR SURVEY CONTROL & BENCHMARKS

UTILITIES

SEE SECT 1 PROJECT INFORMATION SHEET FOR UTILITIES

13 M-21 CURVE DATA

M-21 LEGAL ALI

Δ = 29°05'40" (RT)
D = 1°30'06"
T = 990.19'
L = 1,937.64'
R = 3,815.80'
E = 126.38'
PC = 154+75.98 N = 535,284.96 E = 12,804,553.59
PI = 164+66.17 N = 535,595.07 E = 12,805,493.96
PT = 174+13.62 N = 535,408.78 E = 12,806,466.47
EX & PROP SUPER = 3%

WB M-21 LEGAL ALI

Δ = 29°05'40" (RT)
D = 1°16'08"
T = 1,171.69'
L = 2,292.82'
R = 4,515.26'
E = 149.55'
PC = 154+75.98 N = 535,302.06 E = 12,804,559.23
PI = 166+47.67 N = 535,588.10 E = 12,805,530.32
PT = 177+68.80 N = 535,395.74 E = 12,806,534.60
EX & PROP SUPER = 3%

EB M-21 LEGAL ALI

Δ = 29°05'40" (RT)
D = 1°27'15"
T = 1,022.53'
L = 2,000.93'
R = 3,940.45'
E = 130.51'
PC = 154+75.98 N = 535,267.87 E = 12,804,559.23
PI = 164+98.51 N = 535,588.10 E = 12,805,530.32
PT = 174+76.91 N = 535,395.74 E = 12,806,534.60
EX & PROP SUPER = 3%

NOTES:

THE WORK COVERED BY THESE PLANS INCLUDES MAINTAINING TRAFFIC, SUPERSTRUCTURE REPLACEMENT AND SUBSTRUCTURE WIDENING. ALL OTHER WORK IS INCLUDED IN SECT 1 PLANS THAT ARE A PART OF THIS CONTRACT.

THE CONTRACTOR SHALL LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK AND SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.

PIERS 1 AND 2 SHALL BE CONSTRUCTED AND BACKFILLED PRIOR TO THE PLACING OF ABUTMENT FILLS.

THE GROUND ADJACENT TO THE TRACKS AND STRUCTURE SHALL BE GRADED BY THE CONTRACTOR TO PROVIDE DRAINAGE.

M-21 TRAFFIC IS TO BE MAINTAINED OVER THE BRIDGE BY PART-WIDTH CONSTRUCTION.

PLAN ELEVATIONS REFER TO NAVD 88 DATUM.

THE TRAIN MOVEMENT AND SPEED INFORMATION SHOWN IN THE PROPOSAL DOES NOT REPRESENT A COMMITMENT BY THE GRAND RAPIDS EASTERN RAILROAD AND IS SUBJECT TO CHANGE WITHOUT NOTICE.

MEASURES SHALL BE TAKEN TO PREVENT DEBRIS FROM FALLING FROM THE STRUCTURE.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)

NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

0 HORZ. (FT) 60

DRAWN BY: C TECH	DATE:	CS: R02 OF 41043	GENERAL PLAN OF SITE	DRAWING	SHEET
CHK'D BY: B ENGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 102973A	M-21 OVER GRAND RAPIDS EASTERN RAILROAD	R02 SITE 001	SECT 2 9
FILE: r0241043site3.dgn	TSC:		3.5 MILES WEST OF THE VILLAGE OF ADA		

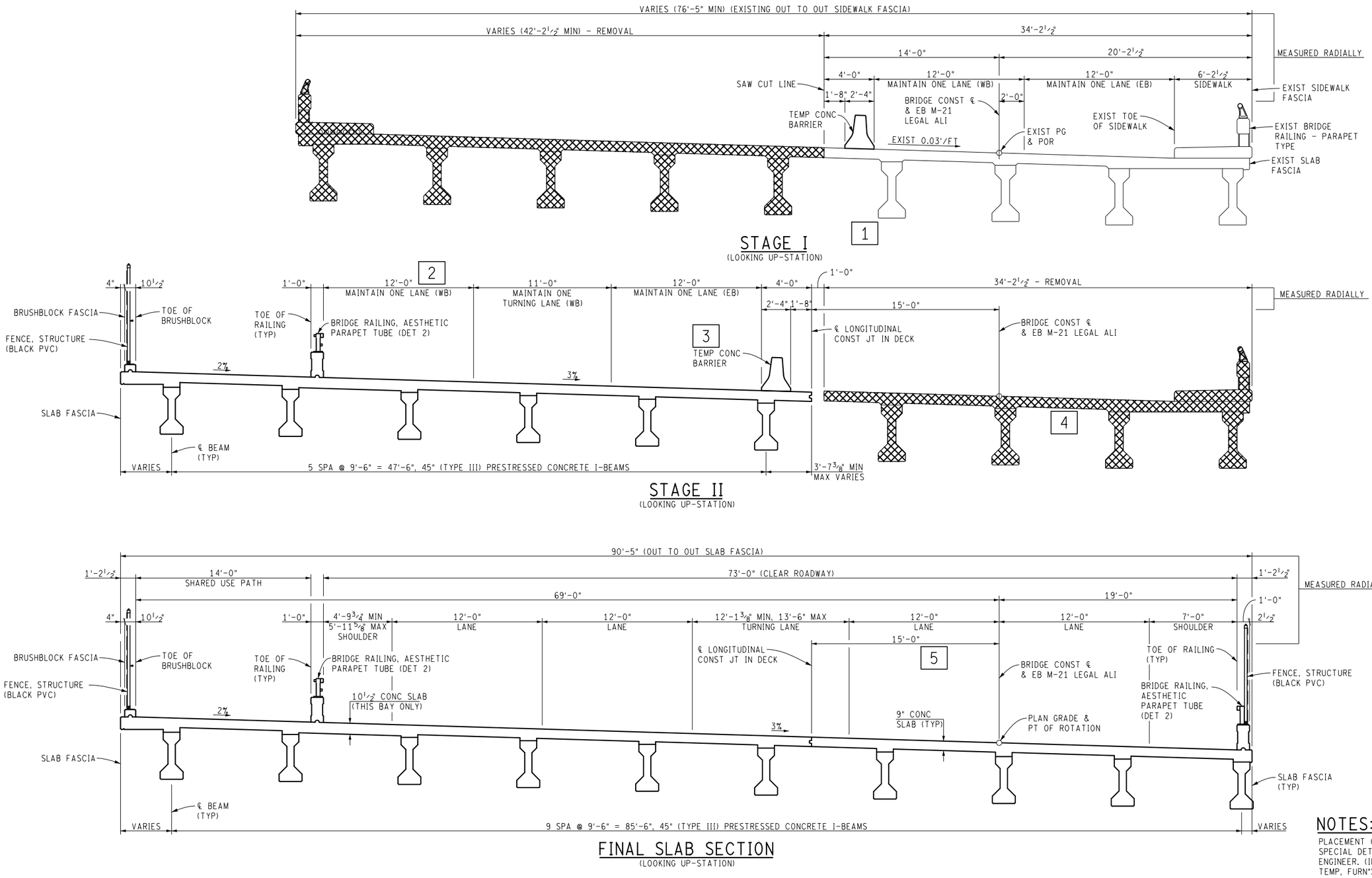
GENERAL PLAN OF SITE

Each bridge in a plan set must have a General Plan of Site. If a proposed General Plan of Site sheet is not required, include the General Plan of Site from existing plans.

1. Benchmarks and witnesses are described on the survey information sheet, descriptions need not be repeated here. Show location of the survey control points, benchmarks, and section corners in plan view. Label each point.
2. Briefly describe the existing structure with number of spans, superstructure type, foundation type, design loading, year constructed, and major applicable rehab work.
3. Label all existing structures with existing text size - Wt. 0. Label proposed structure with proposed 1.5x text - Wt. 1. Label the bridge as “EXISTING BRIDGE”, “PROPOSED BRIDGE”, or “PROPOSED REHAB”. Place a box around existing bridge callouts and a double box around proposed bridge callouts.
4. Show all existing utilities. Label underground telephone, water main and fiber optic lines with the “Caution – Critical Utility” cell. Label electric and underground gas with the “Hazardous or Flammable Material” cell. Existing sewer, sanitary sewer, and sanitary force main only need to be labeled without flagging of a critical utility cell.
5. Utilities to remain in-place are not labeled as such. Utilities to be relocated by others must be labeled with the RELOC B/O cell. Place the utility owner’s name in an oval below the cell. If proposed utility work is detailed elsewhere in the plan set, label that utility with a callout. For example “PROPOSED FREEWAY LIGHTING, SEE LIGHTING PLANS”. Utilities to be relocated prior to construction should be shown as existing.
6. ROW is dimensioned only to legal alignments. If a legal alignment is not available then the ROW is dimensioned from ROW line to ROW line.
7. Situation plan should show a topographic survey of the area within 150’ beyond the ends of the bridge and 100’ outside the fascias of the proposed structure. Show the following:
   a. Alignment with stationing
   b. Label reference points (stations not required)
   c. Curbs and pavement edges
   d. Bodies of water & wetland boundaries
   e. Existing structures and proposed structures
   f. Show existing contours at a 2’ or 5’ interval.
   g. Survey control points and benchmarks with control point and benchmark number. (note: if survey monuments are located on the bridge, they must be shown and the preserve monument cell should be placed on the drawing)
   h. Existing and proposed utilities including sewers and drainage structures and utility poles.
   i. Traffic flow arrows
8. Typical approach section is no longer required on bridge plans because duplicate information is shown on road plans. It can be added on a case-by-case basis for unique situations.
9. Profile along Roadway alignment. Generally the vertical scale is exaggerated 5x the horizontal scale. The profile should show the following:
   a. Proposed Structure including structural slab, girders, abutments, piers, sleeper slabs & foundations
   b. Existing substructure.
   c. Proposed/existing roadway below.
   d. Proposed vertical geometry: label PVI station & elevations, curve lengths, and longitudinal grades. Show PC & PT’s with circles but stations and elevations are not needed.
   e. Show existing ground profile along proposed profile.
   f. Label bottom of footing elevations,
   g. Backfill slopes and quantities of backfill at each substructure unit.
   h. Dimension the point of minimum vertical clearance.
   i. Label piles and subfootings
10. Dimension span lengths from Ref Pt to Ref Pt, and structure length from Ref Pt A to Ref Pt B. Note Ref Pt stations and elevations.
11. Show name of stream or river and use an arrow to show flow direction.
12. The bridge location description need only be inserted on the title block of the General Plan of Site and the General Plan of Structure. List the facility associated with the bridge’s control section first, then the route under/over. Finally, list the proximity of the structure to the nearest city/town, major highway or county line as shown in MiBridge.
13. Horizontal curve data can be shown in the plan view if the bridge is on a tangent section. For curved geometry, show curve data.
14. Give reference point coordinates for proposed substructure units only.
15. The sheet scale applies to the situation plan. On the profile the vertical scale should be noted. The following scales are supported for creating alignments therefore site sheet scales should use one of the following:

    1” = 30’, 1” = 40’, 1” = 50’, 1” = 80’, 1” = 100’

16. Sufficient data must be provided to permit the structure to be staked out in its proper location. If the alignment cannot be clearly shown on the situation plan, an Alignment Diagram shall be added to the sheet.
17. If backfill quantities are given at each substructure unit in the profile, note 8.03.U is not needed.



NOTES:

PLACEMENT OF TEMPORARY BARRIER SHALL BE ACCORDING TO SPECIAL DETAIL R-126-SERIES OR AS APPROVED BY THE ENGINEER. (INCLUDED IN THE PAY ITEM "CONC BARRIER, TEMP, FURN") (SEE SECT 1 PLANS)

CROSS HATCHED PORTIONS OF THE EXISTING STRUCTURE SHALL BE REMOVED AS SHOWN.

SUBSTRUCTURE STAGING SHALL COINCIDE WITH SUPERSTRUCTURE STAGING UNLESS OTHERWISE SHOWN ON THE REMOVAL DETAILS.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: R02 OF 41043	CONSTRUCTION STAGING DETAILS
CHK'D BY: B ENGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 102973A	
FILE: r0241043cs.dgn	TSC:		

DRAWING	SHEET
R02 CONSTG 001	SECT 2 11

TEST HOLE NO. TH104

LOCATION: EASTBOUND US-10 MEDIAN, STA. 28+89
NORTHING 13202074, EASTING: 764242.9
LATITUDE: 43.596646, LONGITUDE: -84.069536
OFFSET: 22 FEET LEFT OF 9 MILE ROAD CENTERLINE
ELEVATION: 621.9 ft

TEST HOLE DATE 9/17/13

		MC %	HP (ksf)
621.90	SANDY TOPSOIL- BROWN		
621.40			
620.90 (8 10 9)	CLAYEY FINE TO MEDIUM SAND- SOME SILT- TRACE GRAVEL- DARK BROWN- MOIST- MEDIUM DENSE (SC/FILL)		
618.90 (3ST)	YD = 122, UC = 2.6	16	4
617.90			
615.90 (4 5 4)	PIER 1 BOTT/FTG EL 615.25 [2]	11	3
613.40 (19 18 27)		10	4.5+
610.90 (15 18 22)	SANDY CLAY- SOME SILT- TRACE GRAVEL- BROWN- VERY STIFF TO HARD (CL)	10	4.5+
608.40 (12 12 14)		11	4.5+
605.90 (13 16 15)		11	4.5+
603.90 (3ST)			
602.90	YD = 125, UC = 3.1	13	2.5
600.90 (12 15 18)		13	3.5
598.40 (10 11 14)	PIER 1 MIN PILE PENETRATION 598.00 [3]	15	2
593.40 (11 11 12)		14	2
588.40 (9 10 9)		17	1.5
583.40 (10 10 12)	SILTY CLAY- SOME SAND- TRACE GRAVEL- OCCASIONAL WET SILTY FINE SAND SEAMS & COBBLES- GRAY- VERY STIFF TO STIFF (CL)	16	1.5
578.40 (10 10 10)		20	1.5
573.40 (7 8 11)		16	1.5
568.40 (10 10 12)		16	2
563.40 (7 9 10)		20	1.5

TEST HOLE NO. TH104

(CONTINUED)

TEST HOLE DATE 9/17/13

		MC %	HP (ksf)	TV (ksf)
559.90	SILTY CLAY- SOME SAND- TRACE GRAVEL- OCCASIONAL WET SILTY FINE SAND SEAMS & COBBLES- GRAY- VERY STIFF TO STIFF (CL)			
558.40 (5 5 5)		31		0.5
553.40 (4 4 4)	CLAYEY SILT- OCCASIONAL WET SANDY SILT SEAMS- GRAY- MEDIUM (ML)	30		0.5
549.90				
548.40 (28 36 39)	SILTY SANDY CLAY- TRACE GRAVEL- GRAY- HARD (CL)	12	4.5+	
547.90	PIER 1 EST PILE TIP EL 546.00 [4]			
543.40 (47 55 58)	FINE TO COARSE SAND- TRACE SILT & GRAVEL- GRAY- WET- EXTREMELY DENSE (SP)			
538.40 (50 57 63)				
533.40 (32 42 56)				
531.90	END OF TEST HOLE AT 90 FEET.			

NOTES: HOLLOW-STEM AUGERS WERE USED TO ADVANCE THE TEST HOLE TO 15 FEET BELOW THE GROUND SURFACE. WASH ROTARY DRILLING WAS THEN USED TO THE EXPLORED DEPTH OF THE BORING, THEREFORE, AN ACCURATE GROUNDWATER LEVEL MEASUREMENT WAS NOT OBTAINED DURING OR AFTER THE COMPLETION OF TEST HOLE ACTIVITIES.

TEST HOLE NO. TH105

LOCATION: WESTBOUND US-10 RIGHT OF WAY, STA. 29+80
NORTHING 13202139.1, EASTING: 764335.8
LATITUDE: 43.5969, LONGITUDE: -84.069289
OFFSET: 45 FEET RIGHT OF 9 MILE ROAD CENTERLINE
ELEVATION: 620.6 ft

TEST HOLE DATE 9/16/13

		MC %	HP (ksf)
	ABUTMENT B BOTTOM/WALL EL 632.99		
620.60			
619.60 (3 2 4)	SANDY CLAY- SOME SILT- TRACE GRAVEL- FREQUENT SAND SEAMS & LAYERS- BROWN- STIFF (CL/FILL)	15	1.5
618.60			
617.10 (3 3 4)	SANDY CLAY- SOME SILT- TRACE GRAVEL- OCCASIONAL SAND SEAMS- BROWN & GRAY- HARD (CL)	14	4.5+
614.60			
613.60 (3ST)	YD = 129, UC = 2.1	12	4.5+
612.10 (10 12 15)	ABUTMENT B TOP/MSE WALL LEVELING PAD EL 616.64	9	4.5+
609.60			
608.60 (3ST)	YD = 132, UC = 3.3	10	2.75
607.60			
606.60 (3ST)	YD = 131, UC = 2.4	11	2
604.60 (5 7 8)		13	2.5
602.10 (6 8 8)		13	2
599.60 (6 7 8)		11	2.75
597.10 (5 7 8)	SANDY CLAY- SOME SILT- TRACE GRAVEL- OCCASIONAL SAND SEAMS- GRAY- HARD TO VERY STIFF (CL)	10	2
	ABUTMENT B MIN PILE PENETRATION 598.00		
592.10 (5 6 7)		15	2
587.10 (5 7 7)		16	2
582.60			
582.10 (5 6 8)		18	1.25
577.10 (5 5 7)		16	1.5
572.10 (5 5 7)	SILTY CLAY- SOME SAND- TRACE GRAVEL- OCCASIONAL WET SANDY SILT SEAMS- GRAY- STIFF (CL)	17	1.75
567.10 (5 6 8)		14	1.5
562.10 (4 6 7)		15	1.5

TEST HOLE NO. TH105

(CONTINUED)

TEST HOLE DATE 9/16/13

		MC %	HP (ksf)	TV (ksf)
559.60				
557.10 (4 5 5)	CLAYEY SILT- OCCASIONAL WET SANDY SILT SEAMS- GRAY- MEDIUM (ML)	22		0.7
552.60				
552.10 (24 25 29)	SILTY SANDY CLAY- TRACE GRAVEL- GRAY- HARD (CL)	10	4.5+	
548.10				
547.10 (65 81)	ABUTMENT B EST PILE TIP EL 546.00			
542.10 (83/6")	FINE TO COARSE SAND- TRACE TO SOME SILT- SOME GRAVEL- OCCASIONAL COBBLES- GRAY- WET- EXTREMELY DENSE (SP-SM)			
537.10				
536.60 (98/6")	END OF TEST HOLE AT 84 FEET.			

NOTES: HOLLOW-STEM AUGERS WERE USED TO ADVANCE THE TEST HOLE TO 15 FEET BELOW THE GROUND SURFACE. WASH ROTARY DRILLING WAS THEN USED TO THE EXPLORED DEPTH OF THE BORING, THEREFORE, AN ACCURATE GROUNDWATER LEVEL MEASUREMENT WAS NOT OBTAINED DURING OR AFTER THE COMPLETION OF TEST HOLE ACTIVITIES.

(0 / 0 / 0) 1st 6 in / 2nd 6 in / 3rd 6 in

NUMBERS IN CIRCLES DENOTE NUMBER OF BLOWS REQUIRED TO DRIVE A 2" O.D. X 1.5" I.D. SPLIT SPOON SAMPLER 3 SUCCESSIVE 6" INCREMENTS USING A 140 LB AUTOMATIC HAMMER FALLING 30".

THE TEST HOLE LOGS REPRESENT POINT INFORMATION. PRESENTATION OF THIS INFORMATION IN NO WAY IMPLIES THAT THE SUBSURFACE CONDITIONS ARE THE SAME AT LOCATIONS OTHER THAN THE EXACT LOCATION OF THE TEST HOLE. SOIL CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM (USCS).

MC = MOISTURE CONTENT PERCENT
HP = HAND PENETROMETER TEST, SHEAR STRENGTH-KIPS/SQ.FT (KSF)
TV = TORVANE, SHEAR STRENGTH-KIPS/SQ.FT (KSF)
LOI = LOSS ON IGNITION, PERCENT
UC = ONE-HALF OF UNCONFINED COMPRESSION (KSF)
YD = DRY UNIT WEIGHT
3ST = 3-INCH DIAMETER SHELBY TUBE

TEST HOLES TH103 AND TH105 WERE DRILLED WITH AN ALL-TERRIAN VEHICLE MOUNTED ROTARY DRILL RIG. THE REMAINING TEST HOLES WERE PERFORMED WITH A TRUCK MOUNTED ROTARY DRILL RIG.

SOLID-STEM AUGERS WITH AN O.D. OF 4-INCHES WERE USED TO THE EXPLORED DEPTH OF TEST HOLES TH101, TH102, TH106, AND TH107. THESE TEST HOLES WERE BACKFILLED WITH AUGER CUTTINGS AND BENTONITE CHIPS.

HOLLOW-STEM AUGERS WITH AN I.D. OF 3 3/4-INCH AND THE WASH ROTARY METHOD WERE USED TO THE EXPLORED DEPTH OF THE REMAINING TEST HOLES. THESE TEST HOLES WERE BACKFILLED WITH AUGER CUTTINGS AND BENTONITE-CEMENT GROUT.

TEST HOLES PERFORMED IN ASPHALT PAVEMENT WERE PATCHED WITH ASPHALT COLD PATCH AFTER BACKFILLING AND TEST HOLES PERFORMED IN PORTLAND CEMENT CONCRETE WERE PATCHED WITH PORTLAND CEMENT QUICK-CRETE.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: S08 OF 09101	SOIL BORING DATA
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 118329A	
FILE: s08_09101_bor.dgn	TSC:		

DRAWING: S08 BORING 002
SHEET: SECT 2 — 12

CONSTRUCTION STAGING

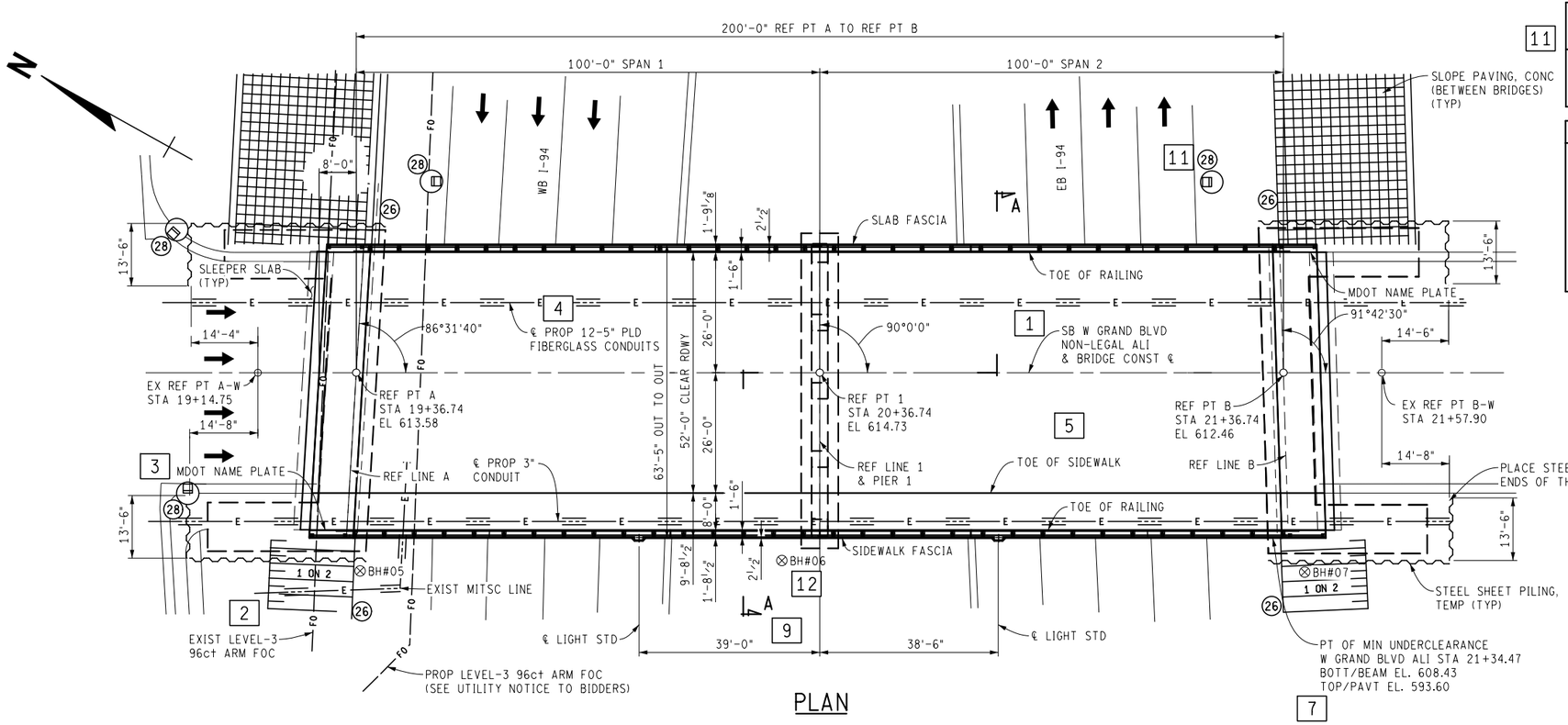
1. Line up separate stages of the deck cross section vertically. If temporary soil retention is needed (e.g. sheet pile) it should be shown on the general plan of structure.
2. Label lane configuration for each stage.
3. Show location of temporary concrete barrier. Ensure minimum edge distance requirements are met. 4ft dimension from the traffic side of the barrier is no longer the standard minimum. See Standard Plans for barrier placement.
4. Cross hatch portions to be removed in each stage.
5. Dimension any longitudinal joints to the Bridge Construction Centerline.

SOIL BORING DATA

1. Borings must be located with station-offsets and/or state plane northing and easting coordinates. Preferably both are shown.
2. Indicate bottom of footing elevations.
3. Indicate minimum pile penetration.
4. Indicate estimated pile tip elevation.
5. Indicate bottom of tremie when applicable.
6. Indicate scour depth.

Show test hole locations on the General Plan of Structure. The soil boring location map is no longer required.

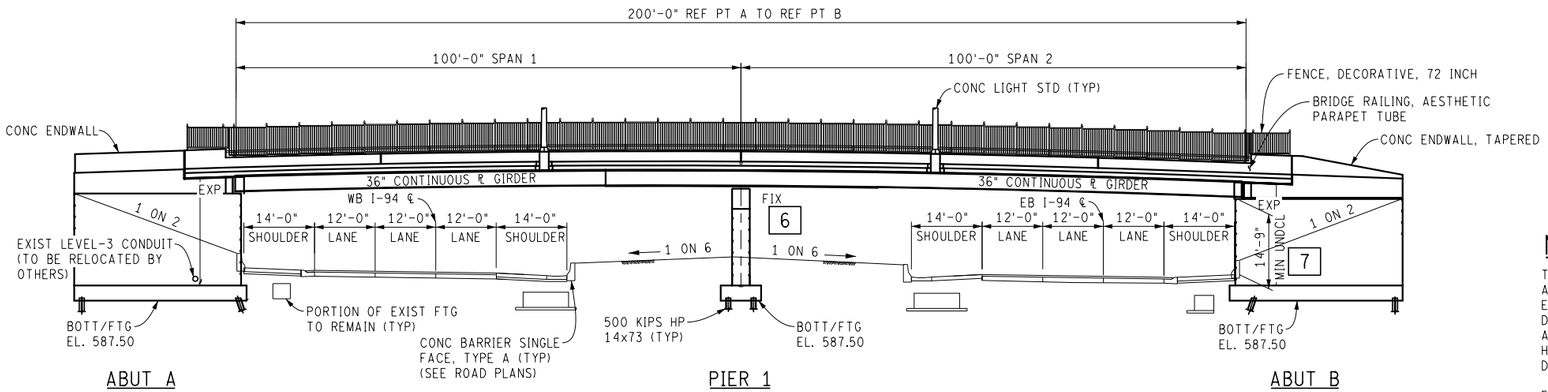
If there is any soil shear data it shall be shown on this sheet.



PLAN

SOIL EROSION AND SEDIMENTATION CONTROL QUANTITIES	
300 Ft	Erosion Control, Silt Fence
4 Ea	Erosion Control, Inlet Protection Fabric Drop

MISCELLANEOUS QUANTITIES	
1 LSUM	Structures, Rem Portions (S13 of 82023)
3031 Cyd	Excavation, Fdn
3484 Cyd	Backfill, Structure, CIP
624 Cyd	Embankment, Structure, CIP
25306 Sft	False Decking
361 Ft	Underdrain, Fdn, 6 inch
161 Syd	Slope Paving, Conc
153 Ft	Slope Paving Header
28 Cyd	Flowable Fill
3947 Sft	Steel Sheet Piling, Temp



ABUT A PIER 1 ABUT B

ELEVATION

(NORMAL TO REFERENCE LINE 1)

NOTES:

THE DESIGN OF THIS STRUCTURE IS BASED ON 1.2 TIMES THE CURRENT AASHTO LRFD BRIDGE DESIGN SPECIFICATION HL-93 LOADING WITH THE EXCEPTION THAT THE DESIGN TANDEM PORTION OF THE HL-93 LOAD DEFINITION SHALL BE REPLACED BY A SINGLE 60 KIP AXLE LOAD BEFORE APPLICATION OF THIS 1.2 FACTOR. THE RESULTING LOAD IS DESIGNATED HL-93 MOD. LIVE LOAD PLUS DYNAMIC LOAD ALLOWANCE DEFLECTION DOES NOT EXCEED 1/1000 OF SPAN LENGTH.

FOR DETAILS OF SLOPE PROTECTION, SEE STANDARD PLAN B-102-SERIES.

THE NOMINAL FATIGUE RESISTANCE RANGE IS BASED ON A DESIGN LIFE OF 75 YEARS.

FALSE DECKING SHALL INCLUDE THE AREA BOUNDED BY REFERENCE LINES A & B AND OUTSIDE FLANGE FASCIAS OF BEAMS A & L DURING REMOVAL AND BEAMS A & K DURING CONSTRUCTION. THE ESTIMATED AREA IS 13453 SQUARE FEET DURING REMOVAL AND 11853 SQUARE FEET DURING PROPOSED CONSTRUCTION.

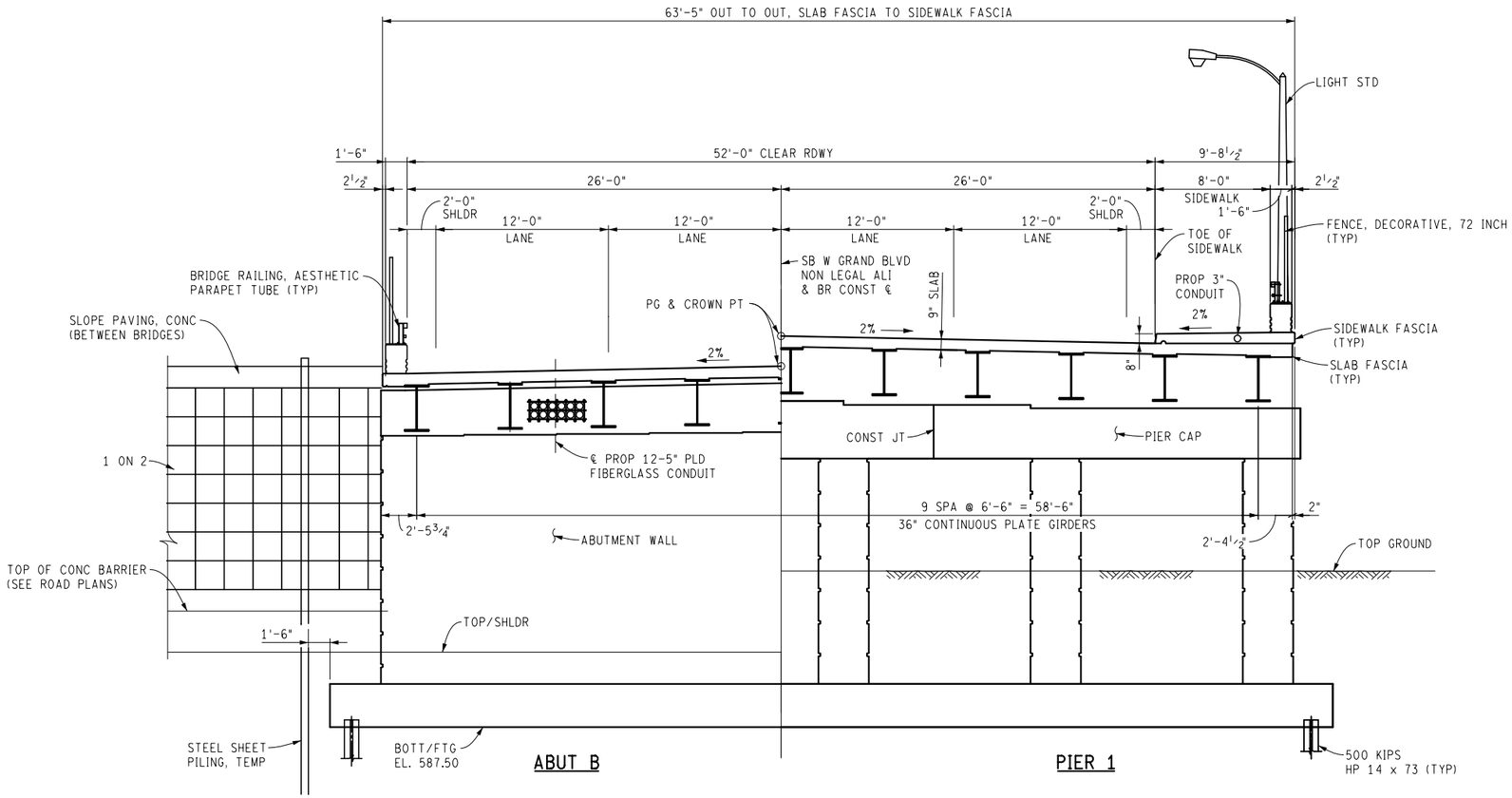
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: S13 of 82023	GENERAL PLAN OF STRUCTURE
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A	I-94 UNDER SB WEST GRAND BLVD
FILE: s13_82023_gpstr.dgn	TSC:		

DRAWING	SHEET
S01 GPSTR 001	SECT 2 14



9

SECTION A-A

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: S13 OF 82023	GENERAL PLAN OF STRUCTURE
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A	I-94 UNDER SB WEST GRAND BLVD
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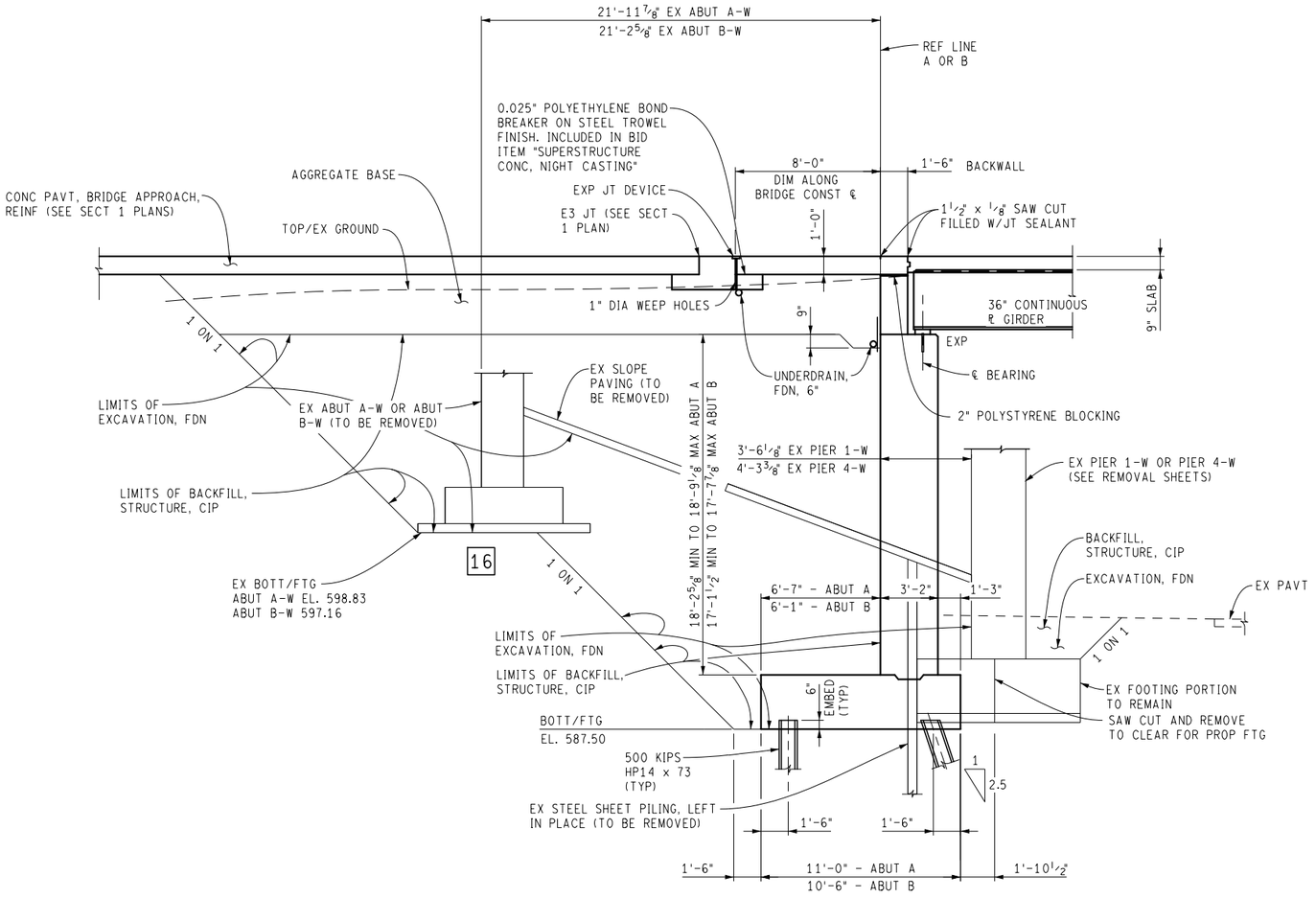
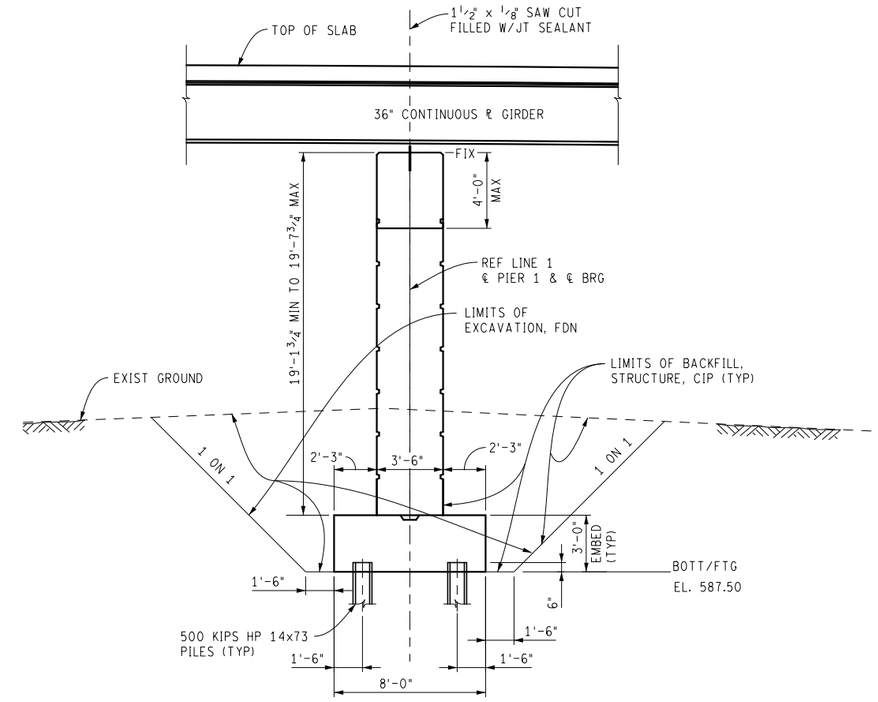


TYPICAL ABUTMENT SECTION



TYPICAL PIER SECTION

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: S13 OF 82023	GENERAL PLAN OF STRUCTURE	DRAWING	SHEET
CHK'D BY: B ENGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A	I-94 UNDER SB WEST GRAND BLVD	S01 GPSTR 003	SECT 2 16
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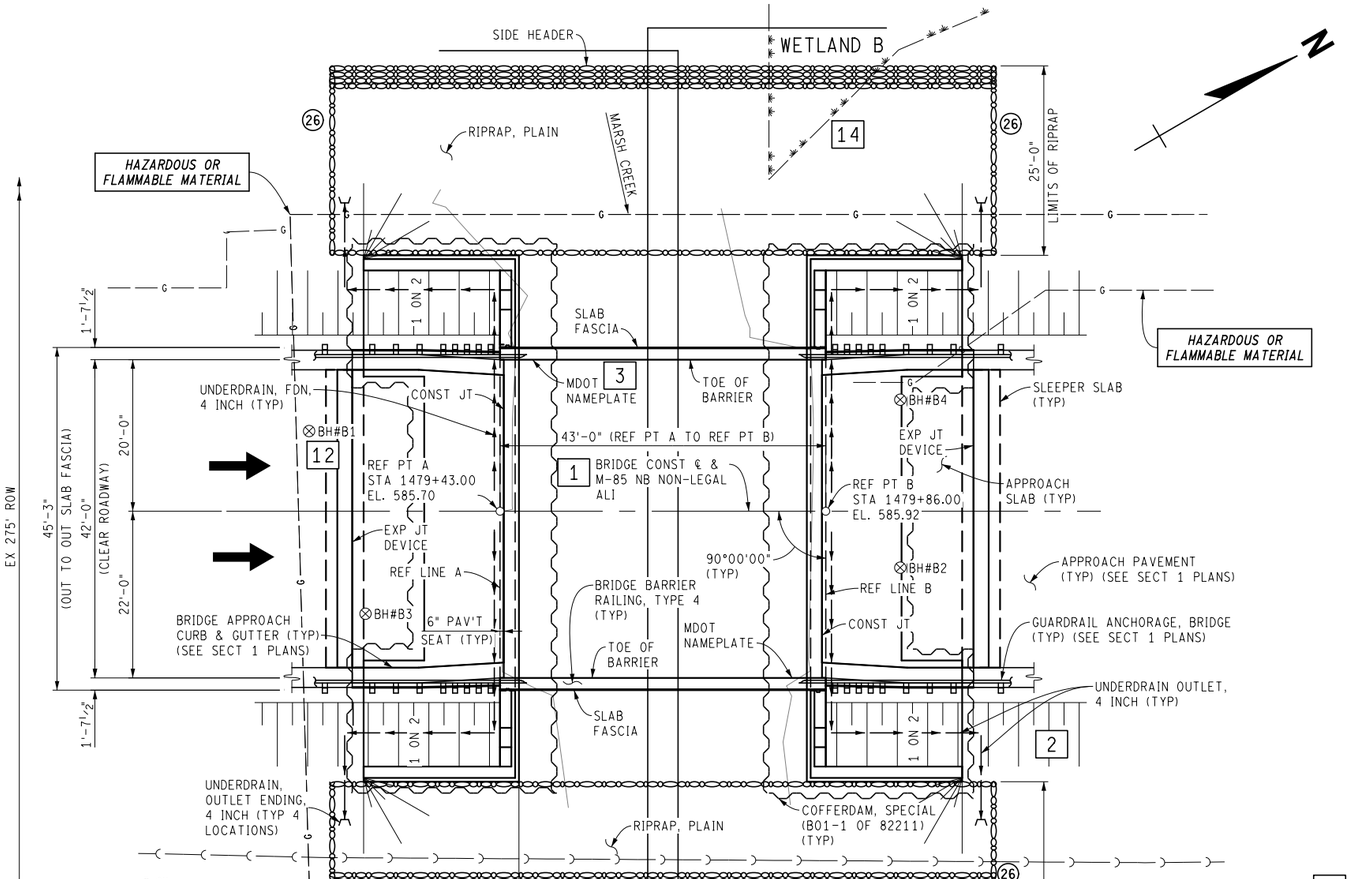

13

SUMMARY OF HYDRAULIC ANALYSIS

	EXISTING			PROPOSED			
FLOOD DATA	DIS-CHARGE (CFS)	WATER SURFACE ELEV. AT U/S FACE OF STRUCTURE	VELOCITY IN D/S CHANNEL (FPS)	WATER SURFACE ELEV. AT U/S FACE OF STRUCTURE	VELOCITY IN D/S CHANNEL (FPS)	WATERWAY AREA (SFT) AT D/S FACE	CHANGE IN WS EL 30 U/S OF PROPOSED STRUCTURE
50 YEAR	1100	584.90	2.01	584.89	2.01	1276.33	-0.01
100 YEAR	1200	585.23	1.95	585.23	1.95	1453.65	0.0
MAXIMUM BRIDGE AREA BELOW LOW CHORD IS 370.5 SQUARE FEET							

NOTES:

THE DRAINAGE AREA CONTRIBUTION TO THIS CROSSING IS 22.6 SQUARE MILES.

THE EXISTING BRIDGE AREA BELOW THE LOW CHORD IS 332.5 FT.

BROKEN CONCRETE SHALL NOT BE USED FOR RIPRAP.

THE WATER SURFACE AND/OR ENERGY GRADE ELEVATIONS SHOWN ON THE ABOVE HYDRAULIC TABLE ARE TO BE USED FOR COMPARISON PURPOSES ONLY AND ARE NOT TO BE USED FOR ESTABLISHING A REGULATORY FLOODPLAIN. THE ELEVATIONS MAY BE USED PROVIDED THEY ARE VERIFIED WITH THE LAND AND WATER MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY.

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SOIL EROSION AND SEDIMENTATION CONTROL QUANTITIES

300 Ft	Erosion Control, Silt Fence
4 Ea	Erosion Control, Filter Bag
180 Ft	Erosion Control, Gravel Filter Berm
370 Ft	Erosion Control, Turbidity Curtain, Deep

MISCELLANEOUS QUANTITIES

1 LSUM	Structures, Rem (B01-1 of 82211)
1950 Sft	False Decking
2800 Cyd	Excavation, Fdn
140 Cyd	Non Haz Contaminated Material Handling and Disposal, LM
1350 Cyd	Backfill, Structure, CIP
290 Cyd	Granular Material, Cl III
1 LSUM	Cofferdam, Special (B01-1 of 82211)
285 Syd	Geotextile, Separator
180 Cyd	Open-Graded Dr Cse, CIP
130 Ft	Underdrain, Fdn, 4 inch
160 Ft	Underdrain Outlet, 4 inch
4 Ea	Underdrain, Outlet Ending, 4 inch
1 LSUM	Conc Surface Coating (B01-1 of 82211)
490 Ton	Riprap, Plain

NOTES:

THE EXISTING BRIDGE SHALL BE FULLY REMOVED. WORK IS INCLUDED IN THE BID ITEM "STRUCTURES, REM (B01-1 OF 82211)".

FALSE DECKING SHALL INCLUDE THE AREA BOUNDED BY REFERENCE LINES A AND B AND OUTSIDE FLANGE FASCIAS OF BEAMS DURING CONSTRUCTION.

THE DESIGN OF THIS STRUCTURE IS BASED ON 1.2 TIMES THE CURRENT AASHTO LRFD BRIDGE DESIGN SPECIFICATION HL-93 LOADING WITH THE EXCEPTION THAT THE DESIGN TANDEM PORTION OF THE HL-93 LOAD DEFINITION SHALL BE REPLACED BY A SINGLE 60 KIP AXLE LOAD BEFORE APPLICATION OF THIS 1.2 FACTOR. THE RESULTING LOAD IS DESIGNATED HL-93 MOD LIVE LOAD PLUS DYNAMIC LOAD ALLOWANCE DEFLECTION DOES NOT EXCEED 1/800 OF SPAN LENGTH.

THE DESIGN OF THE DECK SLAB IS BASED UPON THE STRIP METHOD AS DEFINED IN THE CURRENT AASHTO LRFD BRIDGE DESIGN SPECIFICATION.

WITHOUT THE PREVENTIVE MEASURES SHOWN ON THESE PLANS, THERE IS A POSSIBILITY THAT STREAM BED SCOUR MAY OCCUR. THE ESTIMATED TOTAL SCOUR DEPTH IS CALCULATED TO BE 12 FEET AT ABUTMENT A AND 11 FEET AT ABUTMENT B. THESE DEPTHS ARE BASED ON A 100 YEAR RUNOFF EVENT.

THE ABUTMENT MAXIMUM AVERAGE FOUNDATION PRESSURE IS CALCULATED TO BE 4180 PSF FOR SERVICE LIMIT STATE, AND 6060 PSF FOR STRENGTH LIMIT STATE AND ARE BASED ON A GROSS FOOTING WIDTH OF 12.5 FT.

ITEMS CAST INTO STRUCTURAL PRECAST CONCRETE TO FACILITATE BRIDGE CONSTRUCTION (FORMING, FINISHING, ETC.) SHALL BE GALVANIZED OR EPOXY COATED.

DO NOT USE WHEELED, ROLLER BASED OR MACHINE MOUNTED COMPACTION EQUIPMENT TO COMPACT THE SUBGRADE, SUBBASE, AND BASE WITHIN 10' OF THE SLEEPER SLAB AFTER IT IS BUILT. USE ONLY HAND/PLATE COMPACTORS. CONTACT PRESSURE OF COMPACTION EQUIPMENT SHALL NOT EXCEED 10 PSI.

THE TREMIE SEAL DESIGN WAS BASED ON A WATER SURFACE AT EL. 576.00.

DIFFICULT SHEET PILE INSTALLATION SHOULD BE ANTICIPATED. THE CONTRACTOR SHOULD BE PREPARED TO IMPACT DRIVE SHEET PILE IF REQUIRED.

ELEVATION OF BEDROCK VARIES.

CONTACT REGION SOILS ENGINEER AT LEAST 3 DAYS PRIOR TO PLACING TREMIE CONCRETE. PERFORM SOUNDINGS WITH STEEL ROD TO VERIFY REMOVAL OF SOIL AND PRESENCE OF BEDROCK PRIOR TO PLACING TREMIE.

TURBIDITY CURTAIN SHALL BE STAGED TO COVER NO MORE THAN HALF OF THE CREEK AT ONE TIME.

PARTIAL OPENING OF CREEK SHALL BE MAINTAINED DURING CONSTRUCTION.

INSTALL TURBIDITY CURTAIN, EXCAVATE BEHIND AND THEN REMOVE BEFORE PLACING THE OTHER LINE OF TURBIDITY CURTAIN.

GEOTEXTILE LINER SHALL BE PLACED ON ALL SLOPES PRIOR TO PLACING RIPRAP. PAYMENT FOR GEOTEXTILE LINER SHALL BE INCLUDED IN PAYMENT FOR RIPRAP.

CONCRETE COATING SHALL BE APPLIED TO THE LIMITS OF BARRIER AS DETAILED. THE TOTAL ESTIMATED AREA FOR CONCRETE COATING IS 80 SYD.

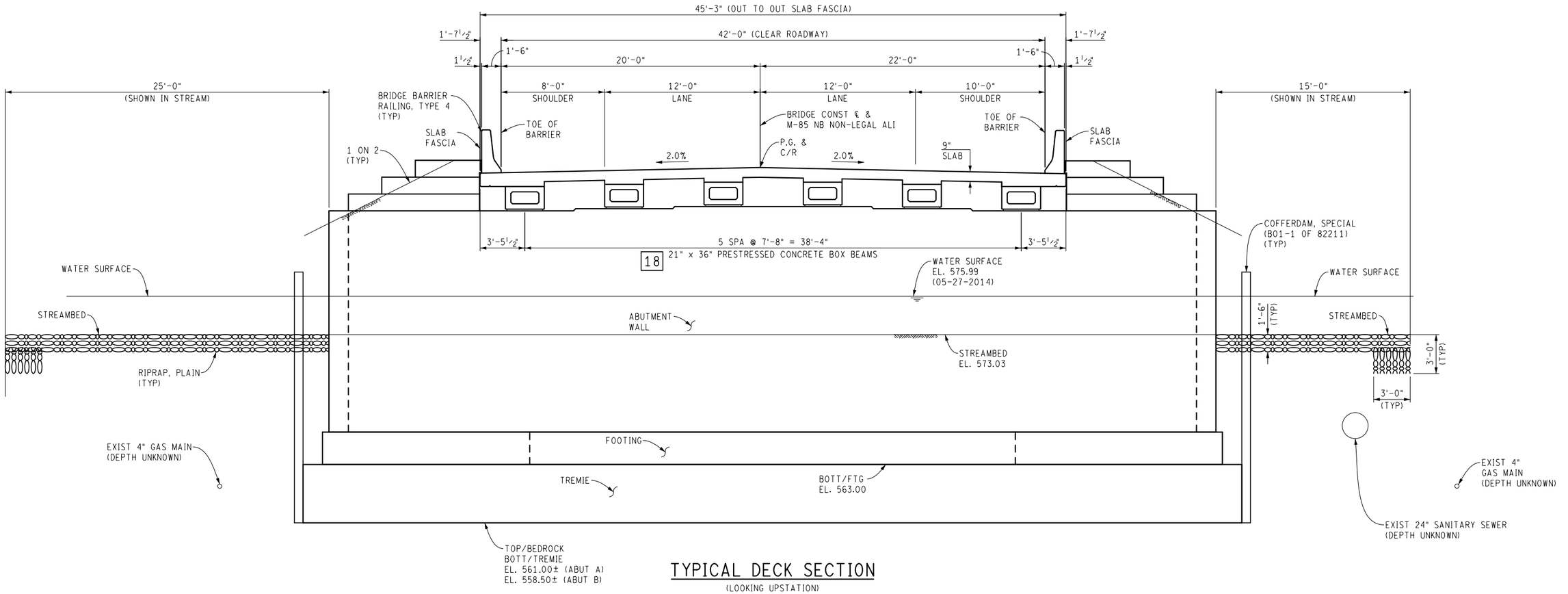
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

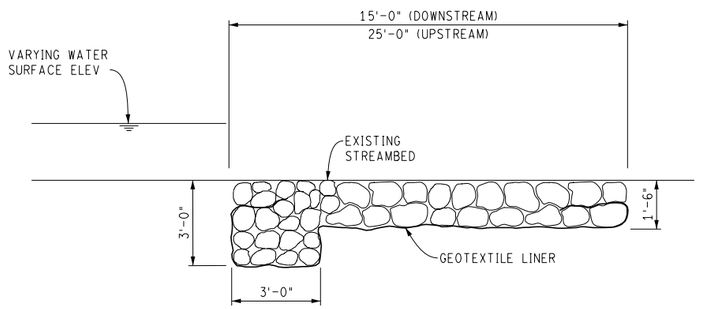
DRAWN BY: CT	DATE:	CS: B01-1 OF 82211	GENERAL PLAN OF STRUCTURE
CHK'D BY: EGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 120062A	M-85 NB OVER MARSH CREEK
FILE: b01-1 82211 gpstr.dgn	TSC: TAYLOR		

DRAWING	SHEET
B01-1 GPSTR 001	SECT 2 17

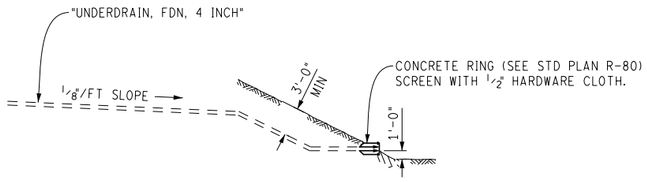


TYPICAL DECK SECTION

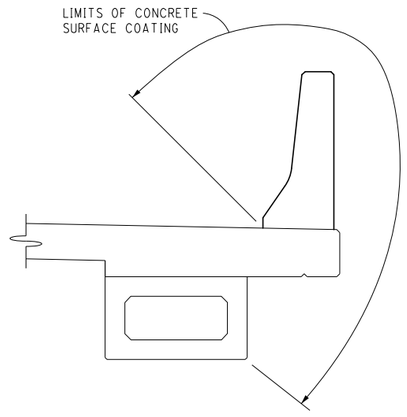
(LOOKING UPSTATION)



SIDE HEADER DETAIL



UNDERDRAIN OUTLET DETAIL



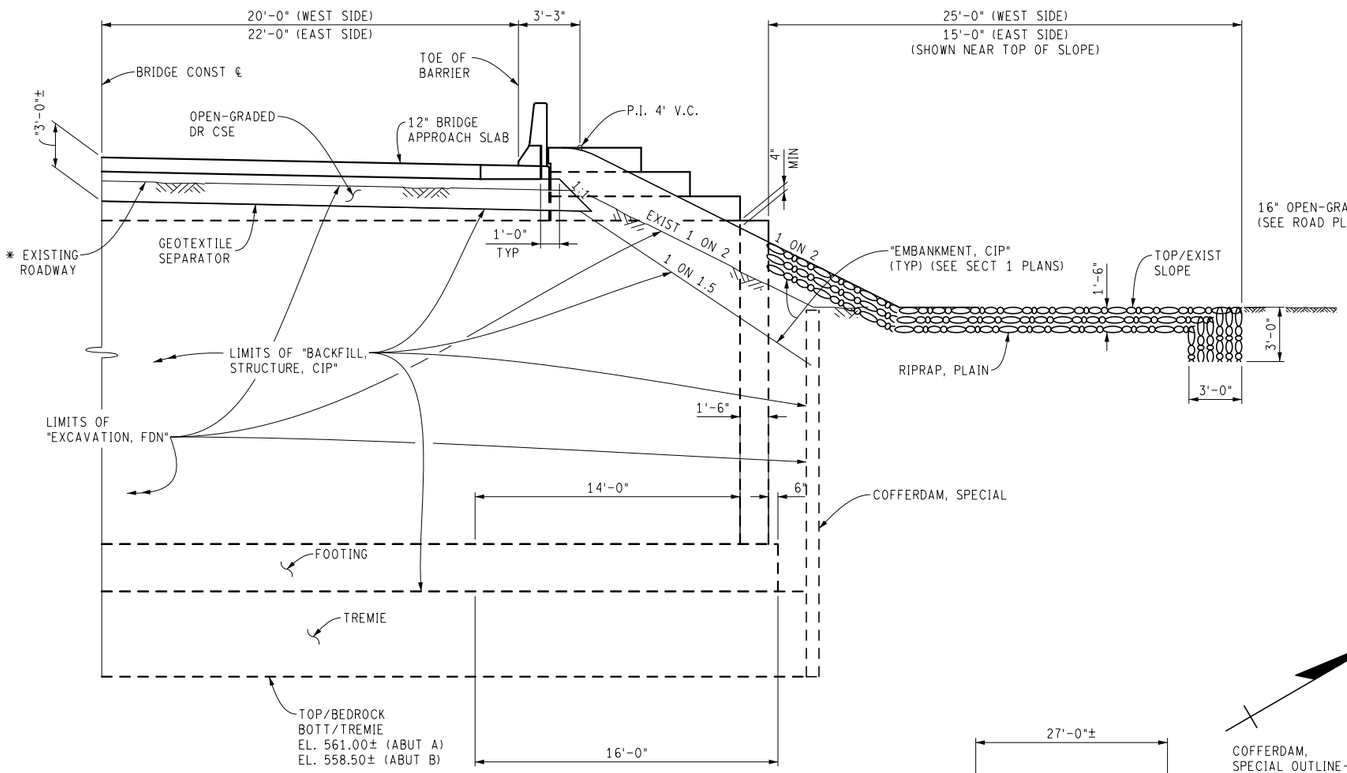
CONCRETE SURFACE COATING LIMITS

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

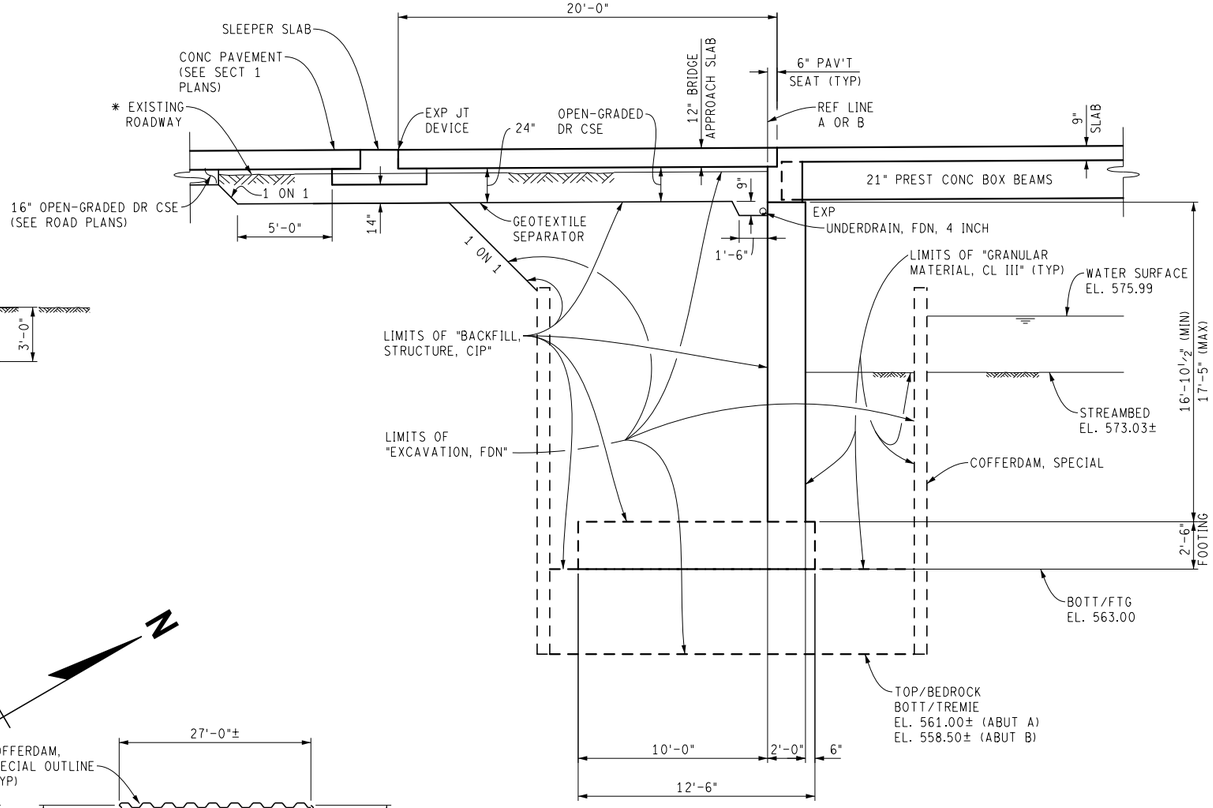
NO SCALE

DRAWN BY: CT	DATE:	CS: B01-1 OF 82211	GENERAL PLAN OF STRUCTURE	DRAWING	SHEET
CHK'D BY: EGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 120062A	M-85 NB OVER MARSH CREEK	B01-1 GPSTR 002	SECT 2 18
FILE: b01-1 82211 gpstr.dgn	TSC: TAYLOR				



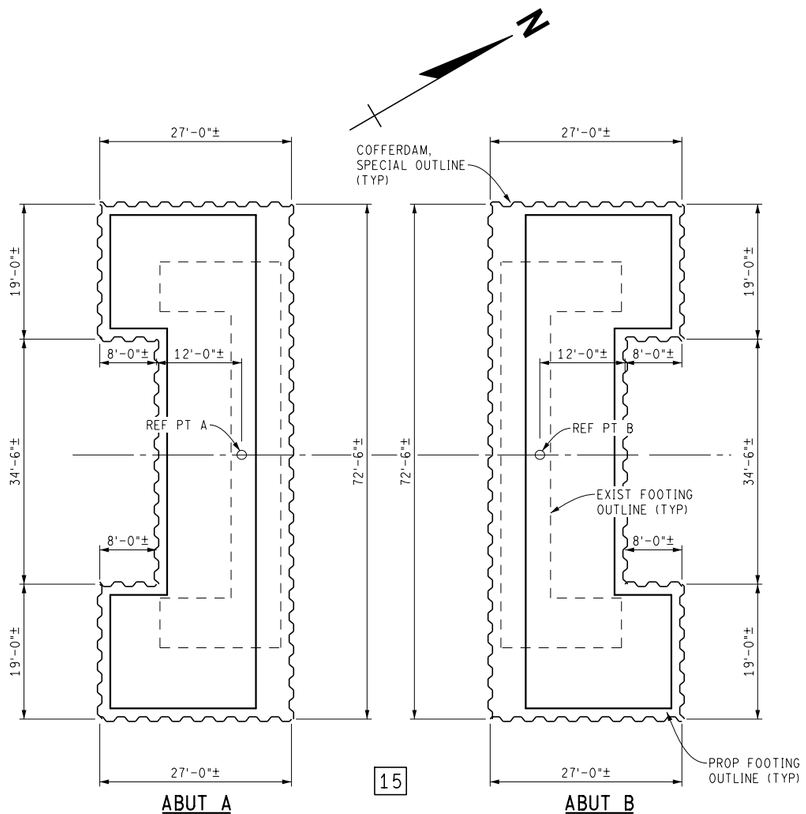
TYPICAL APPROACH SECTION

* UPPER LIMIT OF EXCAVATION PAYMENT AT ABUT A & B IS TO BOTTOM OF EXISTING PAVEMENT.



TYPICAL ABUTMENT SECTION

* UPPER LIMIT OF EXCAVATION PAYMENT AT ABUT A & B IS TO BOTTOM OF EXISTING PAVEMENT.



PLAN OF COFFERDAM

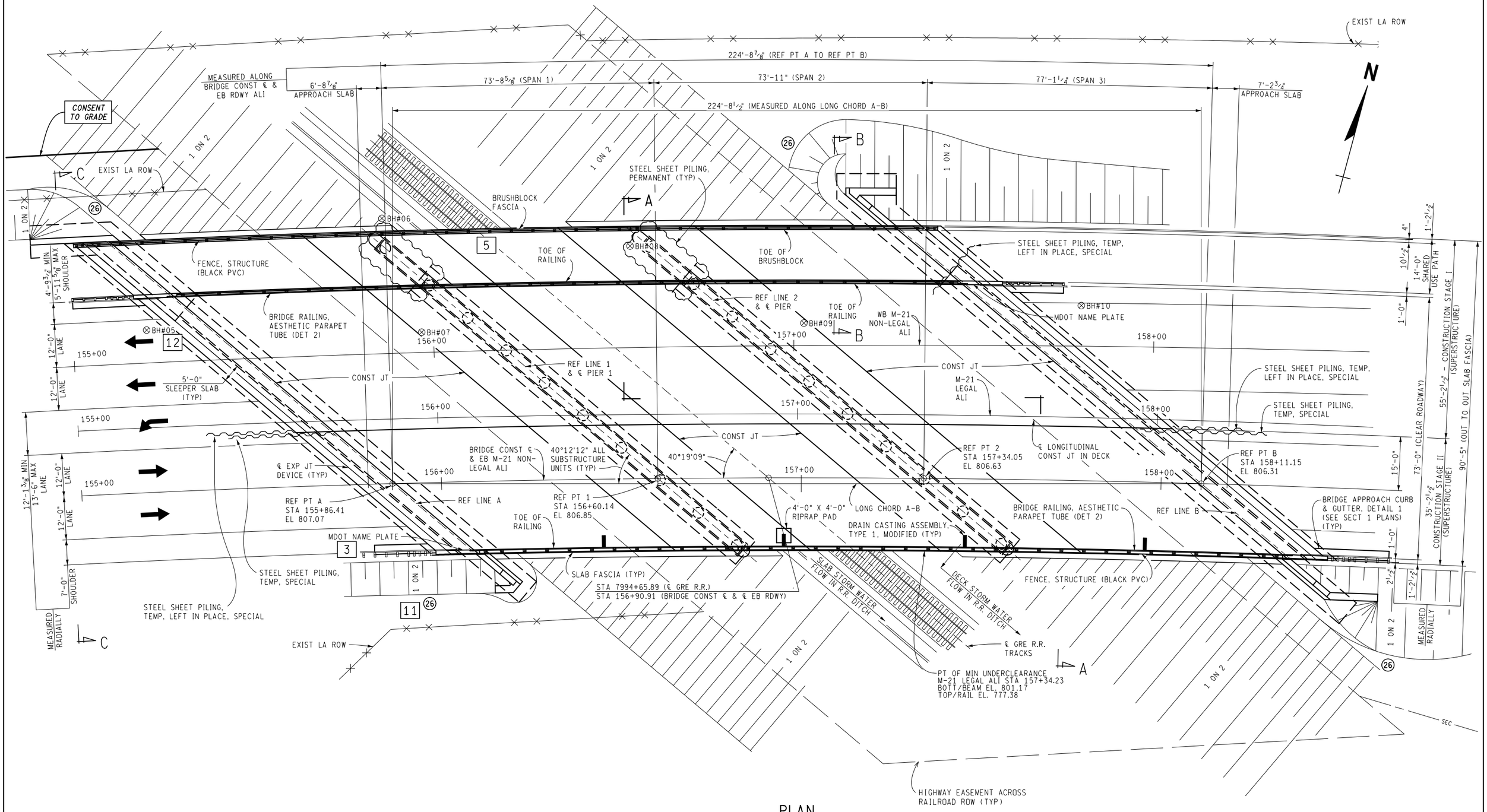
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: CT	DATE:	CS: B01-1 OF 82211	GENERAL PLAN OF STRUCTURE
CHK'D BY: EGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 120062A	M-85 NB OVER MARSH CREEK
FILE: b01-1 82211 gpstr.dgn	TSC: TAYLOR		

DRAWING	SHEET
B01-1 GPSTR 003	SECT 2 19



PLAN

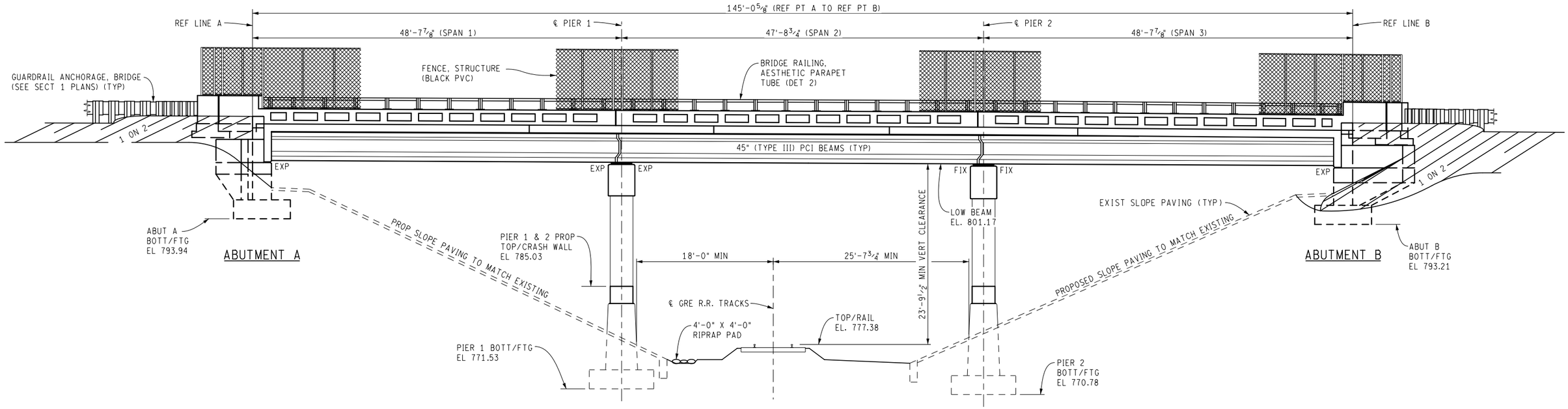
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: R02 of 41043	GENERAL PLAN OF STRUCTURE
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 102973A	M-21 OVER GRAND RAPIDS EASTERN RAILROAD
FILE: r0241043st9.dgn	TSC: GRAND RAPIDS		3.5 MILES WEST OF THE VILLAGE OF ADA

DRAWING	SHEET
R02 GPSTR 001	SECT 2 20



ELEVATION - SOUTH FASCIA

(VIEWED NORMAL TO REFERENCE LINES)

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: R02 OF 41043	GENERAL PLAN OF STRUCTURE
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 102973A	M-21 OVER GRAND RAPIDS EASTERN RAILROAD
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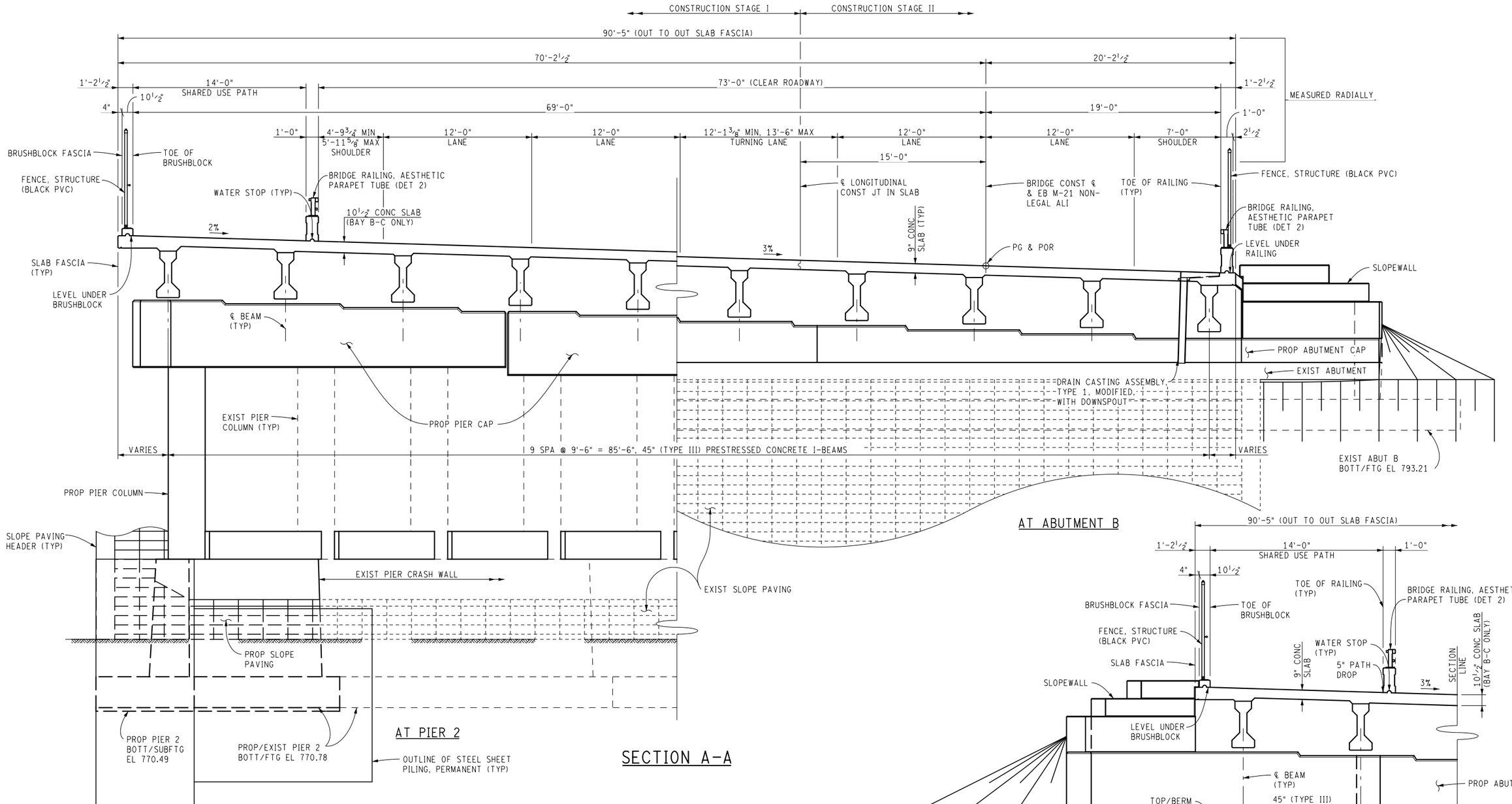

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
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MDOT Michigan Department of Transportation

NO SCALE

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CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 102973A	M-21 OVER GRAND RAPIDS EASTERN RAILROAD
FILE: r0241043st9.dgn	TSC:		3.5 MILES WEST OF THE VILLAGE OF ADA

DRAWING	SHEET
R02 GPSTR 003	SECT 2 22

11

SOIL EROSION AND SEDIMENTATION CONTROL QUANTITIES				
CAT 0002	CAT 0004	TOTAL	UNIT	ITEM
250	N/A	250	Ft	Erosion Control, Silt Fence
5	N/A	5	Cyd	Erosion Control, Maintenance, Sediment Removal

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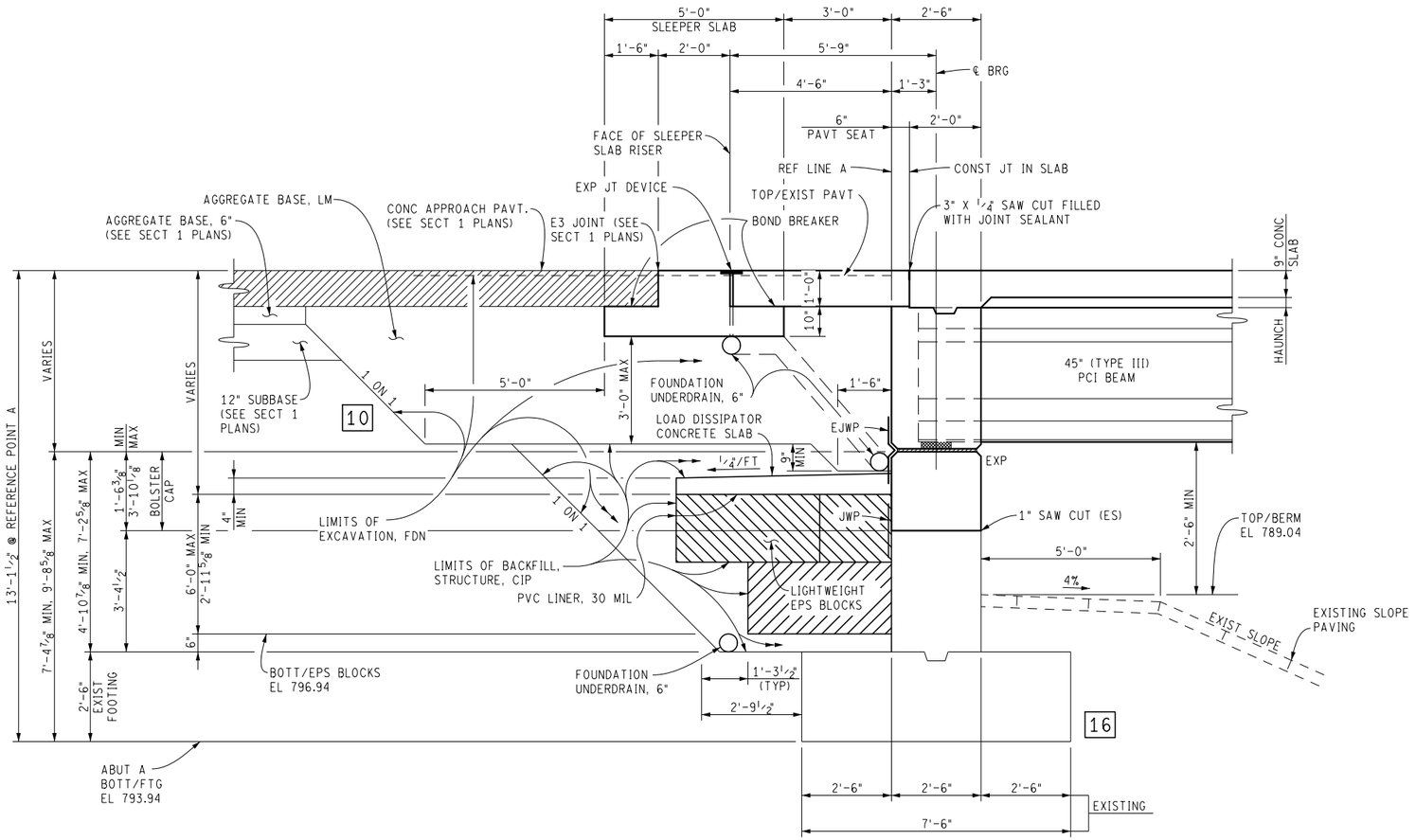
MISCELLANEOUS QUANTITIES				
CAT 0002	CAT 0004	TOTAL	UNIT	ITEM
565	22	617	Cyd	Aggregate Base, LM
350	22	372	Cyd	Backfill, Expanded Polystyrene Block
1414	127	1541	Cyd	Backfill, Structure, CIP
342	49	391	Cyd	Backfill, Structure, CIP, Dense-Graded, Modified
276	16	292	Cyd	Conc Base Cse, Reinf, Modified
0.96	0.04	1	LSUM	Conc Surface Coating (R02 OF 41043)
2902	247	3149	Cyd	Excavation, Fdn
11,414	880	12,294	Sft	False Decking
622	16	638	Syd	PVC Liner for Expanded Polystyrene Block
53,762	2488	56,250	Dlr	Railroad Inspection and Flagging
2	N/A	2	Syd	** Riprap, Plain
244	66	310	Syd	*** Slope Paving, Conc
145	8	153	Ft	Slope Paving Header
2056	601	2657	Sft	Steel Sheet Piling, Permanent
303	N/A	303	Sft	Steel Sheet Piling, Temp, Special
898	N/A	898	Sft	Steel Sheet Piling, Temp, Left in Place, Special
1	N/A	1	LSUM	Structures, Rem Portions (R02 OF 41043)
1034	24	1058	Ft	Underdrain, Fdn, 6 inch
200	N/A	200	Ft	Underdrain Outlet, 6 inch
8	N/A	8	Ea	Underdrain, Outlet Ending, 6 inch

** REQUIRED FOR ONE DECK DRAIN SPLASH PAD, AS SHOWN ON GENERAL PLAN OF STRUCTURE PLAN VIEW DRAWING R02-GPSTR-001.

*** "SLOPE PAVING, CONC" INCLUDES THE NEW CONCRETE REQUIRED FOR SUBSTRUCTURE WIDENING AND AN ADDITIONAL AMOUNT TO REPAIR EXISTING SLOPE PAVING, AS DIRECTED BY THE ENGINEER.



SECTION THRU EXISTING ABUTMENT A

(SHOWING PROPOSED BOLSTER CAP)

NOTES:

THE RECONSTRUCTION DESIGN IS BASED ON 1.2 TIMES THE CURRENT AASHTO LRFD BRIDGE DESIGN SPECIFICATION HL-93 LOADING WITH THE EXCEPTION THAT THE DESIGN TANDEM PORTION OF THE HL-93 LOAD DEFINITION SHALL BE REPLACED BY A SINGLE 60 KIP AXLE LOAD BEFORE APPLICATION OF THIS 1.2 FACTOR. THE RESULTING LOAD IS DESIGNATED HL-93 MOD. LIVE LOAD PLUS DYNAMIC LOAD ALLOWANCE DEFLECTION DOES NOT EXCEED 1/1000 OF SPAN LENGTH. THE ORIGINAL STRUCTURE WAS DESIGNED FOR HS25 AND ALTERNATE MILITARY LOADING BASED ON AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.

THE USE OF VIBRATORY EQUIPMENT TO INSTALL STEEL SHEET PILING IS PROHIBITED.

THE CONTRACTOR SHALL CONTACT THE REGION SOILS ENGINEER TO PERFORM A FOUNDATION INSPECTION AFTER FOOTING IS EXCAVATED AND PRIOR TO FORMING OF THE FOOTING. THE CONTRACTOR SHALL PROVIDE THE ENGINEER AT LEAST A 3 DAY ADVANCE NOTICE TO INITIATE THE INVESTIGATION.

FOR DETAILS OF SLOPE PROTECTION, SEE STANDARD PLAN B-102-SERIES.

EJWP DENOTES JOINT WATERPROOFING, EXPANSION.

JWP DENOTES JOINT WATERPROOFING.

ES DENOTES EACH SIDE.

FALSE DECKING SHALL INCLUDE THE AREA BOUNDED BY REFERENCE LINES 1 & 2 AND OUTSIDE FLANGE FASCIAS OF BEAMS. THE ESTIMATED AREA IS 5,655 SQUARE FEET DURING REMOVAL AND 6,456 SQUARE FEET DURING PROPOSED CONSTRUCTION.

CONCRETE SURFACE COATING SHALL BE APPLIED TO THE SLAB FASCIAS, UNDERSIDE OF DECK FASCIA, OUTSIDE FACE OF FASCIA BEAMS, ABUTMENTS, RETURNWALLS, SLOPEWALLS, PIERS AND TO ALL EXPOSED AREAS OF BRIDGE RAILING, RAILING END WALLS & BRUSHBLOCK IN THE AMOUNT OF 2,257 SYD. SEE SPECIAL PROVISION FOR COATING COLOR AND NUMBER.

DO NOT USE WHEELED, ROLLER BASED OR MACHINE MOUNTED COMPACTION EQUIPMENT TO COMPACT THE SUBGRADE, SUBBASE, AND BASE WITHIN 10' OF THE SLEEPER SLAB AFTER IT IS BUILT. USE ONLY HAND/PLATE COMPACTORS. CONTACT PRESSURE OF COMPACTION EQUIPMENT SHALL NOT EXCEED 10 PSI.

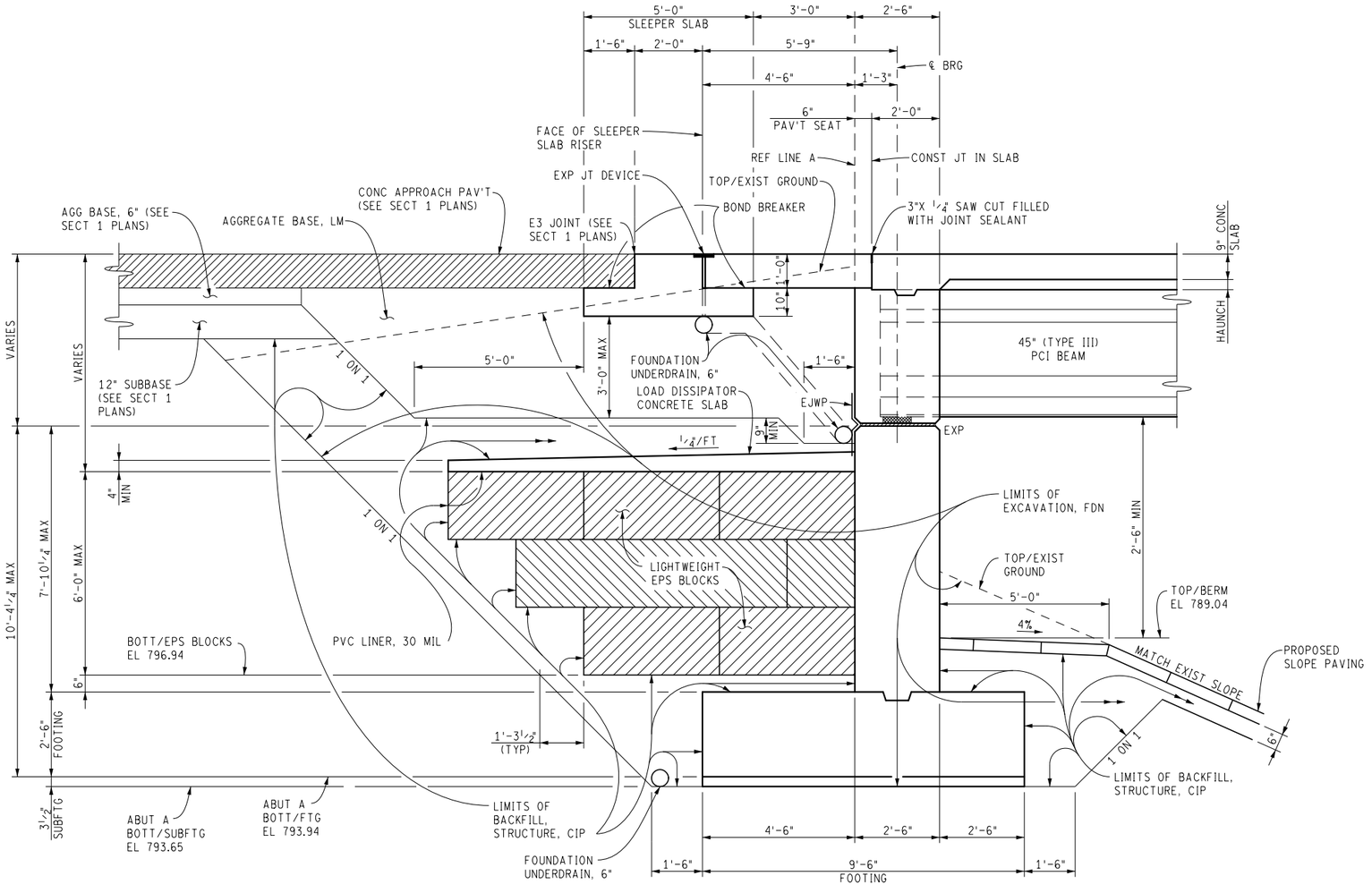
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

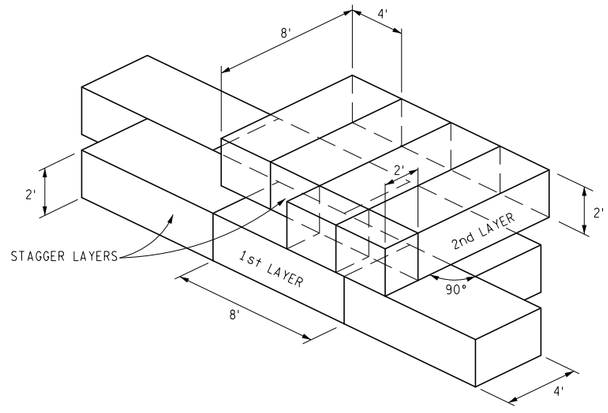
NO SCALE

DRAWN BY: C TECH	DATE:	CS: R02 OF 41043	GENERAL PLAN OF STRUCTURE
CHK'D BY: B ENGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 102973A	M-21 OVER GRAND RAPIDS EASTERN RAILROAD
FILE: r0241043st9.dgn	TSC:		3.5 MILES WEST OF THE VILLAGE OF ADA

DRAWING	SHEET
R02 GPSTR 004	SECT 2 23



SECTION THRU PROPOSED ABUTMENT A EXTENSION



EPS BLOCK LIGHTWEIGHT FILL DETAILS

(SHOWING SITUATION BEHIND ABUTMENT A PROPOSED ABUTMENT EXTENSION, OTHER LOCATIONS ARE SIMILAR)
(ALL TRIMMING OF EPS BLOCKS SHALL BE AS DIRECTED BY THE ENGINEER)

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)											
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION	MDOT Michigan Department of Transportation	NO SCALE	DRAWN BY: C TECH	DATE: 01/24/15
										CHK'D BY: B ENGR CORR BY: CT	DESIGN UNIT: UNIT
										FILE: r0241043st9.dgn	TSC:

CS: R02 OF 41043	GENERAL PLAN OF STRUCTURE	DRAWING	SHEET
JN: 102973A	M-21 OVER GRAND RAPIDS EASTERN RAILROAD	R02 GPSTR 005	SECT 2 24
	3.5 MILES WEST OF THE VILLAGE OF ADA		

JN: 102973A
STAGE I — REMOVAL

JN: 102973A
STAGE II — REMOVAL

PLAN

ELEVATION

SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

HALF-SECTION THRU BACK-FILL NEAR ABUT.

DETAIL A

MISCELLANEOUS QUANTITIES		
Item	Unit	Amount
Slope Protection Class A	Sq. Yd.	1,462
Slope Protection Headers	L. Ft.	558
Removal of Structure	L. Sum	L. Sum

Note:
The Design of this Structure is based on the M.D.S.H. Specifications for the Design of Highway Bridges, 1958 Edition and Current AASHTO Standard Specifications for Highway Bridges H-25 And Alternate Military Loading. Live Load plus Impact Deflection Equals 1/800 of Length Span.

JN: 102973A

REMOVE EXISTING SUPERSTRUCTURE AND PORTIONS OF EXISTING ABUTMENTS, PIERS & SLOPE PAVING. INCLUDED IN THE BID ITEM "STRUCTURES, REM PORTIONS (R02 OF 41043)".

1

The Top of Roadway Slab & Tops of Sidewalks are Parallel To the Vertical Curve and Tangents, Except as Modified By Super-elevation Transition.

This Structure is on Two Horizontal Curves. The Fascia Lines, Curb Lines & Longitudinal Construction Joints North of the ℄ are Parallel to the West Bound Roadway Curve. The Fascia Lines, Curb Lines, And Longitudinal Construction Joints South of the Bridge ℄ are Parallel to the East Bound Roadway Curve.

The Contractor Shall be Responsible For Providing Adequate Protection to Bottom And Sides of the Footing Excavations Against Damage by Personnel, Equipment and Water.

For Details of Slope Protection, See Standard Sheet S-8.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

M-21 (RELOC.) OVER THE G.T.W. R.R. 3.5 MILES W. OF THE VILLAGE OF ADA

GENERAL PLAN OF STRUCTURE

MICHIGAN ENGINEERS, INC.

T 76560

APPROVED _____ DESIGN SUPERVISING ENGINEER 2-26-76

APPROVED _____ ENGINEER OF DESIGN SECTION 1

SQUAD BOOKS		
DRAWN BY	G.D.	1-74
TRACED BY		
CHECKED BY	G.M.K.	1-74
SHEET 4 OF 22		

X02 of 41043A

JN: 102973A

NOTE:
CARE SHALL BE TAKEN TO AVOID DAMAGING THE EXISTING STEEL REINFORCEMENT DURING CONCRETE REMOVAL. PROJECTING REINFORCEMENT SHALL BE CLEANED, STRAIGHTENED AND RE-EMBEDED IN PROPOSED CONCRETE. NOT PAID FOR SEPARATELY BUT INCLUDED IN THE BID ITEM "STRUCTURES, REM PORTIONS (R02 OF 41043)".

JN: 102973A

PROPOSED WORK
DENOTES REMOVAL PORTIONS

THE ONLY ITEMS OF WORK TO BE DONE FROM THIS SHEET ARE IDENTIFIED BY THE LEGEND BOX ABOVE, LABELED WITH THIS PROJECT'S JOB NUMBER.

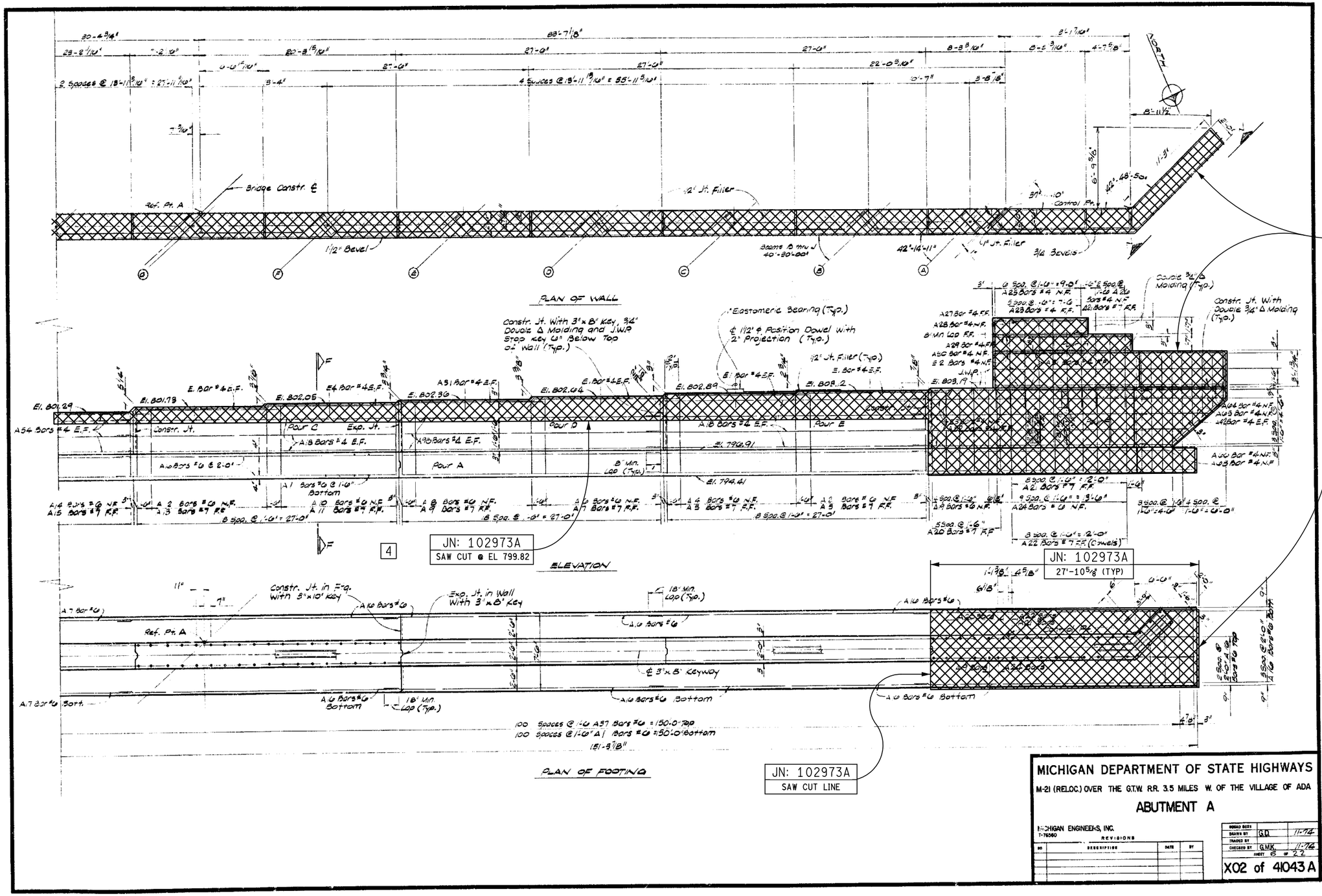
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)

NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: R02 OF 41043	EXISTING GENERAL PLAN OF STRUCTURE	DRAWING	SHEET
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 102973A	REMOVAL	R02 REM 001	SECT 2 25
FILE: r0241043rem.dgn	TSC: GRAND RAPIDS		M-21 OVER GTW RR 3.5 MI W OF ADA		



JN: 102973A

REMOVE PORTIONS OF EXISTING ABUTMENT. INCLUDED IN THE BID ITEM "STRUCTURES, REM PORTIONS (R02 OF 41043)".

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

M-21 (RELOC.) OVER THE G.T.W. R.R. 3.5 MILES W. OF THE VILLAGE OF ADA

ABUTMENT A

MICHIGAN ENGINEERS, INC.
T-76560

REVISIONS

NO	DESCRIPTION	DATE	BY

ROAD DES		
DRAWN BY	GD	11-74
TRACED BY		
CHECKED BY	GMK	11-74

SHEET 8 OF 22

X02 of 41043 A

JN: 102973A

PROPOSED WORK
DENOTES REMOVAL PORTIONS

THE ONLY ITEMS OF WORK TO BE DONE FROM THIS SHEET ARE IDENTIFIED BY THE LEGEND BOX ABOVE, LABELED WITH THIS PROJECT'S JOB NUMBER.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)

NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: R02 OF 41043	EXISTING ABUTMENT DETAILS
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 102973A	REMOVAL
FILE: r0241043rem.dgn	TSC: GRAND RAPIDS		M-21 OVER GTW RR 3.5 MI W OF ADA

DRAWING	SHEET
R02 REM 002	SECT 2 26

GENERAL PLAN OF STRUCTURE

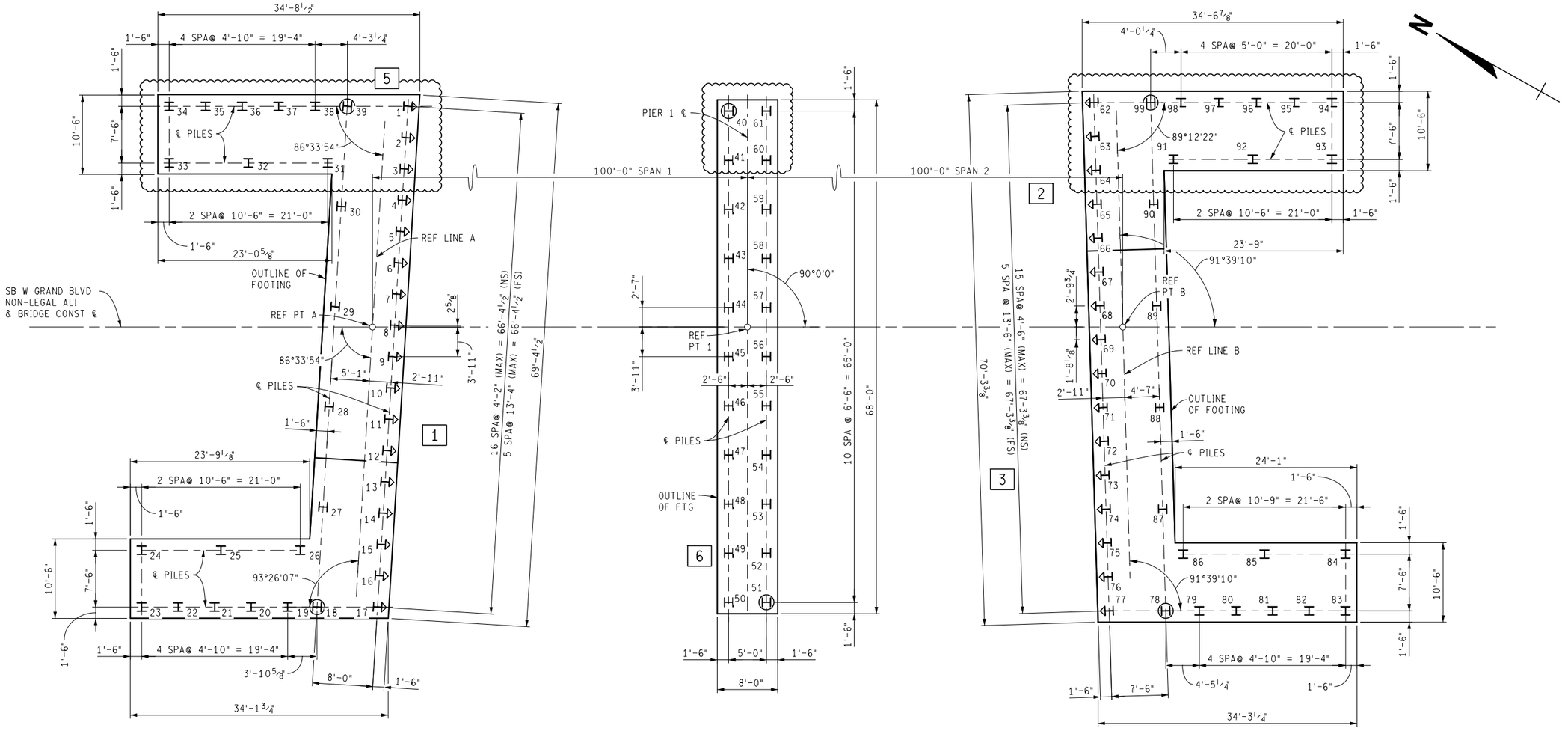
Each bridge in a plan set must have a General Plan of Structure. If a proposed General Plan of Structure sheet is not required, include the General Plan of Structure from existing plans.

1. Label all alignments as “legal” or “non-legal” alignment. “Centerline” is no longer used to describe alignments. Alignment can be abbreviated as Ali. For example “M-21 LEGAL ALI” or “I-96 NON-LEGAL ALIGNMENT”. Legal alignments are used to describe ROW. See the MDOT Survey Standards of Practice for more information. The site sheet and general plan sheets relate the bridge const. centerline to the alignment. Subsequent sheets need only refer to the bridge const. centerline.
2. Slope lines shall be shown to indicate the relationship of the elevations of the proposed structure and the existing ground.
3. Indicate MDOT nameplate location.
4. Show utilities attached to the structure.
5. Mask out roadway under the bridge deck.
6. Label supports and pin & hanger locations as fixed or expansion.
7. Point of minimum vertical clearance should be labeled in elevation and plan view.
8. Elevation views for bridges over roadways and railroads should be drawn looking down the road under so that lane widths and clearances to substructure can be shown. Bridges over water should be drawn looking perpendicular to the bridge construction centerline.
9. The section through deck slab should show the abutment and the pier. Show any utilities cast into the slab or under the slab.
10. Show limits of excavations and fills at each substructure unit.
11. Show soil erosion and sedimentation control quantities in a separate quantity box. Indicate approximate positions on the plan view with circled numbers corresponding to Standard Plan R-96. Place number 26 at the toe of slopes in each bridge quadrant. Circled numbers are not needed if no specific location is given for an SESC item. SESC legend is not required because it is located in the standard plan.
12. Label all borings shown in the soil boring data sheets. If a boring is located far from the structure, place the boring cell as close to the location as possible within the bounds of the drawing and indicate that the exact position is not shown with a note.
13. Provide summary of hydraulic analysis for all structures over water.
14. Show wetland boundaries with appropriate linestyle.
15. A separate Plan of Cofferdam is not necessarily required for each cofferdam project if cofferdam dimensions can be shown in other views.
16. Show removals of existing substructures on the general plan of structure sheets. Existing substructures should be shown with solid wt. 0 lines.
17. Separate quantities by category in all miscellaneous quantity boxes. If only one category exists there is no need to specify a category.
18. Always give height and width for box beams.

REMOVAL SHEETS

1. Reference previous plan sheets when detailing removals. Hatch areas where removal is required with a Wt. 2 line. Always call out the removal pay item when indicating removals. When removing portions of structures, identify what portions are to be removed.
2. Indicate stage lines when applicable
3. Cross out quantities, sheet scales, and notes not pertaining to current job number.
4. Show saw cut lines with either dimensions or elevations.
5. Give estimated quantity of steel to salvage if structural steel is being salvaged.

If no existing sheets are available, draw existing structure from survey. Label any critical dimensions or elevations as “FIELD VERIFY”.



FOUNDATION PLAN

500 KIPS 14x73 H-PILES							
LOCATION	PILE TYPE	NUMBER OF PILES	ESTIMATED LENGTH FURNISHED & DRIVEN EACH LFT	ESTIMATED LENGTH FURNISHED & DRIVEN TOTAL LFT	PILE POINTS (EACH)	SPLICES (EACH)	CUT-OFF ELEV.
ABUT A	TEST	2	140	280	2	2	588.00
	VERTICAL	20	130	2600	20	2	588.00
	BATTERED	17	140	2380	17	2	588.00
PIER 1	TEST	2	140	280	2	2	588.00
	VERTICAL	20	130	2600	20	2	588.00
ABUT B	TEST	2	140	280	2	2	588.00
	VERTICAL	20	130	2600	20	2	588.00
	BATTERED	16	140	2240	16	2	588.00
TOTAL				13,260	99	198	

MISCELLANEOUS QUANTITIES		
13,260	Ft	Pile, Steel, Furn and Driven, 14 inch
6	Ea	Test Pile, Steel, 14 inch
99	Ea	Pile Point, Steel
1	LSUM	Pile Driving Equipment, Furn (S13 OF 82023)
784	Ft	Prebore, Fdn Piling
198	Ea	Pile, Steel, Splice

PREBORE PILE TABLE		
ABUT A	PIER 1	ABUT B
1 31 34 37	40 60	62 91 94 97
2 32 35 38	41 61	63 92 95 98
3 33 36 39		64 93 96 99

NOTES:

H --DENOTES VERTICAL PILES.

⊢▷ --DENOTES BATTERED PILES.

Ⓗ --DENOTES VERTICAL TEST PILES.

☁ --DENOTES PREBORE PILES. SEE PREBORE PILE TABLE

4

NS DENOTES NEAR SIDE.

FS DENOTES FAR SIDE.

ES DENOTES EACH SIDE.

NOTES CONT'D:

STEEL PILES SHALL BE HP 14x73.

BATTER PILES FOR ABUTMENTS A & B SHALL BE DRIVEN TO A 2.5V:1H BATTER ANGLE.

DRIVE ALL PILES TO A NOMINAL PILE DRIVING RESISTANCE NOT LESS THAN 500 KIPS. DETERMINE NOMINAL PILE DRIVING RESISTANCE (Rndr) USING THE FHWA MODIFIED GATES DYNAMIC FORMULA .

THE ESTIMATED PILE LENGTH IS BASED ON THE STATIC ANALYSIS.

USE STEEL FOR H-PILES AND SPLICES THAT HAVE A YIELD STRENGTH NOT LESS THAN 50,000 psi.

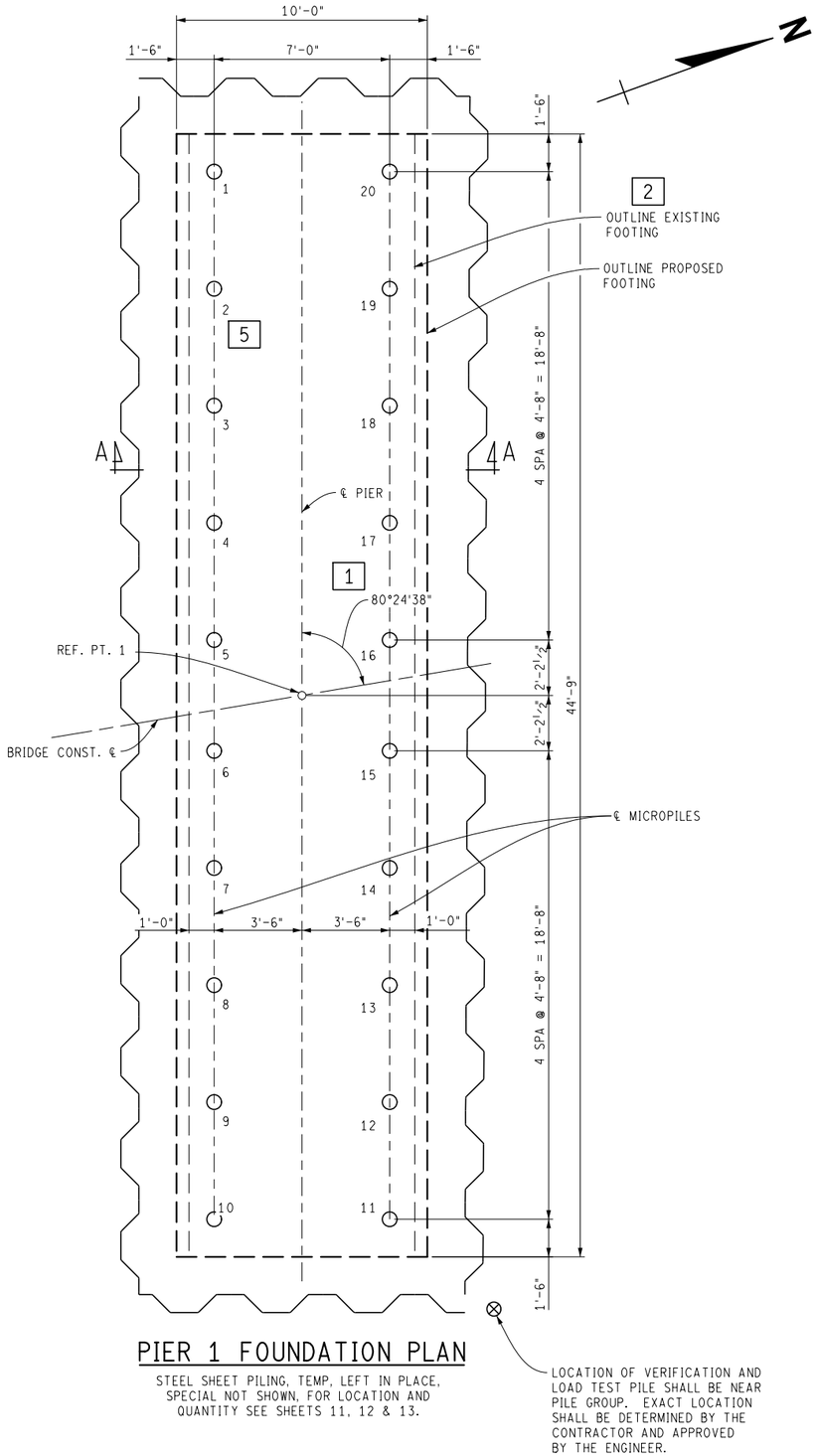
THE FACTORED PILE RESISTANCE AVAILABLE TO RESIST ALL FACTORED LOADS INCLUDING THE ESTIMATED FACTORED DOWNDRAG IS EQUAL TO 50 PERCENT OF NOMINAL PILE DRIVING RESISTANCE.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

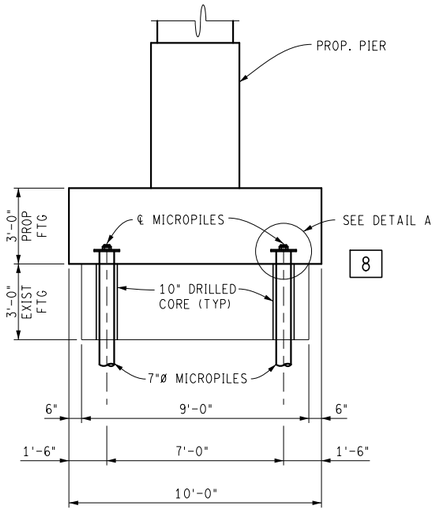
DRAWN BY: C TECH	DATE:	CS: S13 OF 82023	PILE DETAILS	DRAWING	SHEET
CH'ED BY: B ENGINEER CORR BY: CT	DESIGN UNIT:	JN: 79784A		S01 FDN 001	SECT 2 28
FILE:s13 82023 fdn 001.dgn	TSC: DETROIT				



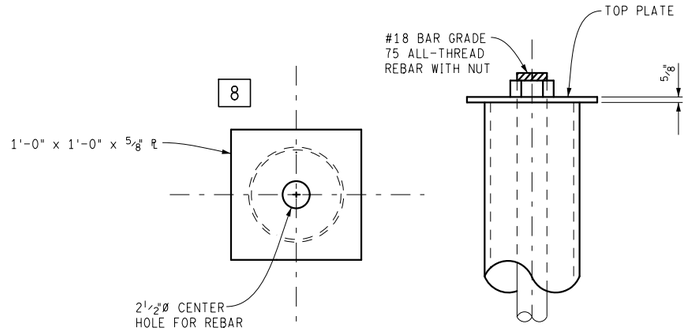
PIER 1 FOUNDATION PLAN

STEEL SHEET PILING, TEMP, LEFT IN PLACE, SPECIAL NOT SHOWN, FOR LOCATION AND QUANTITY SEE SHEETS 11, 12 & 13.

LOCATION OF VERIFICATION AND LOAD TEST PILE SHALL BE NEAR PILE GROUP. EXACT LOCATION SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.



SECTION A-A



DETAIL A

60 TON CAPACITY 7"ø MICROPILE							
LOCATION	PILE TYPE	NUMBER OF PILES	ESTIMATED LENGTH FURNISHED & DRIVEN		PILE POINTS (EACH)	SPLICES (EACH)	CUT-OFF ELEV.
			EACH LFT	TOTAL LFT			
PIER 1	VERIFICATION	1	65	65			895.09
	VERTICAL	20	65	1300			895.09
TOTAL		21		1365			

MISCELLANEOUS QUANTITIES	
1 LSUM	Micropile, Mobilization (S01 of 63191)
1 Ea	Micropile Verification Load Test
20 Ea	Micropiles

NOTES:

○ --DENOTES VERTICAL PILES.

⊗ --DENOTES VERIFICATION TEST PILE (SACRIFICIAL).

ALL PILES SHALL BE INSTALLED TO THE ESTIMATED BOTTOM OF SHAFT ELEVATION.

ALL PILES ARE DESIGNED FOR AN ALLOWABLE COMPRESSIVE LOAD OF 60 TONS.

PILES ARE TO BE INSTALLED TO SUCH ACCURACY THAT THE CONSTRUCTION TOLERANCES IN THE SPECIAL PROVISION HAVE BEEN MET.

PILES SHALL BE CLOSELY INSPECTED/MONITORED DURING INSTALLATION TO ENSURE ADEQUATE STRUCTURAL INTEGRITY. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ANY PILES DEEMED DAMAGED BY THE ENGINEER.

THE STEEL CASING SHALL BE A MINIMUM OF .498" NOMINAL WALL THICKNESS (NP-80), 7" O.D. AND HAVE A MINIMUM YIELD STRESS OF 80 KSI.

THE MICROPILE REINFORCING BAR SHALL BE AN #18 BAR GRADE 75 WILLIAMS ALL-THREAD REBAR (OR EQUIVALENT) CONFORMING TO ASTM A-615. LENGTH OF COUPLE BAR SECTIONS SHALL BE DETERMINED BASED ON THE OVERHEAD CLEARANCE AVAILABLE AT EACH PILE LOCATION.

STEEL FOR THE MICROPILE TOP BEARING PLATE WITH SIDE STIFFENERS SHALL CONFORM TO ASTM A572 GRADE 50.

SEE SPECIAL PROVISION FOR PLUNGE LENGTH LOCATION/REQUIREMENT.

CONTRACTOR SHALL ENSURE THAT THE TOP OF THE MICROPILE HAS A SMOOTH LEVEL SURFACE PRIOR TO INSTALLING THE BEARING PLATE.

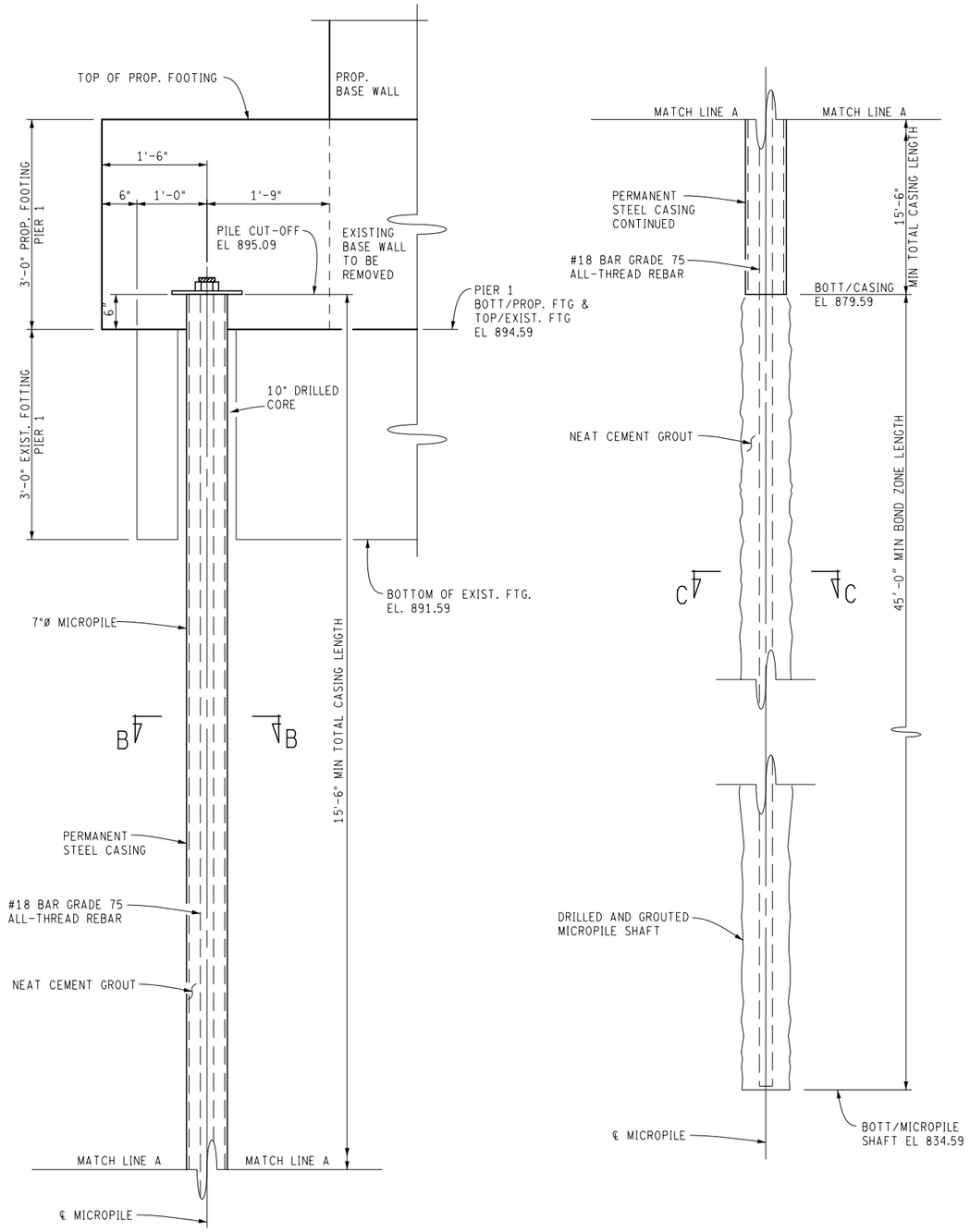
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

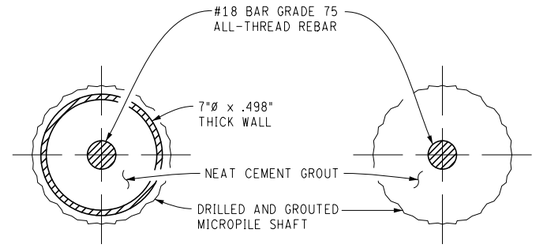
NO SCALE

DRAWN : C TECH	DATE:	CS: S01 OF 63191	MICROPILE DETAILS
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 81109A	
FILE: s01 63191 fdn.dgn	TSC:		

DRAWING	SHEET
S01 FDN 001	SECT 2 29



MICROPILE ELEVATION



SECTION B-B

SECTION C-C

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: S01 OF 63191	MICROPILE DETAILS	DRAWING: S01 FDN 002
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 81109A		SHEET: SECT 2 30
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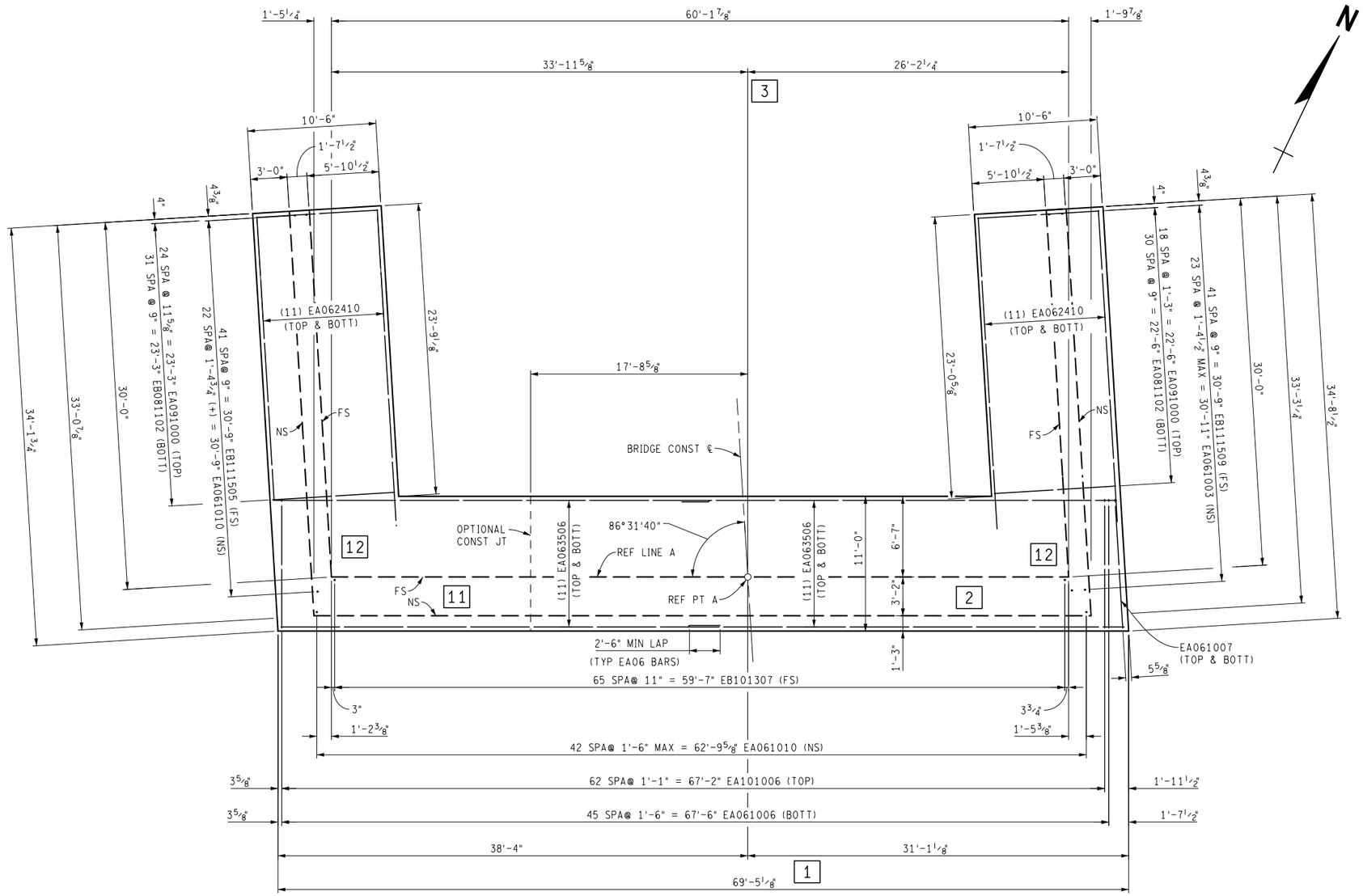


PLAN OF FOOTING - ABUTMENT A

MISCELLANEOUS QUANTITIES		
TOTAL	UNIT	ITEM
754	Cyd	Substructure Conc
435	Sft	Joint Waterproofing
33440	Sin	Bearing, Elastomeric, 1 inch

NOTES:

JWP DENOTES JOINT WATERPROOFING.

NS DENOTES NEAR SIDE.

FS DENOTES FAR SIDE.

ES DENOTES EACH SIDE.

FOR BEVEL AND MOLDING DETAILS, SEE STANDARD PLAN B-103-SERIES.

LOW TEMPERATURE PROTECTION OF CONCRETE SHALL BE APPLIED ACCORDING TO SECTION 706.03J, OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. LOW TEMPERATURE PROTECTION OF CONCRETE WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE BID ITEM "SUBSTRUCTURE CONC".

THE CONTRACTOR MAY ADHESIVE ANCHOR POSITION DOWELS IN HOLES DRILLED IN THE CONCRETE AT ABUTMENTS.

AT NO TIME PRIOR TO ERECTING THE BEAMS, SHALL THE HEIGHT OF THE BACKFILL ON THE BACKSIDE OF THE ABUTMENT BE HIGHER THAN THE BACKFILL ON THE FRONTSIDE.

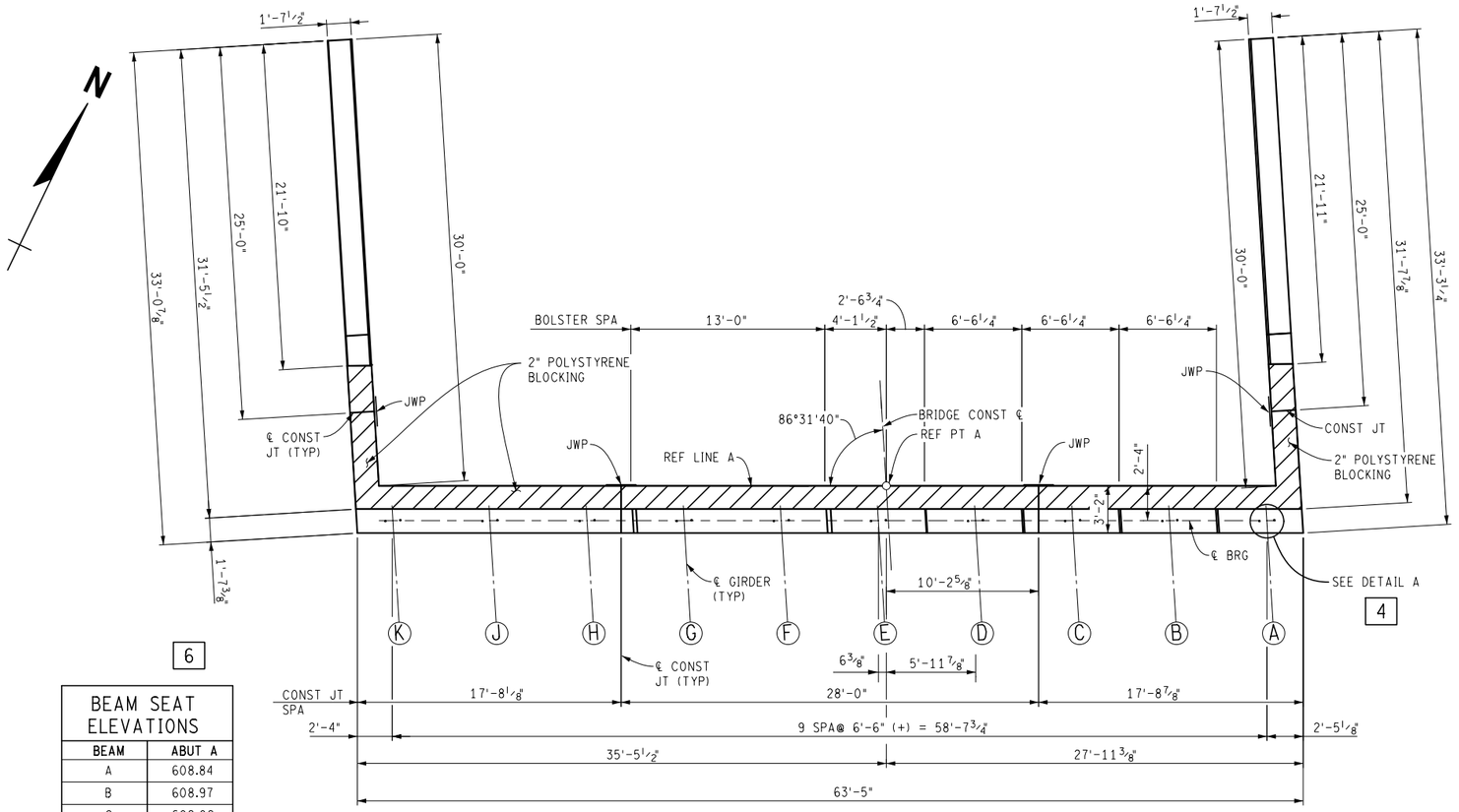
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: S13 OF 82023	ABUTMENT DETAILS
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A	
FILE: s13_82023_abut_001.dgn	TSC:		

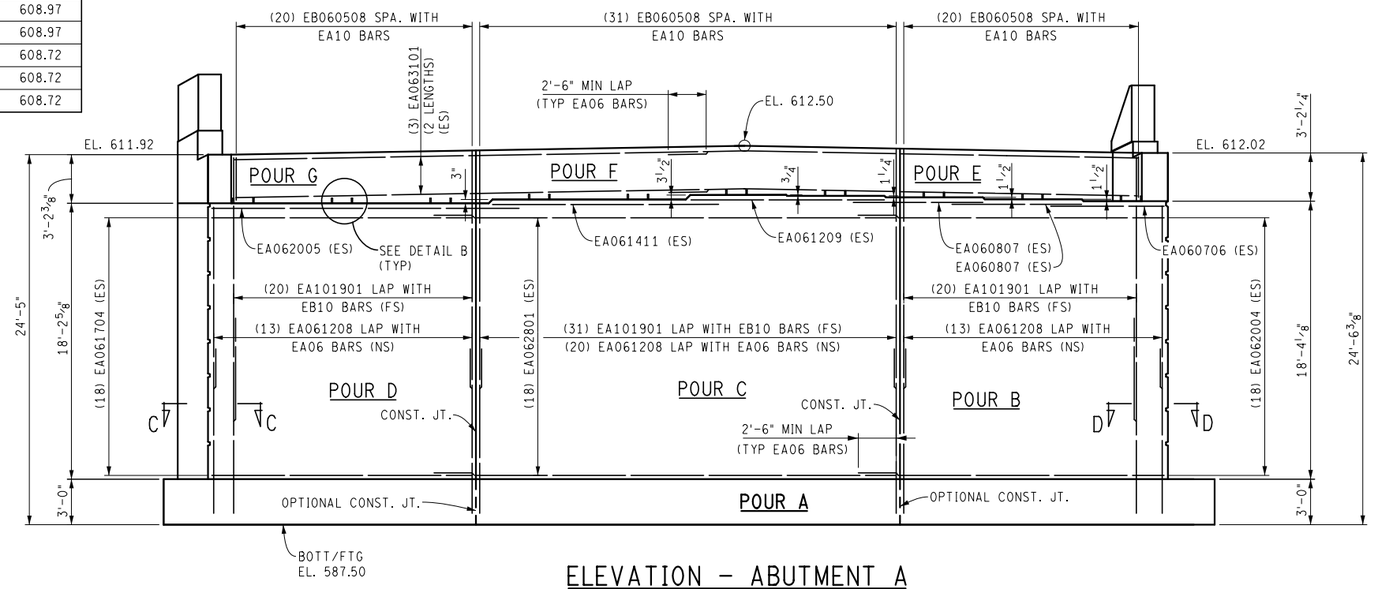
DRAWING	SHEET
S01 ABUT 001	SECT 2 31



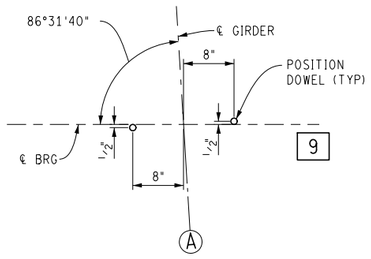
6

PLAN OF WALL – ABUTMENT A

BEAM SEAT ELEVATIONS	
BEAM	ABUT A
A	608.84
B	608.97
C	609.09
D	609.20
E	609.26
F	608.97
G	608.97
H	608.72
J	608.72
K	608.72

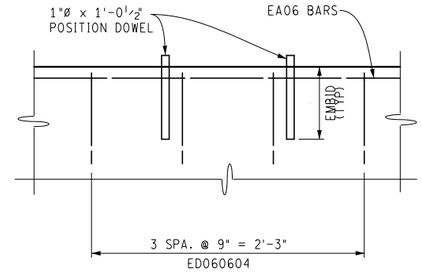


ELEVATION – ABUTMENT A



9

DETAIL A

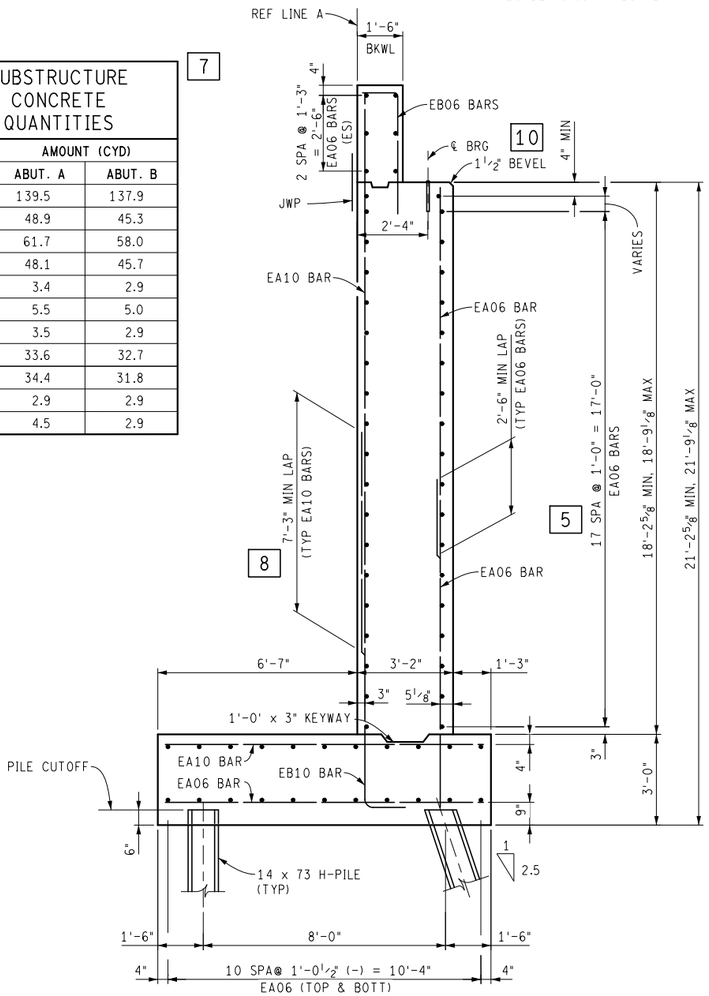


DETAIL B

(TYP 10 BEARINGS - ABUT A)
(TYP 10 BEARINGS - ABUT B)

SUBSTRUCTURE CONCRETE QUANTITIES		
POUR	AMOUNT (CYD)	
	ABUT. A	ABUT. B
A	139.5	137.9
B	48.9	45.3
C	61.7	58.0
D	48.1	45.7
E	3.4	2.9
F	5.5	5.0
G	3.5	2.9
H	33.6	32.7
J	34.4	31.8
K	2.9	2.9
L	4.5	2.9

7



SECTION THRU ABUT A

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: S13 OF 82023	ABUTMENT DETAILS	DRAWING	SHEET
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A		S01 ABUT 002	SECT 2 32
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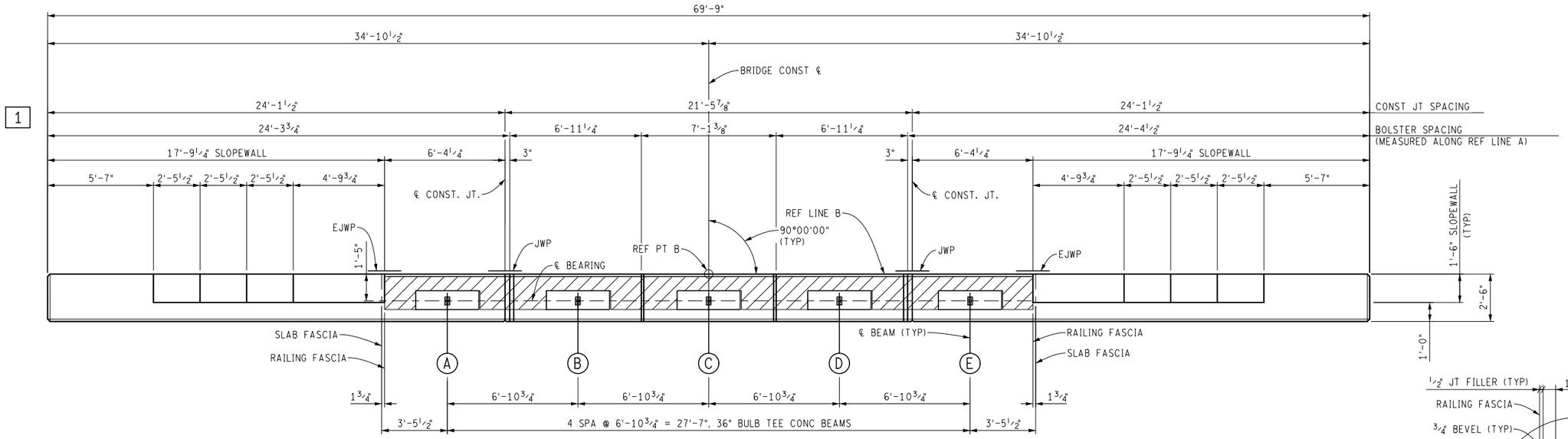
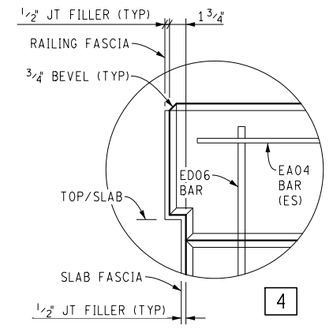
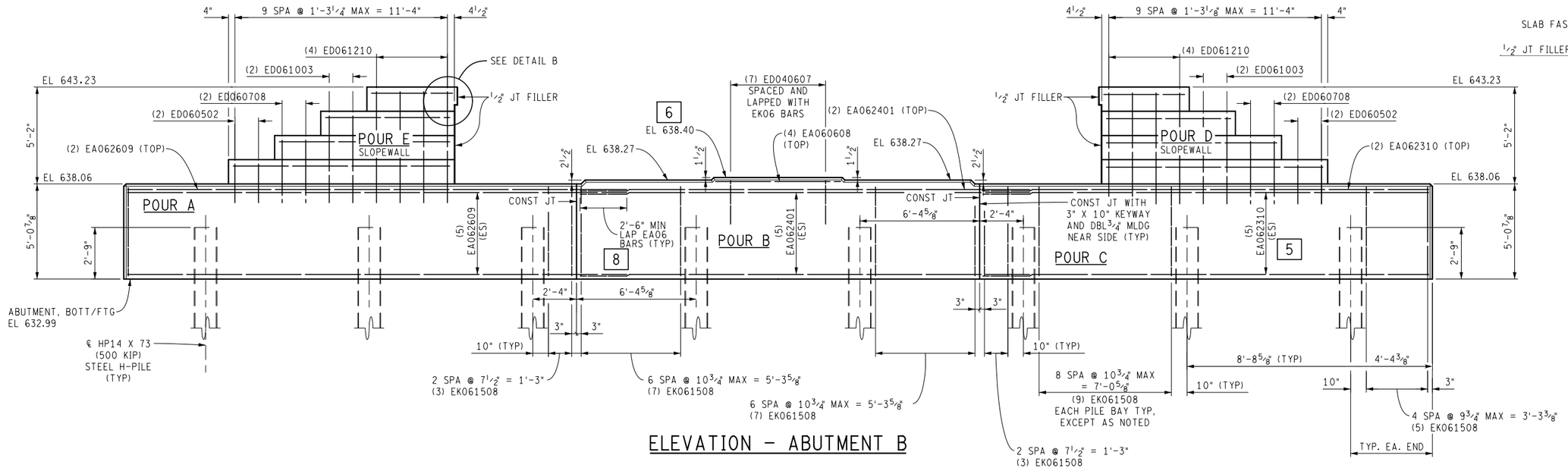


WALL PLAN – ABUTMENT B



DETAIL B



ELEVATION – ABUTMENT B

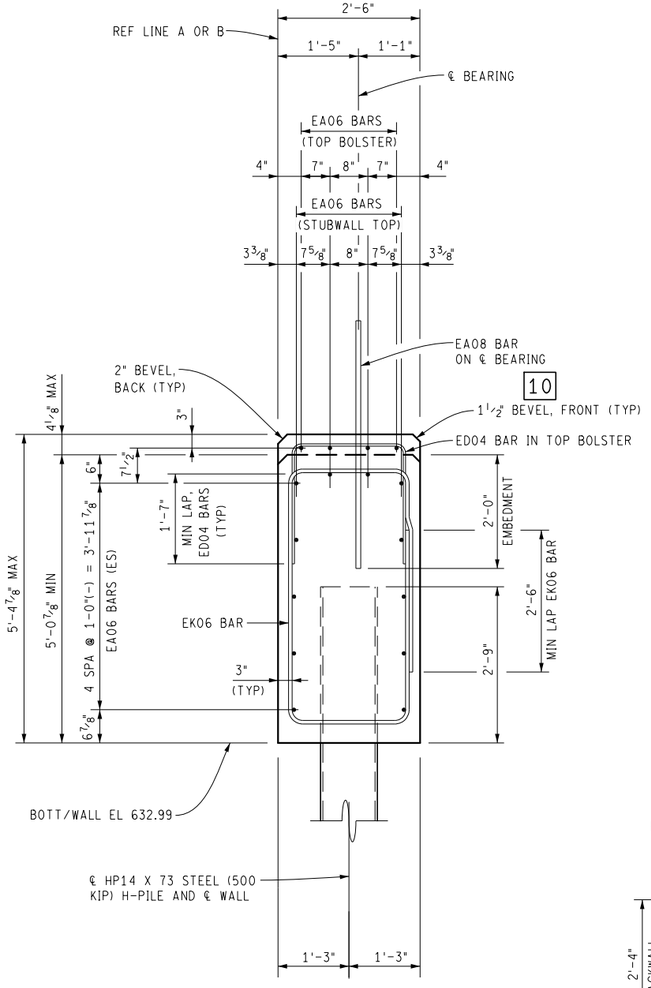
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

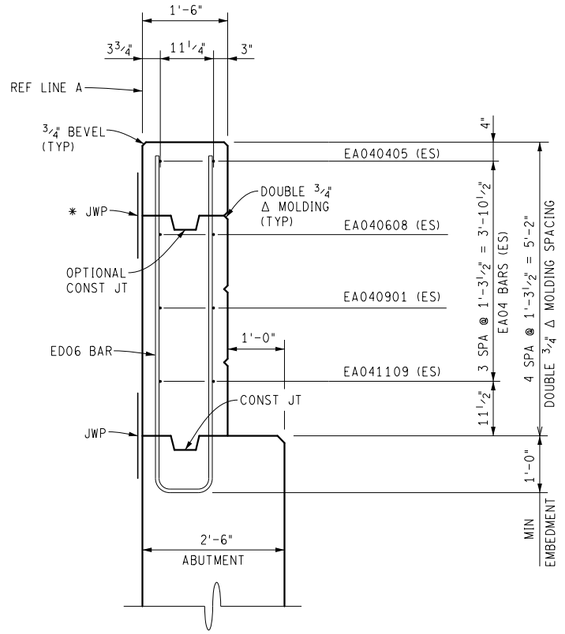
NO SCALE

DRAWN BY: CT	DATE:	CS: S08 OF 09101	ABUTMENT DETAILS
CHK'D BY: B. ENGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 118329A	
FILE: s08 09101 abut02.dgn	TSC: BAY		

DRAWING	SHEET
S08 ABUT 002	SECT 2 33

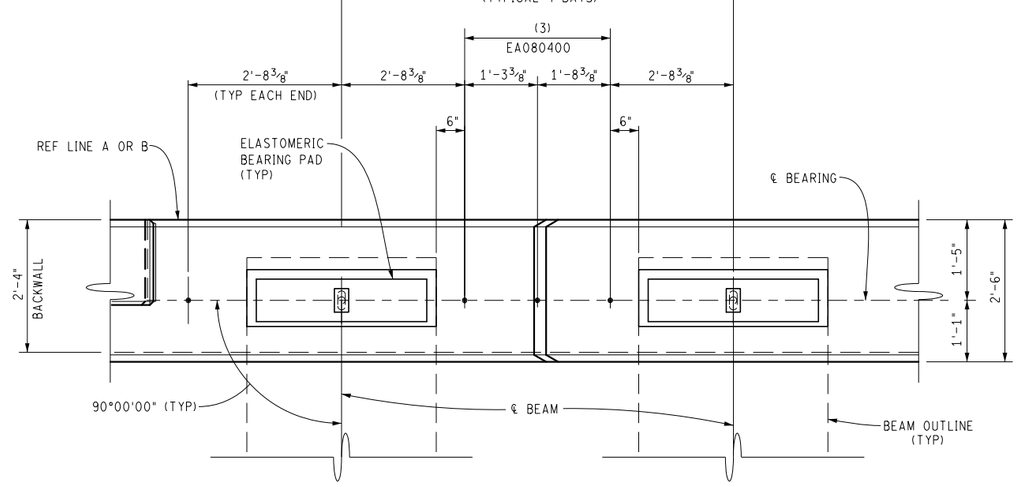


TYPICAL ABUTMENT SECTION



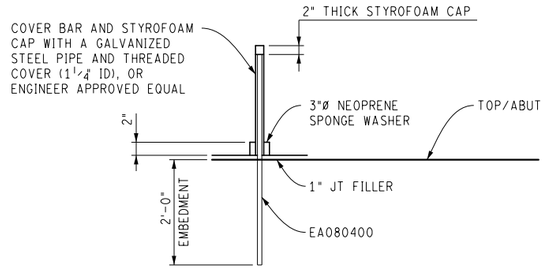
TYPICAL SLOPEWALL SECTION

* IF OPTIONAL CONST JOINT IS USED, THERE WILL BE NO PAYMENT FOR THE REQUIRED JOINT WATERPROOFING.



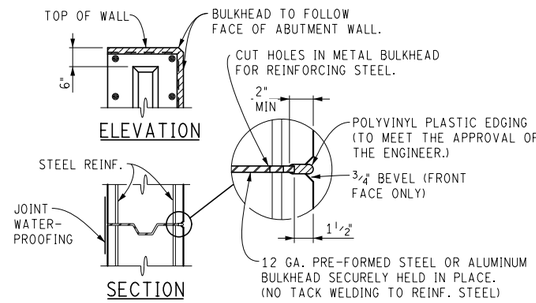
PARTIAL ABUTMENT WALL PLAN

(SHOWING EA08 VERTICAL BARS IN THE ABUTMENT WALL, ON THE ℄ OF BEARING, BETWEEN THE BEAMS. TYPICAL FOR EACH BAY)



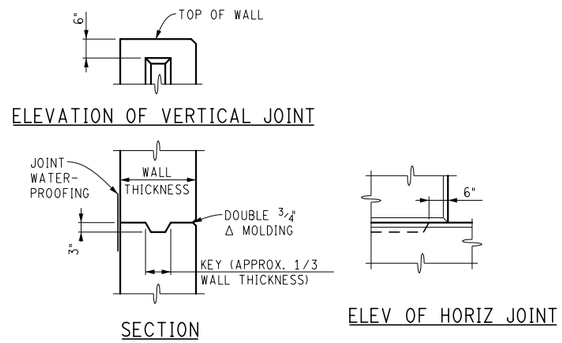
DETAIL G

ALL WORK AND MATERIAL FOR THE STYROFOAM CAP, METAL SLEEVE AND NEOPRENE SPONGE WASHER SHALL BE INCLUDED IN THE BID ITEM "SUPERSTRUCTURE, CONC, NIGHT CASTING".



METAL BULKHEAD DETAILS

NOTES: METAL BULKHEAD MAY BE USED AS ALTERNATE CONSTRUCTION JOINT AT CONTRACTOR'S EXPENSE. CARE IS TO BE USED IN CASTING CONCRETE AROUND BULKHEAD TO PREVENT DISLOCATION OR MISALIGNMENT OF THE BULKHEAD.



CONSTRUCTION JOINT DETAILS

NOTE: WHERE OPTIONAL CONSTRUCTION JOINTS ARE USED, THERE WILL BE NO PAYMENT FOR THE REQUIRED JOINT WATERPROOFING.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: CT	DATE:	CS: S08 OF 09101	ABUTMENT DETAILS	DRAWING: S08 ABUT 003
CHK'D BY: B. ENGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 118329A		SHEET: SECT 2 34
FILE: s08 09101 abut03.dgn	TSC: BAY			

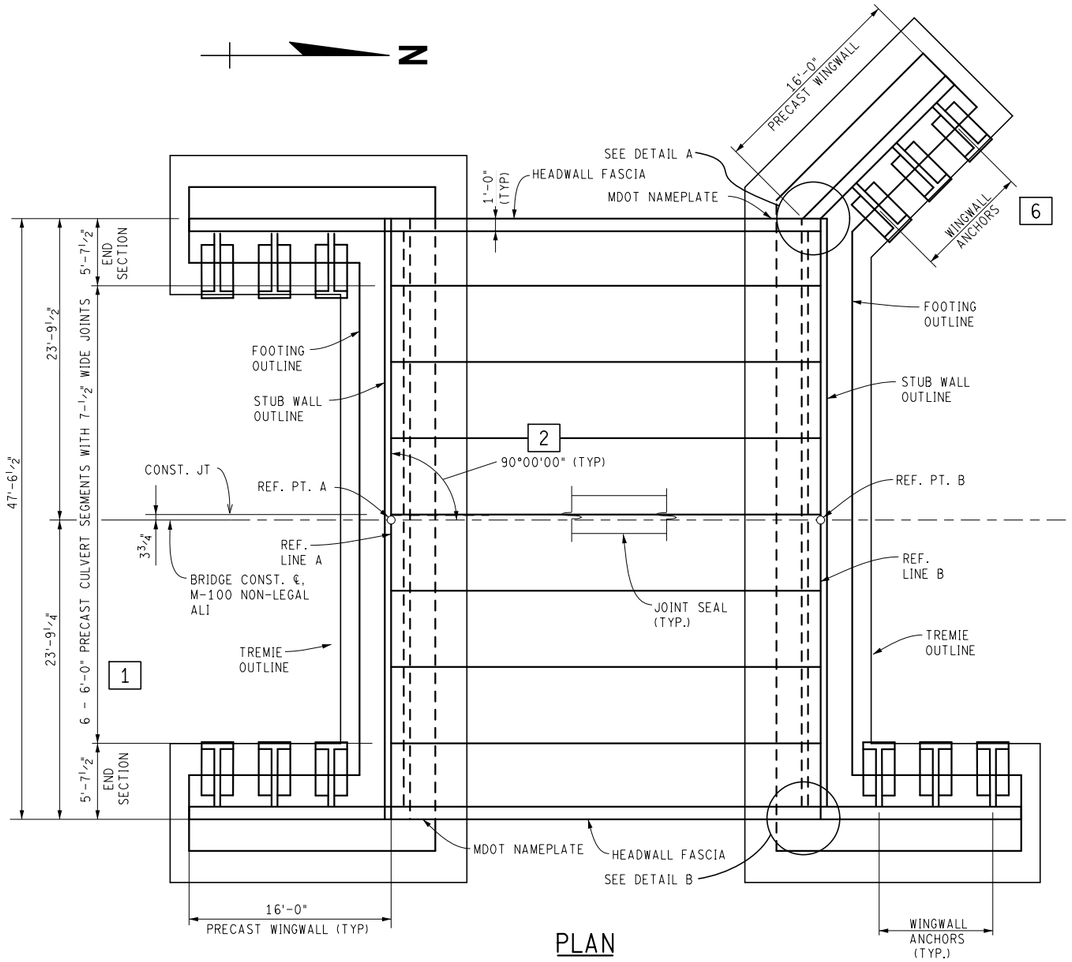
PILE DETAILS

1. Provide enough dimensions to stake out piles from the reference point and reference line.
2. Show the outlines of footings and any stage lines or construction joints in the footings.
3. When dimensioning piles and pile spacing, keep in mind the tolerance for placing steel piles is ±6". Pile spacings given to 1/8" are not truly constructible.
4. Differentiate between battered piles, test piles, prebored piles, and vertical piles in the legend.
5. Give each pile a unique number.
6. The Rolled Steel Shapes tool, found in the MDOT Tools menu, can be used to draw steel piles to their specific dimensions.
7. Pile splice details (not shown here) should also be shown in the pile details but may be on a separate sheet.
8. Micropile details may differ with the pile capacity required. Verify design with geotechnical engineer.

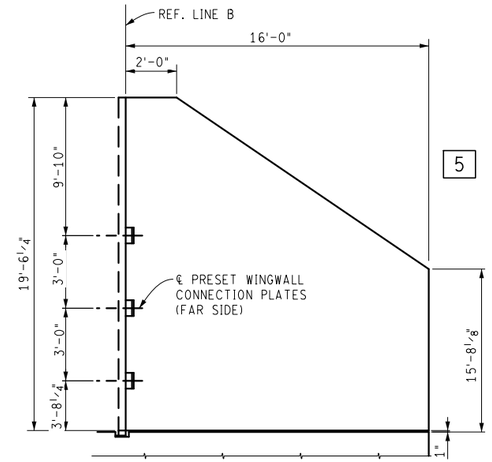
ABUTMENT DETAILS

Abutment drawings must include a plan view, an elevation view, and a typical section. Elevation views are oriented looking at the front face of wall. The plan view is a projection of the elevation view.

1. Provide dimensions to stake out footing from the reference point. Show Bridge Const. Centerline, Reference Line, Reference Point, and angle of crossing on the plan of footing and plan of wall.
2. Show outline of the abutment walls not yet constructed as a dashed line.
3. Give dimensions along the back of abutment for locating the corners of the abutment and dimension rebar from these corners.
4. Details should be shown on the same sheet where they are called out on the larger drawing. Details and sections should be labeled in alphabetical order, starting over for each new type of sheet. For example the Abutment Detail sheets might have Details A-D, a detail shown on the Superstructure Details sheets could start over with Detail A.
5. Bar spacings should be shown in section view when possible. Give number of bars and bar designations (size and length) in the elevation or plan view.
6. Beam elevations can be given in table format if desired. Tables may be helpful for abutments with independent backwalls to avoid congestion on the drawing.
7. Give volumes of individual concrete pours to the nearest 0.1 Cyd. Do not provide a subtotal. Totals should only appear in the Miscellaneous Quantity box.
8. Always show rebar laps where they occur, and show the proper length of lap. Lap lengths are preferably dimensioned on the detail, but can be shown in a Minimum Lap table instead.
9. Give exact locations of position dowels. Detail the dowel diameter, total length, embedment length, and projection. Use a scale for this detail large enough so the dowels can be seen.
10. Section views should always show concrete bevels.
11. If FS or NS are used to describe location other than in-and-out of the page, they should be labeled. Simply assuming that the near side is the same side as the callout is not appropriate.
12. If the angle of the return walls differs from the bridge skew that angle should be dimensioned. If no specific dimensions are given it is generally assumed the return wall angle matches the bridge skew.

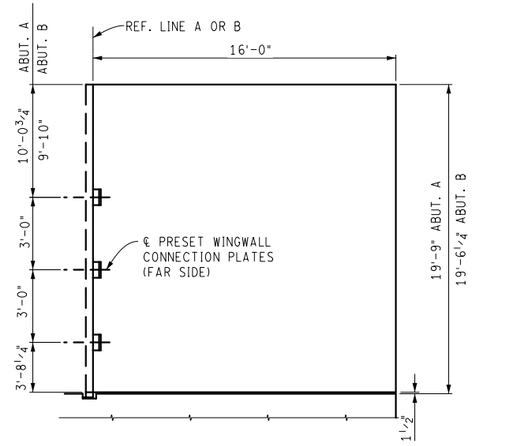


PLAN



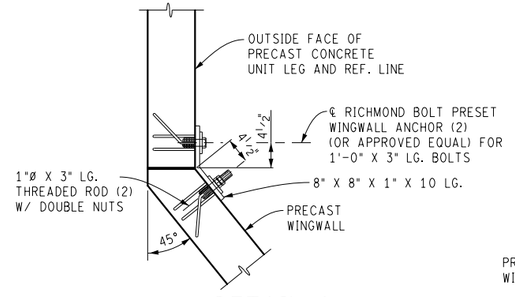
NW PRECAST WINGWALL ELEVATION

THE END OF THE WINGWALL IS APPROXIMATELY 1'-0" ABOVE FINISHED GRADE



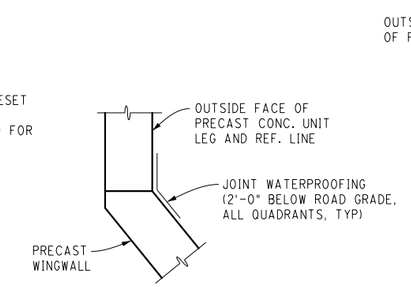
TYPICAL PRECAST WINGWALL ELEVATION

NE, SE & SW QUADRANTS



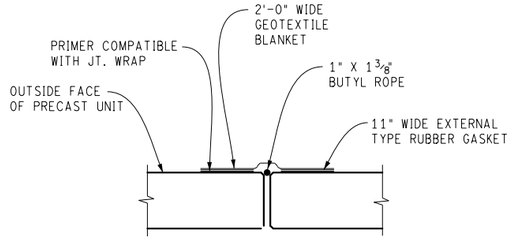
DETAIL A

(CORNER DETAIL @ ANCHOR)



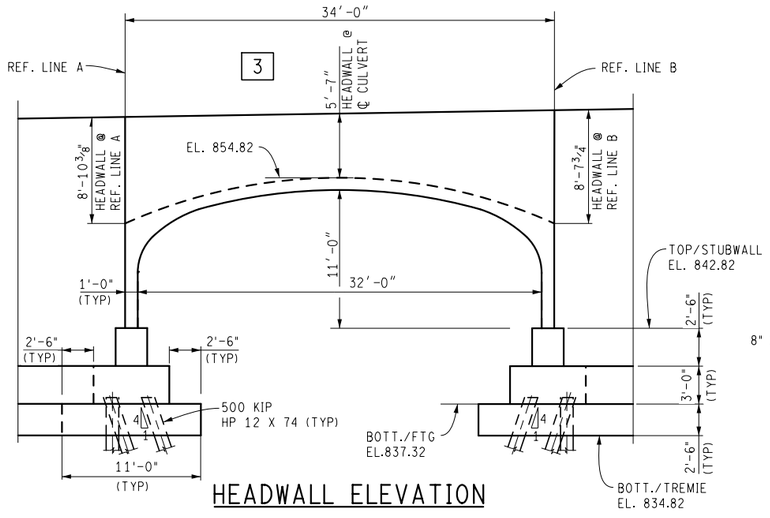
DETAIL A

(CORNER DETAIL)

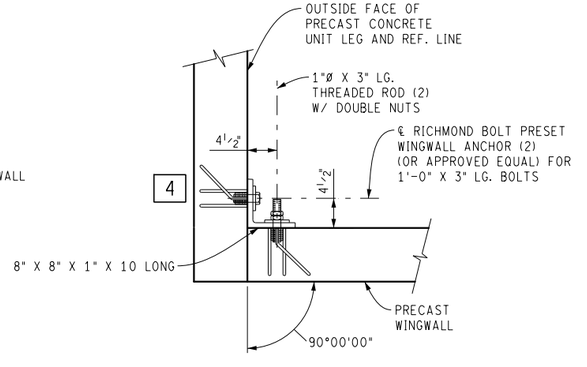


JOINT SEAL DETAIL

SEE SPECIAL PROVISION FOR PRECAST THREE-SIDED CULVERT

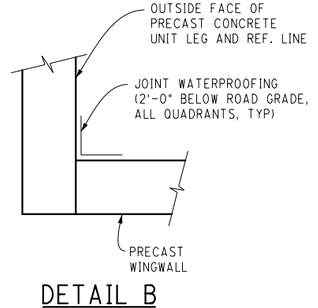


HEADWALL ELEVATION



DETAIL B

(CORNER DETAIL @ ANCHOR)



DETAIL B

(CORNER DETAIL)

MISCELLANEOUS QUANTITIES	
87 Sft	Joint Waterproofing
48 Ft	Culv, Precast Three-Sided or Arch, 32 foot by 11 foot

NOTES:

PRECAST WINGWALLS AND PRECAST WINGWALL ANCHORS SHALL BE CAST MONOLITHICALLY, SEE SPECIAL PROVISION. PRECAST WINGWALLS AND PRECAST WINGWALL ANCHORS SHALL NOT BE PAID FOR SEPERATELY BUT INCLUDED IN THE BID ITEM " CULV, PRECAST THREE-SIDED OR ARCH, 32 FOOT BY 11 FOOT".

THE PRE-STRESSING CABLES INSTALLED AT THE BOTTOM OF THE CULVERT LEGS FOR HANDLING AND SHIPPING PURPOSES SHALL BE CUT AND REMOVED JUST BEFORE SETTING THE UNITS ON THE FOUNDATION PER MANUFACTURERS RECOMMANDATION AND AS APPROVED BY THE ENGINEER. CONTRACTOR SHALL PLACE PRECUT HARD WOOD BLOCKS BETWEEN THE OUTSIDE OF THE LEGS AND OUTSIDE EDGE OF THE KEYWAY AT ALL FOUR CORNERS TO PREVENT LEGS OF THE UNIT FROM SPREADING. THESE BLOCKS SHOULD BE PLACED BEFORE RELEASING THE TENSION ON THE LIFTING CABLES. THIS WORK IS INCLUDED IN THE PAYMENT FOR CULVERT.

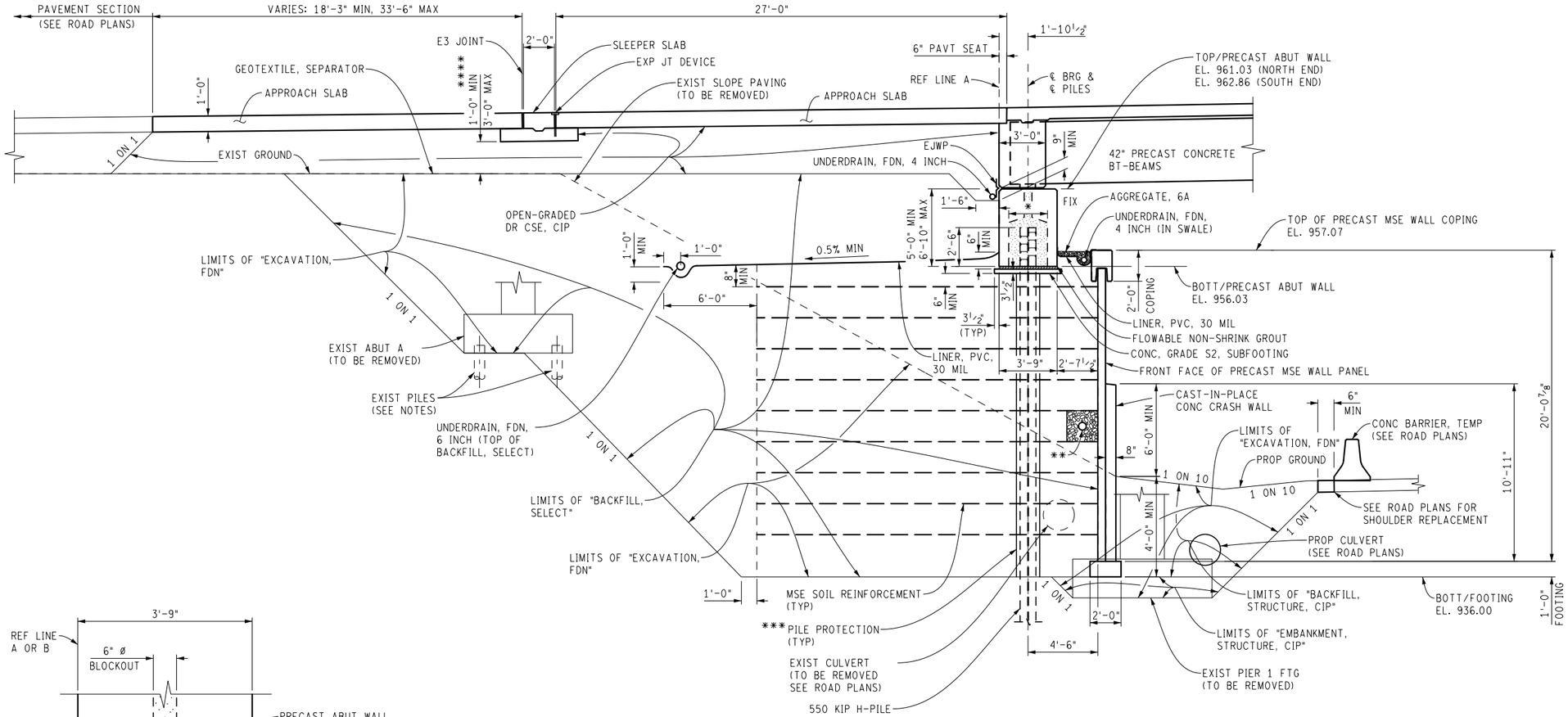
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: B01 OF 23071	CULVERT DETAILS
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 105939	
FILE: b01 23071 culv.dgn	TSC:		

DRAWING	SHEET
b01 culv 001	SECT 2 36



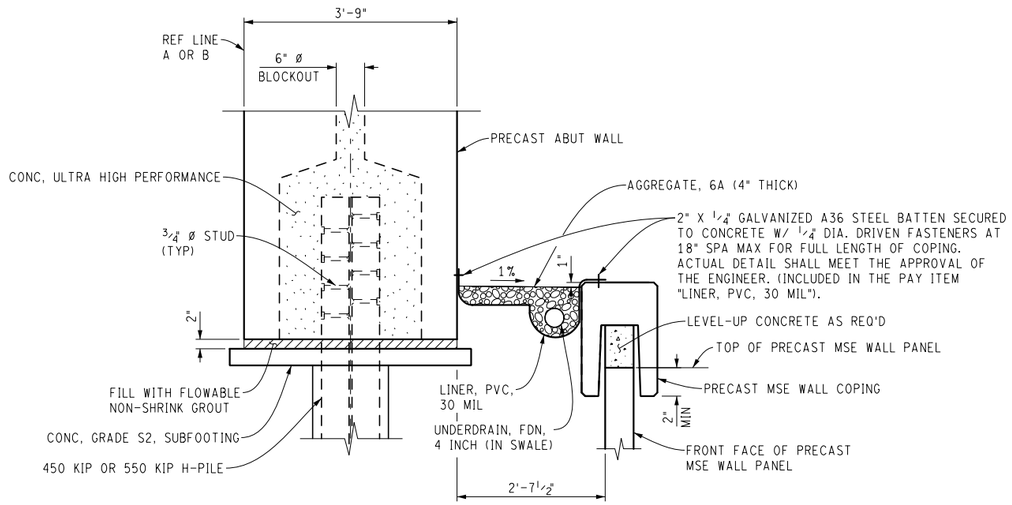
SECTION B-B

* 2'-6" ø BLOCKOUT (FILL W/ "CONC, ULTRA HIGH PERFORMANCE").

** UNDERDRAIN, FDN, 6 INCH (SURROUNDED BY 2'-0" X 2'-0" COARSE AGGREGATE WITH GEOTEXTILE LINER ON OUTSIDE. COARSE AGGREGATE TO BE PAID FOR AS "AGGREGATE, 6A").

*** PILE PROTECTION FROM BOTTOM OF SUBFOOTING TERMINATING AT EL. 936.00.

**** EXTEND OPEN-GRADED DR CSE, CIP FROM BOTTOM OF SLEEPER SLAB FOR A DEPTH OF 36 INCH MAX, NOT TO EXTEND BELOW THE TOP OF ABUTMENT WALL EXCEPT WHEN NECESSARY TO PROVIDE A MINIMUM OF 12 INCH BELOW SLEEPER SLAB.



ABUTMENT - MSE WALL SECTION

NOTES:

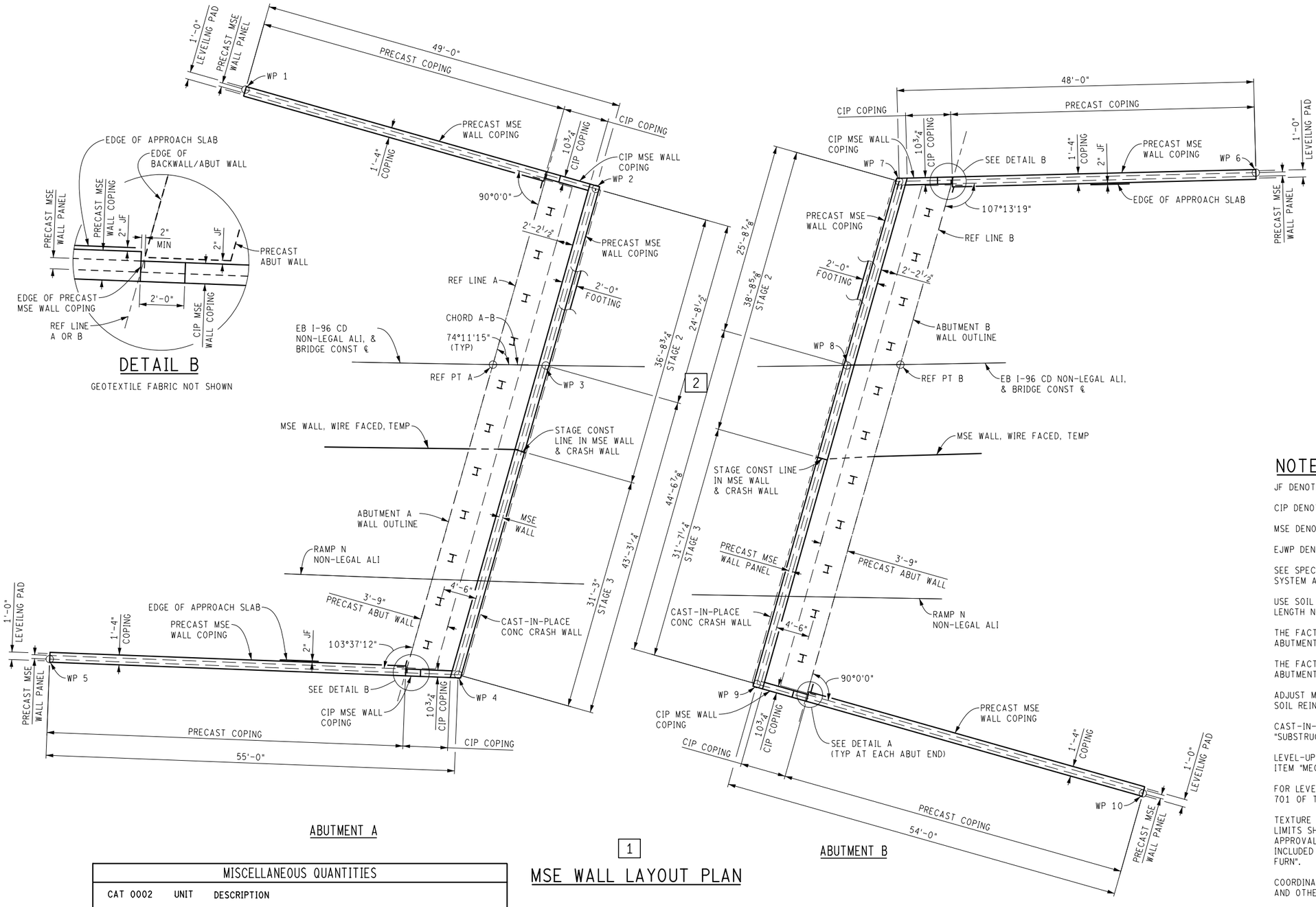
DO NOT USE WHEELED, ROLLER BASED OR MACHINE MOUNTED COMPACTION EQUIPMENT TO COMPACT THE SUBGRADE, SUBBASE, AND BASE WITHIN 10' OF THE SLEEPER SLAB AFTER IT IS BUILT. USE ONLY HAND/PLATE COMPACTORS. CONTACT PRESSURE OF COMPACTION EQUIPMENT SHALL NOT EXCEED 10 PSI.

CUT-OFF EXISTING PILES TO THE BOTTOM OF EXCAVATION LIMITS.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)													
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION	MDOT Michigan Department of Transportation	NO SCALE		DATE: 04/04/14	CS: S05 OF 47064	GENERAL PLAN OF STRUCTURE	DRAWING	SHEET
											DESIGN UNIT: UNIT	JN: 112879A	EB I-96 CD OVER NB US-23	S05 GPSTR 003	SECT 2 37
										FILE: s05 47064 gpstr 003.dgn	TSC: BRIGHTON				

DETAIL B

GEOTEXTILE FABRIC NOT SHOWN

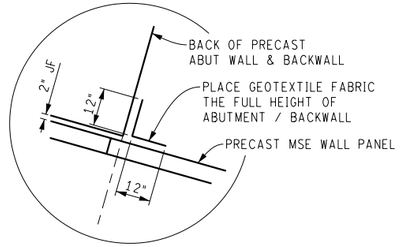


ABUTMENT A

ABUTMENT B

1

MSE WALL LAYOUT PLAN



DETAIL A

MSE COPING NOT SHOWN

GEOTEXTILE FABRIC AND JF WILL BE INCLUDED IN THE PAY ITEM "MECHANICALLY STABILIZED EARTH WALL, PRECAST, INSTALL".

MISCELLANEOUS QUANTITIES

CAT 0002	UNIT	DESCRIPTION
319	Ft	Mechanically Stabilized Earth Wall Coping, Precast
64	Ft	Mechanically Stabilized Earth Wall Coping, CIP
203	Ft	Mechanically Stabilized Earth Wall, Leveling Pad, Conc
7,719	Sft	Mechanically Stabilized Earth Wall, Precast, Furn
7,719	Sft	Mechanically Stabilized Earth Wall, Precast, Install
3,300	Sft	Mechanically Stabilized Earth Wall, Wire Faced, Temp, Furn
3,300	Sft	Mechanically Stabilized Earth Wall, Wire Faced, Temp, Install
49	Cyd	Substructure Conc

NOTES:

JF DENOTES JOINT FILLER

CIP DENOTES CAST-IN-PLACE.

MSE DENOTES MECHANICALLY STABILIZED EARTH.

EJWP DENOTES EXPANSION JOINT WATERPROOFING.

SEE SPECIAL PROVISION FOR "MECHANICALLY STABILIZED EARTH RETAINING WALL SYSTEM AT BRIDGE".

USE SOIL REINFORCEMENT FOR MSE WALLS AND MSE RETURN WALLS OF A LENGTH NOT LESS THAN 22 FEET.

THE FACTORED BEARING RESISTANCE OF THE SUBGRADE IS 23,600 PSF AT ABUTMENT A AND 23,000 PSF AT ABUTMENT B.

THE FACTORED BEARING RESISTANCE OF THE SUBGRADE IS 19,800 PSF AT ABUTMENT A RETURN WALL AND 19,200 PSF AT ABUTMENT B RETURN WALL.

ADJUST MSE SOIL REINFORCEMENT TO AVOID FOUNDATION PILES. DO NOT CUT SOIL REINFORCEMENT.

CAST-IN-PLACE CONC CRASH WALLS AND FOOTINGS ARE PAID FOR AS "SUBSTRUCTURE CONC".

LEVEL-UP CONCRETE AND NON-SHRINK GROUT SHALL BE INCLUDED IN THE PAY ITEM "MECHANICALLY STABILIZED EARTH WALL COPING, PRECAST".

FOR LEVEL-UP CONCRETE USE GRADE S1 CONCRETE ACCORDING TO SECTION 701 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

TEXTURE THE EXPOSED FACE OF PRECAST CONCRETE FACING PANELS TO THE LIMITS SHOWN ON THESE PLANS WITH AN ASHLAR STONE PATTERN MEETING THE APPROVAL OF THE ENGINEER. PAYMENT FOR TEXTURING PANELS WILL BE INCLUDED IN THE PAY ITEM "MECHANICALLY STABILIZED EARTH WALL, PRECAST, FURN".

COORDINATE PLACEMENT OF SOIL REINFORCEMENT WITH UNDERDRAINS, PIPES AND OTHER OBSTRUCTIONS.

CUTTING OF THE MSE SOIL REINFORCEMENT IS PROHIBITED.

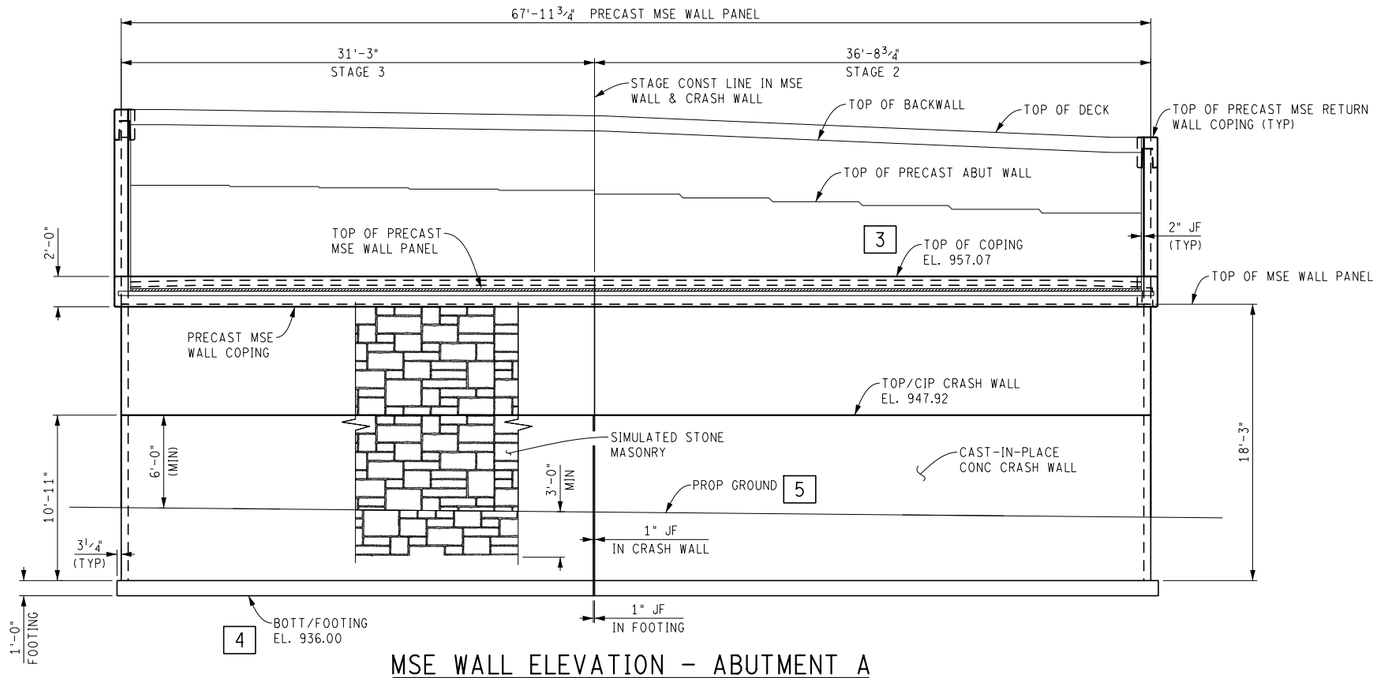
FIELD VERIFY THAT THE TOP OF CRASH WALL IS A MINIMUM OF 6'-0" ABOVE THE PROPOSED GROUND. ADJUST THE ELEVATION AS APPROVED BY THE ENGINEER.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

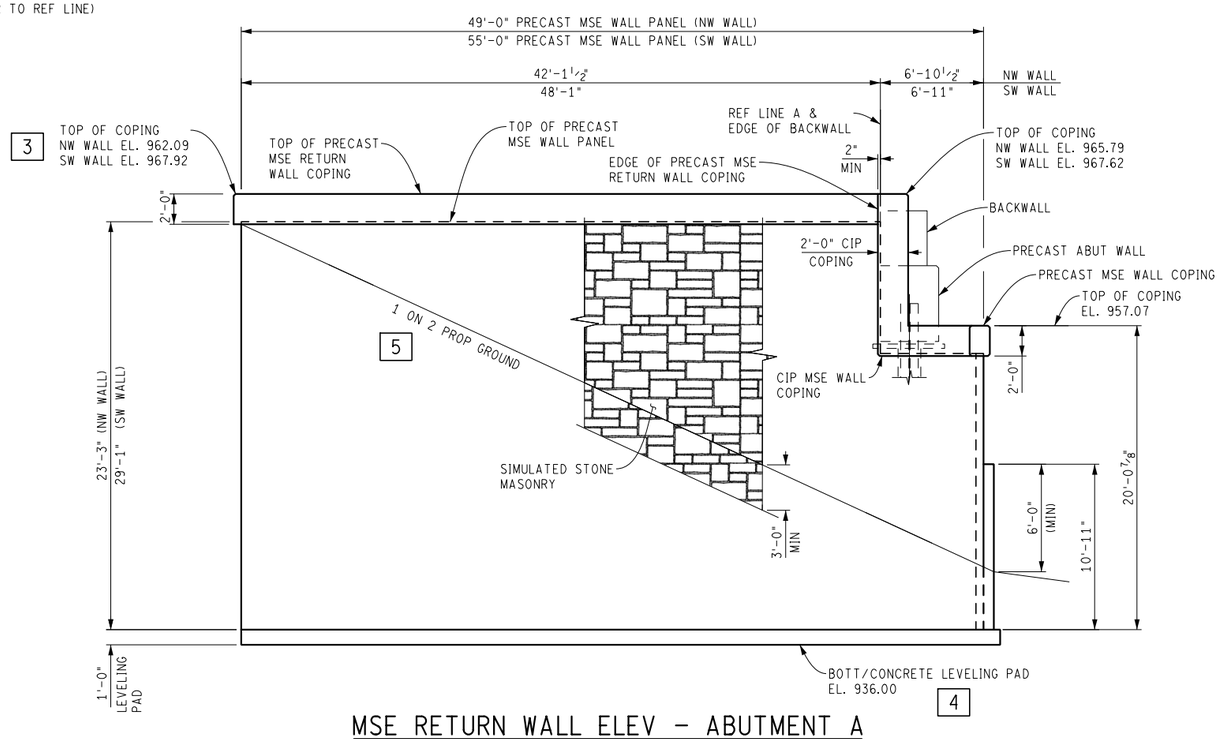
NO SCALE

	DATE: 04/04/14	CS: S05 OF 47064	MSE WALL DETAILS	DRAWING: S05 MSE 001
	DESIGN UNIT: UNIT	JN: 112879A		SHEET: SECT 2 38
FILE: s05 47064 mse 001.dgn	TSC: BRIGHTON			



MSE WALL ELEVATION - ABUTMENT A

(PERPENDICULAR TO REF LINE)



MSE RETURN WALL ELEV - ABUTMENT A

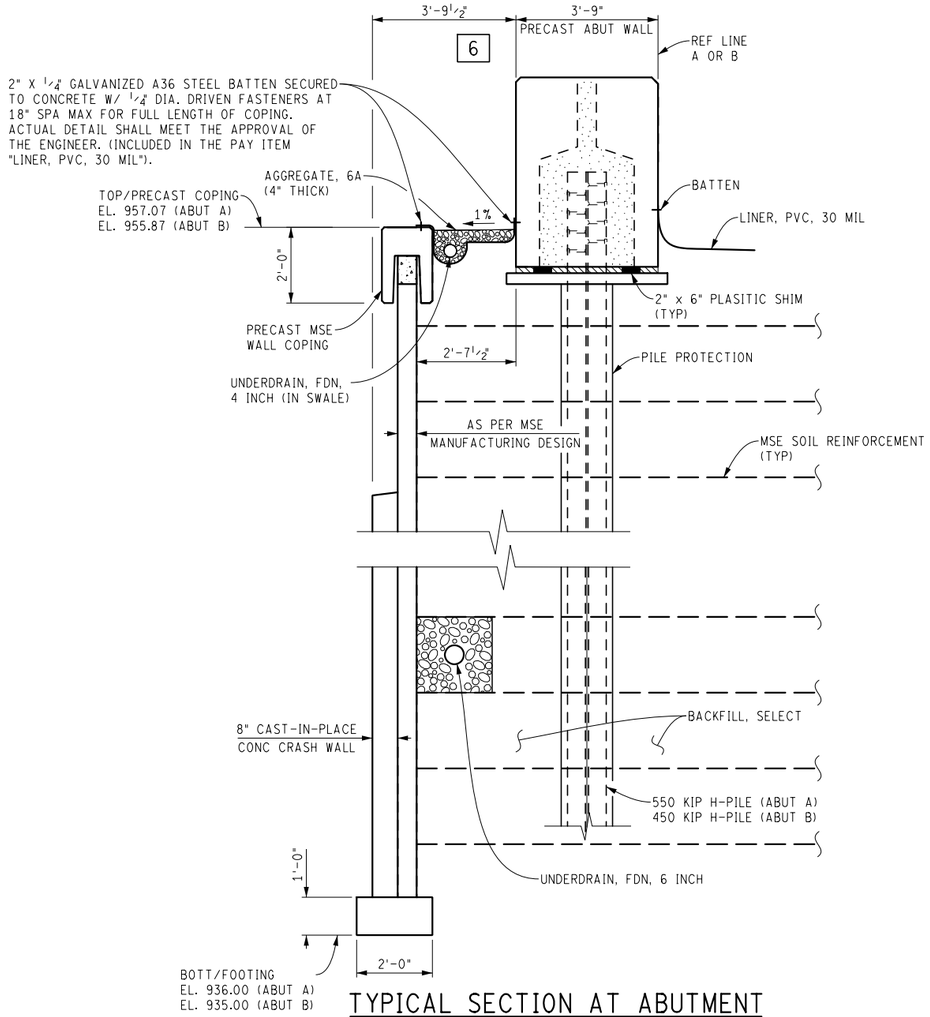
(ALONG FACE OF PRECAST MSE WALL PANEL)

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

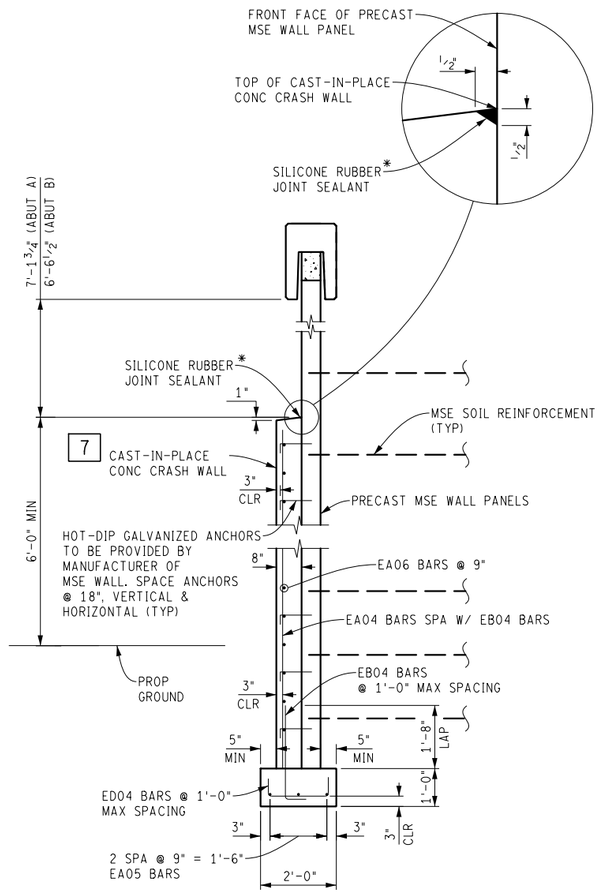
MDOT Michigan Department of Transportation

NO SCALE

	DATE: 04/04/14	CS: S05 OF 47064	MSE WALL DETAILS	DRAWING: S05 MSE 002
	DESIGN UNIT: UNIT	JN: 112879A		SHEET: SECT 2 39
FILE: s05 47064 mse 002.dgn	TSC: BRIGHTON			



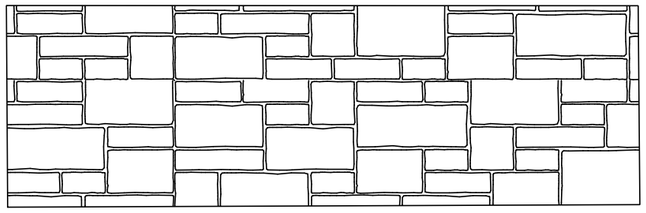
TYPICAL SECTION AT ABUTMENT



CAST-IN-PLACE CONC CRASH WALL DETAIL

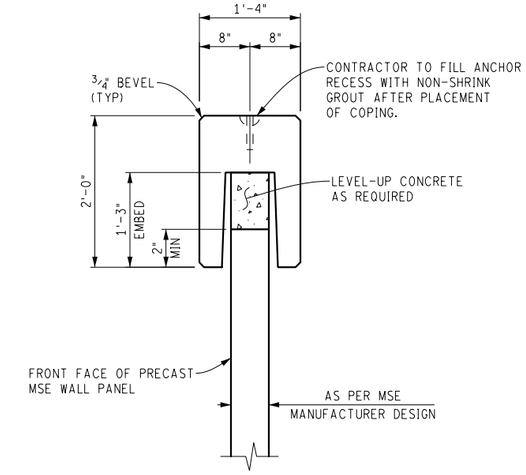
* INCLUDED IN PAY ITEM "SUBSTRUCTURE CONC"

SIMULATED STONE MASONRY QUANTITIES (FOR INFORMATION ONLY)	
MSE @ ABUT A	MSE @ ABUT B
209 Syd	201 Syd



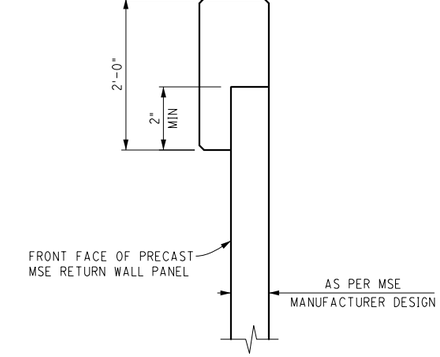
SANSTONE ASHLAR STONE FORM LINER

SEE SPECIAL PROVISION "SIMULATED STONE MASONRY".



PRECAST MSE WALL COPING DETAIL

COPING REINFORCEMENT NOT SHOWN



CAST-IN-PLACE MSE RETURN WALL COPING DETAIL

COPING REINFORCEMENT NOT SHOWN

NOTES:

HOT-DIP GALVANIZED ANCHORS ARE INCLUDED WITH PAY ITEM "MECHANICALLY STABILIZED EARTH WALL, PRECAST, FURN".

TEXTURING OF MSE WALLS WILL BE SANDSTONE ASHLAR STONE PATTERN. PAID FOR AS "MECHANICALLY STABILIZED EARTH WALL, PRECAST, FURN".

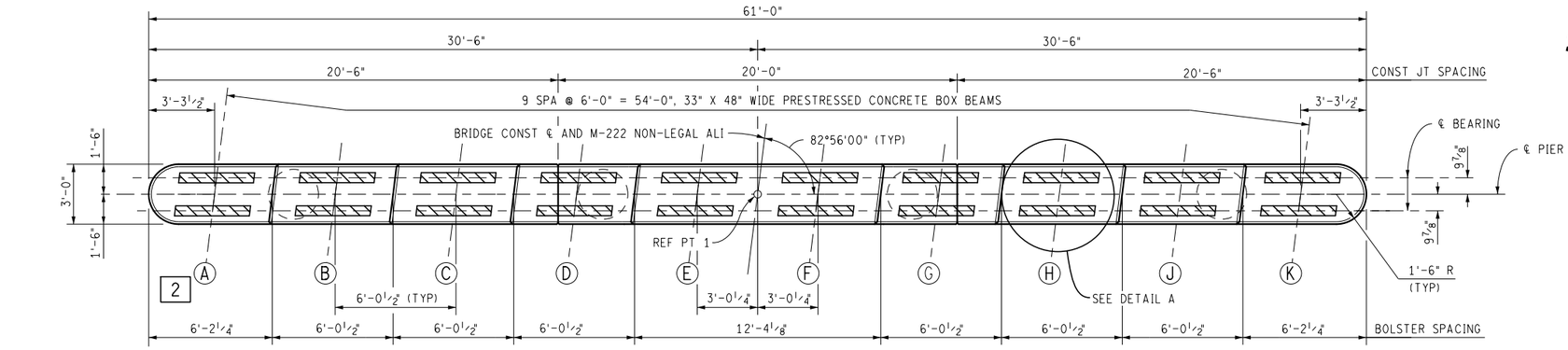
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

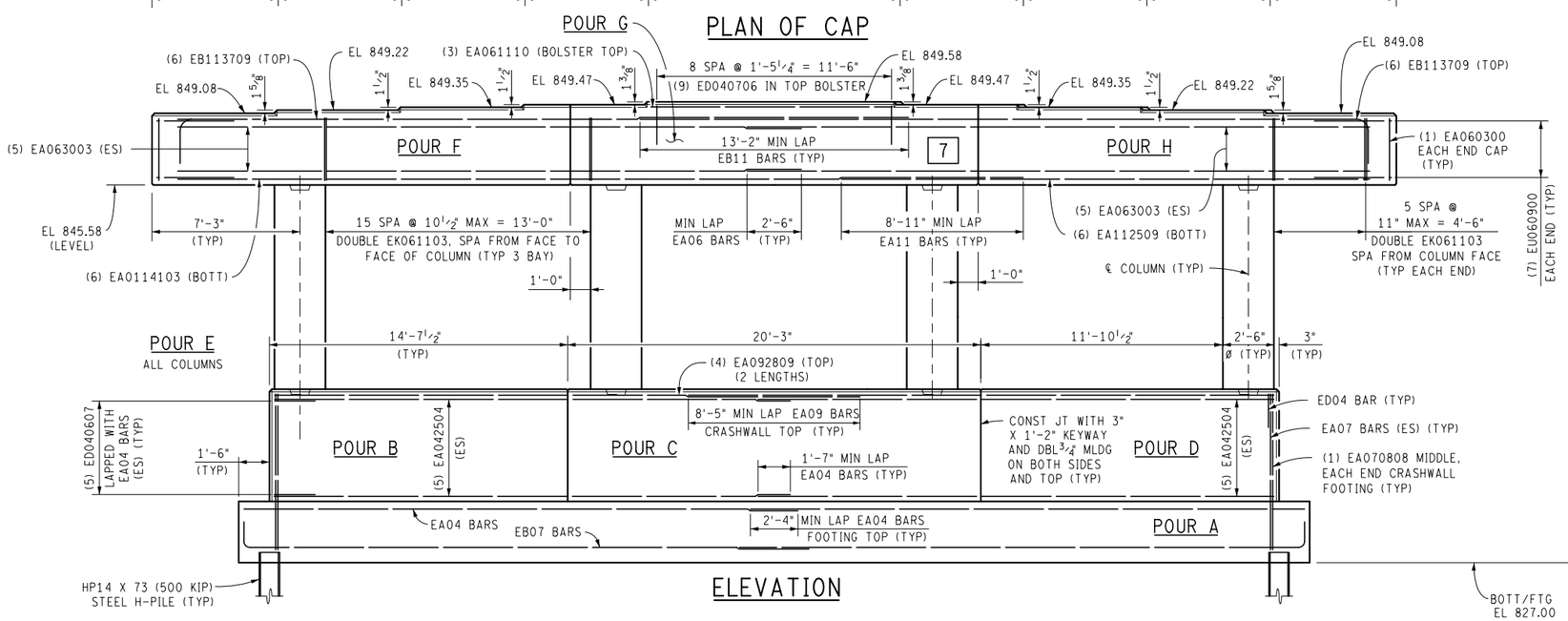
NO SCALE

	DATE: 04/04/14	CS: S05 OF 47064	MSE WALL DETAILS
	DESIGN UNIT: UNIT	JN: 112879A	
FILE: s05 41064 mse 004.dgn	TSC: BRIGHTON		

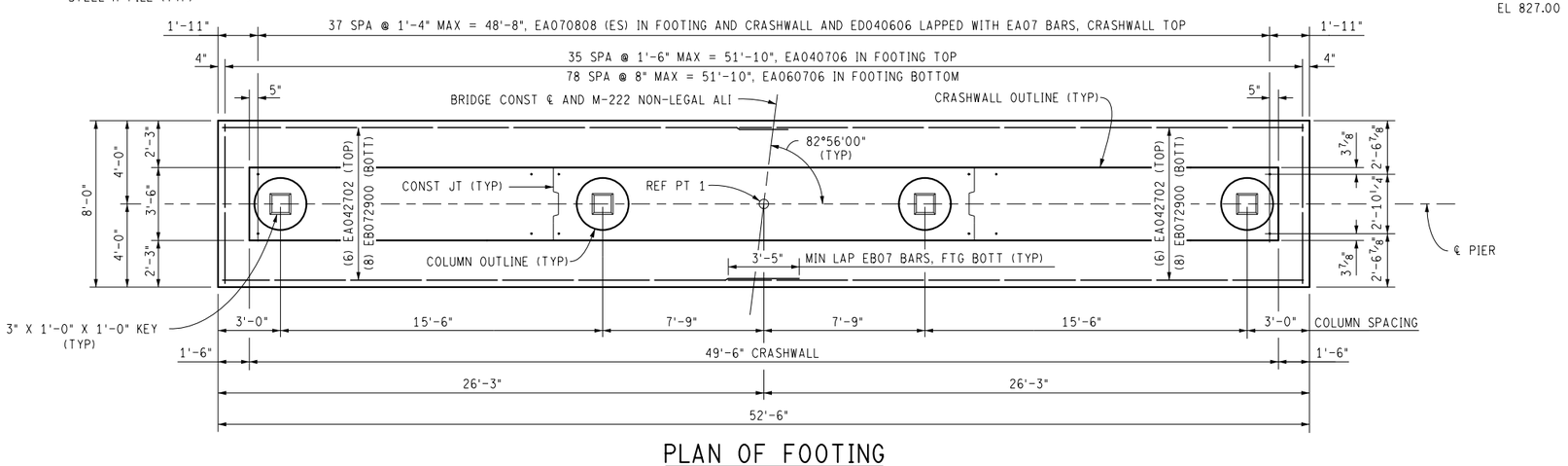
DRAWING	SHEET
S05 MSE 004	SECT 2 40



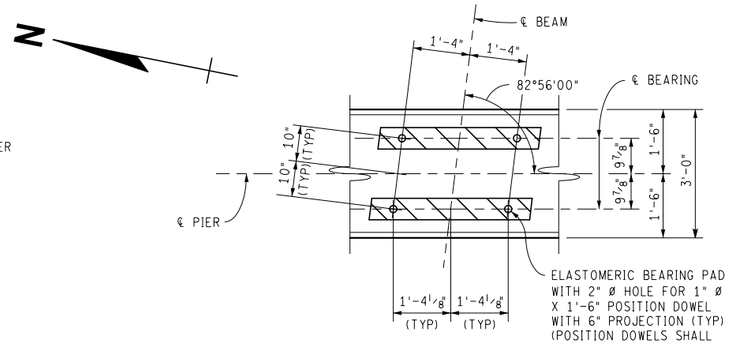
PLAN OF CAP



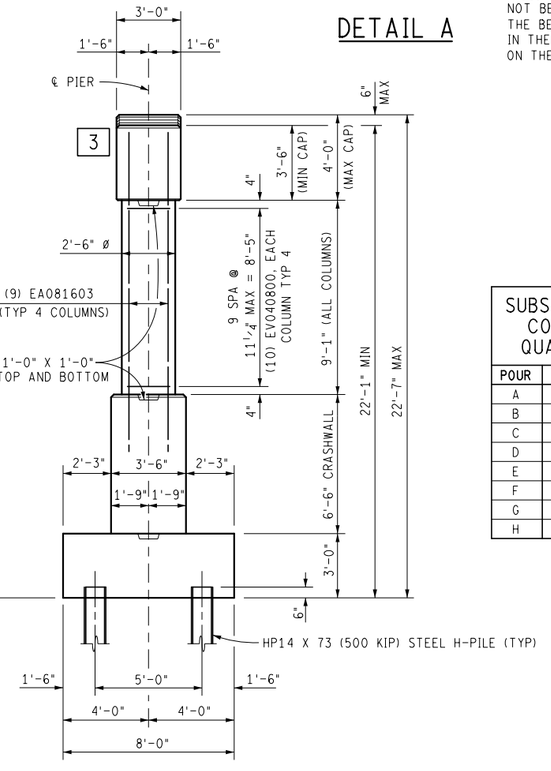
ELEVATION



PLAN OF FOOTING



DETAIL A



END VIEW

SUBSTRUCTURE CONCRETE QUANTITIES

POUR	AMOUNT (CYD)
A	46.7
B	12.4
C	16.9
D	12.4
E	6.6
F	9.2
G	9.6
H	9.2

MISCELLANEOUS QUANTITIES

123 Cyd Substructure Conc

NOTES:

ES DENOTES EACH SIDE.

FOR BEVEL AND MOLDING DETAILS, SEE STANDARD PLAN B-103-SERIES.

FOR PILE QUANTITIES, LAYOUT AND NOTES, SEE DRAWING S01-PILE-001 AND 002.

LOW TEMPERATURE PROTECTION OF CONCRETE SHALL BE APPLIED ACCORDING TO SECTION 706.03J, OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. LOW TEMPERATURE PROTECTION OF CONCRETE WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE BID ITEM "SUBSTRUCTURE CONC".

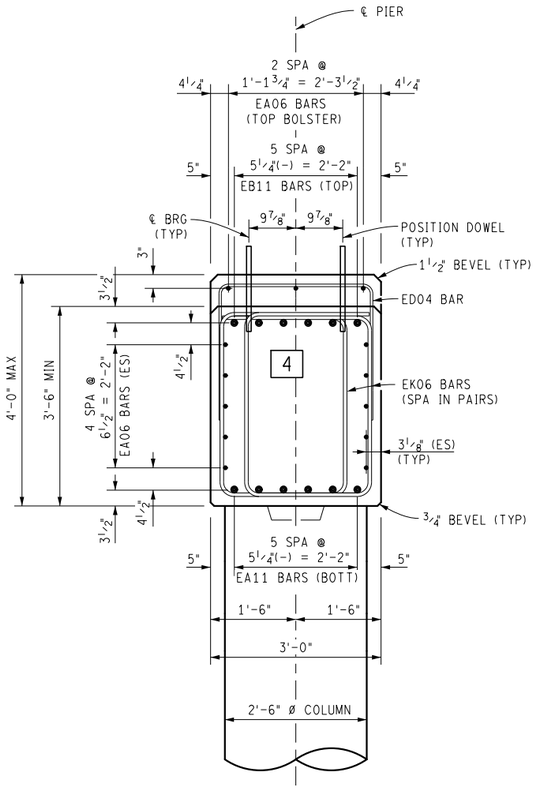
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

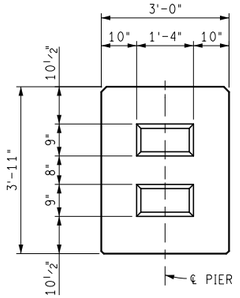
DRAWN BY: C. TECH	DATE:	CS: S01 OF 03112	PIER DETAILS
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 73748A	
FILE: S01 03112 pier.dgn	TSC:		

DRAWING	SHEET
S01 PIER 001	SECT 2 41

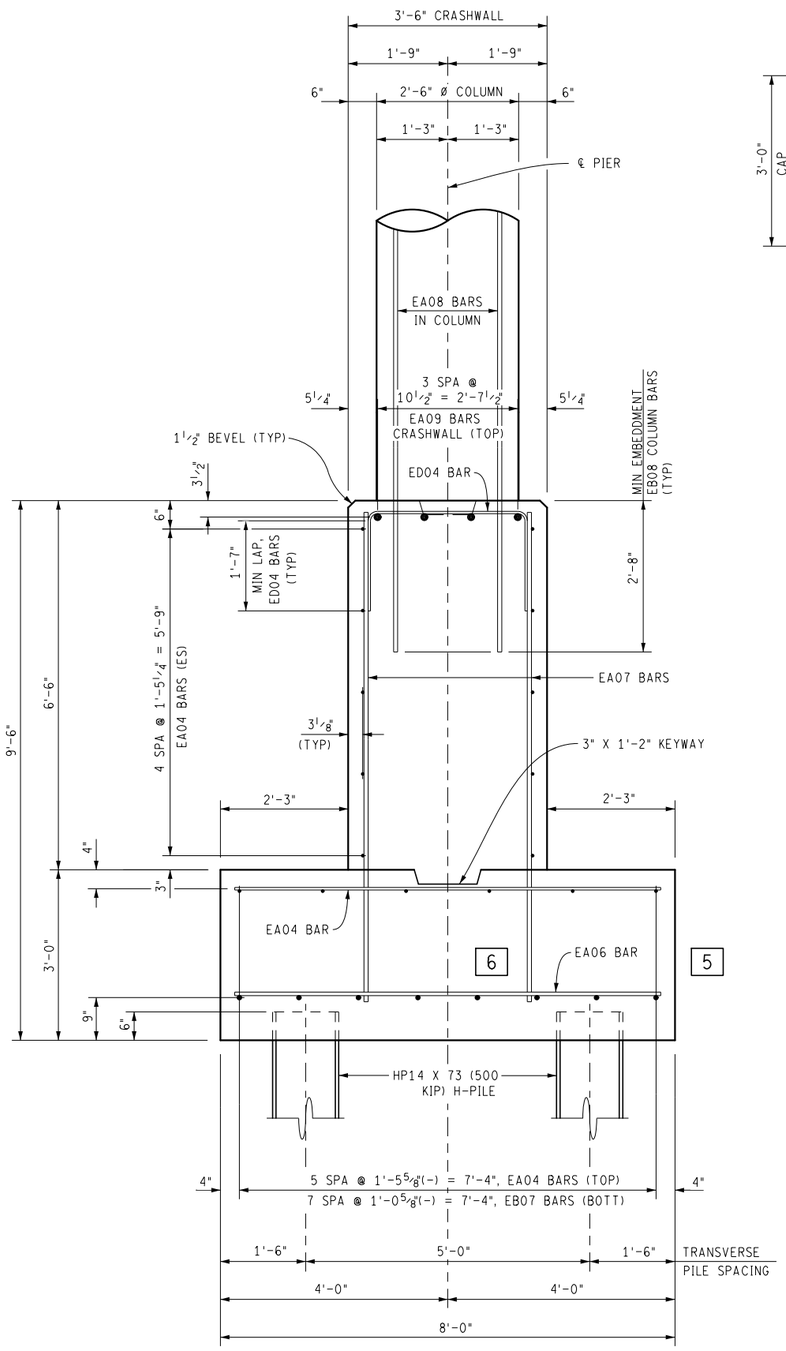


TYPICAL CAP SECTION

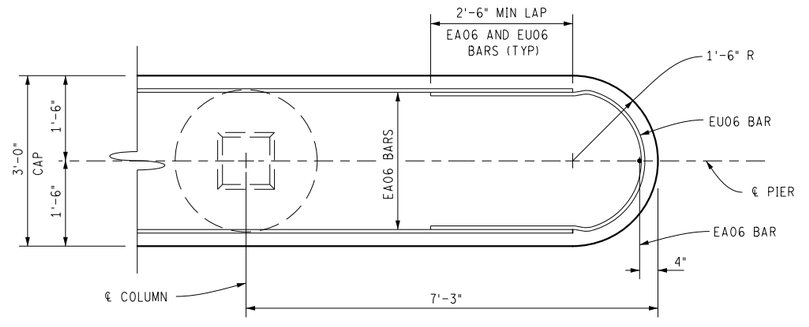
TYPICAL COLUMN SECTION



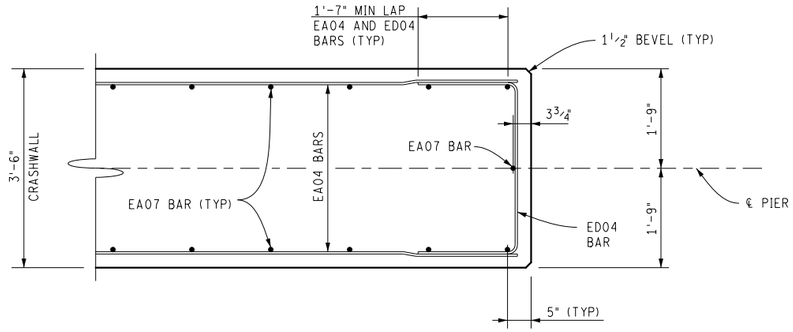
SHEAR KEY DETAIL
(@ CAP CONST JOINT)



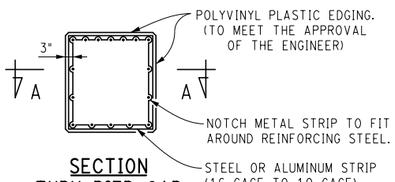
TYPICAL FOOTING/CRASHWALL SECTION



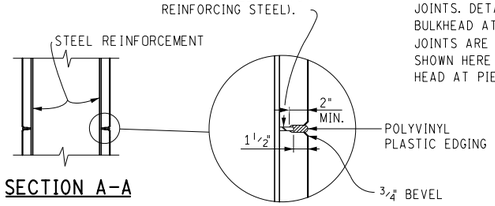
TYPICAL CAP END SECTION
(EK06 BARS ARE NOT SHOWN)



TYPICAL CRASHWALL END SECTION



SECTION THRU PIER CAP



SECTION A-A

NOTE:
PARTIAL METAL BULKHEAD MAY ALSO BE USED AT THE CRASHWALL CONSTRUCTION JOINTS. DETAILS FOR PARTIAL METAL BULKHEAD AT THE CRASWALL CONSTRUCTION JOINTS ARE SIMILAR TO THE DETAILS SHOWN HERE FOR PARTIAL METAL BULK-HEAD AT PIER CAP CONSTRUCTION JOINTS.

PARTIAL METAL BULKHEAD DETAILS

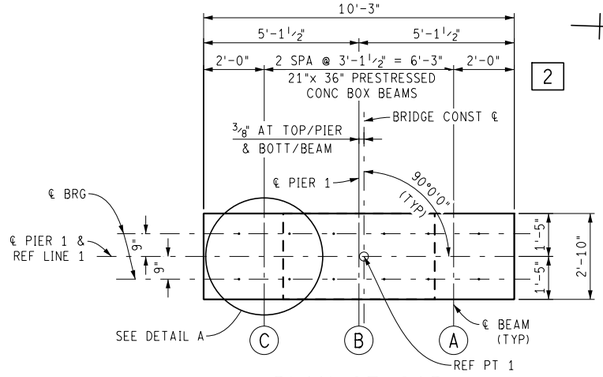
NOTE: PARTIAL METAL BULKHEAD MAY BE USED AS ALTERNATE CONSTRUCTION JOINT AT CONTRACTOR'S EXPENSE. CARE IS TO BE USED IN CASTING CONCRETE TO PREVENT DISLOCATION OR MISALIGNMENT OF THE BULKHEAD.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

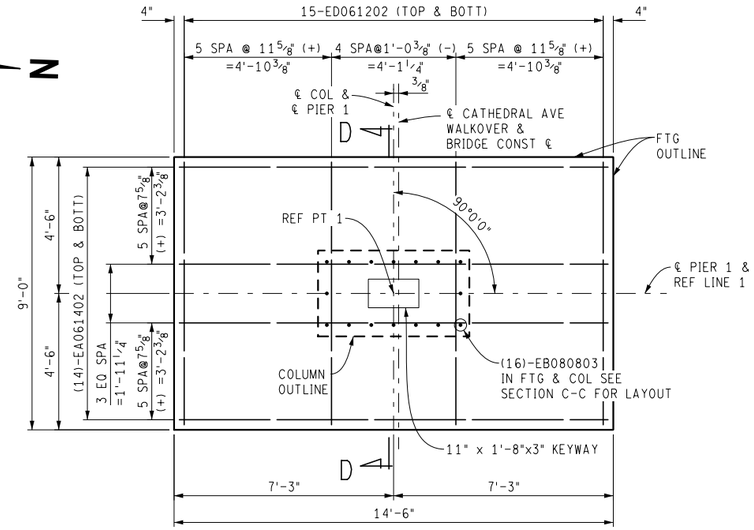
MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: S01 OF 03112	PIER DETAILS	DRAWING: S01 PIER 002
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 73748A		SHEET: SECT 2 42
FILE: S01 03112 pier.dgn	TSC:			

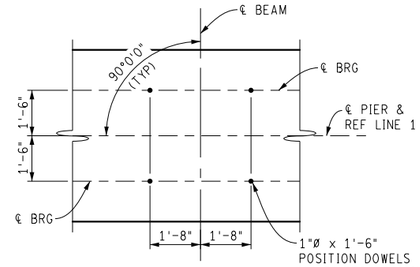


PLAN OF CAP

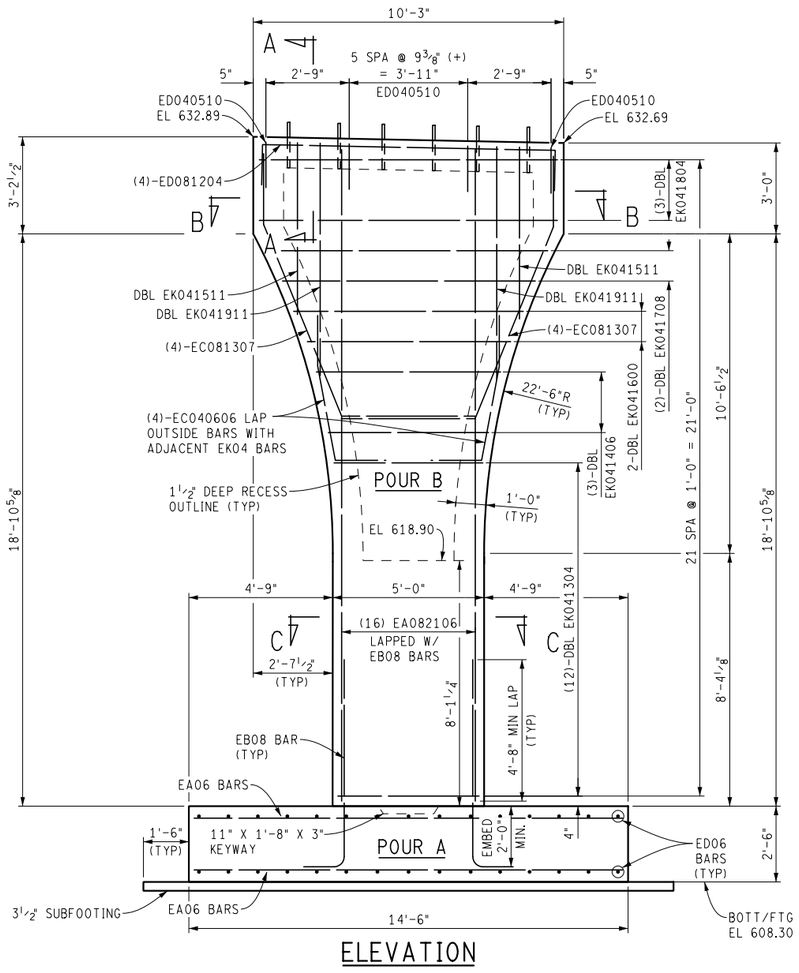


PLAN OF FOOTING

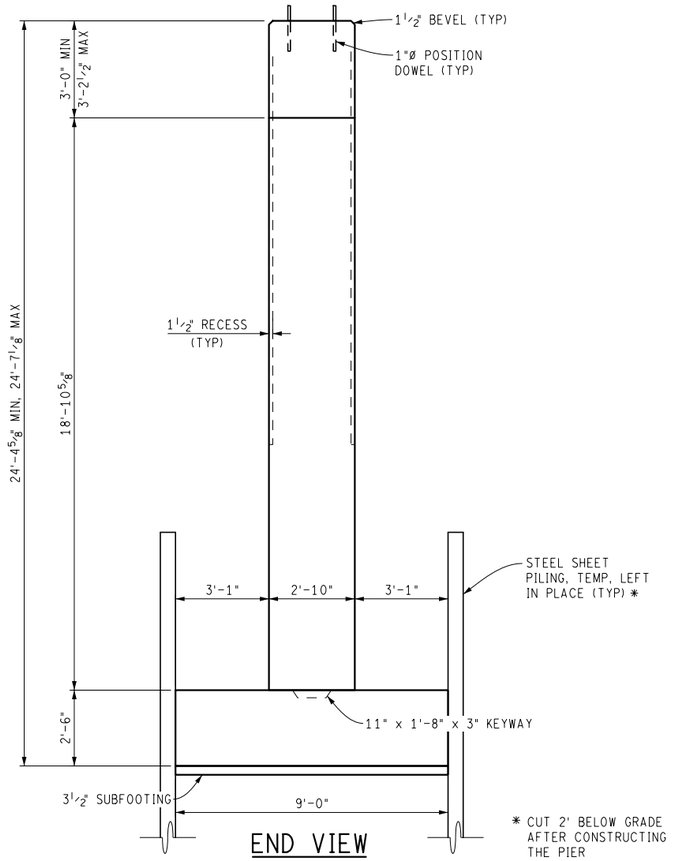
TEMPORARY SHEET PILING & SUBFOOTING NOT SHOWN FOR CLARITY



DETAIL A



ELEVATION



END VIEW

MISCELLANEOUS QUANTITIES	
29 Cyd	Substructure Conc
2 Cyd	Conc, Grade S2, Subfooting
3 Syd	Substructure Horizontal Surface Sealer

SUBSTRUCTURE CONCRETE QUANTITIES	
POUR	AMT (CYDS)
A	13.4
B	15.1

NOTES:

DBL DENOTES DOUBLE.

FOR BEVEL AND MOLDING DETAILS, SEE STANDARD PLAN B-103-SERIES.

THE CONTRACTOR MAY ADHESIVE ANCHOR POSITION DOWELS IN HOLES DRILLED IN THE CONCRETE AT PIER 1.

LOW TEMPERATURE PROTECTION OF CONCRETE SHALL BE APPLIED ACCORDING TO SECTION 706.03 J, OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. LOW TEMPERATURE PROTECTION OF CONCRETE WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE BID ITEM "SUBSTRUCTURE CONC".

THE MATERIAL PROPERTIES OF "CONC, GRADE S2, SUBFOOTING" SHALL BE THOSE OF CONCRETE, GRADE S2.

THE SUBSTRUCTURE EXCAVATION AND CONCRETE QUANTITIES TAKE INTO CONSIDERATION THE ADDITIONAL CONCRETE AND EXCAVATION NECESSARY TO EXCAVATE AND POUR TO THE TEMPORARY STEEL SHEET PILING.

FOR PIER DESIGN, THE MAXIMUM FOUNDATION PRESSURE IS CALCULATED TO BE 2765 PSF FOR SERVICE LIMIT STATE (UNDER PERMANENT LOADS ONLY) BASED ON AN EFFECTIVE FOOTING WIDTH OF 9', AND 4410 PSF FOR STRENGTH LIMIT STATE BASED ON AN EFFECTIVE FOOTING WIDTH OF 7'-11 1/2".

SUBSTRUCTURE HORIZONTAL SURFACE SEALER SHALL BE APPLIED TO THE TOP HORIZONTAL SURFACE OF PIER 1 AFTER THE ELASTOMERIC BEARINGS HAVE BEEN PLACED IN FINAL POSITION ON THE STRUCTURE. VERTICAL SURFACES ACCIDENTALLY COATED SHALL BE CLEANED AT CONTRACTOR'S EXPENSE.

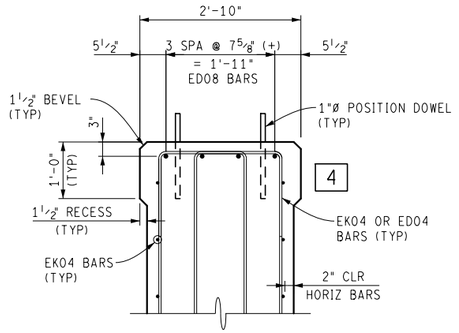
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

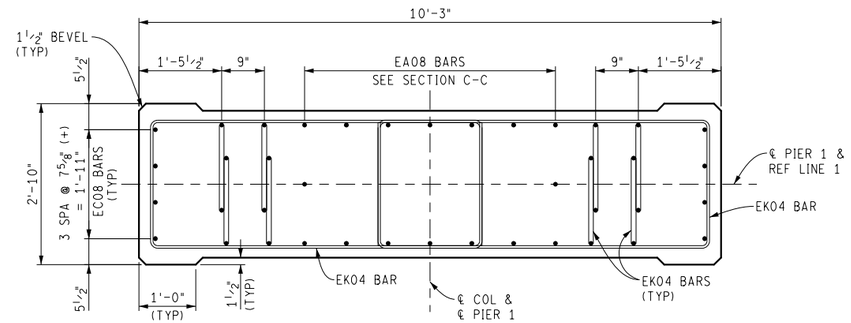
NO SCALE

DRAWN BY: C TECH	DATE:	CS: P03 OF 82192	PIER DETAILS
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 123456A	
FILE: p03_82192_pier_001.dgn	TSC: DETROIT		

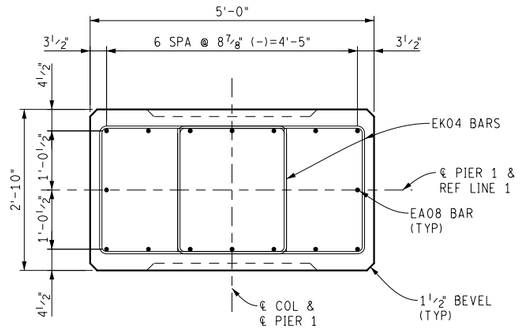
DRAWING	SHEET
P03 PIER 001	SECT 2 43



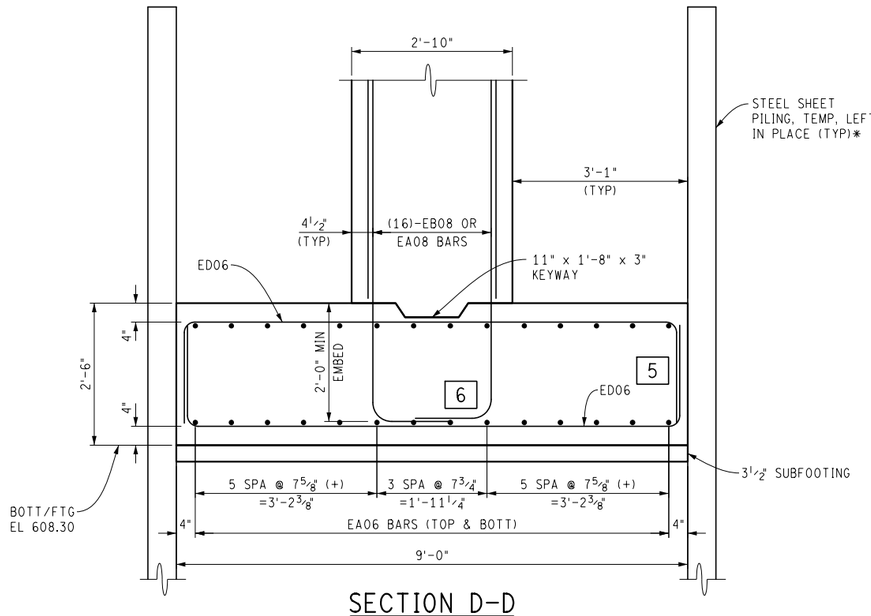
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

* CUT 2' BELOW GRADE
AFTER CONSTRUCTING
THE PIER

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: P03 OF 82192	PIER DETAILS
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 123456A	
FILE: p03_82192_pier_002.dgn	TSC:		

DRAWING	SHEET
P03 PIER 002	SECT 2 44

CULVERT DETAILS

1. Plan view should show number of culvert segments.
2. Show reference lines, bridge construction centerlines, and angle of crossing.
3. Show headwall in elevation view with elevations on each side of the headwall.
4. Show hardware for wingwall attachments.
5. Give elevation views of all wingwalls.
6. Wingwall anchors are typically detailed by the fabricator, however they should be shown so that potential interference between the anchor and cofferdam can be shown.

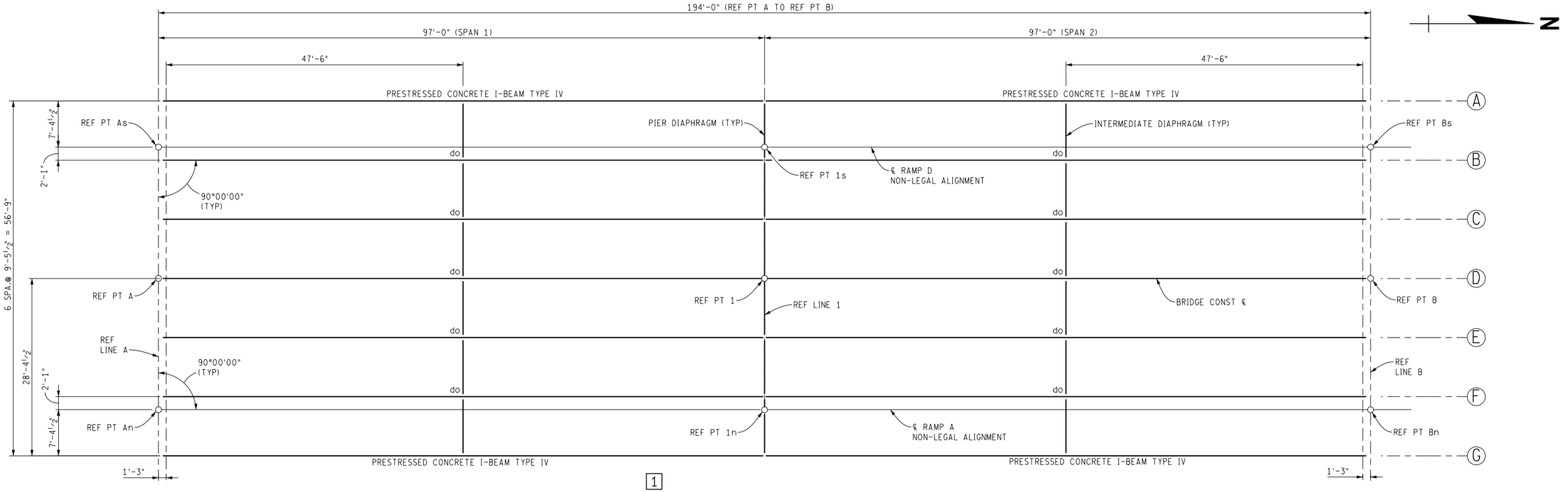
MSE WALL DETAILS

In practice, the general plan of site details should be placed in the plan set with other general plan sheets. This sheet is shown here with the MSE wall sheets because these details would be used on bridges with MSE walls.

1. MSE wall layouts should be shown in plan view.
2. Give locations with respect to the bridge construction centerline.
3. Label top of coping elevations
4. Label bottom of leveling pad elevation.
5. Show approximate proposed ground line.
6. Section through wall should show the relative location of the abutment.
7. If cast-in-place concrete crashwall is used, detail the reinforcement on a separate sheet.

PIER DETAILS

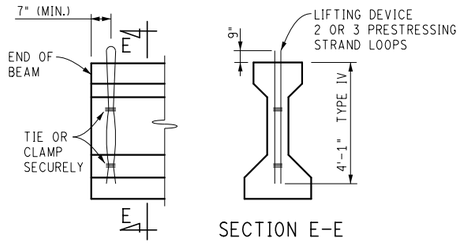
1. Give pier cap plan view, footing plan view, pier elevation, and end view. Plan views must show relationships to reference points/lines.
2. Show beam centerlines and beam spacing in the plan of cap.
3. Typically, the cap and footing in the cross sections will be too small to show reinforcing. Provide details on the following sheet.
4. When detailing pier cap reinforcement, the following shall apply:
   a. Interference between pier reinforcement and all anchor bolts or position dowels must be avoided. Therefore position dowels should always be shown.
   b. Show concrete bevels
   c. Label the distance between the top longitudinal steel and the pier cap top (usually 3") as "min".
5. Provide bent bars for bottom footing reinforcement if development length over piles is not adequate.
6. If bent column bars are required, bent ends should point towards the center of the column.
7. Place laps in areas of low stress.



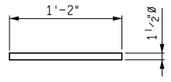
1

ERECTION DIAGRAM

PRESTRESSING STRAND LIFTING DEVICES		
STRAND SIZE	NO. OF STRANDS	BEAM WT. (TONS)
3/8"	2	20
7/16"	2	27
1/2"	2	36
3/8"	3	30
7/16"	3	40.5
1/2"	3	54



LIFTING DEVICE



POSITION DOWEL DETAIL

MISCELLANEOUS QUANTITIES	
1344 Ft	Prest Conc I Beam, Furn, 54 inch
1344 Ft	Prest Conc I Beam, Erect, 54 inch
2898 Sin	Bearing, Elastomeric, 2¾ inch
3542 Sin	Bearing, Elastomeric, 3½ inch

NOTES:

PRESTRESSING STRANDS SHALL BE GIVEN AN INITIAL PRESTRESS OF 44,000 LBS PRESTRESS

CONCRETE INSERTS SHALL BE 1" DIAMETER AT ABUTMENT END OF BEAMS: DAYTON SUPERIOR, TYPE B-1 HEAVY OR TYPE B-18: WILLIAMS FORM, TYPE C 12 OR TYPE C -19: MEADOW BURKE, TYPE CT-2 OR TYPE CX-4: OR EQUAL. INSERTS SHALL BE CAST WITH THE BEAMS. FIELD INSTALLATION OF INSERTS IS NOT ALLOWED.

CONCRETE INSERTS SHALL BE 7/8" DIAMETER ELECTROPLATED FERRULE LOOP INSERTS (MEDIUM HIGH CARBON WIRE) OR APPROVED EQUAL ON INSIDE OF FASCIA BEAMS AT MIDSPAN. INSERTS SHALL BE CAST WITH THE BEAMS. FIELD INSTALLATION OF INSERTS IS NOT ALLOWED.

END BLOCKS ARE OPTIONAL.

TOTAL ESTIMATED CHANGE OF LENGTH OF BOTTOM FLANGE AT TRANSFER OF PRESTRESS FORCE IS 7/8".

THE ESTIMATED BEAM CAMBER AT RELEASE IS 2 3/8". THIS CAMBER IS DUE TO PRESTRESS AND DEAD LOAD OF THE BEAM ONLY AND IS MEASURED IN THE ERECTED POSITION.

DURING HANDLING AND TRANSPORTATION, BEAMS CAN BE SUPPORTED 3 FEET FROM THE END.

THREADING OF REINFORCEMENT AND INSTALLATION INTO CONCRETE INSERTS IS INCLUDED IN THE BID ITEM "PREST CONC I BEAM, FURN, 54 INCH".

LIFTING DEVICES SHALL BE REMOVED AFTER BEAMS ARE ERECTED. REMOVAL IS INCLUDED IN THE BID ITEM "PREST CONC I BEAM, ERECT, 54 INCH".

USE NON-DEFORMED STEEL RODS IN ACCORDANCE WITH AASHTO M 270 GRADE 36 AND HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111, AS POSITION DOWELS FOR PRECAST BEAMS.

PRESTRESSING STRAND SHALL BE 0.6" NOMINAL DIAMETER MEETING THE REQUIREMENTS OF AASHTO M203 (ASTM A416), GRADE 270, LOW RELAXATION STRAND.

COAT THE ENTIRE OUTSIDE AND BOTTOM OF THE FASCIA BEAM USING A MATERIAL SELECTED FROM THE SPECIAL PROVISION FOR CONCRETE SURFACE COATINGS. APPLY THE COATING ACCORDING TO THE SPECIAL PROVISION.

STEEL FOR SOLE PLATES AND OTHER BEARING COMPONENTS SHALL MEET THE REQUIREMENTS OF AASHTO M 270 GRADE 36.

BEAM STEEL REINFORCEMENT, INCLUDING STIRRUPS, SHALL BE GRADE 60 (KSI).

FIELD DRILLING SHALL BE ALLOWED FOR SIGN SUPPORT ANCHORS ONLY. LOCATION OF ANCHORS SHALL BE AS DETAILED ON TRAFFIC & SAFETY SIGN SUPPORT SPECIAL DETAILS. ANY DAMAGE TO THE BEAMS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE AND APPROVED BY THE ENGINEER.

ITEMS CAST INTO THE BEAMS TO FACILITATE BRIDGE CONSTRUCTION (FORMING, FINISHING, ETC.) SHALL BE GALVANIZED OR EPOXY COATED.

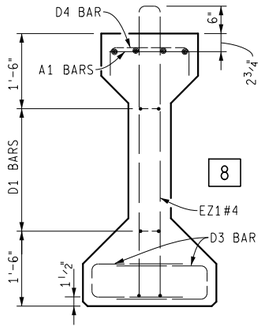
IF THE POSITION DOWELS AT ABUTMENTS ARE MISALIGNED, IN RELATIONSHIP TO THE CENTERLINE OF BEARINGS, DUE TO TEMPERATURE EFFECTS ON THE BEAMS, HOLES IN THE ELASTOMERIC BEARINGS SHALL BE CENTERED ON THE DOWELS.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

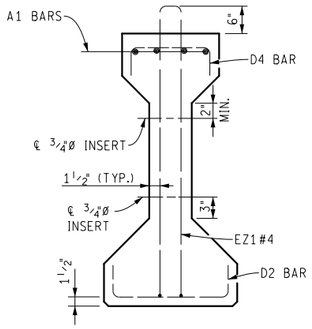
NO SCALE

DRAWN BY: C TECH	DATE:	CS: S04 OF 09101	PRESTRESSED CONCRETE I-BEAM DETAILS	DRAWING: S04 PREST 001
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 108778A		SHEET: SECT 2 46
FILE: s04 09101 prest.dgn	TSC:			

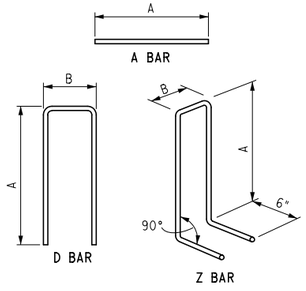


8

SECTION A-A



SECTION B-B



2

BEAM DATA		
SPAN	1	2
TYPE	IV	IV
NO.REQ.	7	7
a	5	5
b	11	30
b'	30	11
c	69	69
d	64	64
E	5 1/2"	6 1/2"
f	14	14
g	53	53
G	6 1/2"	5 1/2"
I	1'-5 7/8"	1'-5 7/8"
J	10"	6"
J'	6"	10"
K	1'-0"	1'-0"
L*	0	0
L'*	0	0
M	10"	10"
P	OPTIONAL	OPTIONAL
Q	1'-10"	1'-10"
R	38'-4 3/4"	38'-4 3/4"
S	68'-10"	68'-10"
T	95'-0"	95'-0"
U	79'-6"	79'-6"
V	11"	11"
Y	96'-0"	96'-0"
Z	6"	6"
APPROX. WEIGHT	40 TON	40 TON

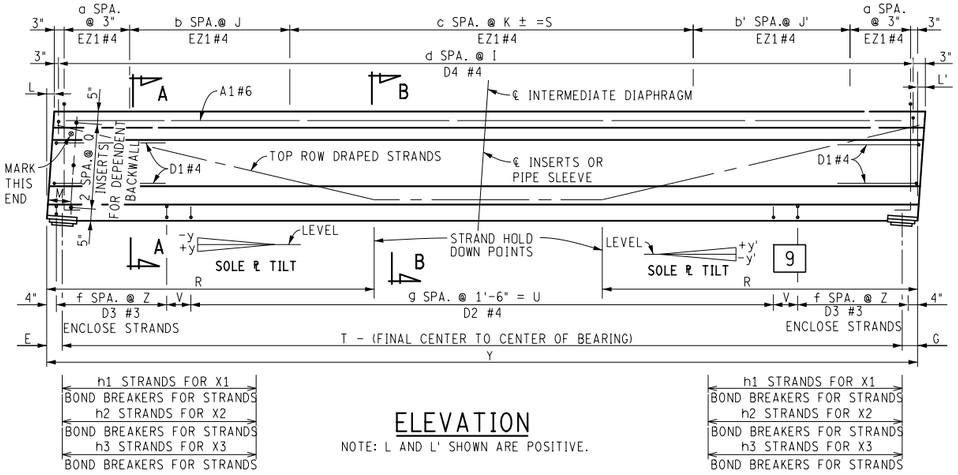
* FORMING DIMENSION. IF L OR L' IS COMPUTED TO BE BETWEEN -1/2" & +1/2" USE L= 0 OR L'= 0.

*MEASURED ALONG BEAM ℄.

4

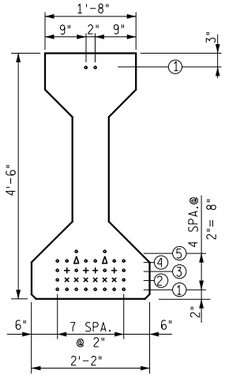
BAR DIMENSIONS		
BAR	DIM.	BEAM TYPE
		IV
A1#6	A	Y-3"
D1#4	A	5'-6"
	B	4 1/2"
D2#4	A	5"
	B	1'-9 1/2"
D3#3	A	1'-5"
	B	5 1/2"
D4#4	A	6"
	B	1'-4"
EZ1#4	A	4'-10 1/2"
	B	5 3/4"

"E" INDICATES EPOXY COATED BAR



ELEVATION

NOTE: L AND L' SHOWN ARE POSITIVE.



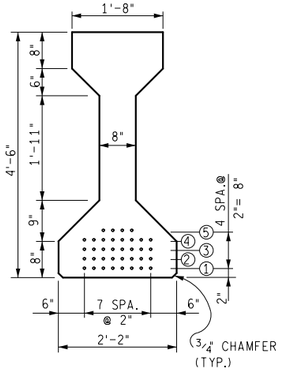
SECTION A-A

SHOWING STRAND ARRANGEMENT AT END FACE
Δ DEBOND STRAND 19'-6" FROM END
+ DEBOND STRAND 11'-6" FROM END
x DEBOND STRAND 7'-6" FROM END

3

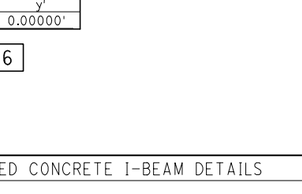
STRAND LOCATION TABLE																	
SPAN	TYPE	MIDSPAN (SECTION B-B) BOTTOM						END FACE (SECTION A-A) BOTTOM						TOP			TOTAL NUMBER	REQUIRED CONCRETE COMPRESSIVE STRENGTH (PSI)	
																		28 DAY	AT RELEASE
1	IV	8	8	8	8	4	0	8	8	8	8	2	0	2	0	0	36	6200	6200
2	IV	8	8	8	8	4	0	8	8	8	8	2	0	2	0	0	36	6200	6200

BOND BREAKERS			
	h	X	
SPAN 1 & 2	1	2	19'-6"
	2	4	11'-6"
	3	6	7'-6"



SECTION B-B

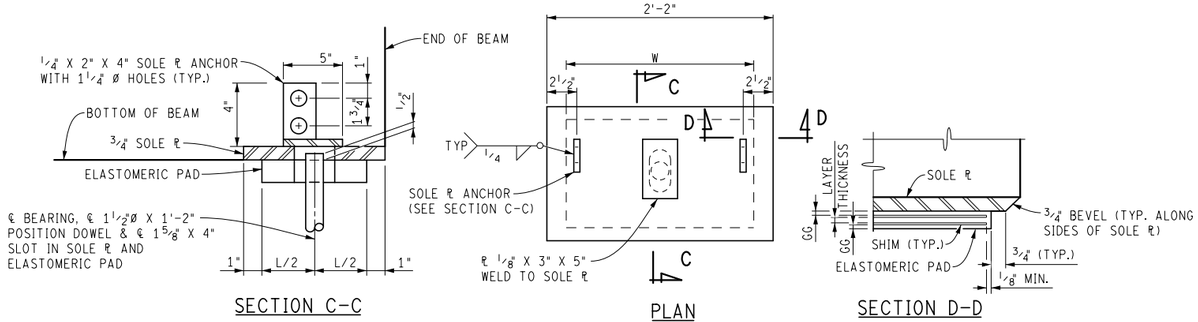
SHOWING STRAND LOCATIONS AT MIDSPAN



7

END BLOCK DETAIL

MAXIMUM LENGTH "P" FOR OPTIONAL END BLOCK IS 3'-0".



BEARING DETAILS

ELASTOMERIC PAD AND SHIM DIMENSIONS				
	SPAN 1		SPAN 2	
	ABUT A	PIER 1	PIER 1	ABUT B
THICKNESS	2 3/4"	3 1/2"	3 1/2"	2 3/4"
(L) PARALLEL TO BEAM	9"	11"	11"	9"
(W) PERPENDIC. TO BEAM	1'-11"	1'-11"	1'-11"	1'-11"
GG	1/32"	3/16"	3/16"	1/32"
LAYERS	5@ 5/16"	6@ 3/8"	6@ 3/8"	5@ 5/16"
SHIMS	6@ 1/8"	7@ 1/8"	7@ 1/8"	6@ 1/8"

SOLE ℄ TILT TABLE				
BEAM LINE	SPAN 1		SPAN 2	
	ABUT A	PIER 1	PIER 1	ABUT B
	y	y'	y	y'
A-G	0.00000'	0.00000'	0.00000'	0.00000'

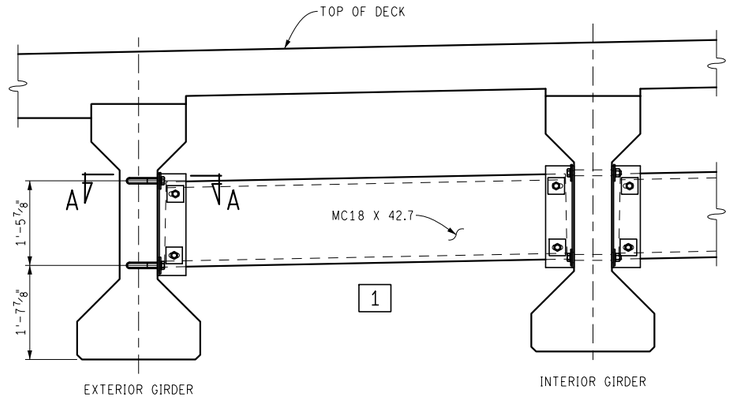
6

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

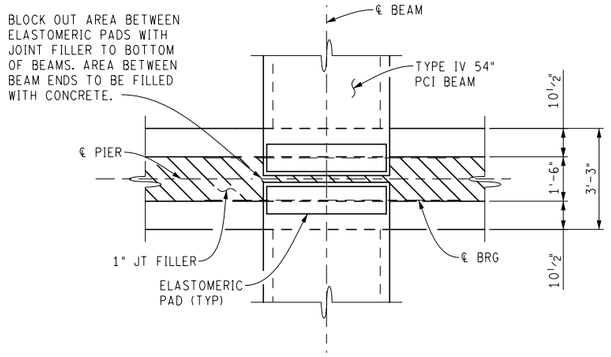
MDOT Michigan Department of Transportation

NO SCALE

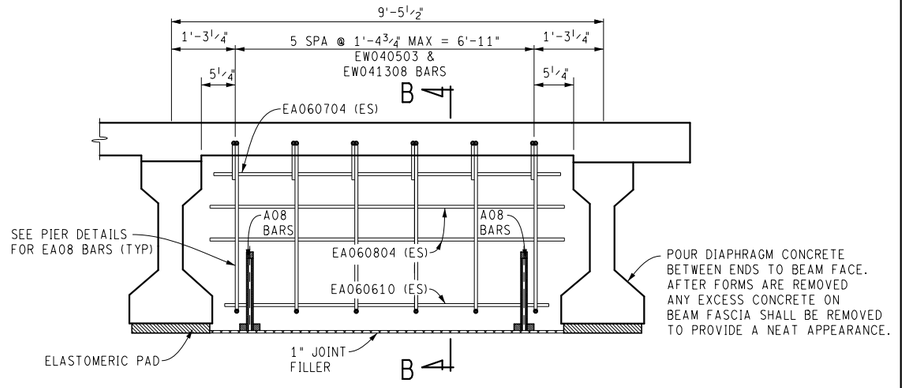
DRAWN BY: C TECH	DATE:	CS: S04 OF 09101	PRESTRESSED CONCRETE I-BEAM DETAILS	DRAWING / SHEET
CHK'D BY: B ENGINEEER CORR BY CT	DESIGN UNIT: UNIT	JN: 108778A		S04 PREST 002 / SECT 2 47
FILE: s04 09101 prest.dgn	TSC:			



PARTIAL TRANSVERSE SECTION AT DIAPHRAGM

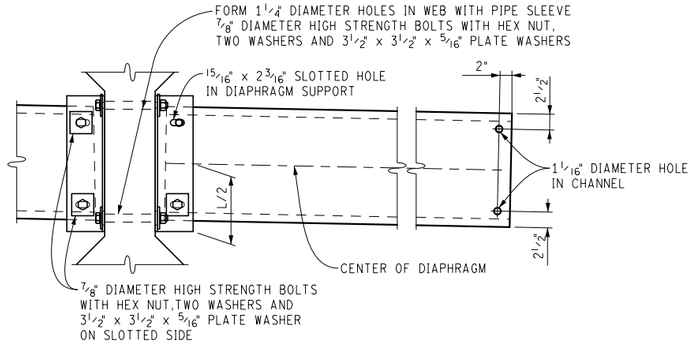


JT FILLER PLAN AT PIER

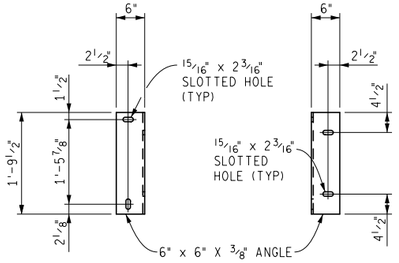


PIER DIAPHRAGM ELEVATION

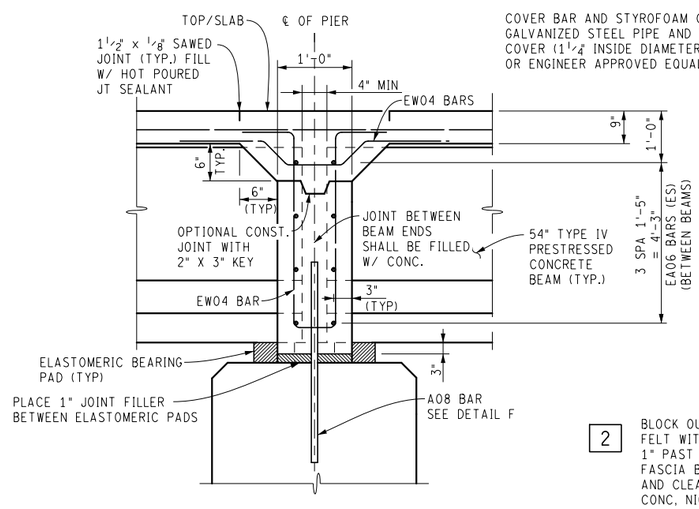
(TYP 6 LOCATIONS)



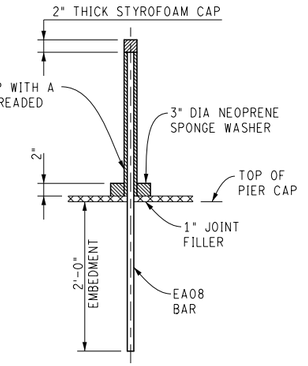
CONNECTION DETAIL



DIAPHRAGM SUPPORT

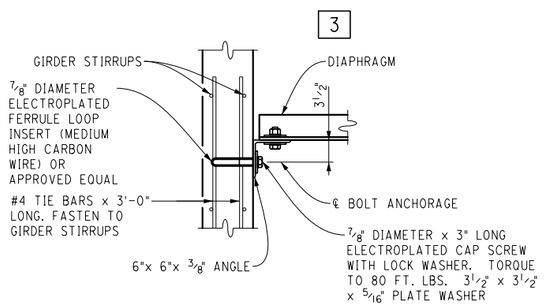


SECTION B-B

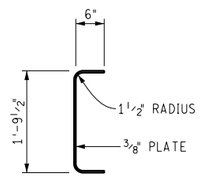


DETAIL F

ALL WORK AND MATERIAL FOR THE STYROFOAM CAP, METAL SLEEVE AND NEOPRENE SPONGE WASHER SHALL BE INCLUDED IN THE BID ITEM "SUPERSTRUCTURE CONC, NIGHT CASTING."



SECTION A-A



ALTERNATE DIAPHRAGM

* X = 2 1/2" FOR ALTERNATE PLATE DIAPHRAGM

2 BLOCK OUT CONCRETE AT ELASTOMERIC BEARINGS. ATTACH NO. 30 ASPHALT FELT WITH ROOFING TAR/ASPHALT TO SIDES OF BEAMS FROM BEAM END TO 1" PAST EDGE OF PIER DIAPHRAGM. REMOVE 1" EXCESS ON OUTSIDE OF FASCIA BEAMS AFTER DIAPHRAGM FORM REMOVAL. ALL LABOR, MATERIALS AND CLEANUP/REMOVAL ARE INCLUDED IN THE BID ITEM "SUPERSTRUCTURE CONC, NIGHT CASTING."

JOINT BETWEEN BEAM ENDS SHALL BE FILLED WITH CONCRETE.

THE CONTRACTOR IS TO PROVIDE A SAWED JOINT 1 1/2" DEEP X 1/8" WIDE (MIN.) IN THE TOP OF SLAB AT THE LOCATIONS SHOWN IN SECTION A-A. THE JOINT IS TO BE SAWED WITHIN 4 HOURS OF REMOVING THE CURING AND IS TO BE FILLED WITH HOT-POURED JOINT SEALANT OR IN THE BID ITEM "SUPERSTRUCTURE CONC, FORM, FINISH, AND CURE, NIGHT CASTING (S04 OF 09101).

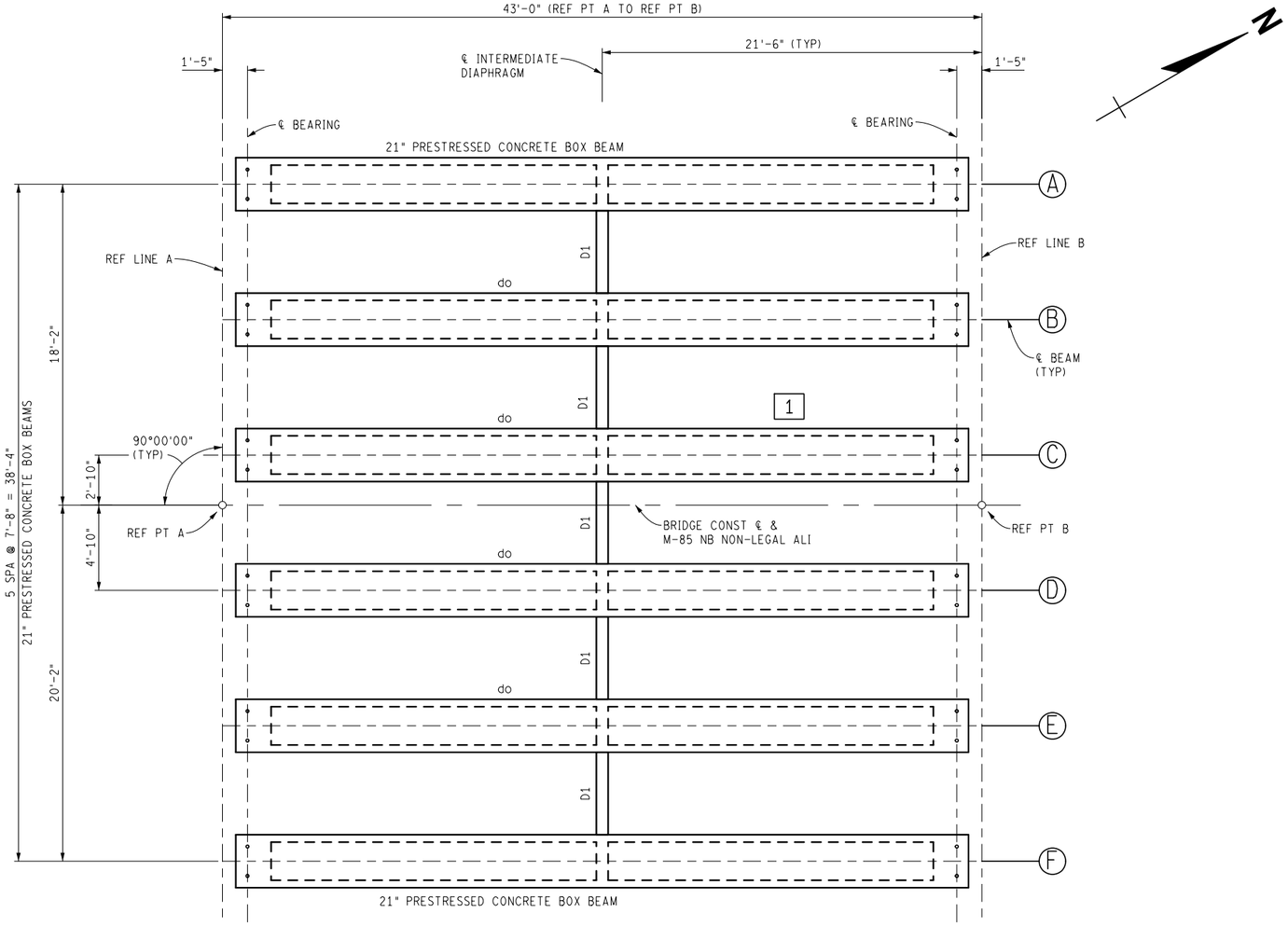
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

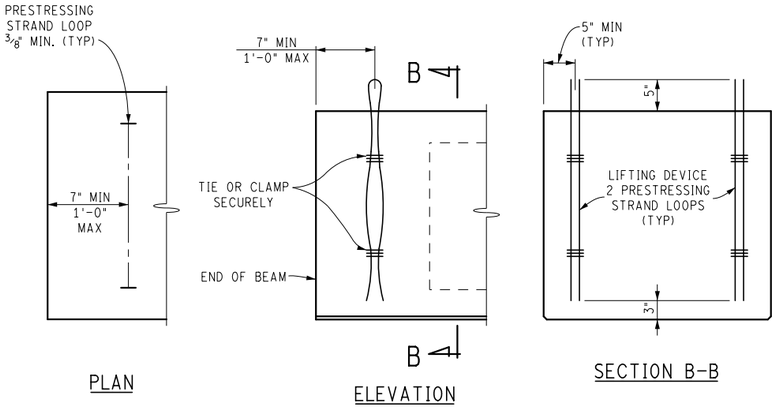
NO SCALE

DRAWN BY: C TECH	DATE:	CS: S04 OF 09101	SUPERSTRUCTURE DETAILS
CHK'D BY: B ENGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 108778A	
FILE: s04 09101 deck.dgn	TSC:		

DRAWING	SHEET
S04 DECK 007	SECT 2 48



ERECTION DIAGRAM



DETAILS OF LIFTING DEVICE

NOTE: LIFTING OF BEAM SHALL BE BY EQUAL LOADS TO EACH PAIR OF LIFTING DEVICES. OTHER TYPES OF LIFTING DEVICES MAY BE USED SUBJECT TO APPROVAL BY THE MICHIGAN DEPARTMENT OF TRANSPORTATION.

PRESTRESSING STRAND LIFTING DEVICES		
BEAM WEIGHT	STRAND SIZE	NUMBER OF STRANDS
11 TONS	3/8"	2

NOTES:

DBL DENOTES DOUBLE.

CONCRETE INSERTS AT THE ABUTMENTS SHALL BE 1" DIAMETER: DAYTON SUPERIOR, TYPE B-1 STANDARD OR TYPE B-18: WILLIAMS FORM, TYPE C 12: MEADOW BURKE, TYPE CT-2: OR EQUAL. INSERTS SHALL BE CAST WITH THE BEAMS. FIELD INSTALLATION OF INSERTS IS NOT ALLOWED.

CONCRETE INSERTS AT INTERMEDIATE DIAPHRAGMS SHALL BE 3/4" DIAMETER: DAYTON SUPERIOR, TYPE B-1 HEAVY OR TYPE B-18: WILLIAMS FORM, TYPE C 12 OR TYPE C -19: MEADOW BURKE, TYPE CT-2 OR TYPE CX-4: OR EQUAL. INSERTS SHALL BE CAST WITH THE BEAMS. FIELD INSTALLATION OF INSERTS IS NOT ALLOWED.

TOTAL ESTIMATED CHANGE OF LENGTH OF BOTTOM FLANGE AT TRANSFER OF PRESTRESS FORCE IS 1/4.

ITEMS CAST INTO THE BEAMS TO FACILITATE BRIDGE CONSTRUCTION (FORMING, FINISHING, ETC.) SHALL BE GALVANIZED OR EPOXY COATED.

PRESTRESSING STRANDS SHALL BE GIVEN AN INITIAL PRESTRESS AS FOLLOWS:
0.6" DIA. - 44,000 LBS PRESTRESS

PRESTRESSING STRAND SHALL BE 0.6" NOMINAL DIAMETER MEETING THE REQUIREMENTS OF AASHTO M203 (ASTM A416),, GRADE 270, LOW RELAXATION STRAND.

THE ESTIMATED BEAM CAMBER AT RELEASE IS 1". THIS CAMBER IS DUE TO PRESTRESS AND DEAD LOAD OF THE BEAM ONLY AND IS MEASURED IN THE ERECTED POSITION.

THREADING OF REINFORCEMENT AND INSTALLATION INTO CONCRETE INSERTS IS INCLUDED IN THE BID ITEM "PREST CONC BOX BEAM, FURN, 21 INCH".

LIFTING DEVICES SHALL BE REMOVED AFTER BEAMS ARE ERECTED. REMOVAL IS INCLUDED IN THE BID ITEM "PREST CONC BOX BEAM, ERECT, 21 INCH".

LONGITUDINAL BEAM STEEL REINFORCEMENT (A BARS) SHALL BE GRADE 60 (KSI). THE DESIGN OF TRANSVERSE BEAM STEEL REINFORCEMENT, STIRRUPS AND SLAB TIES (ED & D BARS) IS BASED ON GRADE 40 (KSI): THE USE OF EITHER GRADE 40 OR GRADE 60 IS ALLOWED IN CONSTRUCTION OF THE BEAM.

USE NON-DEFORMED STEEL RODS IN ACCORDANCE WITH AASHTO M 270 GRADE 36 AND HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111, AS POSITION DOWELS FOR PRECAST BEAMS.

STEEL FOR SOLE PLATES AND OTHER BEARING COMPONENTS SHALL MEET THE REQUIREMENTS OF AASHTO M 270 GRADE 36. SOLE PLATES ARE REQUIRED IN ALL BEAM ENDS.

3

REQUIRED CONCRETE COMPRESSIVE STRENGTH	
28 DAY	AT RELEASE
5800 PSI	5000 PSI

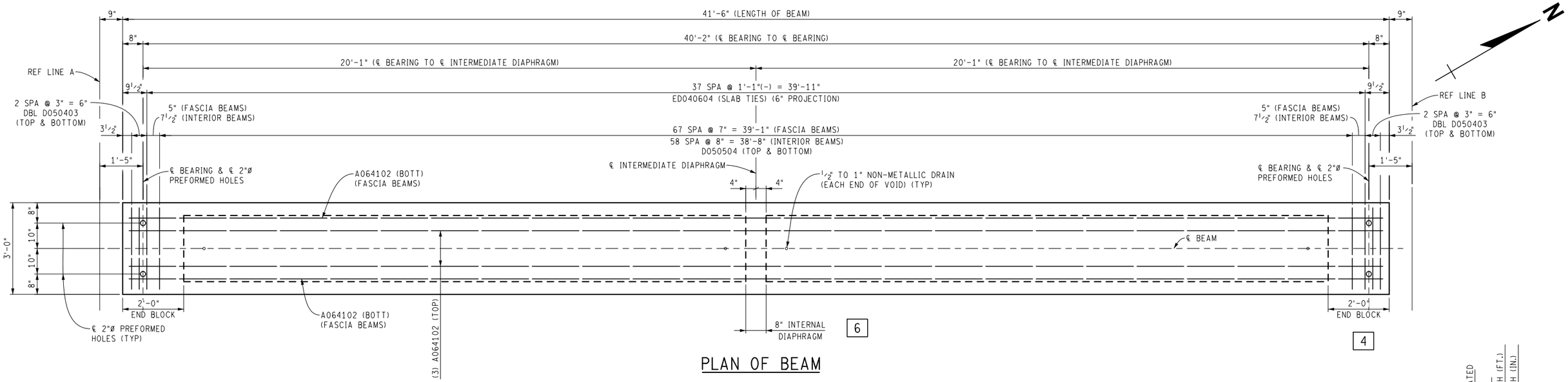
MISCELLANEOUS QUANTITIES		
1980	Sin.	Bearing, Elastomeric, 1 1/2 inch
249	Ft	Prest Conc Box Beam, Furn, 21 inch
249	Ft	Prest Conc Box Beam, Erect, 21 inch

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

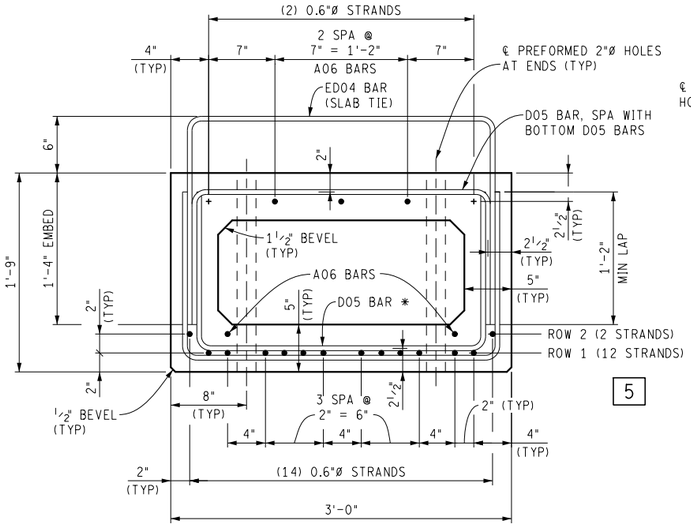
MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: B01-1 OF 82211	BOX BEAM DETAILS	DRAWING: B01-1 PREST 001
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 120062A		SHEET: SECT 2 49
FILE:b01-1 82211 prest.dgn	TSC:			

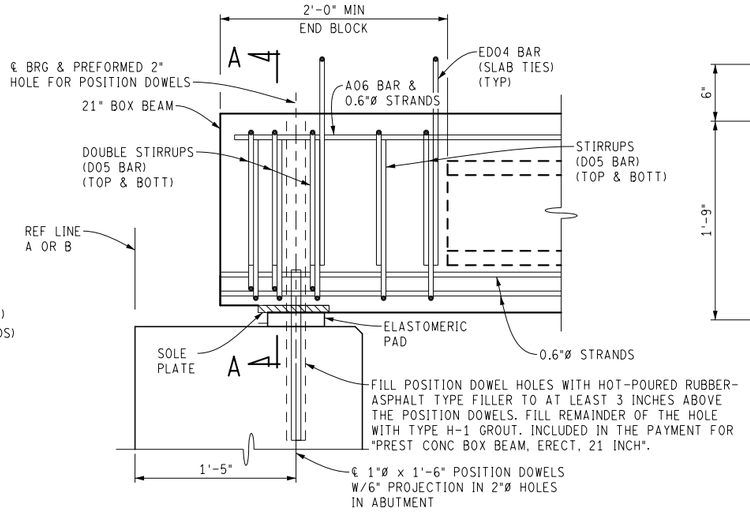


PLAN OF BEAM



TYPICAL BEAM SECTION

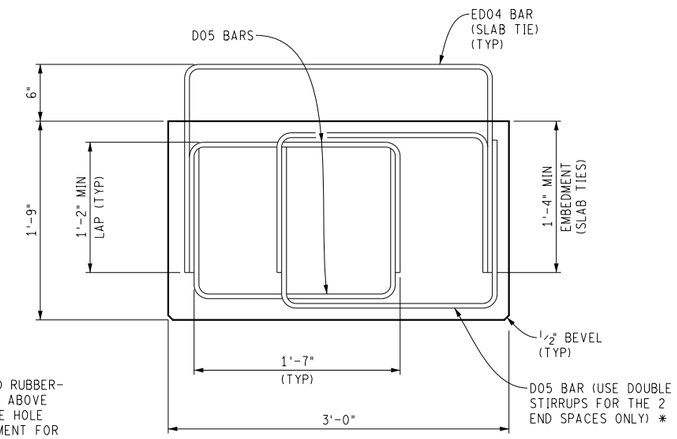
* D05 BARS SHALL ENCASE STRANDS FOR 2'-7" FROM END OF BEAM.
* D05 BARS MAY BE PLACED UNDER STRANDS ELSEWHERE.
+ DEBOND TOP STRANDS IN MIDDLE HALF OF BEAM.



SECTION THRU END BLOCK

PERPENDICULAR TO REF LINE

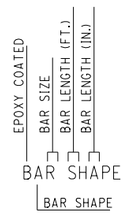
NOTE: BACKWALL AND DECK NOT SHOWN FOR CLARITY



SECTION A-A

STRANDS NOT SHOWN.

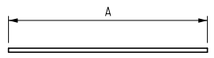
* D05 BARS SHALL ENCASE STRANDS FOR 2'-7" FROM ENDS OF BEAMS.



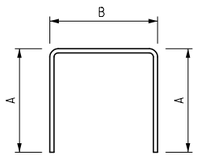
BAR LEGEND

BOX BEAM BAR DIMENSION

BAR	DIMENSION	
	A	B
D040203	11"	5"
D050403	1'-4"	1'-7"
D050504	1'-4"	2'-8"
ED040604	1'-10"	2'-8"



2 A BAR



D OR ED BAR

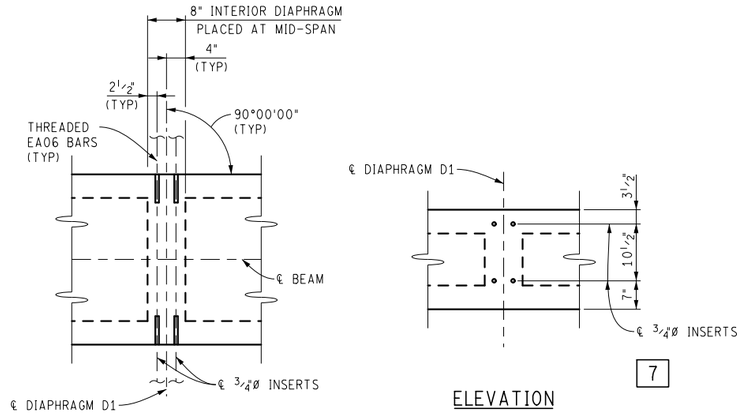
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: B01-1 OF 82211	BOX BEAM DETAILS
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 120062A	
FILE:b01-1 82211 prest.dgn	TSC:		

DRAWING	SHEET
B01-1 PREST 002	SECT 2 50



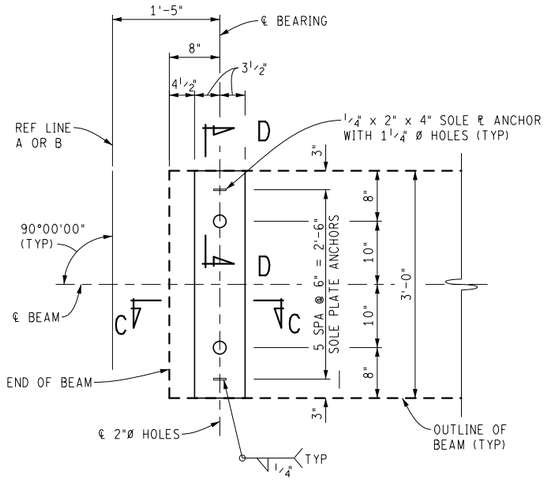
PLAN

ELEVATION

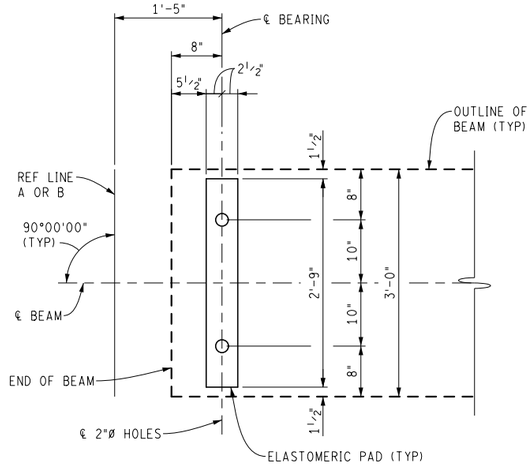
7

INTERMEDIATE DIAPHRAGM INSERT DETAILS

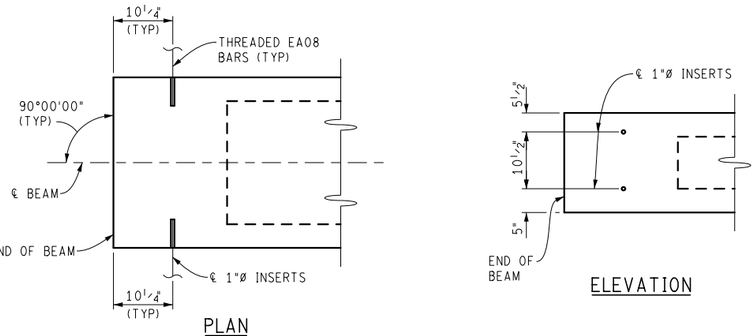
(OMIT INSERTS ON THE OUTSIDE OF FASCIA BEAMS)



PLAN OF SOLE PLATE



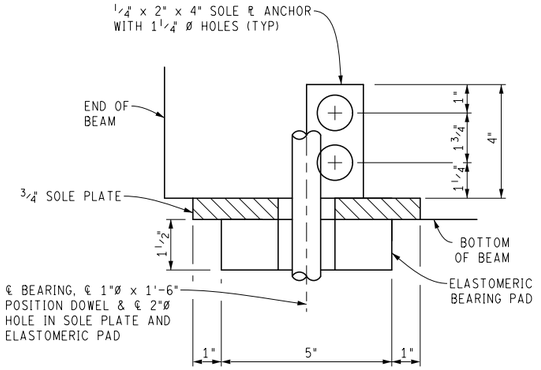
PLAN OF BEARING PAD



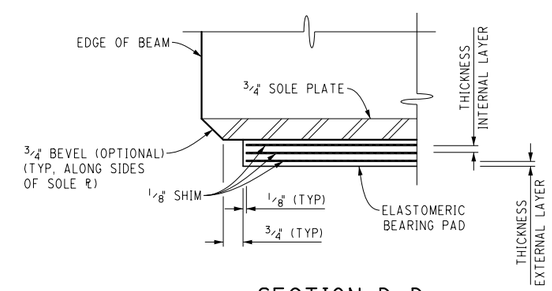
PLAN

ELEVATION

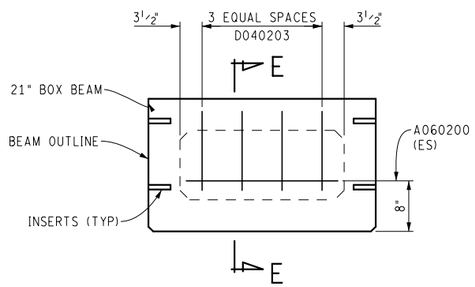
BACKWALL INSERT DETAILS

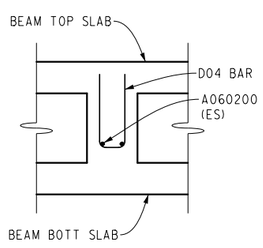


SECTION C-C



SECTION D-D





SECTION E-E

ELEVATION OF INTERNAL DIAPHRAGM

POSITION DOWEL DETAIL

(24 REQUIRED)
NOT PAID FOR SEPARATELY
BUT INCLUDED IN PAYMENT FOR
"PREST CONC BOX BEAM, FURN, 21 INCH"

ELASTOMERIC PAD & SHIM DIMENSIONS		
LOCATION	ABUT A	ABUT B
LENGTH (PARALLEL TO BEAM)	5"	5"
WIDTH (PERPENDICULAR TO BEAM)	33"	33"
TOTAL THICKNESS	1½"	1½"
EXTERNAL LAYERS	2 @ 7/32"	2 @ 7/32"
INTERNAL LAYERS	2 @ 11/32"	2 @ 11/32"
SHIMS	3 @ ⅛"	3 @ ⅛"
SOLE PLATE REQUIRED	YES	YES

SOLE PLATE TILT TABLE		
BEAM LINE	ABUT A	ABUT B
	Y	Y
A	0"	0"
B	0"	0"
C	0"	0"
D	0"	0"
E	0"	0"
F	0"	0"

SOLE ℄ TILT

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: LMB	DATE: 07-21-15	CS: B01-1 OF 82211	BOX BEAM DETAILS	DRAWING
CHK'D BY: ZEVCHAK CORR BY: KLATT	DESIGN UNIT: FEUERSTEIN	JN: 120062A		B01-1 PREST 003
FILE: b01-1 82211 prest.dgn	TSC: TAYLOR			SHEET SECT 2 51

PRESTRESSED CONCRETE BEAM DETAILS

Generally speaking, all the information needed to fabricate the prestressed girders should be included in the Prestressed Concrete Beam Details. Items furnished with the concrete beams should also be detailed including rebar and position dowels.

1. The framing plan must show the reference lines, bearing centerline, bridge construction centerline, angle of crossing, beam centerlines, diaphragm locations, and span lengths.
2. Fill out all dimensions for each span. Beams with identical span lengths may have slightly different dimensions and shear reinforcement spacing.
3. Show strand locations and debonding both graphically in the section view and in tabular format.
4. Give lengths for all reinforcing bars. Total bar counts and weights are not required. Generally only bars that protrude from the top of the beam are epoxy coated.
5. Give bearing pad dimensions. Detail the number of layers and shims in the elastomeric bearings.
6. Always include a sole plate tilt table, even if there is 0 tilt.
7. Show the end block detail, but label it as optional.
8. Section locations are shown on the elevation view. AA shows the D1 bars placed horizontally at the end of the beams. BB shows concrete insert locations for intermediate diaphragms.
9. Pay attention to sole the sole plate tilt value. The sign convention is different on each end.

SUPERSTRUCTURE DETAILS

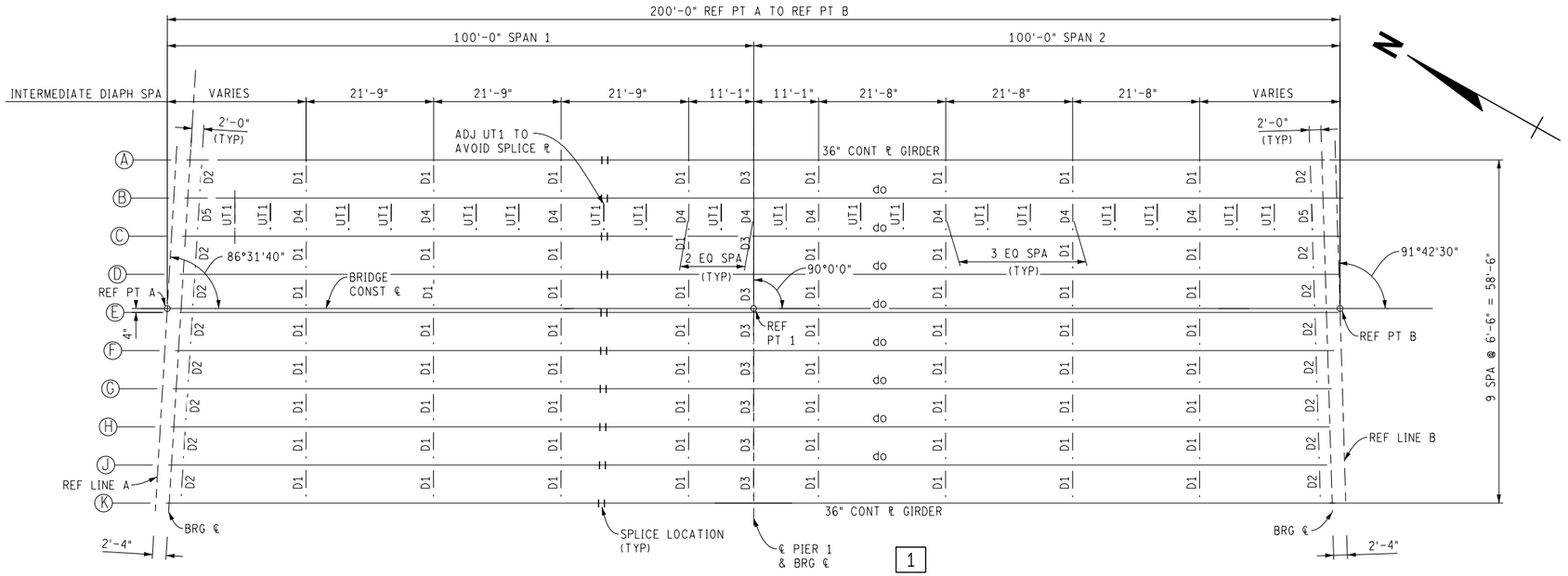
In practice, these superstructure details should be placed in the plan set with other superstructure details such as deck reinforcement, approach slab details, etc. This sheet is shown here with the prestressed beam sheets because these details would be used on bridges with prestressed concrete beams.

1. In recent years the department has preferred steel for intermediate diaphragms. Erecting steel diaphragms is usually quicker than forming, pouring, and curing a concrete diaphragm. Check with the engineer for the intended design.
2. Include all notes from the Design Guide labeled “Plan Notes”. Place plan notes near the detail from the Guide. Do not include “Notes” from the Design Guide, these are instructions for using the Guide. Do not include notes from Chapter 8 of the Bridge Design Manual that are identical to notes in the design guides.
3. Check that inserts don’t interfere with strands or rebar locations.

BOX BEAM DETAILS

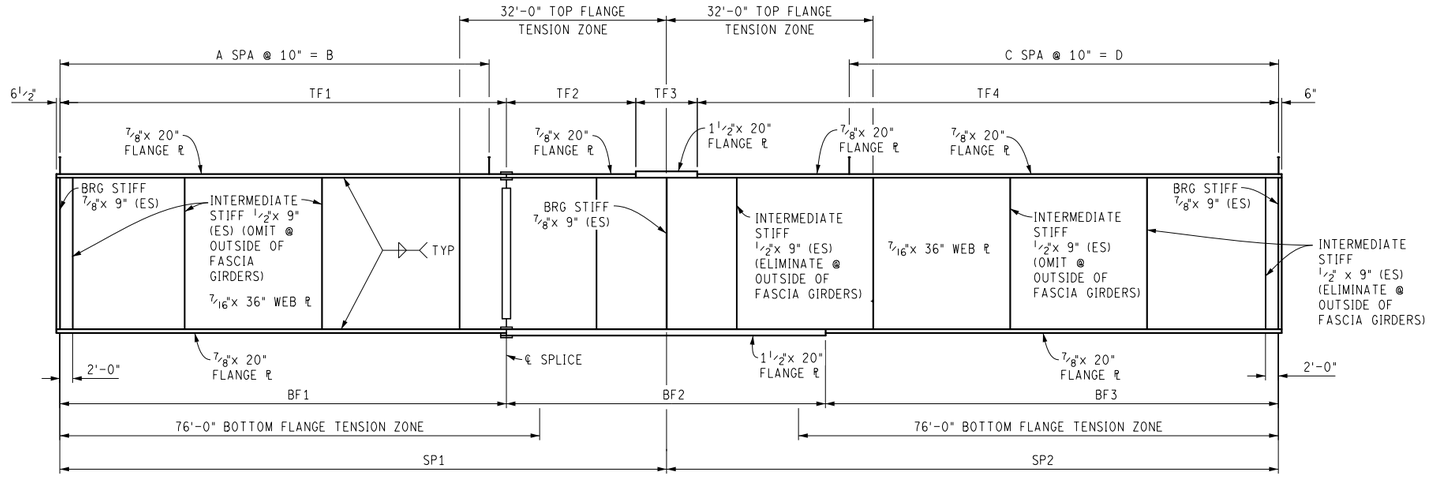
Box beams don’t have standardized sheets like the PCI beams. The same logic applies though, the fabricator should have everything needed to construct the beams from the Box Beam Details.

1. Box beam framing plans typically show the beam outline. Voids cast into the beam are shown with a dashed line.
2. Provide dimensions needed for box beam stirrups and longitudinal rebar. Since this rebar is furnished with the beam, it should not appear in the Reinforcement Detail Sheet.
3. Provide requited concrete release and 28 day strengths.
4. Space reinforcement to miss holes for position dowels.
5. Show any debonding required in the typical beam section.
6. Provide dimensions for any internal diaphragms. External diaphragms should be detailed in the superstructure detail sheets.
7. Locate all inserts required for diaphragm reinforcement. Don’t assume the fabricator will look at the superstructure details.



1

ERECTION DIAGRAM



GIRDER ELEVATION

2

GIRDER DIMENSIONS

GDR	TF1 & BF1	TF2	TF3	BF2	TF4 & BF3	SP1	SP2
A	70'-8 7/8"	20'-6"	9'-8 7/8"	50'-7"	92'-0 5/8"	96'-1 1/2"	96'-10 7/8"
B	71'-2 1/4"	21'-2 3/8"	8'-3"	50'-6 1/4"	92'-11 7/8"	96'-6 1/4"	97'-1 1/4"
C	71'-6 1/8"	21'-2 1/8"	8'-5 1/4"	50'-8 1/2"	93'-1"	96'-11"	97'-3 1/2"
D	71'-10 1/8"	21'-1 7/8"	8'-7 3/8"	50'-10 5/8"	93'-2 1/4"	97'-3 3/4"	97'-5 7/8"
E	72'-2 1/8"	21'-1 5/8"	8'-9 3/8"	51'-0 3/4"	93'-3 1/2"	97'-8 3/8"	97'-8 1/4"
F	72'-6"	21'-1 3/8"	8'-11 3/4"	51'-3"	93'-4 5/8"	98'-1 1/8"	97'-10 5/8"
G	72'-10"	21'-1 1/8"	9'-1 3/4"	51'-5"	93'-5 7/8"	98'-5 7/8"	98'-0 7/8"
H	73'-1 7/8"	21'-1"	9'-3 7/8"	51'-7 1/4"	93'-7 1/8"	98'-10 5/8"	98'-3 1/4"
J	73'-5 7/8"	21'-0 3/8"	9'-6 3/4"	51'-9 3/8"	93'-7 7/8"	99'-3 3/8"	98'-5 1/2"
K	73'-8 3/4"	20'-1 1/8"	11'-9 3/8"	52'-1 3/4"	92'-8 3/4"	99'-8 1/8"	98'-7 7/8"

STUD SHEAR DEVELOPER SPACING

GDR	A	B	C	D
A	83	68'-9"	84	69'-2 7/8"
B	84	69'-2 1/2"	84	69'-5 1/4"
C	84	69'-6"	84	69'-7 1/2"
D	84	69'-10"	84	69'-9 7/8"
E	85	70'-2 1/2"	85	70'-0 1/4"
F	85	70'-6"	85	70'-2 5/8"
G	85	70'-10"	85	70'-4 7/8"
H	86	71'-2 1/2"	85	70'-7 1/4"
J	86	71'-6"	85	70'-9 1/2"
K	87	71'-8 1/2"	86	70'-11 7/8"

MISCELLANEOUS QUANTITIES

408332 Lb	Structural Steel, Plate, Furn and Fab
408332 Lb	Structural Steel, Plate, Erect
1 LSUM	Field Repair of Damaged Coating (S13 of 82023)
1 LSUM	Shear Developers (S13 of 82023)
4320 Sin	Bearing, Elastomeric, 2 3/4 inch
3360 Sin	Bearing, Elastomeric, 3 1/2 inch

NOTES:

NS DENOTES NEAR SIDE.

FS DENOTES FAR SIDE.

ES DENOTES EACH SIDE.

POSITION DOWEL LENGTHS SHOWN ARE MINIMUM. DOWELS LONGER THAN THOSE SHOWN MAY BE FURNISHED AT NO ADDITIONAL COST.

SHEAR DEVELOPERS SHALL BE ¾" DIAMETER STUDS.

FIELD CONNECTIONS SHALL BE BOLTED WITH ¾" HIGH-STRENGTH BOLTS (EXCEPT AS NOTED).

THE GIRDERS SHALL BE CAMBERED WITH ORDINATES AS SHOWN ON THE CAMBER DIAGRAM. HEATING IS TO BE USED, IF NECESSARY, TO PROVIDE THE CAMBER WITHIN THE TOLERANCE SPECIFIED IN THE AWS SPECIFICATIONS. THE CAMBER SHOWN IS TO BE MEASURED WITH THE GIRDER LYING ON ITS SIDE.

THE QUANTITY STRUCTURAL STEEL INCLUDES:
STEEL .....408,332 LBS
TOTAL .....408,332 LBS

ALL STRUCTURAL STEEL SHALL BE COATED ACCORDING TO SUBSECTION 716 OF THE STANDARD SPECIFICATIONS. THE COLOR OF THE URETHANE PROTECTIVE COAT SHALL BE MEDIUM GRAY. FEDERAL STANDARD 595C COLOR NUMBER 26357.

STRUCTURAL STEEL SHALL CONFORM TO AASHTO M270, GRADE 50, AASHTO M270, GRADE 36, STEEL MAY BE USED IN LIEU OF THESE STEELS FOR BEARINGS, DIAPHRAGMS, AND CROSS FRAMES.

THE PLATE SURFACES OF THE MAIN GIRDER SPLICES, AND ALL OTHER BOLTED CONNECTIONS UNLESS NOTED OTHERWISE, SHALL BE COATED ACCORDING TO SUBSECTION 716.03.B.2.A FOR SLIP CRITICAL CONNECTIONS. COATED CONNECTIONS (FAYING SURFACES) SHALL MEET THE MINIMUM CURE TIMES ACCORDING TO THE PRODUCT QUALIFICATION TEST AND SUBSECTION 716.02 BEFORE CONNECTION ASSEMBLY.

END DIAPHRAGMS SHALL BE FIELD DRILLED AND BOLTED TO THE EXISTING BEAMS PRIOR TO POURING THE DECK. INTERMEDIATE DIAPHRAGMS SHALL BE FIELD DRILLED AND BOLTED TO THE EXISTING BEAMS AFTER POURING THE DECK.

THE PLATE SURFACES OF THE MAIN GIRDER SPLICES, AND ALL OTHER BOLTED CONNECTIONS UNLESS NOTED OTHERWISE, SHALL BE COATED ACCORDING TO SUBSECTION 716.03.B.2.A FOR SLIP CRITICAL CONNECTIONS. COATED CONNECTIONS SHALL MEET THE MINIMUM CURE TIMES ACCORDING TO THE PRODUCT QUALIFICATION TEST AND SUBSECTION 716.02 BEFORE CONNECTION ASSEMBLY.

IF THE POSITION DOWELS AT ABUTMENTS ARE MISALIGNED, IN RELATIONSHIP TO THE CENTERLINE OF BEARINGS, DUE TO TEMPERATURE EFFECTS ON THE GIRDERS, HOLES IN THE ELASTOMERIC BEARINGS SHALL BE CENTERED ON THE DOWELS.

USE NON-DEFORMED STEEL RODS IN ACCORDANCE WITH AASHTO M 270 GRADE 36 AND HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111, AS POSITION DOWELS FOR BEAMS.

ALL DIAPHRAGMS, CONNECTION PLATES AND STIFFENERS FOR THIS BRIDGE ARE CONSIDERED AS PRIMARY MEMBERS BY THE ENGINEER AND MUST MEET THE CHARPY TEST REQUIREMENTS FOR MAIN STRUCTURAL MEMBERS SHOWN IN SUBSECTION 90604 OF THE STANDARD SPECIFICATIONS.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)

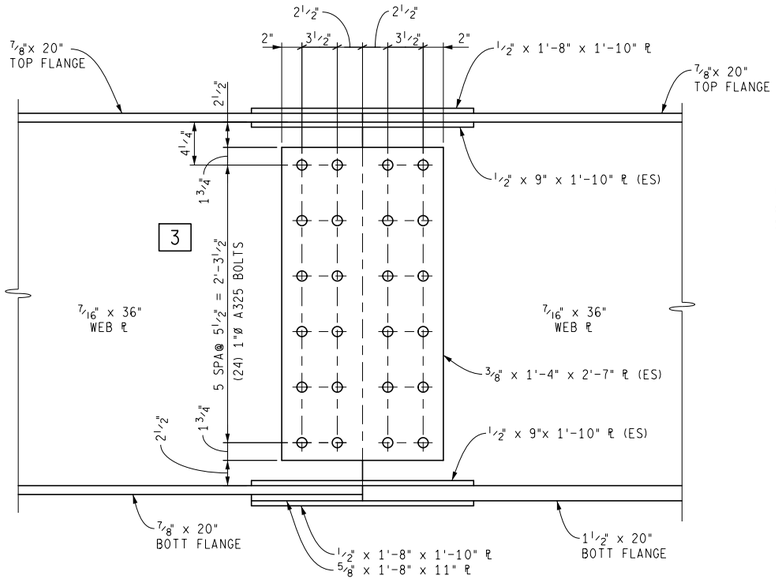
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

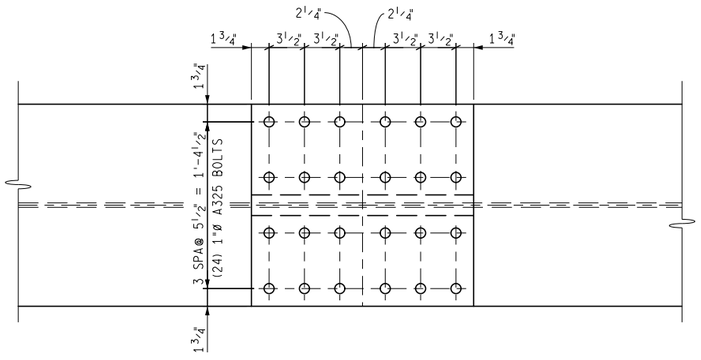
NO SCALE

DRAWN BY: C TECH	DATE:	CS: S13 OF 82023	STRUCTURAL STEEL DETAILS (PLATE GIRDER)
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A	
FILE:S13_82023_steel_001.dgn	TSC:		

DRAWING	SHEET
S01 STEEL 001	SECT 2 53

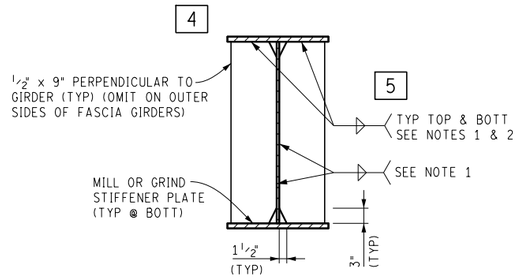


SPLICE ELEVATION



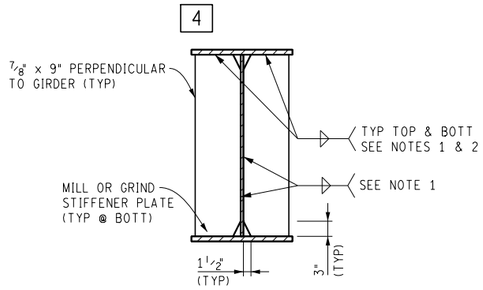
FLANGE SPLICE DETAIL

(TOP & BOTTOM FLANGES)



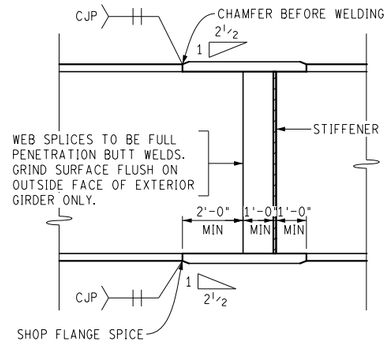
TRANSVERSE STIFFENER DETAIL & INTERMEDIATE DIAPHRAGM

NOTE 1: STOP WELD 1/4" SHORT OF CORNER CLIPS
NOTE 2: WRAP WELD AROUND OUTSIDE EDGE



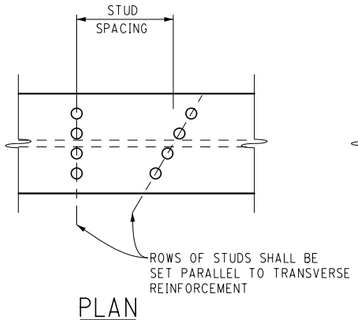
BEARING STIFFENER DETAILS

NOTE 1: STOP WELD 1/4" SHORT OF CORNER CLIPS
NOTE 2: WRAP WELD AROUND OUTSIDE EDGE

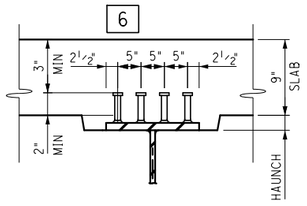


SHOP SPLICE CLEARANCES

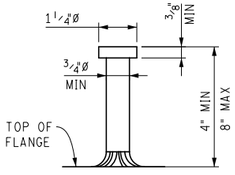
7



PLAN



SECTION



STUD DETAIL

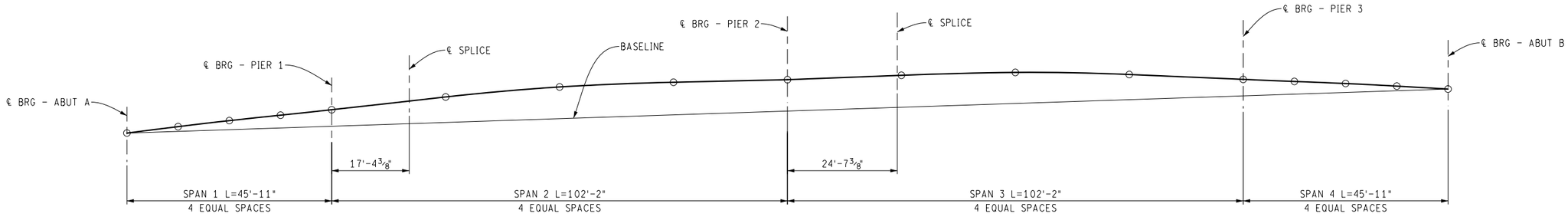
STUD SHEAR DEVELOPER DETAILS

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: S13 OF 82023	STRUCTURAL STEEL DETAILS	DRAWING
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A	(PLATE GIRDER)	S01 STEEL 002
FILE: s13_82023_spdet_001.dgn	TSC:			SHEET SECT 2 54



CAMBER DIAGRAM

8 9

CAMBER ORDINATES
(BEFORE BEAM SELF WEIGHT DEFLECTION)

LOCATION	GIRDER A*	GIRDER B-J*	GIRDER K*	GIRDER A-K**
ABUT A	0"	0"	0"	0"
0.25L	1/4"	1/4"	1/4"	1 7/8"
0.50L	1/4"	1/4"	1/4"	3 5/8"
0.75L	1/8"	1/8"	1/8"	5 1/8"
PIER 1	0"	0"	0"	6 5/8"
0.25L	2 1/8"	2 1/8"	2 1/8"	10 1/4"
0.50L	2 3/4"	3 1/8"	2 3/4"	12 3/4"
0.75L	2"	2"	2"	13 1/8"
PIER 2	0"	0"	0"	12 5/8"
0.25L	1 3/4"	1 3/4"	1 3/4"	12 7/8"
0.50L	2 5/8"	2 7/8"	2 5/8"	12 1/2"
0.75L	2"	2"	2"	10 1/8"
PIER 3	0"	0"	0"	6 5/8"
0.25L	1/8"	1/8"	1/8"	5 1/8"
0.50L	1/4"	1/4"	1/4"	3 5/8"
0.75L	1/4"	1/4"	1/4"	1 7/8"
ABUT B	0"	0"	0"	0"
@ SPLICE SPAN 2	1 1/2"	1 1/2"	1 1/2"	
@ SPLICE SPAN 3	1 5/8"	1 5/8"	1 5/8"	

* CAMBER ORDINATES ARE TO THE CHORDS FROM C-C BEARINGS.
** CAMBER ORDINATES ARE TO THE SLOPING BASELINE BETWEEN ABUTMENT BEARINGS.

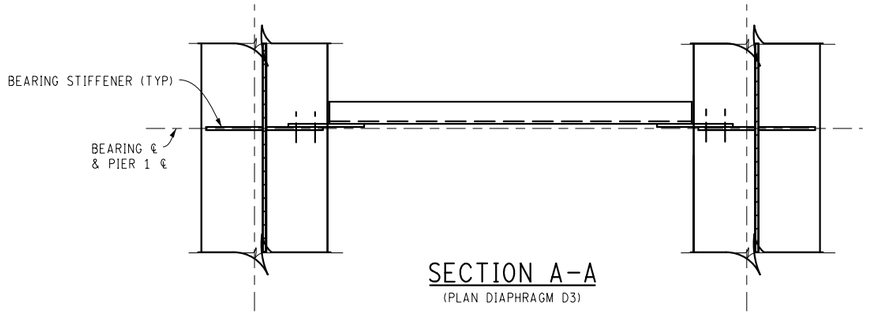
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

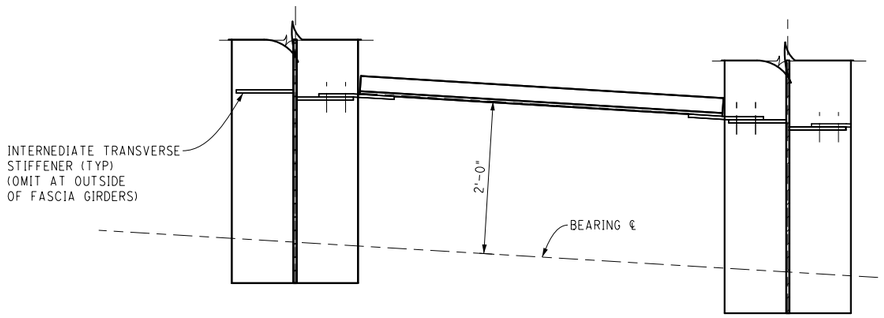
NO SCALE

DRAWN BY: C TECH	DATE:	CS: S03 OF 63101	STRUCTURAL STEEL DETAILS
CHK'D BY: B ENGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 78628A	
FILE: S03 63101 steel.dgn	TSC:		

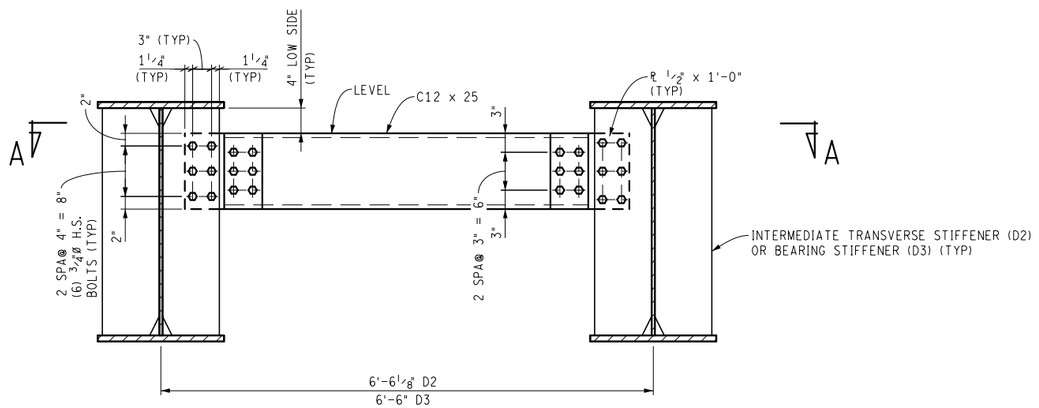
DRAWING	SHEET
S01 STEEL 003	SECT 2 55



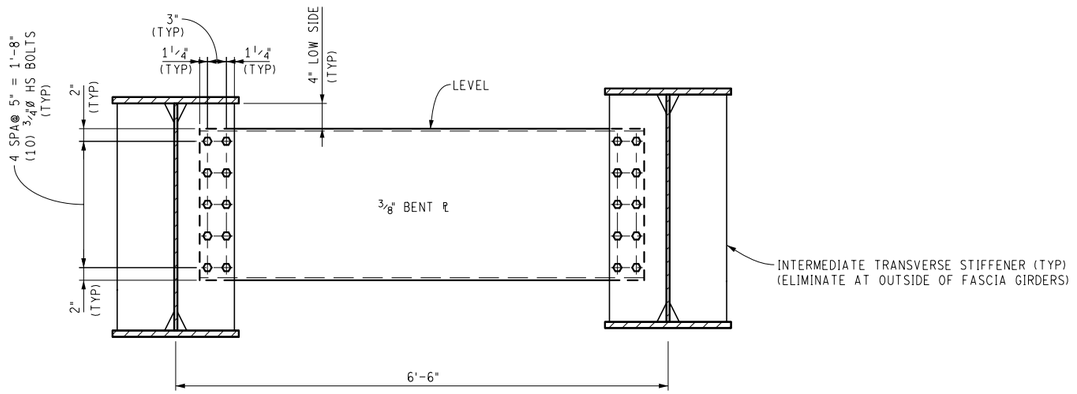
SECTION A-A
(PLAN DIAPHRAGM D3)



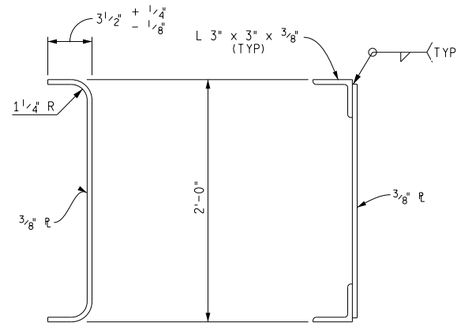
SECTION A-A
(PLAN DIAPHRAGM D2)



ELEVATION OF D2 & D3
(12 D2 REQUIRED)
(12 D3 REQUIRED)



ELEVATION OF D1
(64 REQUIRED)



ALTERNATE

TYPICAL INTERMEDIATE DIAPHRAGM D1

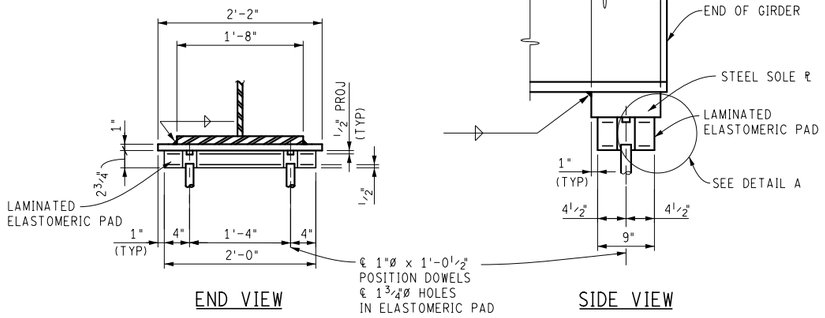
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

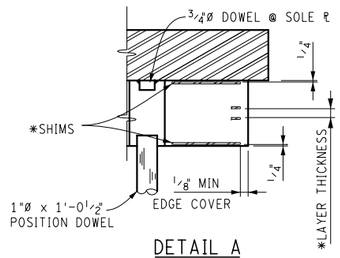
NO SCALE

DRAWN BY: CT	DATE: 10-1-14	CS: S13 OF 82023	STRUCTURAL STEEL DETAILS
CHECKED BY: EGR CORR BY: CT	DESIGN UNIT:	JN: 79784A	
FILE: s13 82023 steel 001.dgn	TSC: DETROIT		

DRAWING	SHEET
S01 STEEL 004	SECT 2 56



END VIEW SIDE VIEW



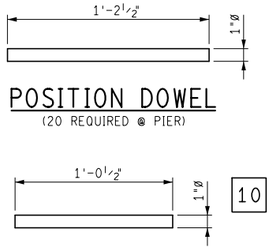
DETAIL A

* SEE ELASTOMERIC PAD AND SHIM DIMENSION TABLE

ELASTOMERIC BEARING DETAILS

(EXPANSION BEARING @ ABUTMENTS)

SOLE ℄ TILT TABLE			
BEAM LINE	ABUT A (y)	PIER 1 (y)	ABUT B (y)
A-K	⅛"	-¼"	-⅛"



POSITION DOWEL

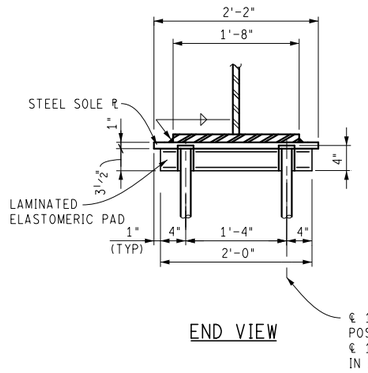
(20 REQUIRED @ PIER)

10

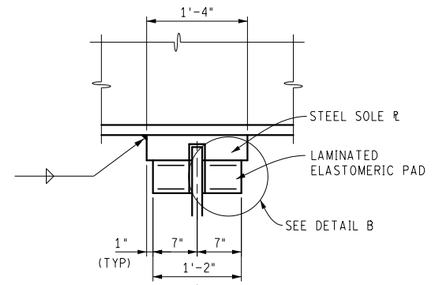
POSITION DOWEL

(40 REQUIRED @ ABUT)

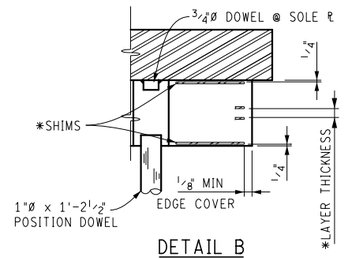
NOTE: POSITION DOWELS WILL NOT BE PAID FOR SEPERATELY, BUT INCLUDED IN THE PAY ITEM "SUBSTRUCTURE CONC".



END VIEW



SIDE VIEW



DETAIL B

° SEE ELASTOMERIC PAD AND SHIM DIMENSION TABLE

ELASTOMERIC BEARING DETAILS

(FIXED BEARING @ PIER)

ELASTOMERIC PAD & SHIM DIMENSIONS			
	ABUT A	PIER 1	ABUT B
(T) THICKNESS	2.75"	3.50"	2.75"
(L) PARALLEL TO BEAM	9"	14"	9"
(W) PERPENDIC. TO BEAM	24"	24"	24"
GG	¼"	3/16"	¼"
LAYERS	4 @ 13/32"	6 @ ⅜"	4 @ 13/32"
SHIMS	5 @ ⅛"	7 @ ⅛"	5 @ ⅛"

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

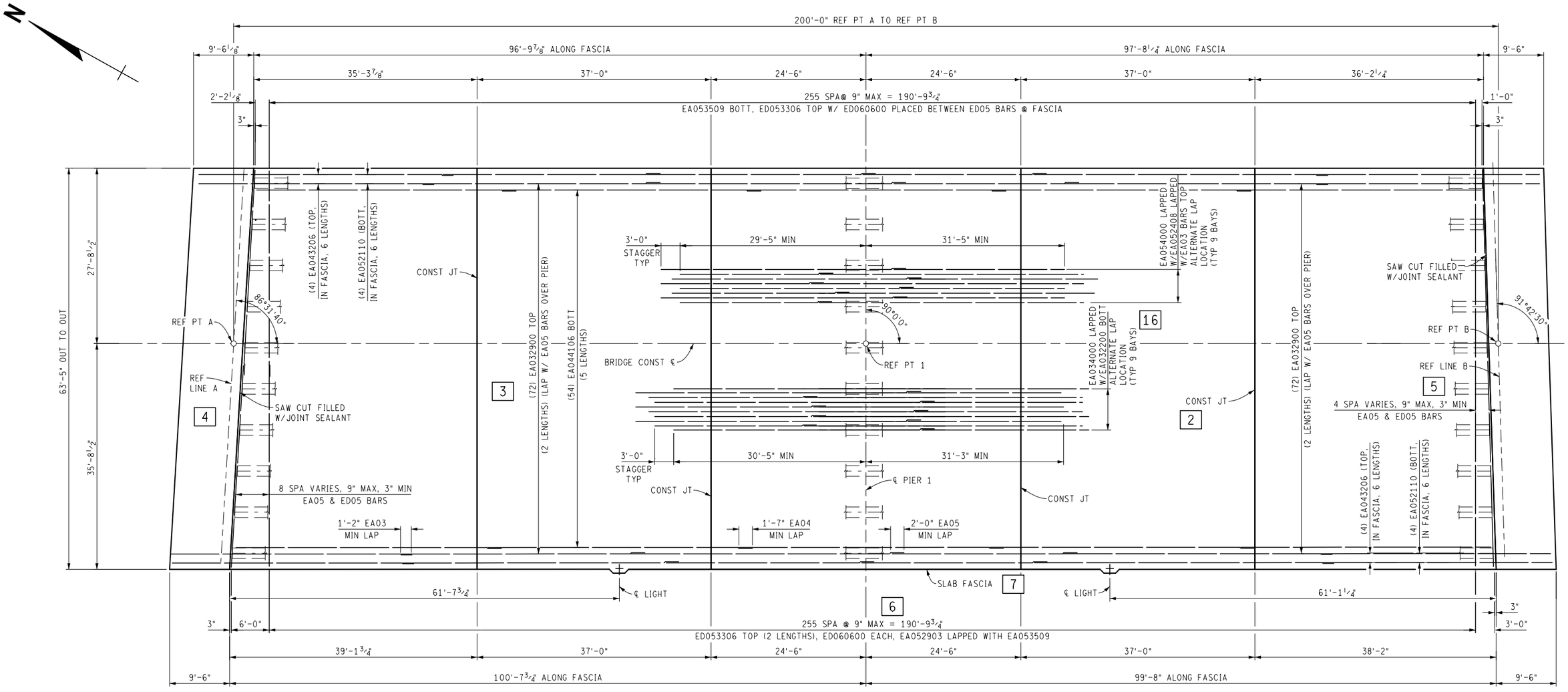
NO SCALE

DRAWN BY: C TECH	DATE:	CS: S13 OF 82023	STRUCTURAL STEEL GIRDERS	DRAWING	SHEET
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A	(PLATE GIRDER)	S01 STEEL 003	SECT 2 57
FILE: s13_82023_steel_003.dgn	TSC:				

STRUCTURAL STEEL DETAILS

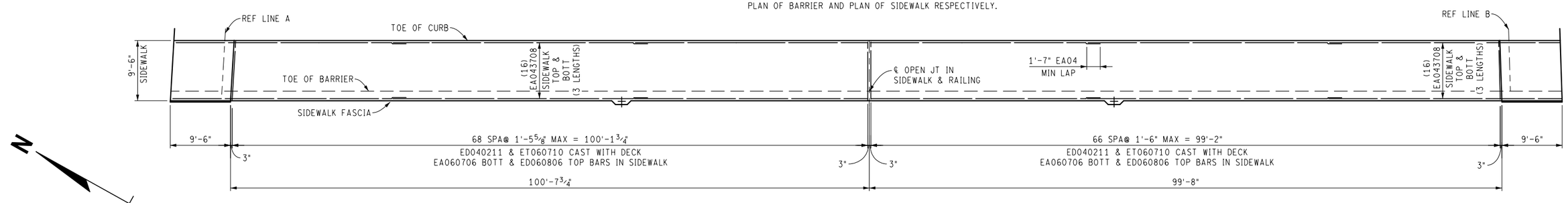
The NSBA has published drawings showing proper details for steel structures. G1.4 – Guidelines for Design Details is a good resource for steel fabrication details.

1. The erection diagram is a plan view of the steel framing and should include the following
   a. Girder centerlines and spacing
   b. Reference lines
   c. Bridge Construction centerlines
   d. Bearing centerlines
   e. Cross frame or diaphragm locations and spacing
   f. Field splice locations
2. The girder elevation should be shown below the erection diagram. The view generally exaggerated in the vertical direction for clarity. Show the following information on the girder elevation:
   a. Dimension changes in plate thickness
   b. Label widths and thicknesses of flange plates, web plates & stiffener plates.
   c. Dimension to field splices
   d. Give distances to stiffeners not connected to cross frames or diaphragms such as jacking stiffeners.
   e. Dimension tension zones
   f. Shear stud longitudinal spacing
   g. Indicate if steel grade differs between plates.
3. Typically splices use 7/8” or 1” diameter bolts. Minimum and maximum bolt spacing and edge distances will depend on bolt diameter.
4. Place bearing stiffeners on both sides of each girder. Place intermediate stiffeners and connection stiffeners on the interior side of fascia girders.
5. Fillet weld sizes need not be shown on the plans.
6. Show standard shear developer details. Modify for number of studs in each row, stud spacing and stud height if applicable.
7. Show shop splice clearances typical detail. MDOT prefers 2’-0” between flange CJP welds and web butt welds.
8. MDOT has typically given cambers at ¼ points along each span. Camber ordinates at each splice are also given.
9. Cambers are shown without any self-weight deflection (girder lying on its side).
10. Position dowels are often provided by the steel fabricator so they are detailed with the structural steel sheets. Specify the total number of dowels required.



PLAN OF SLAB 1

* EL04 BARS AND ET04 BARS ARE CAST WITH DECK. SEE PLAN OF BARRIER AND PLAN OF SIDEWALK RESPECTIVELY.



PLAN OF SIDEWALK

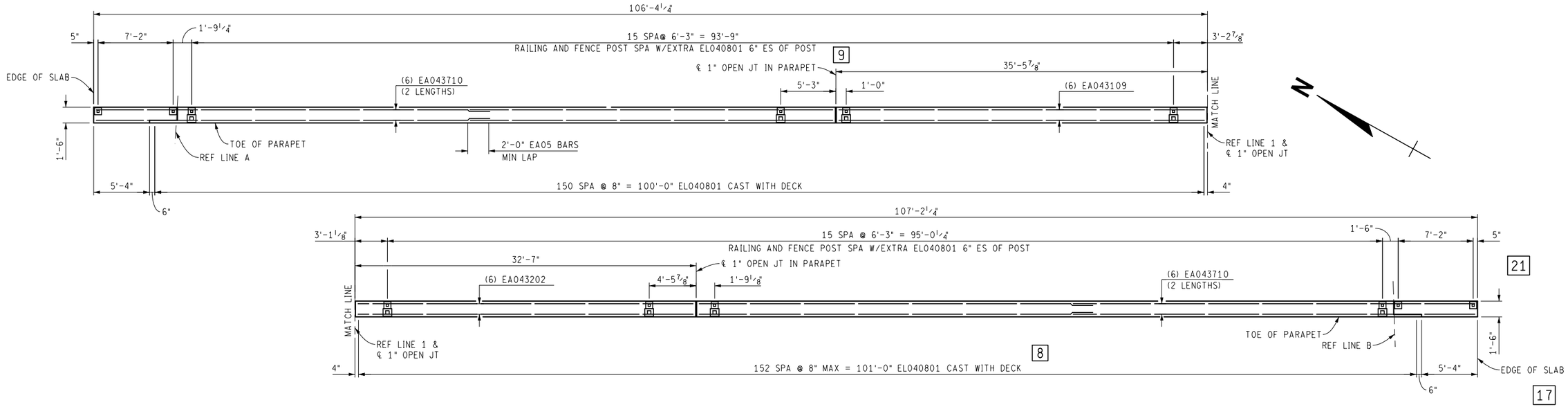
* EL04 BARS CAST WITH SIDEWALK. SEE PLAN OF BARRIER.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

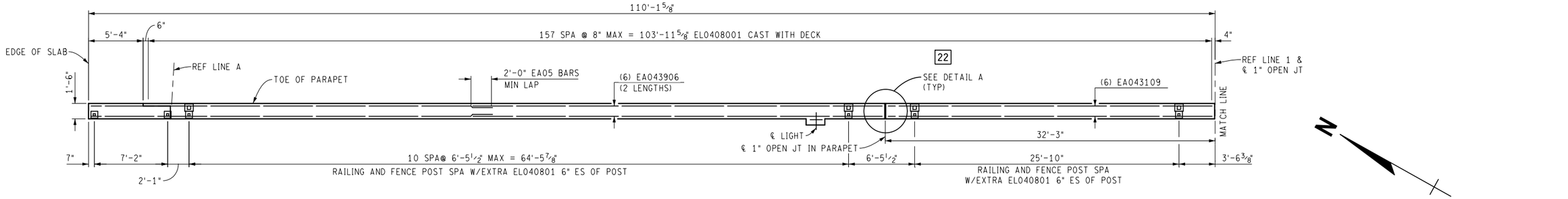
MDOT Michigan Department of Transportation

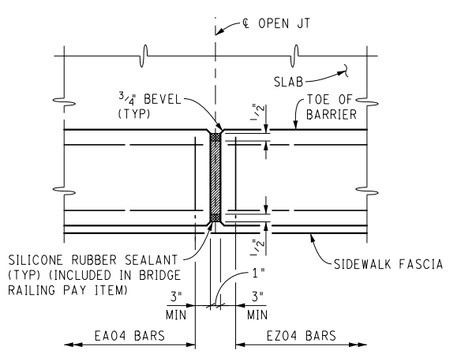
NO SCALE

DRAWN BY: C TECH	DATE:	CS: S13 OF 82023	SUPERSTRUCTURE DETAILS	DRAWING: S13 DECK 001
CHK'D BY: EGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A		SHEET: SECT 2 59
FILE:s13 82023 deck 001.dgn	TSC:			

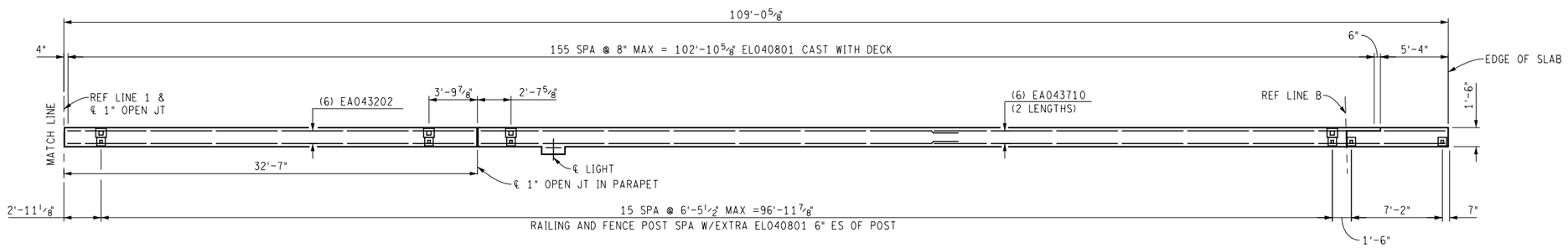


PLAN OF EAST BARRIER





DETAIL A
(BRIDGE RAILING OPEN JT)



PLAN OF WEST BARRIER

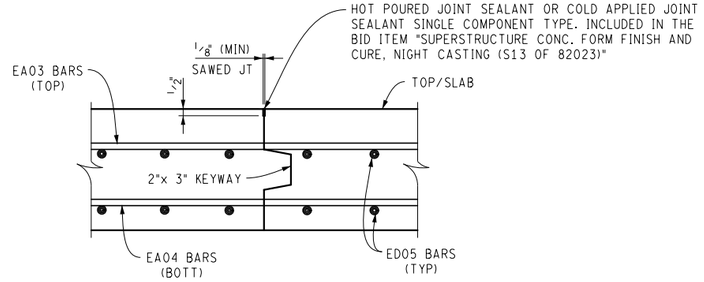
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

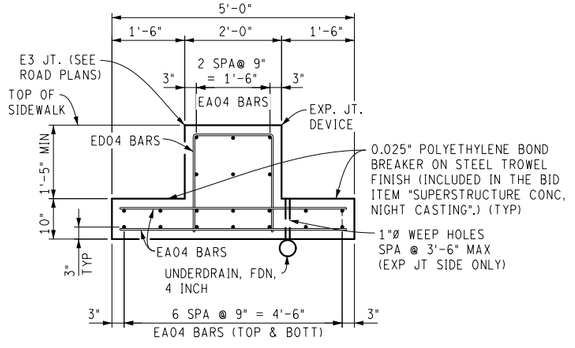
NO SCALE

DRAWN BY: C TECH	DATE:	CS: S13 OF 82023	SUPERSTRUCTURE DETAILS
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A	
FILE: s13 82023 deck 002.dgn	TSC: DETROIT		

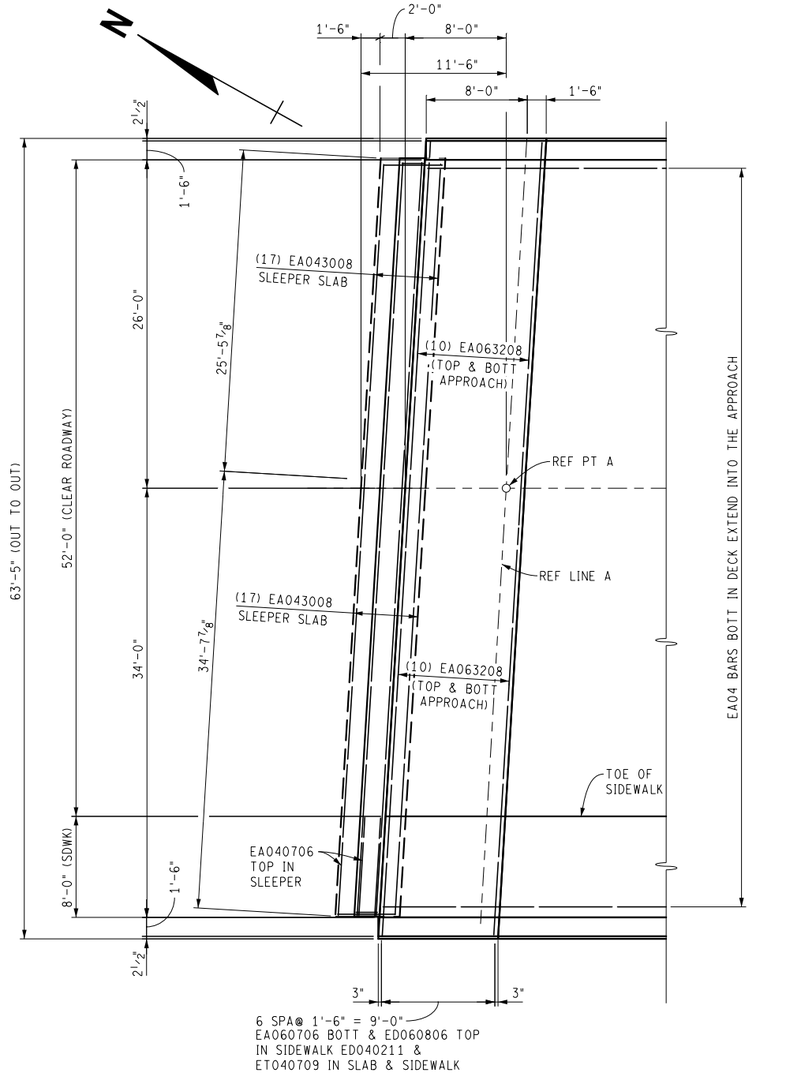
DRAWING	SHEET
S01 DECK 002	SECT 2 60

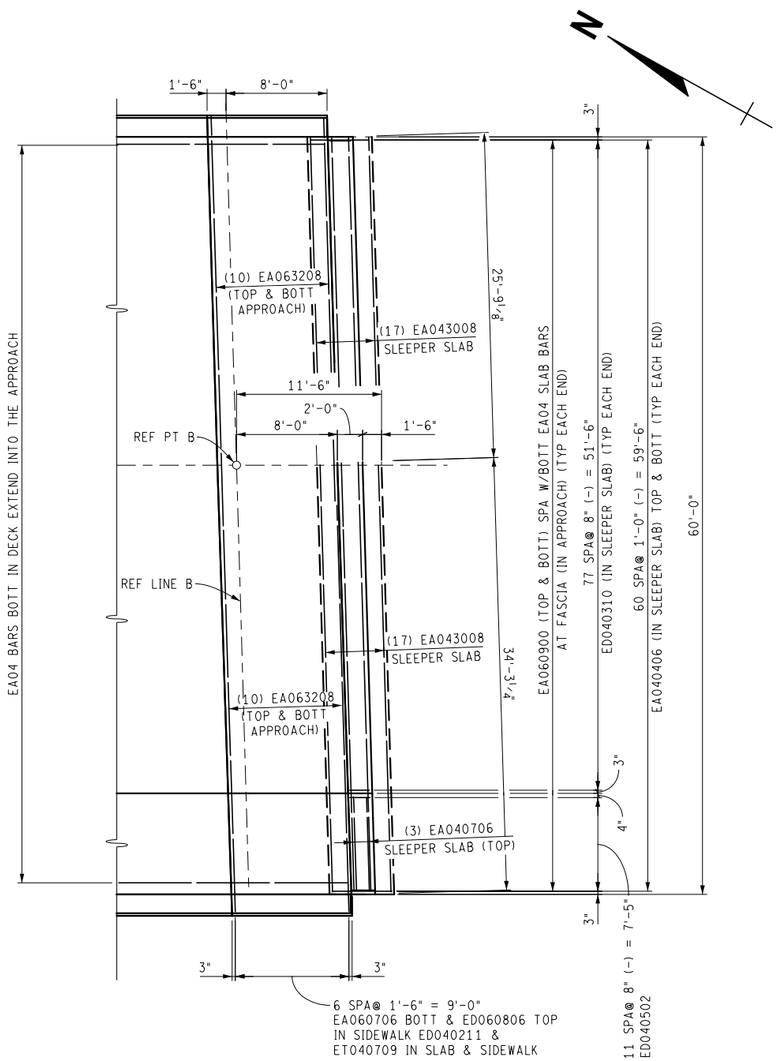


TYPICAL CONSTRUCTION JOINT

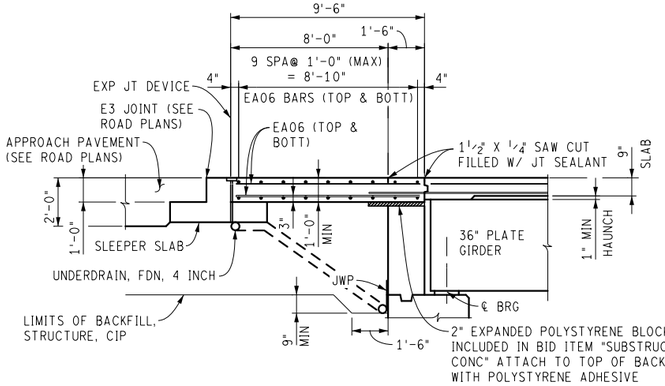


TYPICAL SECTION THRU SLEEPER SLAB AT SIDEWALK

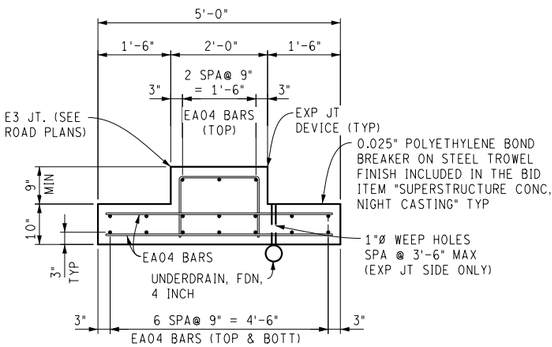




APPROACH AND SLEEPER SLAB PLAN



TYPICAL SECTION THRU SLIDING SLAB



TYPICAL SECTION THRU SLEEPER SLAB

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NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION	MDOT Michigan Department of Transportation	NO SCALE	DRAWN BY: C TECH	DATE:
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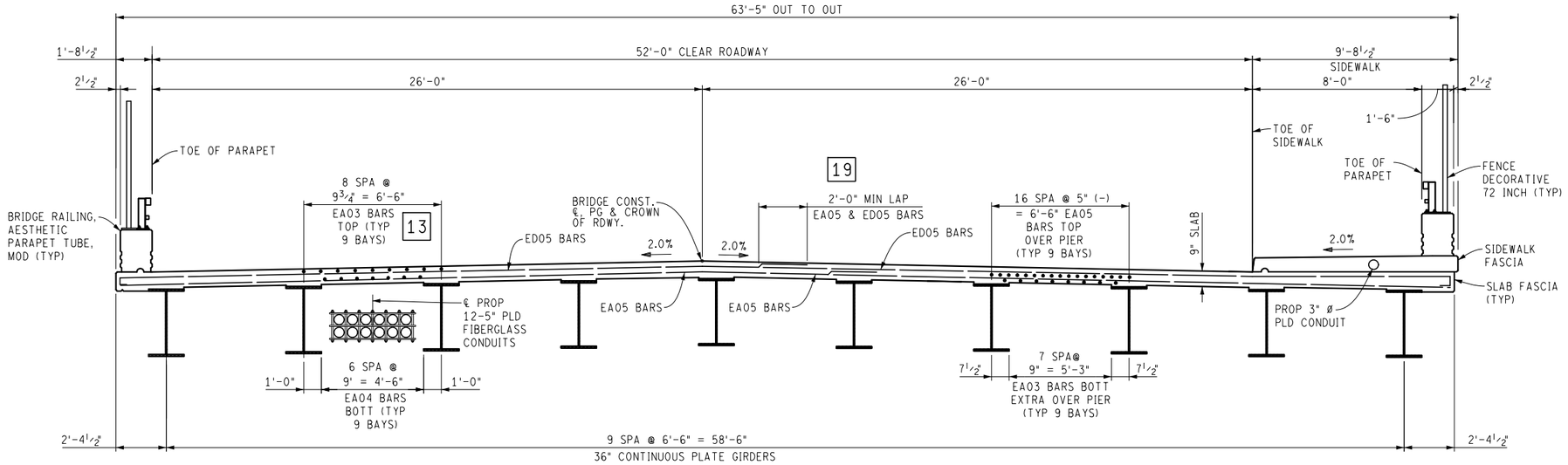
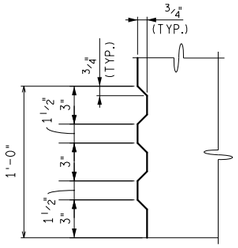
										FILE: s13 82023 deck 003.dgn	TSC: TAYLOR

CS: S13 OF 82023	SUPERSTRUCTURE DETAILS	DRAWING	SHEET
JN: 79784A		S01 DECK 003	SECT 2 61

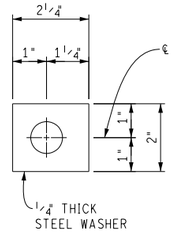


SLAB SECTION

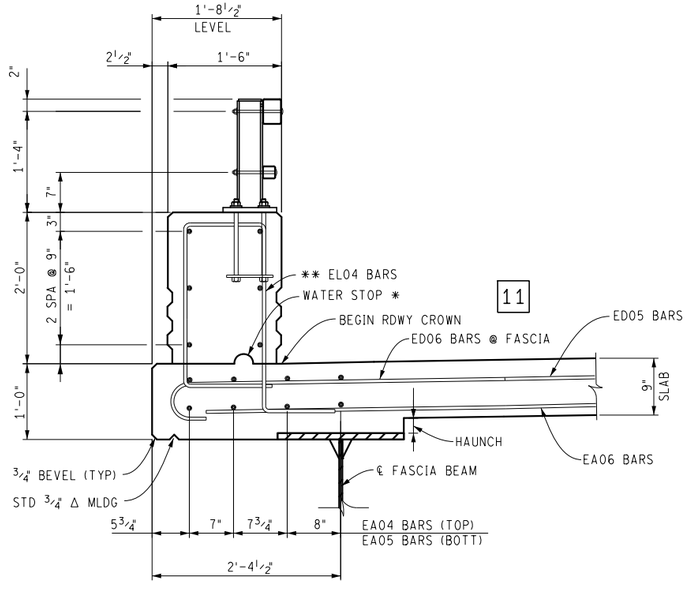
18 LOOKING UPSTATION



AESTHETIC TREATMENT DETAIL

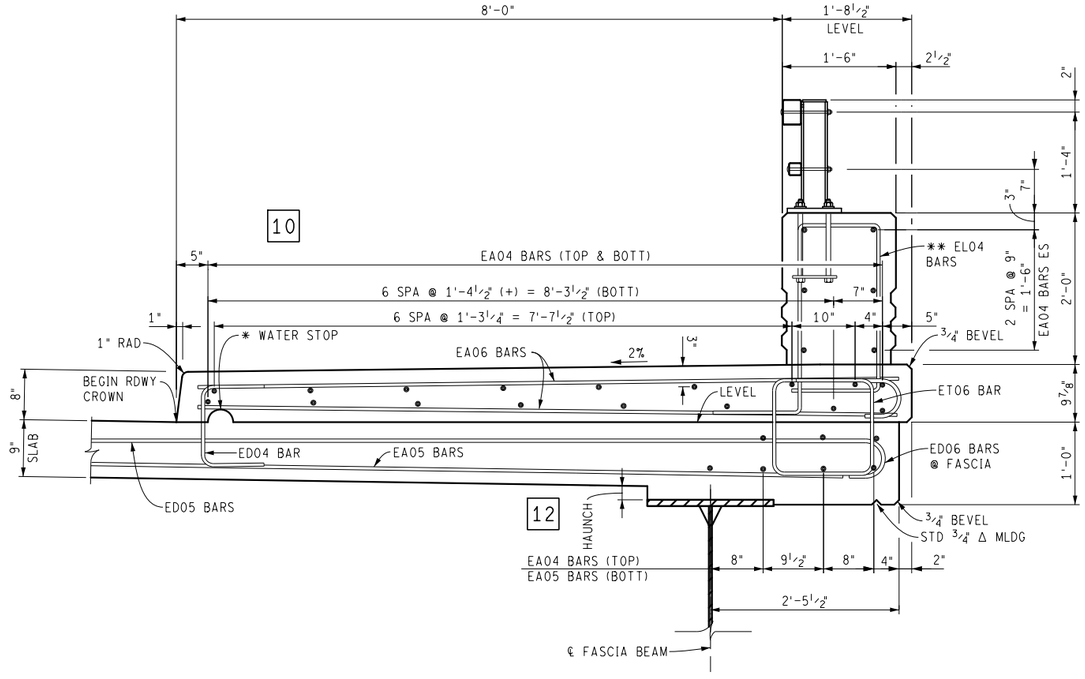


WASHER DETAIL



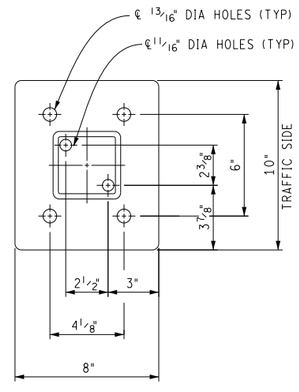
EAST RAILING SECTION

* 2" HIGH x 4" LONG (±), FORMING NOT REQUIRED
** PLACE ADDITIONAL EL04 BARS 6" EACH SIDE OF RAILING POST ℄



WEST PARAPET AND WALK SECTION

* 2" HIGH x 4" LONG (±), FORMING NOT REQUIRED
** PLACE ADDITIONAL EL04 BARS 6" EACH SIDE OF RAILING POST ℄



RAILING BASE PLATE

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

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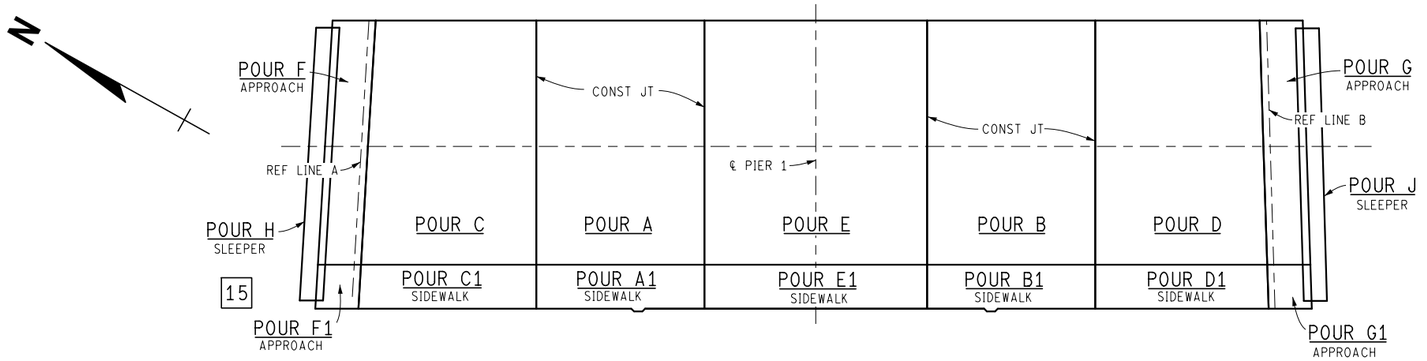
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A	
FILE: s13_82023_deck_004.dgn	TSC:		

DRAWING	SHEET
S01 DECK 004	SECT 2 62



POUR DIAGRAM

SUPERSTRUCTURE CONCRETE QUANTITIES	
POUR	AMT (CYDS)
✳ A	68.8
✳ B	68.8
✳ C	68.8
✳ D	68.8
✳ E	91.2
✳ F	22.3
✳ G	22.3
H	15.1
J	15.1
A1	10.0
B1	10.0
C1	10.0
D1	10.0
E1	13.4
F1	2.2
G1	2.2

✳ INDICATES NIGHT CASTING REQUIRED

14

MISCELLANEOUS QUANTITIES		
88	Cyd	Superstructure Conc
411	Cyd	Superstructure Conc, Night Casting
1	LSUM	Superstructure Conc, Form, Finish, and Cure (S13 OF 82023)
1	LSUM	Superstructure Conc, Form, Finish, and Cure, Night Casting (S13 OF 82023)
432	Ft	Bridge Railing, Aesthetic Parapet Tube, Mod
✳✳ 432	Ft	Fence, Decorative, 72 inch
411	Cyd	Bridge Ltg, Oper and Maintain
1	LSUM	Bridge Ltg, Furn and Rem (S13 OF 82023)
1	Ea	Elec Grounding System
2796	Ft	Conduit, Fiberglass, 5 inch, Structure
233	Ft	Conduit, Fiberglass, 3 inch

✳✳ THE DECORATIVE FENCE HEIGHT MUST BE ADJUSTED ON THE TOP OF THE ENDWALLS SO THAT THE TOP OF THE FENCE IS LEVEL ALONG THE BRIDGE, INCLUDED IN THE BID ITEM "FENCE, DECORATIVE, 72 INCH".

NOTES:

ES DENOTES EACH SIDE.

NS DENOTES NEAR SIDE.

FS DENOTES FAR SIDE.

HPJS DENOTES HOT-POURED JOINT SEALANT.

FOR BRIDGE RAILING, ANCHORAGE FOR GUARDRAIL AND NAME PLATE MOUNTING DETAILS, SEE STANDARD PLAN B-25-SERIES. FOR DETAILS OF NAME PLATES, MOLDINGS AND BEVELS, AND LIGHT STANDARD ANCHOR BOLT ASSEMBLIES, SEE STANDARD PLAN B-103-SERIES.

FOR NAME PLATE LOCATION, SEE GENERAL PLAN OF STRUCTURE SHEET.

LOW TEMPERATURE PROTECTION OF CONCRETE SHALL BE APPLIED ACCORDING TO SECTION 706.03 J. OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. LOW TEMPERATURE PROTECTION OF CONCRETE WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE CONCRETE BID ITEMS.

THE CONTRACTOR IS TO PROVIDE A SAWED JOINT 1 1/2" DEEP BY 1/8" WIDE (MINIMUM) IN THE TOP OF SLAB AT TRANSVERSE CONSTRUCTION JOINTS AND OVER PIER AT CENTERLINE. THE JOINT IS TO BE SAWED WITHIN 4 HOURS OF REMOVING THE CURING AND IS TO BE FILLED WITH HOT-POURED JOINT SEALANT OR COLD-APPLIED JOINT SEALANT, SINGLE COMPONENT TYPE. (INCLUDED IN THE BID ITEM "SUPERSTRUCTURE CONC, FORM, FINISH AND CURE, NIGHT CASTING (S13 OF 82023)").

THIS DECK POUR IS DESIGNATED A NIGHT POUR, AND THEREFORE SUBJECT TO THE RESTRICTIONS OF SECTION 706.03 I. OF THE STANDARD SPECIFICATIONS.

GROUNDING CABLES AND TOP OF GROUNDING RODS SHALL BE PLACED 1'-0" MINIMUM BELOW FINISHED GROUND.

A RUBBED SURFACE FINISH ON THE VERTICAL AND TOP CONCRETE SURFACES OF THE PARAPET RAILING IS REQUIRED ON THIS STRUCTURE ON THE SIDE WITH SIDEWALK.

"EDGE" OR "GROOVE" DENOTES EDGING OR GROOVING WITH AN APPROVED TOOL.

DECK POURS ARE TO BE MADE IN THE FOLLOWING SEQUENCE A, B, C, D, E, F AND G. WHENEVER A DECK POUR IS MADE, AT LEAST 15 HOURS SHALL HAVE ELAPSED SINCE THE ADJACENT SECTION WAS PLACED. THIS INCLUDES SECTIONS SEPARATED BY LONGITUDINAL AS WELL AS TRANSVERSE JOINTS.

NO PORTION OF THE DECK FORMWORK SHALL ENCROACH ON THE EXISTING UNDERCLEARANCE.

FILL PERPENDICULAR RAILING JOINTS WITH 1" JOINT FILLER TO 1/2" FROM THE BEVELS OF RAILING AND SEAL REMAINING 1/2" WITH A SILICONE RUBBER SEALANT. INCLUDED IN THE BID ITEM "BRIDGE RAILING, AESTHETIC PARAPET TUBE, MOD").

THE UTILITY COMPANY SHALL BE NOTIFIED ONE WEEK IN ADVANCE OF THE TIME OF INSTALLATION OF THE DUCTS IN THE SIDEWALK OR RAILING.

THE LIGHT STANDARD ANCHOR BOLT ASSEMBLIES ARE INCLUDED IN THE PAYMENT FOR "BRIDGE RAILING, AESTHETIC PARAPET TUBE, MOD".

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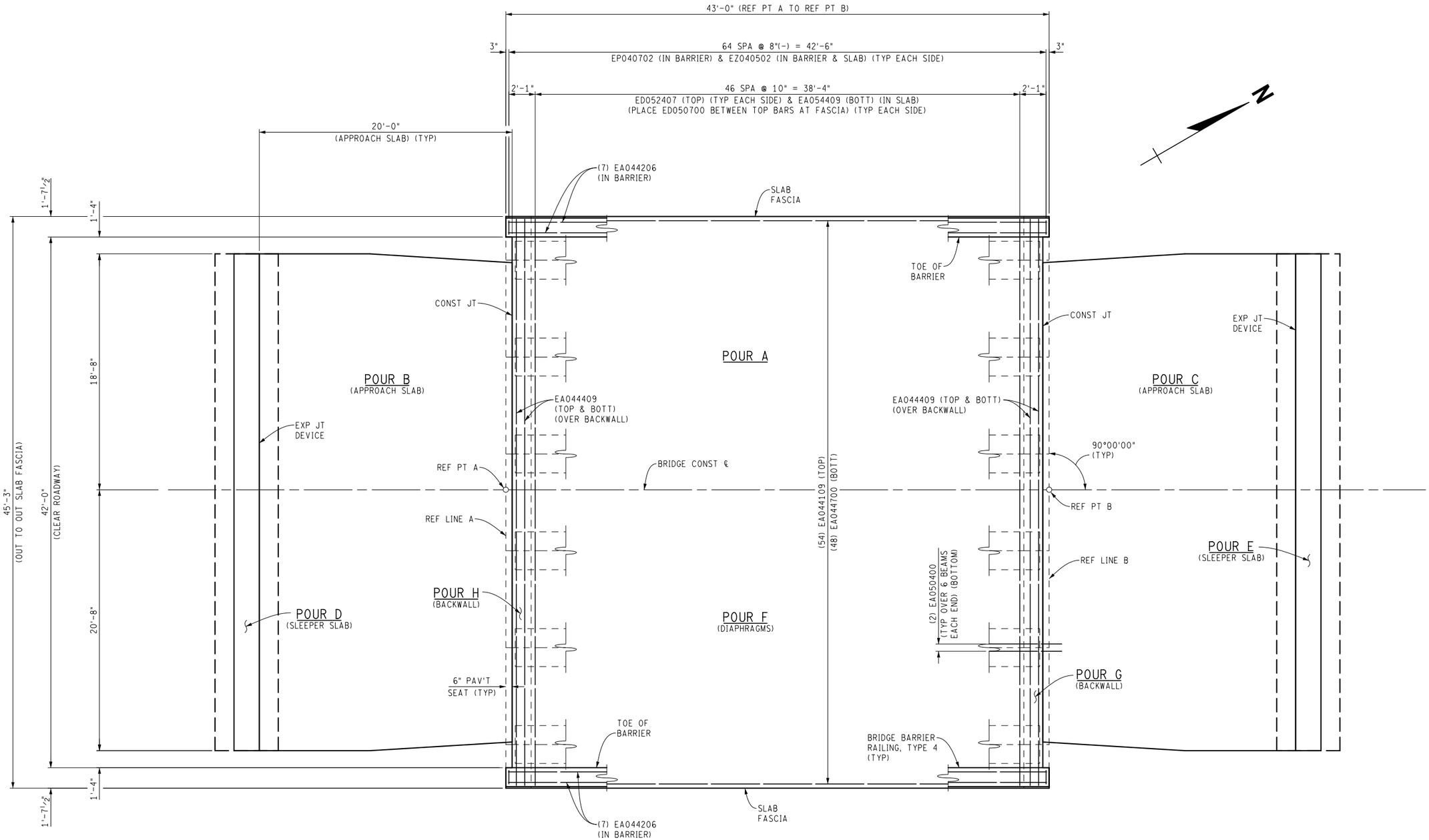
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 79784A		SHEET: SECT 2 63
FILE: s13_82023_deck_004.dgn	TSC:			



PLAN OF SLAB

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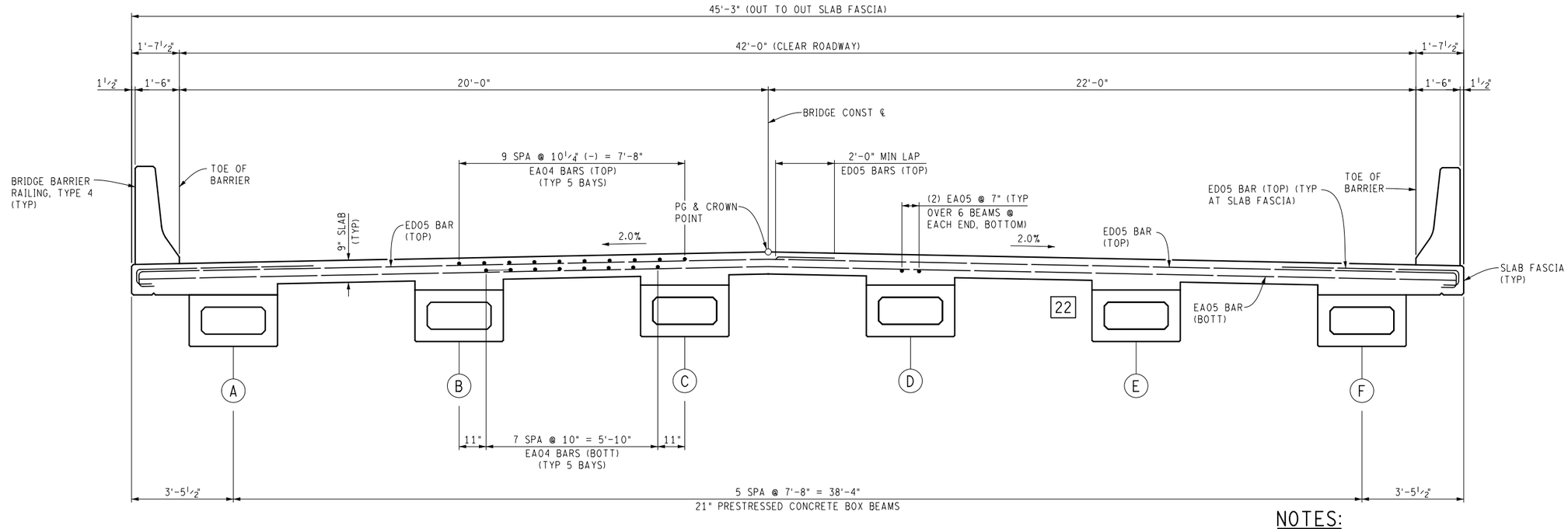
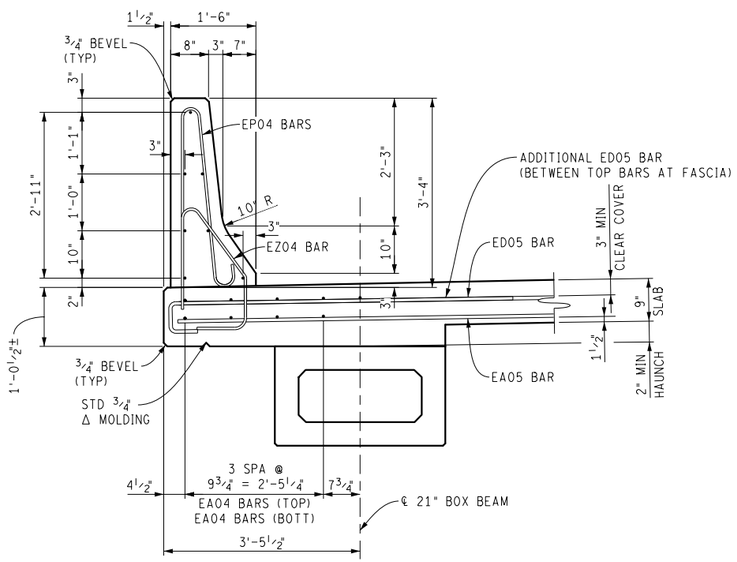
FILE:b01-1 82211 deck.dgn	TSC:		

DRAWING	SHEET
B01-1 DECK 001	SECT 2 64



TYPICAL SLAB SECTION

(LOOKING UPSTATION)



TYPICAL BARRIER SECTION

* 2" HIGH X 4" LONG (±). FORMING NOT REQUIRED.

MISCELLANEOUS QUANTITIES

32 Cyd	Superstructure Conc
1 LSUM	Superstructure Conc, Form, Finish, and Cure (B01-1 OF 82211)
121 Cyd	Superstructure Conc, Night Casting
1 LSUM	Superstructure Conc, Form, Finish, and Cure, Night Casting (B01-1 OF 82211)
86 Ft	Bridge Barrier Railing, Type 4
140 Sft	Joint Waterproofing, Expansion
10 Sft	Joint Waterproofing
4 Ea	Reflective Marker, Permanent Barrier
1 LSUM	Bridge Ltg, Furn and Rem (B01-1 OF 82211)
121 Cyd	Bridge Ltg, Oper and Maintain

MIN. LAP TABLE

EA03 BARS - 1'-2"
EA04 BARS - 1'-7"
EA05 BARS - 2'-0"
EA06 BARS - 2'-4"

SUPERSTRUCTURE CONCRETE QUANTITIES

POUR	AMT (CYDS)
* A	62.4
* B	29.3
* C	29.3
D	9.0
E	9.0
F	1.0
G	6.5
H	6.5

* INDICATES NIGHT CASTING IS REQUIRED

NOTES:

JWP DENOTES JOINT WATERPROOFING.

EJWP DENOTES EXPANSION JOINT WATERPROOFING.

NS DENOTES NEAR SIDE.

FS DENOTES FAR SIDE.

ES DENOTES EACH SIDE.

FOR BRIDGE RAILING, ANCHORAGE FOR GUARDRAIL AND NAME PLATE MOUNTING DETAILS, SEE STANDARD PLAN B-17-SERIES. FOR DETAILS OF NAME PLATES, MOLDINGS AND BEVELS, SEE STANDARD PLAN B-103-SERIES.

"EDGE" OR "GROOVE" DENOTES EDGING OR GROOVING WITH AN APPROVED TOOL.

ALPHABETICAL DESIGNATION OF DECK POURS IS NOT TO BE CONSTRUED AS A POUR SEQUENCE.

FOR NAME PLATE LOCATION, SEE GENERAL PLAN OF STRUCTURE SHEET.

LOW TEMPERATURE PROTECTION OF CONCRETE SHALL BE APPLIED ACCORDING TO SECTION 706.03 J. OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. LOW TEMPERATURE PROTECTION OF CONCRETE WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE CONCRETE BID ITEMS.

DO NOT POUR DECK CONCRETE UNTIL DIAPHRAGM CONCRETE ATTAINS A COMPRESSIVE STRENGTH OF 3,000 psi.

THIS DECK POUR IS DESIGNATED A NIGHT POUR, AND THEREFORE SUBJECT TO THE RESTRICTIONS OF SECTION 706.03 I. OF THE STANDARD SPECIFICATIONS.

NO PORTION OF DECK FORMWORK OR SUPPORTS SHALL PROTRUDE ABOVE THE TOP OF PROPOSED HAUNCH (OR TOP OF THE BEAM WHERE THERE IS NO PROPOSED HAUNCH).

THE CONTRACTOR IS TO PROVIDE A SAWED JOINT 3" DEEP BY 1/4" WIDE (MINIMUM) IN THE TOP OF SLAB AT TRANSVERSE CONSTRUCTION JOINTS OVER THE BACKWALL. IF AN OPTIONAL CONSTRUCTION JOINT IS NOT USED, THE JOINT IS TO BE SAWED WITHIN 24 HOURS OF PLACING THE CURING AND IS TO BE FILLED WITH HOT-POURED JOINT SEALANT. (INCLUDED IN THE BID ITEM "SUPERSTRUCTURE CONC, FORM, FINISH, AND CURE, NIGHT CASTING (B01-1 OF 82211)").

SLIP FORMING OF THE BRIDGE BARRIER RAILING IS NOT ALLOWED.

THE CONTRACTOR MAY USE METAL STAY IN PLACE FORMS. IF USED, ELIMINATING THE POLYSTYRENE AND FILLING THE CORRUGATIONS WITH CONCRETE IS PROHIBITED.

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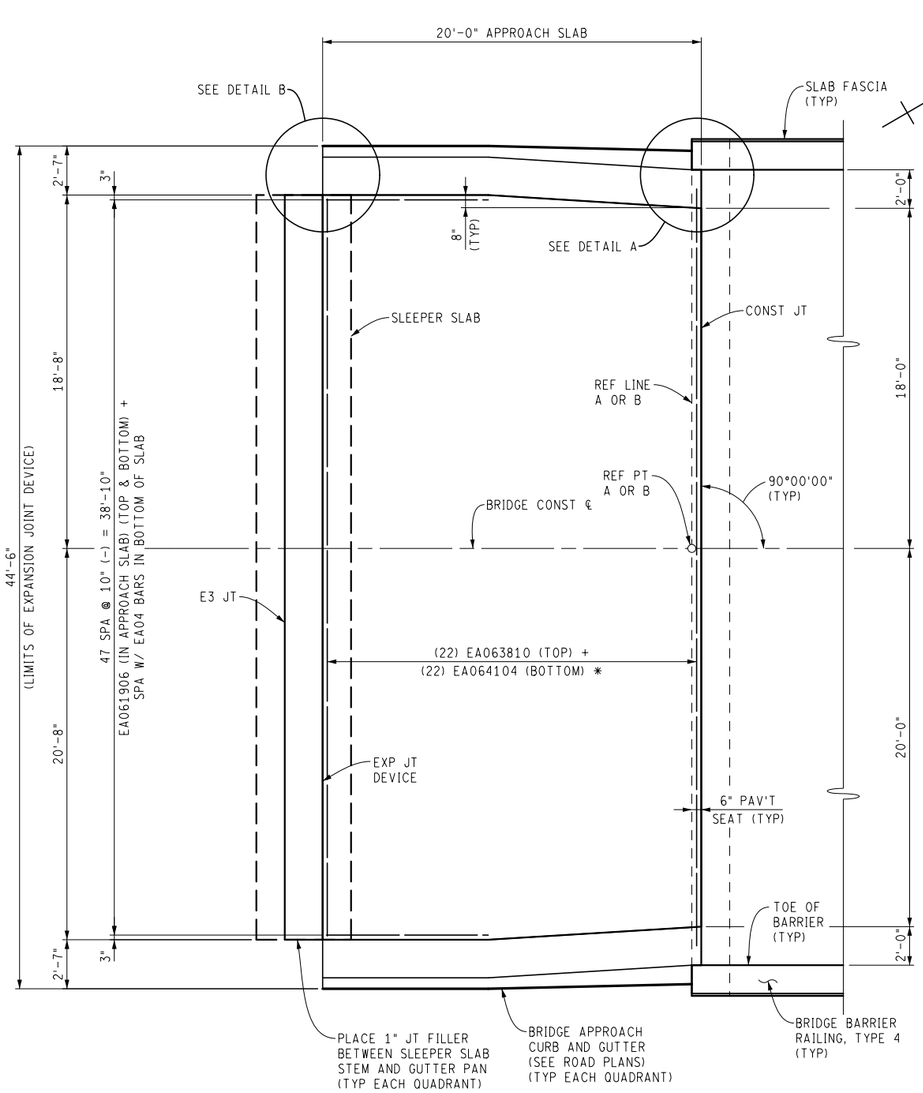
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 120062A		B01-1 DECK 002	SECT 2 65
FILE:b01-1 82211 deck.dgn	TSC: TAYLOR				

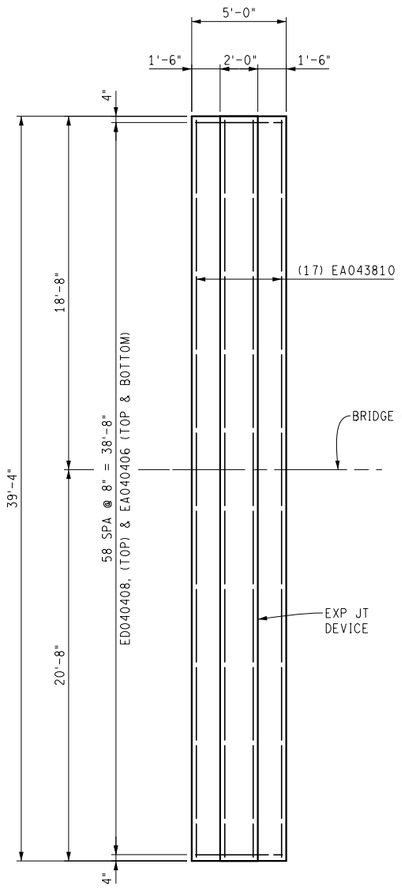


PLAN OF APPROACH

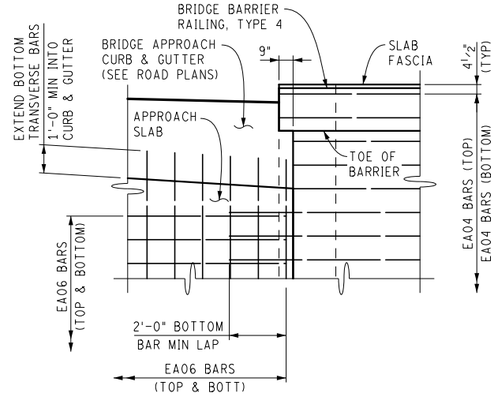
(SOUTH APPROACH SLAB SHOWN, NORTH APPROACH SLAB SIMILAR)

* BOTTOM TRANSVERSE REINFORCEMENT SHALL EXTEND A MIN OF 1'-0" BEYOND SLAB INTO THE CURB AND GUTTER.

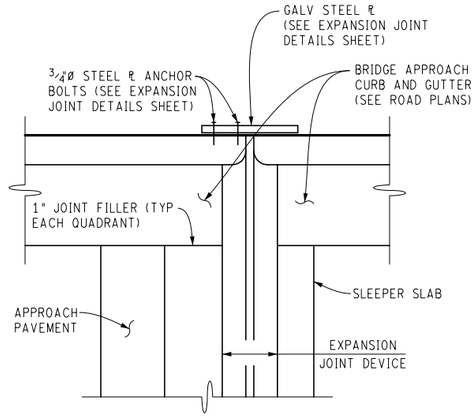
+ FIELD CUT REBAR TO FIT TAPERED AREAS.



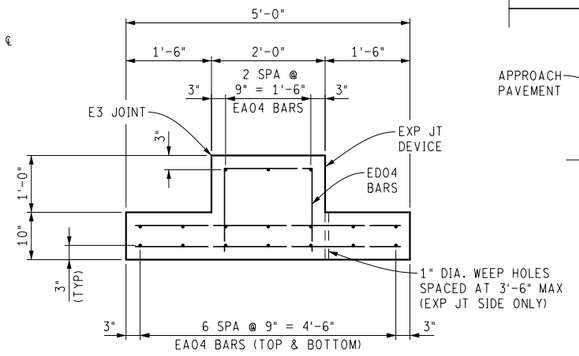
PLAN OF SLEEPER SLAB



DETAIL A

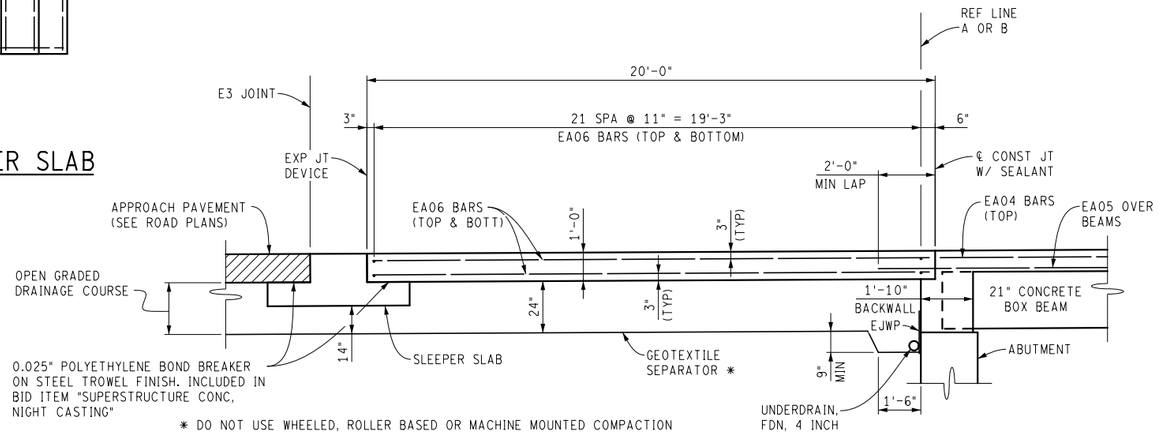


DETAIL B



TYPICAL SECTION THRU SLEEPER SLAB

CONTRACTOR SHALL ENSURE THAT WEEP HOLES ARE OPEN AND FREE OF DEBRIS PRIOR TO PLACING EXPANSION JOINT DEVICE.



* DO NOT USE WHEELED, ROLLER BASED OR MACHINE MOUNTED COMPACTION EQUIPMENT TO COMPACT THE SUBGRADE, SUBBASE, AND BASE WITHIN 10' OF THE SLEEPER SLAB AFTER IT IS BUILT. USE ONLY HAND/PLATE COMPACTORS. CONTACT PRESSURE OF COMPACTION EQUIPMENT SHALL NOT EXCEED 10 PSI.

SECTION THRU APPROACH SLAB

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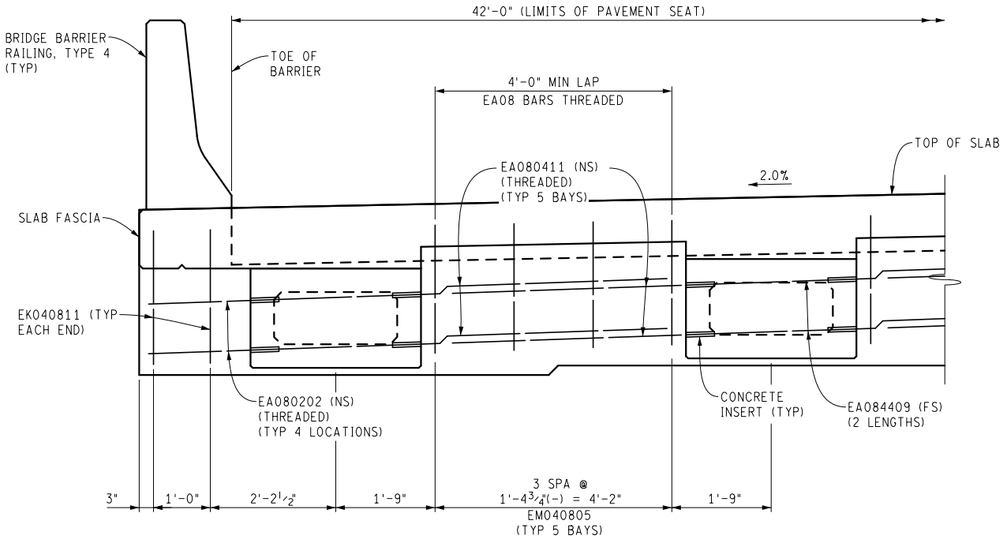
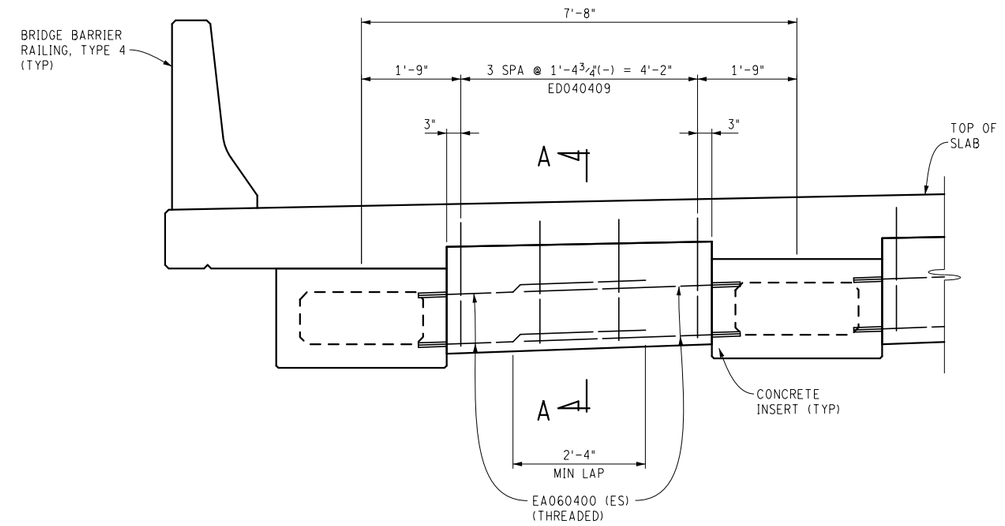
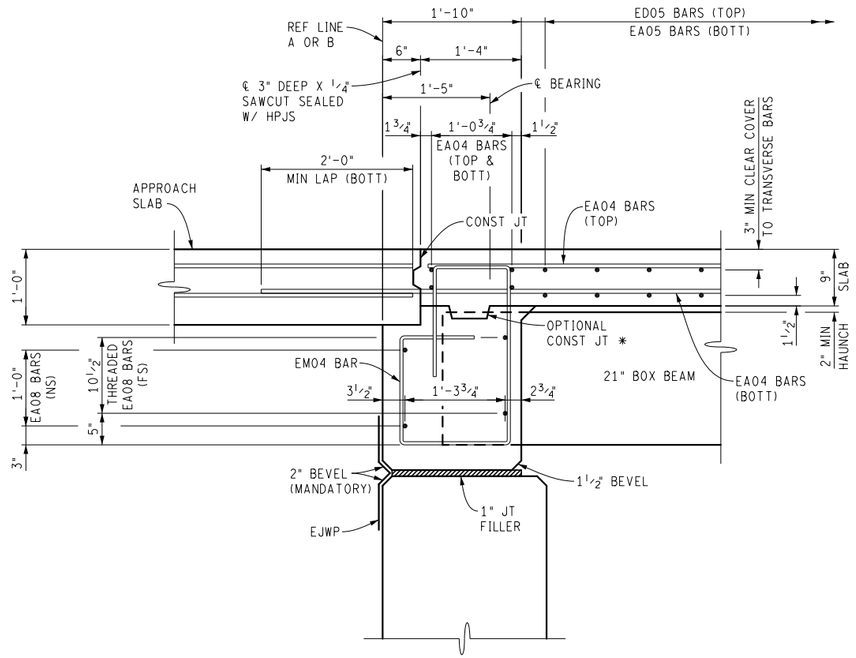


PARTIAL BACKWALL ELEVATION



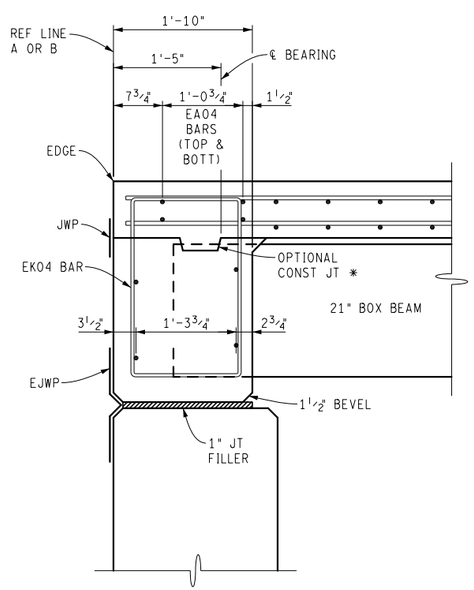
INTERMEDIATE DIAPHRAGM ELEVATION

(TYP 5 LOCATIONS)

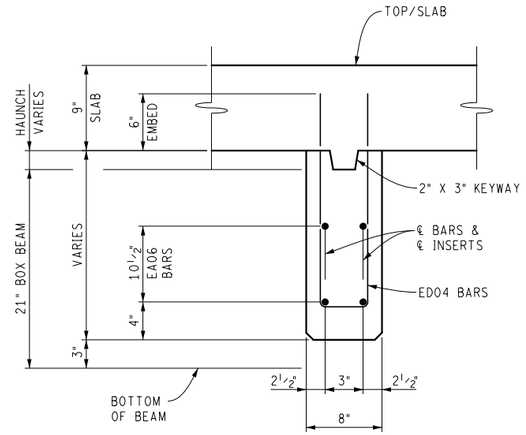


TYPICAL BACKWALL SECTION

* IF CONSTRUCTION JOINT IS USED, CAST LOWER PORTION OF BACKWALL PRIOR TO PLACING DECK REINFORCEMENT.



TYPICAL BACKWALL SECTION UNDER BARRIER



SECTION A-A

(TYPICAL INTERMEDIATE DIAPHRAGM SECTION)

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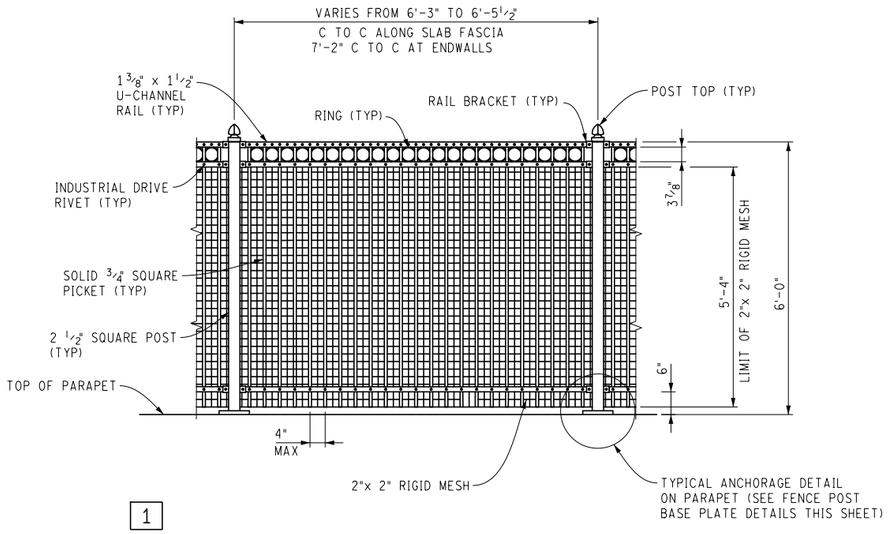
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 120062A	
FILE:b01-1 82211 deck.dgn	TSC:		

DRAWING	SHEET
B01-1 DECK 004	SECT 2 67

SUPERSTRUCTURE DETAILS

The superstructure details sheets should include, at a minimum, plan views showing reinforcing details for the structural slab, sidewalk (if present), barriers, approach slab, and sleeper slab. Cross sections must also be shown for the structural slab, sidewalk, and railing. Details must also be shown for concrete diaphragms, end walls, and integral or semi-integral backwalls.

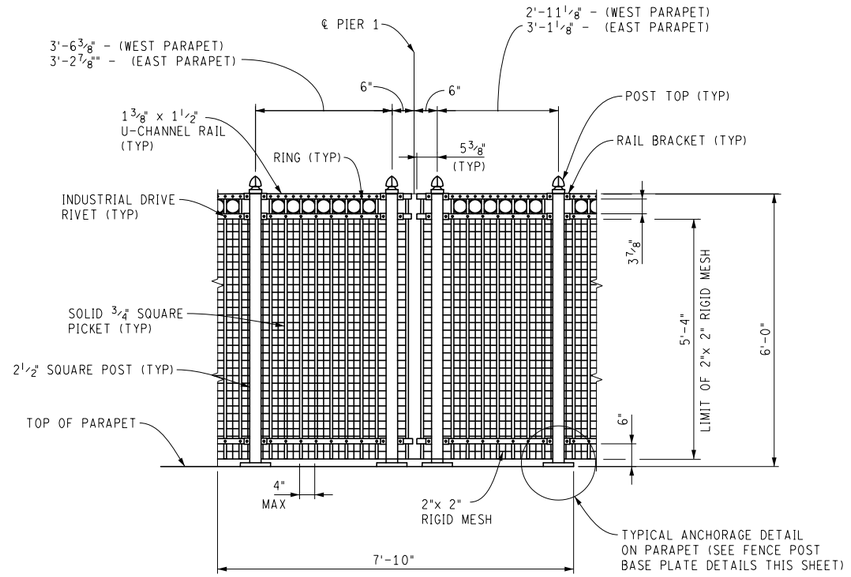
1. The structural slab should be shown on a single sheet when possible.
2. Show all construction joints.
3. Give rebar totals in plan view. Show rebar spacing in the deck section.
4. Show reference lines, and reference points.
5. Partially show the top of beams at intervals along the deck to help with rebar placement.
6. Typically reinforcement is detailed with the concrete it is first cast into. For example, the vertical barrier bars that tie into the slab are cast into the slab and should be detailed with the slab. Occasionally it the detailer may find it easier to detail the barrier reinforcement in a separate plan view. If so, place a note under the view title. Aesthetic parapet tube barrier is often easier to detail this way.
7. Be consistent in use of the term “deck” or “slab”
8. Bars not cast with the barrier should be noted as such.
9. Note the need for extra bars at rail posts.
10. Present each barrier section at a scale sufficient to clearly show 2 line rebar.
11. Do not show ED06 bars in the overhang above the top longitudinal steel. It should be placed at the same level as the top transverse rebar.
12. The majority of the time, the 1:1 bevel traditionally shown for the haunch is not built. Stay-in-place forms usually used by contractors will form the deck vertically from the edge of flange.
13. Its better practice to specify the number of bays a callout is applicable to rather than using “each bay”.
14. Keep notes and quantities together. It is preferable to show the concrete quantities together with the pour diagram.
15. Smaller pours should specify what structural element is being identified.
16. Additional rebar in the negative moment areas can either be lapped with the normal reinforcement or placed in addition to standard longitudinal reinforcement.
17. Use either the edge of slab or reference lines to locate the barrier longitudinally along the deck.
18. Slab sections should always be shown looking upstation.
19. Position laps for top transverse steel in mid-bay. Position laps for bottom slab steel over a beam.
20. For decks where the haunch depth exceeds 6”, place additional bars per Guide 6.42.03A. Callout bars in the plan of deck, and show them in section view.
21. The gap in bridge barriers must be sufficient to provide room for the movement of the bridge without the barrier binding.
22. Show details needed to prevent water from going through the joint and falling on the ground below the bridge.



1

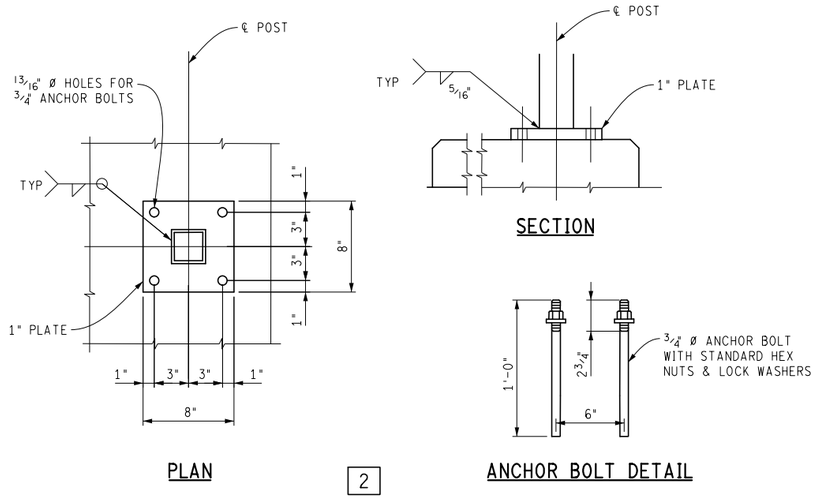
72 INCH TYPICAL FENCE SECTION ELEVATION

ALL RAILING INSTALLED ON TOP OF PARAPET SHALL HAVE ADDITIONAL 2" SQUARE WIRE MESH TACK WELDED ON OUTSIDE FACE. WIRE MESH IS INCLUDED IN THE PAY ITEM "FENCE, DECORATIVE, 72 INCH".



72 INCH FENCE SECTION ELEVATION @ PIER 1

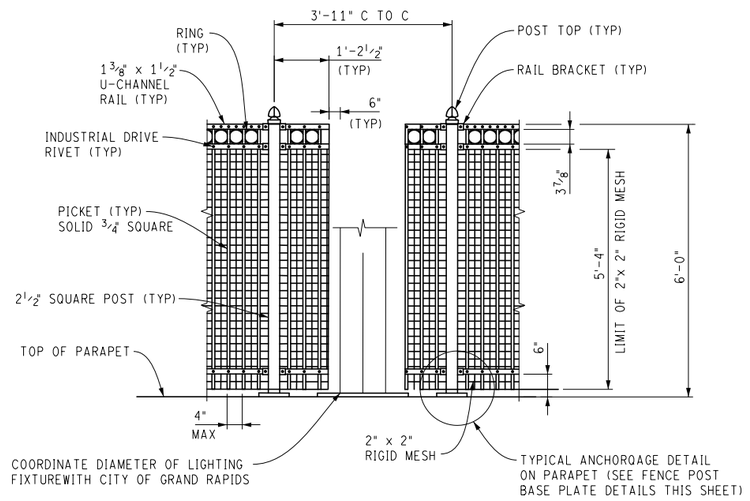
ALL RAILING INSTALLED ON TOP OF PARAPET SHALL HAVE ADDITIONAL 2" SQUARE WIRE MESH TACK WELDED ON OUTSIDE FACE. WIRE MESH IS INCLUDED IN THE PAY ITEM "FENCE, DECORATIVE, 72 INCH".



2

FENCE POST BASE PLATE DETAILS

ALL WORK AND MATERIAL COST SHOWN ABOVE ARE INCLUDED IN THE PAY ITEMS "FENCE, DECORATIVE, 72 INCH"



3

72 INCH FENCE SECTION ELEVATION @ LIGHT POLE

ALL RAILING INSTALLED ON TOP OF PARAPET SHALL HAVE ADDITIONAL 2" SQUARE WIRE MESH TACK WELDED ON OUTSIDE FACE. WIRE MESH IS INCLUDED IN THE PAY ITEM "FENCE, DECORATIVE, 72 INCH".

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

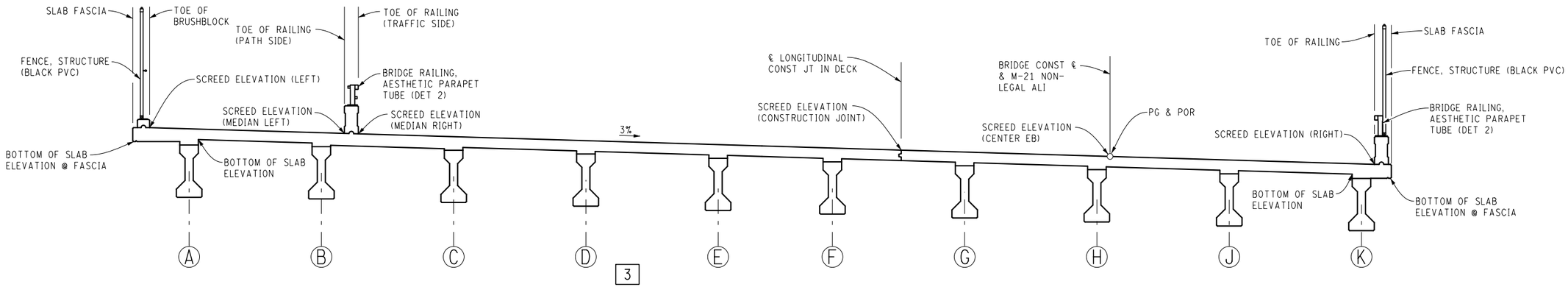
DRAWN BY: C TECH	DATE:	CS: S01 of 12345	FENCE DETAILS	DRAWING: S01 FENCE 001
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 12345A		SHEET: SECT 2 69
FILE: s13_82023_fence.dgn	TSC:			

1 BOTTOM OF SLAB ELEVATIONS

	REF.A	SPAN 1								REF.1	SPAN 2									REF.2	SPAN 3									REF.B
		0	1	2	3	4	5	6	7	8	0	1	2	3	4	5	6	7	8		0	1	2	3	4	5	6	7	8	
A	FASCIA	808.17	808.19	808.20	808.20	808.18	808.15	808.09	808.03	807.95	807.94	807.96	807.98	807.98	807.96	807.93	807.87	807.80	807.73		807.73	807.75	807.77	807.77	807.76	807.72	807.67	807.59	807.51	
	RIGHT	808.60	808.61	808.62	808.61	808.58	808.54	808.47	808.40	808.32	808.32	808.33	808.34	808.34	808.32	808.28	808.22	808.15	808.08		808.07	808.10	808.12	808.12	808.11	808.07	808.02	807.95	807.87	
B	LEFT	808.31	808.34	808.35	808.35	808.32	808.28	808.21	808.13	808.04	808.03	808.06	808.07	808.07	808.05	808.01	807.95	807.88	807.80		807.80	807.83	807.85	807.86	807.85	807.81	807.75	807.68	807.60	
	RIGHT	808.27	808.30	808.31	808.31	808.28	808.24	808.17	808.09	808.00	807.99	808.02	808.03	808.03	808.01	807.97	807.91	807.84	807.76		807.76	807.79	807.81	807.82	807.81	807.77	807.71	807.64	807.56	
C	LEFT	807.99	808.01	808.02	808.02	808.00	807.95	807.89	807.81	807.72	807.71	807.73	807.75	807.75	807.73	807.69	807.64	807.56	807.48		807.48	807.51	807.53	807.54	807.53	807.50	807.44	807.37	807.29	
	RIGHT	807.95	807.97	807.98	807.98	807.96	807.91	807.85	807.77	807.68	807.67	807.69	807.71	807.71	807.71	807.69	807.65	807.60	807.52		807.44	807.47	807.49	807.50	807.49	807.46	807.40	807.33	807.25	
D	LEFT	807.66	807.68	807.70	807.69	807.67	807.63	807.56	807.48	807.39	807.39	807.41	807.43	807.43	807.41	807.37	807.32	807.25	807.17		807.16	807.19	807.22	807.23	807.22	807.18	807.13	807.06	806.97	
	RIGHT	807.62	807.64	807.66	807.65	807.63	807.59	807.52	807.44	807.35	807.35	807.37	807.39	807.39	807.37	807.33	807.28	807.21	807.13		807.12	807.15	807.18	807.19	807.18	807.14	807.09	807.02	806.93	
E	LEFT	807.33	807.36	807.37	807.37	807.35	807.30	807.24	807.16	807.07	807.07	807.09	807.11	807.11	807.09	807.06	807.00	806.93	806.85		806.85	806.88	806.90	806.91	806.90	806.87	806.81	806.74	806.65	
	RIGHT	807.29	807.32	807.33	807.33	807.31	807.26	807.20	807.12	807.03	807.03	807.05	807.07	807.07	807.05	807.02	806.96	806.89	806.81		806.81	806.84	806.86	806.87	806.86	806.83	806.77	806.70	806.61	
F	LEFT	807.00	807.03	807.05	807.05	807.02	806.98	806.92	806.84	806.75	806.75	806.77	806.79	806.79	806.78	806.74	806.68	806.61	806.53		806.53	806.56	806.59	806.60	806.59	806.55	806.50	806.42	806.33	
	RIGHT	806.96	806.99	807.01	807.01	806.98	806.94	806.88	806.80	806.71	806.71	806.73	806.75	806.75	806.74	806.70	806.64	806.57	806.49		806.49	806.52	806.55	806.56	806.55	806.52	806.46	806.38	806.29	
G	LEFT	806.68	806.70	806.72	806.72	806.70	806.66	806.60	806.52	806.43	806.43	806.45	806.47	806.47	806.46	806.42	806.37	806.30	806.22		806.22	806.25	806.28	806.29	806.27	806.24	806.18	806.09	806.00	
	RIGHT	806.64	806.66	806.68	806.68	806.66	806.62	806.56	806.48	806.39	806.39	806.41	806.43	806.43	806.42	806.38	806.33	806.26	806.18		806.18	806.21	806.24	806.25	806.23	806.20	806.14	806.05	805.96	
H	LEFT	806.35	806.38	806.40	806.40	806.38	806.34	806.27	806.20	806.11	806.11	806.13	806.15	806.16	806.14	806.11	806.05	805.98	805.91		805.90	805.94	805.96	805.97	805.96	805.91	805.85	805.76	805.66	
	RIGHT	806.31	806.34	806.36	806.36	806.34	806.30	806.23	806.16	806.07	806.07	806.09	806.11	806.12	806.10	806.07	806.01	805.94	805.87		805.86	805.90	805.92	805.93	805.92	805.87	805.81	805.72	805.62	
J	LEFT	806.03	806.06	806.08	806.08	806.06	806.02	805.95	805.88	805.79	805.79	805.82	805.84	805.84	805.83	805.79	805.74	805.67	805.59		805.59	805.62	805.65	805.65	805.63	805.59	805.52	805.43	805.32	
	RIGHT	805.99	806.02	806.04	806.04	806.02	805.98	805.91	805.84	805.75	805.75	805.78	805.80	805.80	805.79	805.75	805.70	805.63	805.55		805.55	805.58	805.61	805.61	805.59	805.55	805.48	805.39	805.28	
K	LEFT	805.71	805.72	805.72	805.71	805.69	805.65	805.60	805.54	805.48	805.47	805.48	805.49	805.48	805.47	805.43	805.39	805.34	805.28		805.27	805.30	805.31	805.30	805.28	805.23	805.16	805.08	804.98	
	FASCIA	805.31	805.33	805.33	805.33	805.31	805.27	805.22	805.16	805.10	805.09	805.10	805.10	805.10	805.08	805.04	805.00	804.94	804.87		804.87	804.88	804.89	804.88	804.84	804.79	804.71	804.61	804.50	

2 SCREED ELEVAIONS

LEFT	809.36	809.38	809.39	809.39	809.37	809.33	809.28	809.22	809.16	809.15	809.17	809.18	809.18	809.16	809.12	809.07	809.01	808.94		808.94	808.96	808.97	808.97	808.96	808.92	808.87	808.80	808.73	
MEDIAN LEFT	808.90	808.92	808.94	808.94	808.93	808.89	808.84	808.77	808.69	808.69	808.71	808.72	808.72	808.70	808.67	808.62	808.55	808.48		808.47	808.50	808.51	808.51	808.50	808.46	808.41	808.34	808.26	
MEDIAN RIGHT	808.86	808.89	808.91	808.91	808.89	808.86	808.80	808.73	808.66	808.65	808.67	808.69	808.69	808.67	808.63	808.58	808.52	808.44		808.44	808.46	808.48	808.48	808.46	808.43	808.37	808.30	808.22	
CONST JOINT	807.57	807.59	807.61	807.61	807.59	807.56	807.50	807.43	807.36	807.35	807.37	807.38	807.38	807.37	807.33	807.28	807.21	807.14		807.13	807.15	807.17	807.17	807.15	807.11	807.05	806.97	806.87	
CENTER EB	807.07	807.09	807.11	807.11	807.09	807.06	807.00	806.93	806.85	806.85	806.87	806.88	806.88	806.86	806.83	806.77	806.71	806.63		806.63	806.65	806.66	806.66	806.64	806.59	806.52	806.42	806.32	
RIGHT	806.43	806.44	806.45	806.44	806.42	806.38	806.34	806.28	806.22	806.21	806.22	806.22	806.21	806.19	806.15	806.11	806.05	805.99		805.98	805.99	805.99	805.98	805.94	805.88	805.80	805.71	805.60	



3 TYPICAL DECK SECTION

(VIEWED LOOKING UP-STATION)

BULKHEAD ELEVATIONS

	ABUT.A					ABUT.B
A	809.37	809.23	809.10	808.98	808.88	808.64
B	809.05	808.93	808.79	808.67	808.57	808.33
C	808.72	808.60	808.47	808.35	808.25	808.02
D	808.39	808.28	808.15	808.03	807.94	807.70
E	808.06	807.96	807.83	807.72	807.62	807.38
F	807.74	807.63	807.51	807.40	807.31	807.06
G	807.41	807.31	807.19	807.08	806.99	806.73
H	807.09	806.99	806.87	806.77	806.68	806.39
J	806.76	806.67	806.55	806.45	806.36	806.05
K	806.44	806.34	806.22	806.11	806.03	805.71

4

TOP OF SLEEPER SLAB ELEVATIONS

	ABUT.A	ABUT.B
LEFT END	809.36	808.73
MEDIAN LEFT	808.90	808.26
MEDIAN RIGHT	808.86	808.22
CONST JOINT	807.57	806.87
CENTER EB	807.07	806.32
RIGHT END	806.43	805.60

5

NOTES:

BOTTOM OF SLAB ELEVATIONS ARE AT RIGHT ANGLES TO THE BEAM CENTERLINE AND ARE BASED ON THE CONDITION THAT THE BEAMS AND DIAPHRAGMS ARE COMPLETELY ERECTED WITH NO OTHER LOADS APPLIED. THESE ELEVATIONS INCLUDE ALLOWANCE FOR DEFLECTION DUE TO FORMS, STEEL REINFORCEMENT, CONCRETE SLAB AND RAILING.

SCREED ELEVATIONS ARE BASED ON THE CONDITION THAT NO SLAB CONCRETE HAS BEEN CAST AND THAT FORMWORK AND STEEL REINFORCEMENT ARE IN PLACE.

SCREED RAILS FOR FINISHING OF STRUCTURAL CONCRETE SHALL BE LOCATED OVER FASCIA BEAMS.

SECTION FOR BOTTOM OF SLAB AND/OR SCREED ELEVATIONS ARE GIVEN ALONG BEAM CENTERLINES FROM CENTERLINE OF BEARING TO CENTERLINE OF BEARING AT EQUAL SPACINGS.

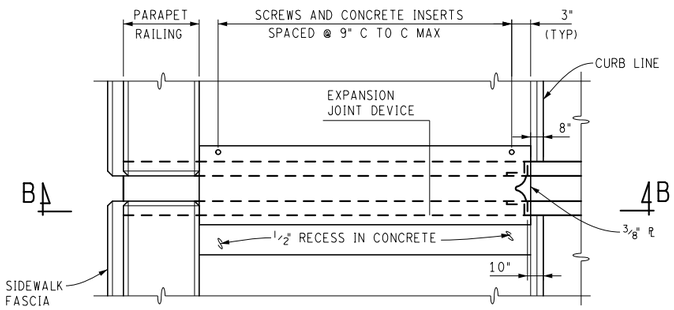
FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

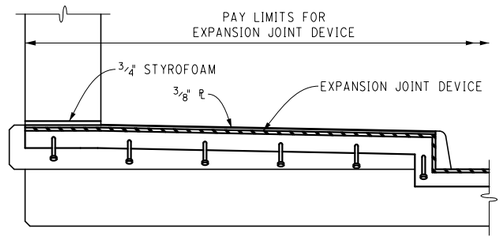
NO SCALE

DRAWN BY: C TECH	DATE: 1/14/15	CS: R02 OF 41043	SLAB AND SCREED DETAILS
CHK'D BY: B ENGR CORR BY: CT	DESIGN UNIT: UNIT	JN: 102973A	
FILE: r02 41043 screed.dgn	TSC:		

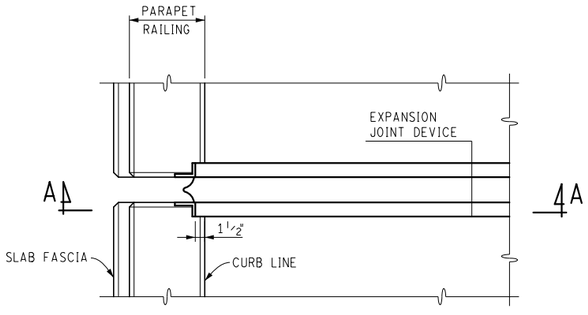
DRAWING: R02 SCREED 001 | SHEET: SECT 2 70



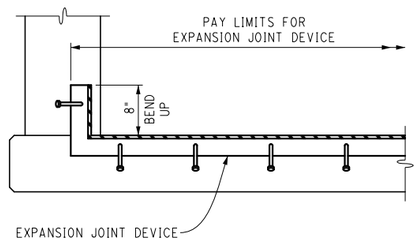
PLAN AT PARAPET RAILING WITH SIDEWALK



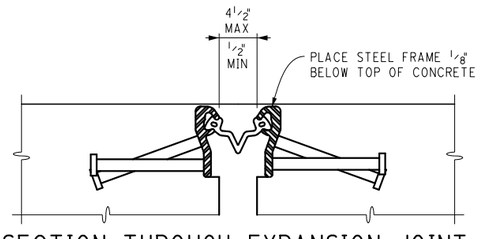
SECTION B – B



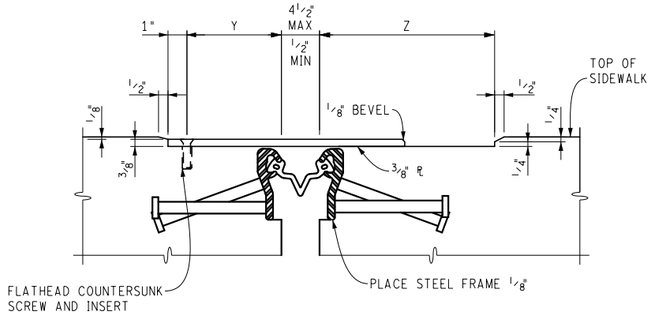
PLAN AT FLUSH MOUNT PARAPET RAILING



SECTION A – A



SECTION THROUGH EXPANSION JOINT



SECTION THROUGH EXPANSION JOINT AND COVER PLATE

WABO STRIP SEAL TYPE M			
TOTAL TRAVEL *	PLATE WIDTH	Y	Z
< 1"	10"	3 3/4"	5 3/4"
1" – 2"	11"	3 3/4"	6 3/4"
2" – 3"	12"	3 3/4"	7 3/4"
> 3"	13"	3 3/4"	8 3/4"

ALL OTHER DEVICES			
TOTAL TRAVEL *	PLATE WIDTH	Y	Z
< 1 1/2"	8"	2 1/2"	5"
1 1/2" – 3 1/2"	10"	2 1/2"	7"
> 3 1/2"	12"	2 1/2"	9"

* SEE TABLE FOR MINIMUM TOTAL TRAVEL ALONG CENTERLINE OF BRIDGE

SIDEWALK SECTIONS

ALL STEEL FOR COVER PLATE SHALL BE AASHTO M270, GRADE 36, MEET THE REQUIREMENTS OF ASTM A786 AND GALVANIZED (ASTM A123).

USE ASTM F 593 (TYPE 304) STAINLESS STEEL 3/4" DIAMETER FLATHEAD COUNTERSUNK SCREWS WITH 3/4" DIAMETER INSERTS.

CAST CURBS AND SIDEWALKS WITH 3/8" SLIDING PLATES IN PLACE TO INSURE THAT INSERTS AND SCREWS ARE ALIGNED PROPERLY. APPLY BOND BREAKER TO SLIDING PLATES PRIOR TO INSTALLATION.

FORM CONCRETE RECESS AREA IN SIDEWALK AND GRIND TO PROVIDE SMOOTH SURFACE. TOOL OR GRIND CONCRETE EDGES TO 1/4" RADIUS. APPLY ONE COAT OF EPOXY RESIN ADHESIVE TO ALLOW BENT SLIDING PLATE TO MOVE FREELY WITHOUT FRICTION. CARE SHALL BE TAKEN SO THAT NO ADHESIVE COMES IN CONTACT WITH ANY PART OF THE EXPANSION JOINT DEVICE OR GLAND. REMOVE ANY FOREIGN PARTICLES FROM THE SURFACE PRIOR TO INSTALLING PLATES.

INSTALL PLATES SO THAT THE SCREWS AND INSERTS ARE SET ON THE HIGH SIDE OF LONGITUDINAL SIDEWALK GRADE.

THE COST OF ALL MATERIALS AND LABOR REQUIRED FOR PROPER INSTALLATION OF THE COVER PLATE IS INCLUDED IN THE PAYMENT FOR THE EXPANSION JOINT DEVICE COVER PLATE.

NOTES:

JOINT TYPES

THE EXPANSION JOINT DEVICE SHALL BE OF A TYPE THAT INCLUDES A CONTINUOUS NEOPRENE (OR EQUIVALENT) SEAL ACROSS THE DECK. UNLESS OTHERWISE NOTED ON THE PLANS, THE CONTRACTOR HAS THE OPTION OF USING ANY OF THE DEVICES LISTED BELOW:

DEVICE	MANUFACTURER
WABO STRIP SEAL – TYPE M	WATSON-BOWMAN & ACME, INC.
WABO STRIP SEAL – TYPE A	WATSON-BOWMAN & ACME, INC.
STEELFLEX-SSA2	D.S. BROWN
STEELFLEX-SSCM	D.S. BROWN
ONFLEX 40 SS	STRUCTURAL RUBBER PRODUCTS CO.

THE MODEL OF THE JOINT TYPE SELECTED SHALL BE SUITABLE TO ACCOMMODATE THE TOTAL MOVEMENT NOTED ON THE PLANS.

COMPLETE WORKING DRAWINGS OF ALL DETAILS OF FABRICATION OF THE EXPANSION JOINT DEVICE SHALL BE SUBMITTED FOR REVIEW IN ACCORDANCE WITH STANDARD SPECIFICATION 104.02. THIS REQUIREMENT IS WAIVED FOR EXPANSION JOINT DEVICES FOR WHICH A SET OF STANDARD INSTALLATION DETAILS HAS BEEN APPROVED. STANDARD INSTALLATION DETAILS CAN BE OBTAINED FROM THE DESIGN DIVISION.

FABRICATION AND INSTALLATION

THE EXPANSION JOINT SHALL BE SHOP FABRICATED TO CONFORM TO THE CONTOUR OF THE BRIDGE DECK, BARRIERS, ETC. IT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS SUBJECT TO NOTES HEREIN AND THE APPROVAL OF THE ENGINEER.

THE TOP OF THE EXPANSION JOINT DEVICE SHALL BE SET 1/8" – 1/4" BELOW THE CONCRETE SLAB (PAVEMENT) WITH A TOLERANCE OF ± 1/8".

THE STEEL ANCHORAGE FOR STRIP SEAL GLANDS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH SUBSECTION 707.03C.17 OF THE STANDARD SPECIFICATIONS.

THE AREA OF THE STEEL ANCHORAGE AND SEALING GLAND WHICH WILL BE IN CONTACT WITH A SEALANT, OR LUBRICANT-ADHESIVE SHALL BE CLEANED WITH TOLUENE OR OTHER APPROVED SOLVENT.

IN THE EVENT THAT SPLICING IS REQUIRED OF THE SEALING GLAND, IT SHALL BE SPLICED BY AN APPROVED METHOD (SUCH AS COLD VULCANIZATION) BY A TRAINED REPRESENTATIVE OF THE MANUFACTURER.

DETAILS AT CURBS OR BARRIERS

THE DETAILS ON THIS SHEET SHOW AN APPROVED MEANS OF TERMINATING THE EXPANSION JOINT DEVICE AT CURBS OR BARRIERS. VARIATIONS OR ALTERNATIVE SCHEMES WILL BE CONSIDERED AND MAY BE USED IF APPROVED BY THE ENGINEER.

MATERIALS

THE COST OF ALL MATERIALS AND LABOR REQUIRED FOR PROPER INSTALLATION OF THE EXPANSION JOINT AND THE TERMINAL ASSEMBLIES AT THE CURBS, SIDEWALKS, OR BARRIERS IS INCLUDED IN THE PAYMENT FOR THE EXPANSION JOINT DEVICE.

STRUCTURE NUMBER	ANGLE OF CROSSING TO NEAREST 10°	LOCATION OF JOINT	MIN. TOT. TRAVEL ALONG CENTERLINE OF BRIDGE *	REQUIRED LENGTH OF EXPANSION JOINT DEVICE
S01-12345	90°	@ N. SLEEPER SLAB	1 1/4"	63.3'
S01-12345	90°	@ S. SLEEPER SLAB	1 1/4"	63.2'

1

QUANTITY		
ITEM	UNIT	AMOUNT
Expansion Joint Device	Ft	127
Expansion Joint Device, Cover Plate	Ft	16

2

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: S01 of 12345	EXPANSION JOINT DETAILS	DRAWING	SHEET
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 12345A	EJ3AA (06-16-2014)	S01 EXPJT 001	SECT 2 71
FILE: s13_82023_expjt.dgn	TSC:				

ABUTMENT A

BAR	DIMENSIONS a	b	c	d	e	f	g	h	j	k	m	p	NO. REQ'D	TOTAL WT.
EA040406	4'-6"												4	12
EA040701	7'-1"												4	19
EA040907	9'-7"												4	26
EA060500	5'-0"												26	195
EA060503	5'-3"												47	371
EA061100	11'-0"												52	859
EA061200	12'-0"												47	847
EA061410	14'-10"												2	45
EA061506	15'-6"												12	279
EA061607	16'-7"												73	1819
EA061906	19'-6"												48	1406
EA063102	31'-2"												24	1123
EA063200	32'-0"												20	961
EA063910	39'-10"												24	1436
EA064000	40'-0"												20	1202
EA071607	16'-7"												116	3932
EB090811	7'-3"	1'-8"											40	1213
EB101005	8'-5"	2'-0"											76	3407
EB101400	12'-0"	2'-0"											84	5060
EB111706	15'-6"	2'-0"											18	1674
EC060807	1'-9"	3'-7"	1'-9"	1'-9"	2'-6"	1'-9"	2'-6"						24	309
ED040506	2'-3"	1'-0"	2'-3"										4	15
ED040802	3'-7"	1'-0"	3'-7"										4	22
ED041008	4'-10"	1'-0"	4'-10"										10	71
ED060706	3'-0"	1'-6"	3'-0"										31	349
												SUBTOTAL:		26,652

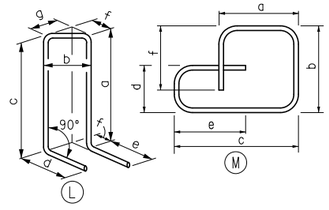
ABUTMENT B

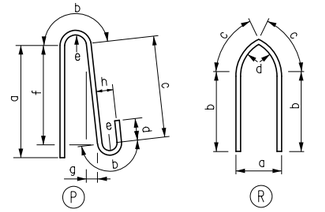
BAR	DIMENSIONS a	b	c	d	e	f	g	h	j	k	m	p	NO. REQ'D	TOTAL WT.
EA040406	4'-6"												4	12
EA040701	7'-1"												4	19
EA040907	9'-7"												4	26
EA060500	5'-0"												26	195
EA060503	5'-3"												47	371
EA061100	11'-0"												52	859
EA061200	12'-0"												47	847
EA061410	14'-10"												2	45
EA061506	15'-6"												12	279
EA061610	16'-10"												73	1846
EA061906	19'-6"												48	1406
EA063102	31'-2"												24	1123
EA063200	32'-0"												20	961
EA063910	39'-10"												24	1436
EA064000	40'-0"												20	1202
EA071610	16'-10"												120	4129
EB090811	7'-3"	1'-8"											44	1334
EB101005	8'-5"	2'-0"											76	3407
EB101400	12'-0"	2'-0"											84	5060

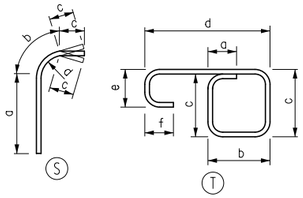
SUPERSTRUCTURE

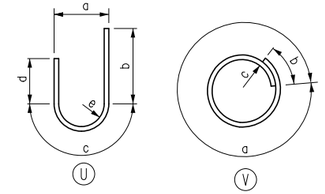
BAR	DIMENSIONS a	b	c	d	e	f	g	h	j	k	m	p	NO. REQ'D	TOTAL WT.
EB111706	15'-6"	2'-0"											18	1674
EC060807	1'-9"	3'-7"	1'-9"	1'-9"	2'-6"	1'-9"	2'-6"						24	309
ED040506	2'-3"	1'-0"	2'-3"										4	15
ED040802	3'-7"	1'-0"	3'-7"										4	22
ED041008	4'-10"	1'-0"	4'-10"										10	71
ED060706	3'-0"	1'-6"	3'-0"										31	349
												SUBTOTAL:		26,997
EA040406	4'-6"												236	710
EA043810	38'-10"												34	882
EA044109	41'-9"												54	1506
EA044206	42'-6"												14	398
EA044409	44'-9"												8	240
EA044700	47'-0"												48	1507
EA050400	4'-0"												24	100
EA054409	44'-9"												47	2194
*EA060400	4'-0"												40	240
EA061906	19'-6"												192	5623
EA063810	38'-10"												44	2566
EA064104	41'-4"												44	2732
*EA080202	2'-2"												8	46
*EA080411	4'-11"												40	525
EA084409	44'-9"												4	478
ED040408	1'-6"	1'-8"	1'-6"										118	368
ED040409	2'-2"	5"	2'-2"										20	63
ED050700	6'-0"	6"	6"										92	672
ED052407	23'-7"	6"	6"										94	2410
EK040911	1'-5 1/2"	2'-3 1/4"	2'-3 1/4"	2'-5 1/2"									8	53
EM040901	1'-0 1/4"	2'-5 1/2"	1'-5 1/2"	1'-7"	1'-0"	1'-6 3/4"							40	243
EP040702	2'-11 3/4"	6 1/4"	2'-10"	3 3/4"	1 1/2"	2'-9 3/4"	3 3/4"	3"					130	623
EZ040502	1'-8 1/2"	3 3/4"	1'-5 1/4"	10"	10 1/2"	0"	10"	1'-2"					130	449
												SUBTOTAL:		24,628

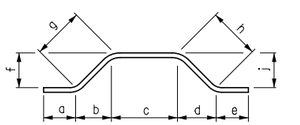
* THREADED

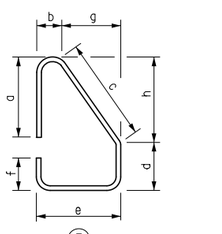


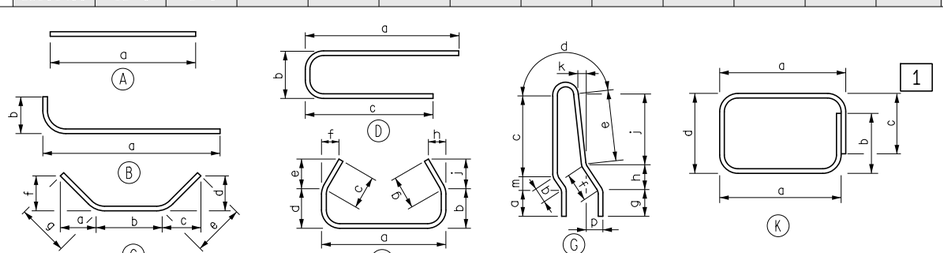












MISCELLANEOUS QUANTITIES

78,277 Lb Reinforcement, Steel, Epoxy Coated

EPOXY COATED
BAR SIZE
BAR LENGTH (FT)
BAR LENGTH (IN)
EA064700
BAR SHAPE

BAR LEGEND

NOTES:

REINFORCEMENT SHALL BE BUNDLED AND TAGGED AS TO THE LOCATION AS SHOWN ON THIS SHEET.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

MDOT Michigan Department of Transportation

NO SCALE

DRAWN BY: C TECH	DATE:	CS: B01-1 OF 82211	STEEL REINFORCEMENT DETAILS
CHK'D BY: B ENGINEER CORR BY: CT	DESIGN UNIT: UNIT	JN: 120062A	
FILE:B01-1 82211 reinf.dgn	TSC:		

DRAWING	SHEET
B01-1 REINF 001	SECT 2 72

FENCE DETAILS

1. Include an elevation for a typical fence section
2. Give details for fence post, baseplate and anchor bolts
3. Include elevation views at expansion joints, light poles, or any other gaps/discontinuities in the fence.

SLAB AND SCREED DETAILS

1. Give bottom of slab elevations at left and right sides of each beam at even intervals along the span.
2. Give screed elevations at each appurtenance, crown point, longitudinal construction joint / stage line, and bridge construction centerline.
3. Show typical locations for slab and screed elevations. Partial deck sections may also be used.
4. Give bulkhead elevations at each transverse construction joint above each beam.
5. Give a table of elevations at the top of sleeper slab for tie in to the adjacent roadway.

EXPANSION JOINT DETAILS

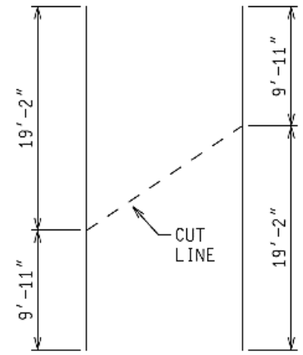
Use the applicable cell from MDOT's current cell library. Remove sidewalk details if not used. This sheet can apply to more than one structure.

1. Fill in length of longitudinal travel required and the length along each expansion joint of for each expansion joint required.
2. Enter total quantity in quantity box.

STEEL REINFORCEMENT DETAILS

1. Show bar diagrams of all bars used in the sheet.
2. Separate bars into groups by substructure unit. Superstructure bars can be separated by deck, sidewalk, barrier, etc. if desired.
3. Provide subtotals for each group of bars.
4. Within each group, sort bars by bend type and arrange in order of increasing total length.
5. Indicate bars to be threaded, or adhesive anchored.
6. Every 5th row is filled in with a block at 90% transparency. The purpose is to help with chart readability.

Fabricators would prefer to have bar of equal length rather than many bars of slightly different length. This can be done by varying lap lengths. When that's not possible, a cut diagram can be used. See the example below.



BAR GROUP AD1
EA062901 (TOTAL 31 BARS)
(QUANTIFIED UNDER WALL A,
USED FOR WALLS A & D)

Place cut diagrams with the Steel Reinforcement Details. When using cut diagrams include the note: "Reinforcement is to be shop cut as shown. The epoxy coating shall be repaired according to the standard specifications."