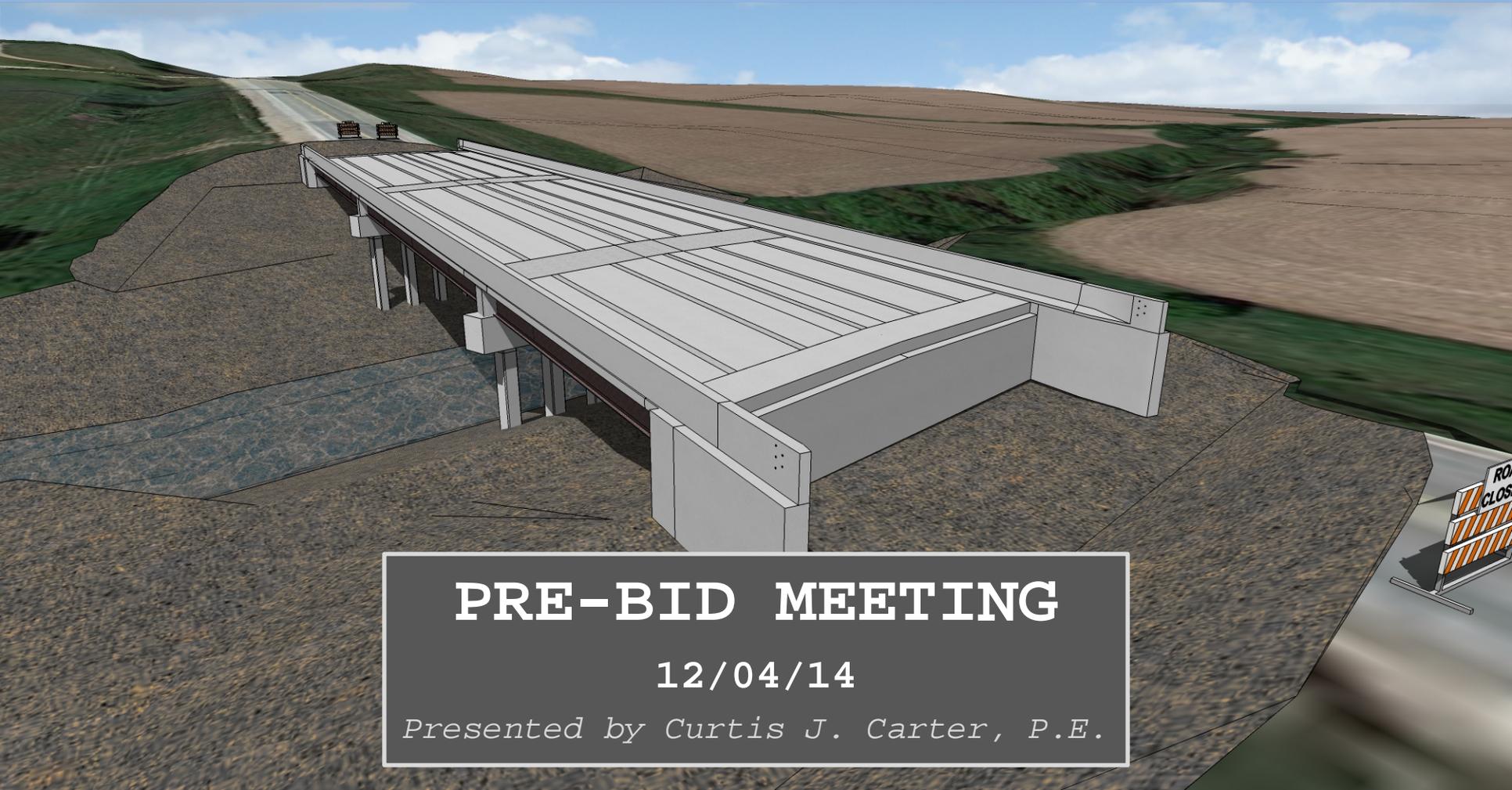


IA-92 OVER LITTLE SILVER CREEK

ACCELERATED BRIDGE CONSTRUCTION PROJECT



PRE-BID MEETING

12/04/14

Presented by Curtis J. Carter, P.E.

MEETING AGENDA:

- FHWA AID Program Overview
- Project Overview
- Highlight Plan Details
- Highlight Plan Addendums (Pending)
- Highlight Special Provisions
- Review Required Submittals
- Review Construction Schedule
- Question & Answer

FHWA AID PROGRAM
ACCELERATED INNOVATION DEPLOYMENT

AID DEMONSTRATION PROJECT:

Project has been awarded FHWA Accelerated Innovation Deployment (AID) Demonstration Grant

- Incentive funding for acceleration of implementation of innovation in highway transportation.
- **Project will be receiving attention on a national level.**

Project Innovations Recognized by AID Program

- **Prefabricated Bridge Elements and Systems** (PBES) for Accelerated Bridge Construction
 - Prefabricated Superstructure Modules
 - Precast Pier Caps
 - Precast Abutment Footings
- **High Performance Materials**
 - Stainless Steel Reinforcing
 - Ultra High Performance Concrete (UHPC)

AID PROGRAM COMMITMENTS:

DOT is committed to the following program requirements:

- Maintain conformance with proposed **accelerated construction modular design concept**
- Provide a **project website** and **live webcam** during construction.
- Provide an **on-site showcase** of innovations, if requested by FHWA.
- Monitor and evaluate the effectiveness of the innovations, including implementation of **laboratory and field testing programs** (in collaboration with Iowa State University).
- Prepare a **final report** after project completion to document the processes, benefits, and lessons learned from implementation of the noted innovations.
- Present and share project details at **conferences and workshops**.
- Conduct a **customer satisfaction survey**.

Contractor shall be required to accommodate the following:

- **Scheduled site visits** by Iowa DOT, FHWA and/or research personnel.
- Installation and maintenance of one or more **job site cameras** (by others).
- **Instrumentation and monitoring** of structural members during/after construction (by others).

PROJECT OVERVIEW

IOWA DOT PROJECT BRF-092-1(64)--38-78

SITE & EXISTING STRUCTURE:

SITE

- IA-92 over Little Silver Creek
- Treynor, IA (15 miles east of Council Bluffs)
- Sag vertical curve road alignment
- Degraded channel, skewed relative to roadway (20°)

EXISTING STRUCTURE

- Constructed in 1953
- 150' x 28' Continuous Concrete Girder Bridge, 0° Skew
- 3-span, frame piers, timber piling
- Plans available from DOT Office of Contracts

IA-92 over
Little Silver Creek



L55

Treynor, IA

Treynor

290th St

© 2014 Google

©2010 Google

Existing 150'-0 x 28'
Continuous Conc. Girder Bridge



92

290th St

WATERWAY OPENING , SPAN 2 , LOOKING UPSTREAM
2/4/10



Looking North

UPSTREAM CHANNEL FROM PIER 1

2/4/10



Looking North

DOWNSTREAM CHANNEL FROM MID SPAN 2
2/4/10



Looking South



EXISTING SITE

ACCELERATED CONST. CONCEPT
PREFABRICATED BRIDGE ELEMENTS & SYSTEMS

ACCELERATED CONSTRUCTION CONCEPT

PREFABRICATE BRIDGE COMPONENTS

- Superstructure modules
- Precast abutment footings & pier caps (optional)
- Components may be constructed at pre-approved casting facility, or in accordance with “Alternate Site Casting” provisions

ASSEMBLE SUBSTRUCTURE

- Drive steel bearing piling
- Assemble/Construct abutment footings and pier caps

ASSEMBLE SUPERSTRUCTURE

- Place superstructure modules
- Connect modules to substructure
- Complete superstructure deck connections

MODULE FABRICATION NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A MODULE FABRICATION PLAN FOR REVIEW AND APPROVAL BY THE ENGINEER. THE MODULE FABRICATION PLAN SHALL MEET THE REQUIREMENTS NOTED IN THE PROJECT SPECIAL PROVISIONS. KEY COMPONENTS OF THE FABRICATION PLAN SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

- NAME AND EXPERIENCE RECORD OF FABRICATOR
- LOCATION AND DESCRIPTION OF FABRICATION SITE
- DESCRIPTION OF PROPOSED EQUIPMENT
- DETAILS OF TEMPORARY SUPPORTS
- SEQUENCE AND SCHEDULE OF FABRICATION OPERATIONS
- DESCRIPTION OF QUALITY CONTROL

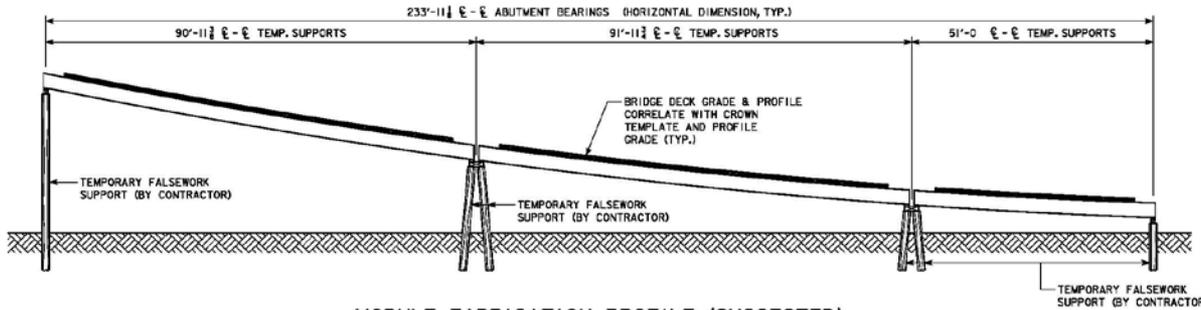
THE CONTRACTOR IS STRONGLY ENCOURAGED TO COMBINE FRAMING / CASTING OPERATIONS FOR ALL MODULES SIMULTANEOUSLY, UNDER TEMPORARY SUPPORT CONDITIONS THAT CORRESPOND WITH THE RELATIVE POSITION (LOCATION AND ELEVATION) OF THE DESIGN BRIDGE SUPERSTRUCTURE SEATS. IOWA DOT HAS COMPLETED A MODULAR BRIDGE PROJECT IN THE PAST (POTTAWATTAMIE DESIGN 11) WHERE THIS FRAMING / CASTING APPROACH WAS DEMONSTRATED SUCCESSFULLY.

THE FOLLOWING IS A SUGGESTED FABRICATION PROCEDURE FOR THE SUPERSTRUCTURE MODULES:

- POSITION ALL STRUCTURAL STEEL FRAMING COMPONENTS FOR ALL MODULES TO CORRESPOND WITH THE RELATIVE LOCATIONS AND ELEVATIONS OF THE FINAL CONSTRUCTED CONDITION. SUPPORT STRUCTURAL STEEL FRAMING COMPONENTS ONLY AT DESIGNATED BEARING LOCATIONS TO ALLOW FOR ACCURATE DEFLECTION OF THE MODULAR UNITS DURING PRECASTING OF THE DECK SECTIONS.
- PLACE MODULE REINFORCING IN ACCORDANCE WITH THE DESIGN PLANS. (PLAN BAR LOCATION WAS DEVELOPED BASED ON OPTIMIZED BAR PLACEMENT BETWEEN ADJACENT MODULES.)
- PLACE CONCRETE FOR ALL MODULES IN ONE COMBINED POUR, USING FORMED BLOCKOUTS AT THE LOCATIONS OF DESIGN CONSTRUCTION JOINTS. CONTROL FINISHED CONCRETE SURFACE TO ACCOUNT FOR THE DESIGN DECK THICKNESS, SKEW, CROWN PROFILE, AND PROFILE GRADE.
- IMPLEMENT QUALITY CONTROL / QUALITY ASSURANCE MEASURES AS NECESSARY TO ENSURE PROPER FIT OF PREFABRICATED SUPERSTRUCTURE MODULES IN THE FINAL ASSEMBLED CONDITION.

DESIGN AND SAFETY OF ALL TEMPORARY SUPPORTS REQUIRED SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. TEMPORARY SUPPORTS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AND ALL TEMPORARY SUPPORTS WITHIN DOT RIGHT-OF-WAY SHALL BE REMOVED BY THE CONTRACTOR PRIOR TO COMPLETION OF THE PROJECT.

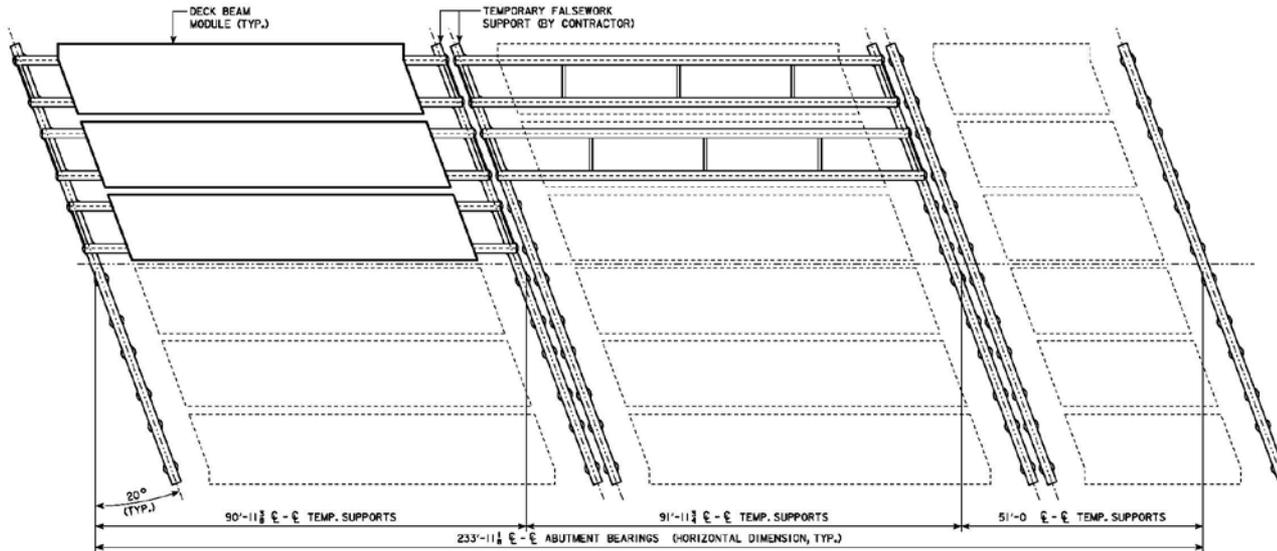
ALL COSTS ASSOCIATED WITH FURNISHING SUPERSTRUCTURE MODULES, INCLUDING TEMPORARY SUPPORTS, FABRICATION, STORAGE AND DELIVERY, SHALL BE INCIDENTAL TO THE INDIVIDUAL PRICE BIDS FOR "SUPERSTRUCTURE MODULE".



MODULE FABRICATION PROFILE (SUGGESTED)

(PROFILE GRADE VERTICAL SCALE EXAGGERATED FOR ILLUSTRATION)
(TEMPORARY SUPPORTS SHOWN FOR ILLUSTRATION ONLY)

REFER TO "GEOMETRIC CONTROL PLAN" FOR PROFILE GRADE AND CROWN TEMPLATE DATA

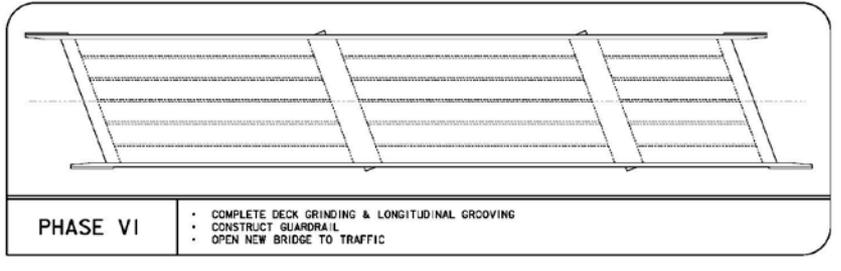
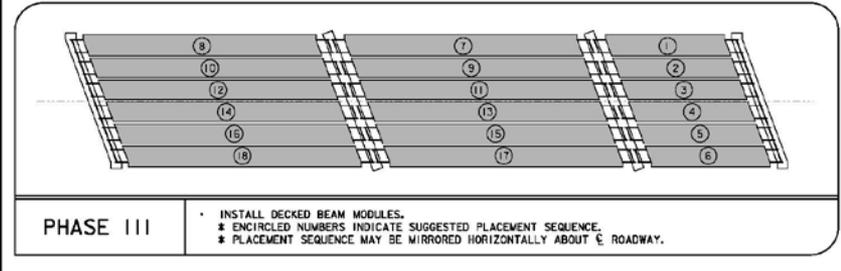
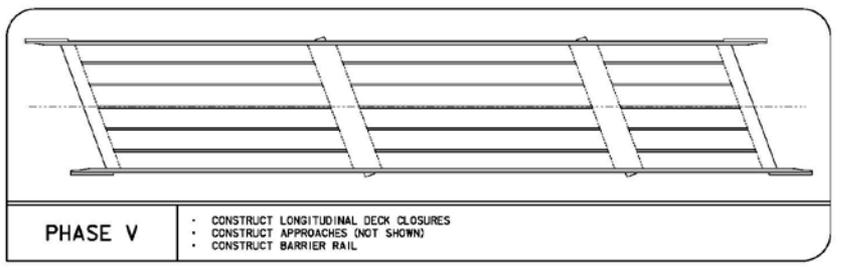
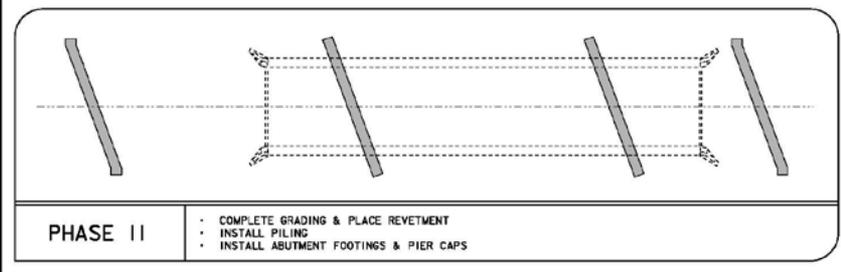
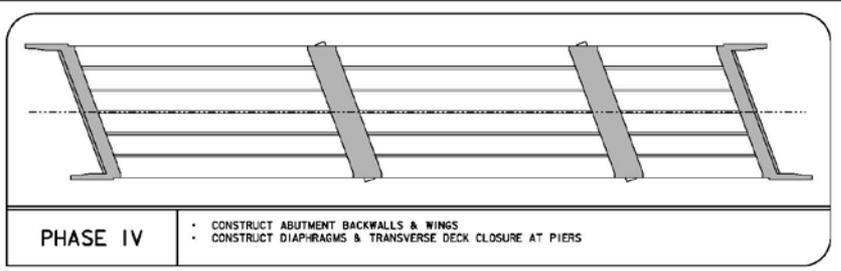
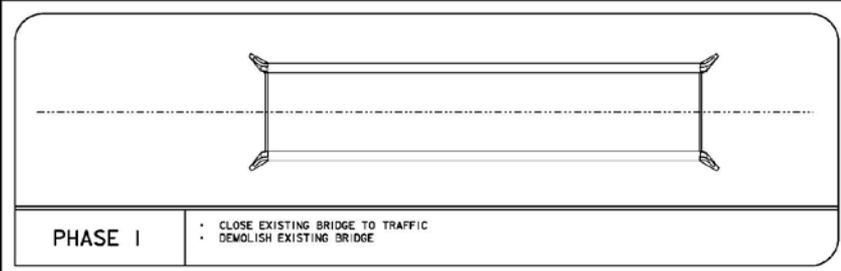


MODULE FABRICATION LAYOUT (SUGGESTED)

(TEMPORARY SUPPORTS SHOWN FOR ILLUSTRATION ONLY)

DESIGN FOR 20° SKEW (R.A.)
234'-0 x 44'-0 MODULAR ROLLED STEEL BEAM BRIDGE
 91'-0 & 51'-0 END SPANS 92'-0 INTERIOR SPAN
FABRICATION PLAN DETAILS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1D OF 5T FILE NO. 30845 DESIGN NO. 115

ALTERNATE SITE CASTING - PLAN DETAILS



SUGGESTED CRITICAL CLOSURE PHASING DIAGRAM

CRITICAL CLOSURE NOTES:

THE CRITICAL ROAD CLOSURE FOR THIS PROJECT IS DEFINED AS THE PERIOD OF TIME THAT IA 92 WILL BE CLOSED TO THROUGH TRAFFIC AT THE PROJECT SITE. THE CRITICAL CLOSURE PERIOD SHALL BE TAKEN AS THE AMOUNT OF CONSECUTIVE CALENDAR DAYS FROM THE START OF ROAD CLOSURE UNTIL THE DATE THAT THE ROADWAY IS PERMANENTLY REOPENED TO THROUGH TRAFFIC. THE SCHEDULED CRITICAL CLOSURE FOR THIS PROJECT IS 21 CALENDAR DAYS.

THE CONTRACTOR IS ENCOURAGED TO COMPLETE THE EXTENT OF WORK THAT IS SAFELY PRACTICABLE OUTSIDE OF THE CRITICAL CLOSURE WINDOW, WHILE MAINTAINING THROUGH TRAFFIC ON IA 92. THE CONTRACTOR MAY PROPOSE LIMITED TRAFFIC CONTROL BEFORE AND/OR AFTER THE CRITICAL CLOSURE PERIOD TO FACILITATE SPECIFIC CONSTRUCTION ACTIVITIES, SUBJECT TO REVIEW AND APPROVAL BY THE DOT. CONTRACTOR SHALL NOTE THAT APPROVAL OF TRAFFIC CONTROL BEFORE AND/OR AFTER THE CRITICAL CLOSURE WINDOW IS NOT (GUARANTEED.) PROPOSED TRAFFIC CONTROL BEFORE AND/OR AFTER CRITICAL CLOSURE WINDOW SHALL MAINTAIN AT LEAST ONE OPEN LANE AT ALL TIMES.

DESIGN FOR 20° SKEW (R.A.)
234'-0 x 44'-0 MODULAR ROLLED STEEL BEAM BRIDGE
 91'-0 & 51'-0 END SPANS 92'-0 INTERIOR SPAN
CRITICAL CLOSURE PLAN
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 9 OF 57 FILE NO. 30846 DESIGN NO. 115

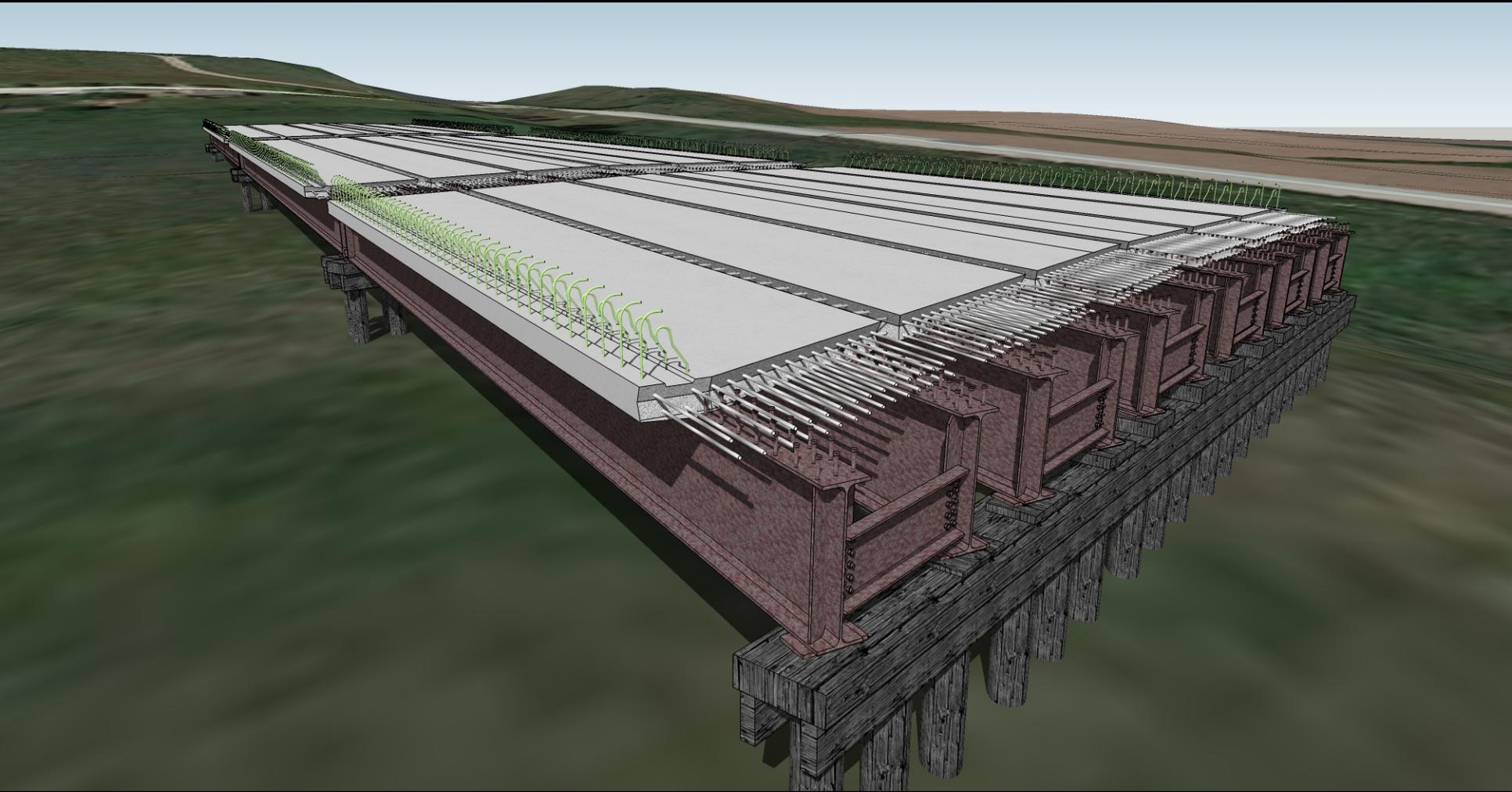
SUGGESTED CONST. SEQUENCE - PLAN DETAILS



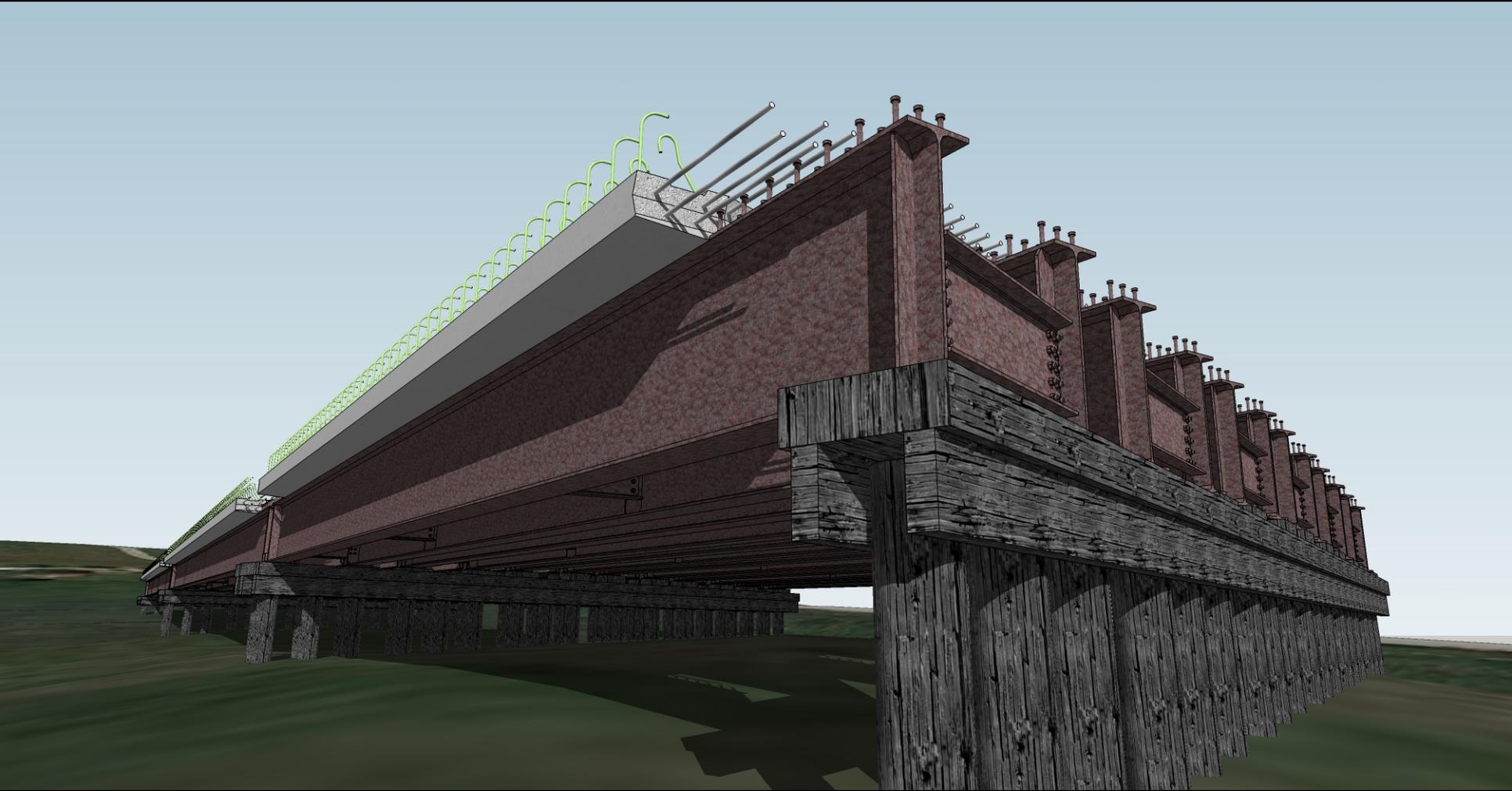
EXAMPLE ALTERNATE SITE MODULE CONSTRUCTION



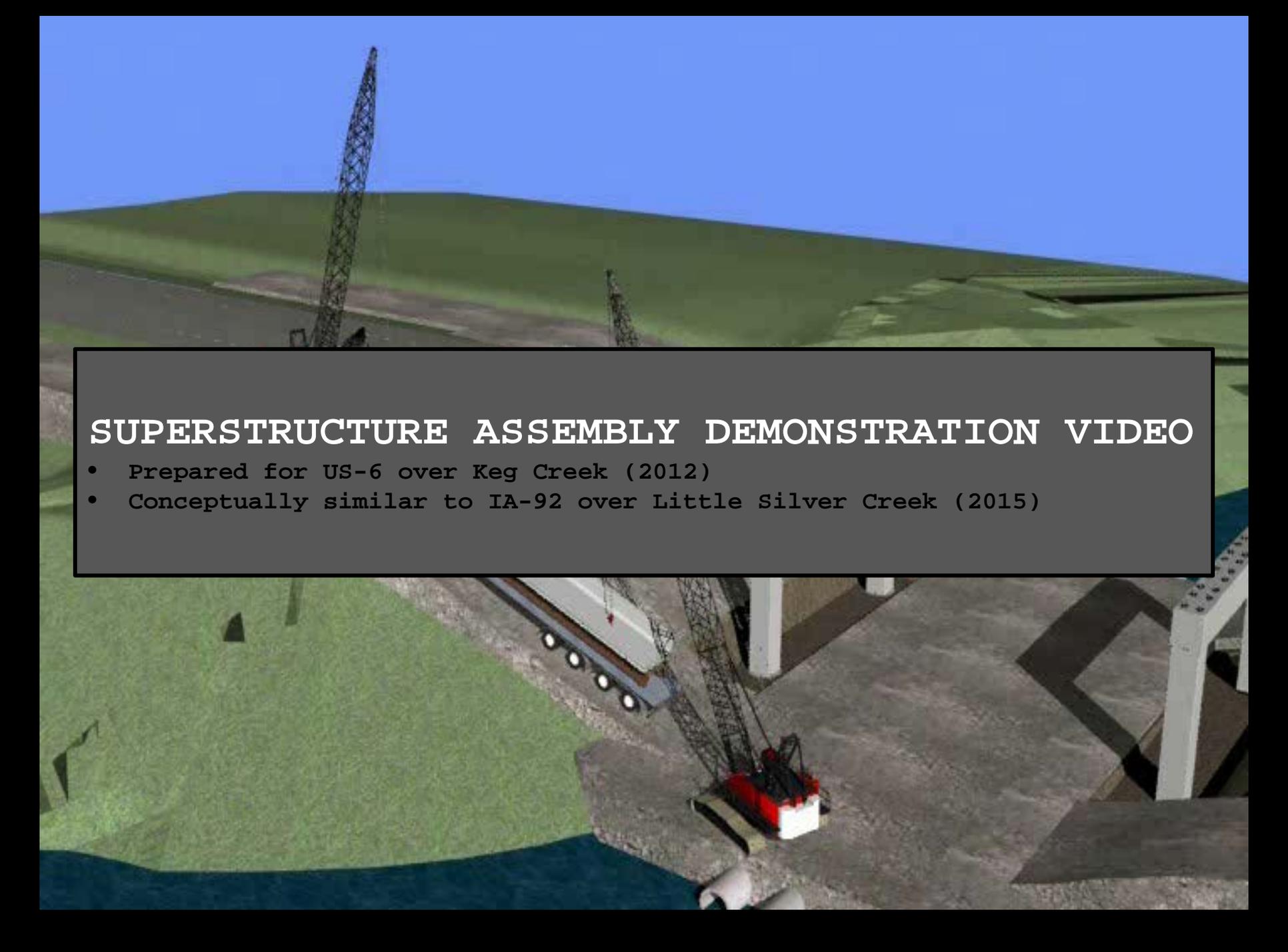
EXAMPLE ALTERNATE SITE MODULE CONSTRUCTION



EXAMPLE TEMPORARY FALSEWORK



EXAMPLE TEMPORARY FALSEWORK

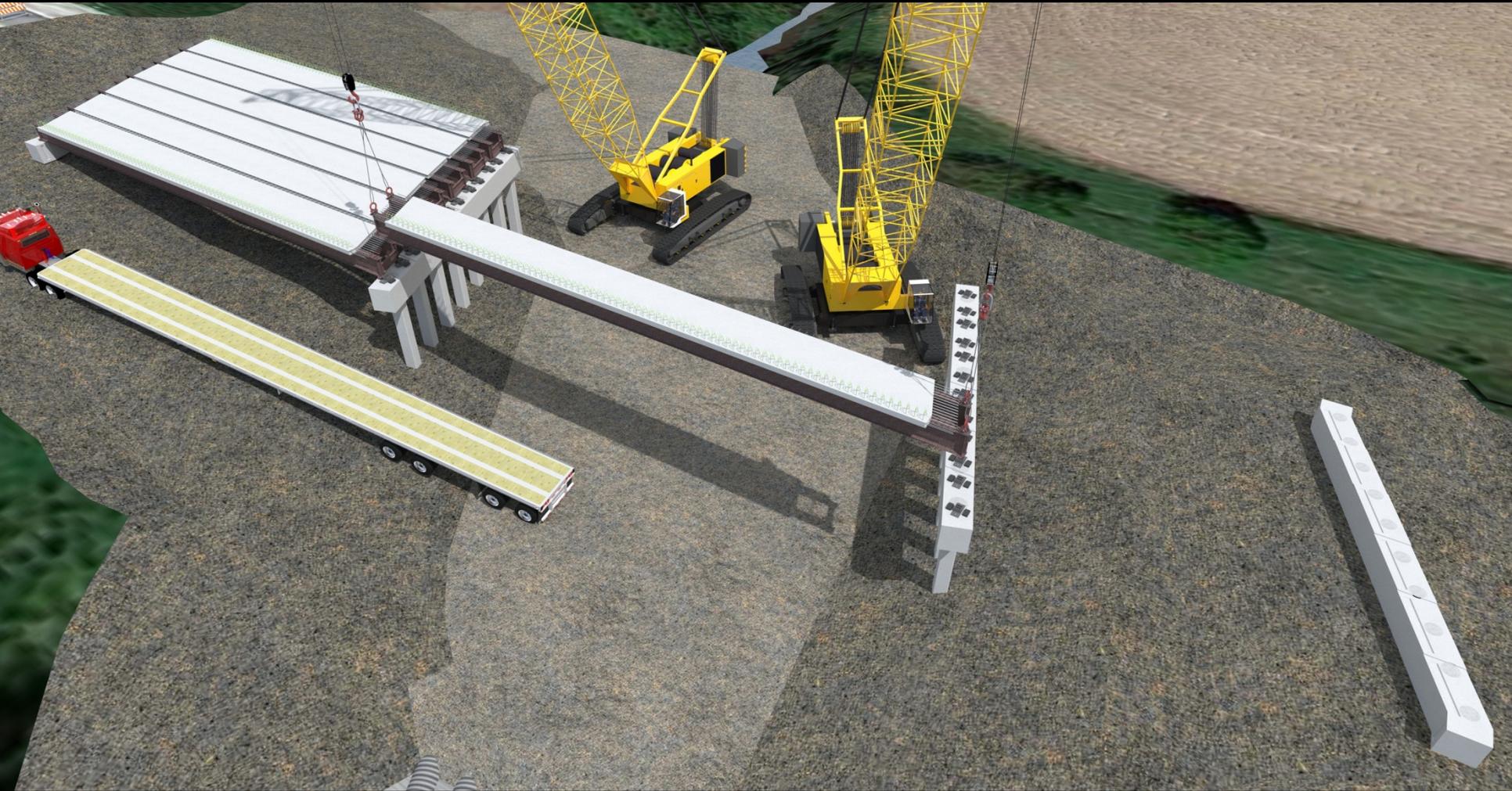


SUPERSTRUCTURE ASSEMBLY DEMONSTRATION VIDEO

- Prepared for US-6 over Keg Creek (2012)
- Conceptually similar to IA-92 over Little Silver Creek (2015)



SUPERSTRUCTURE MODULE PLACEMENT



SUPERSTRUCTURE MODULE PLACEMENT

PLAN DETAIL HIGHLIGHTS

IOWA DOT PROJECT BRF-092-1(64)-38-87

PLAN DETAIL HIGHLIGHTS:

ABUTMENTS

- Relatively **conventional design** with simplified geometry for accelerated construction
- Pile **prebore** will be required
- **Precast or cast-in-place** footings will be permissible.

PIERS

- Conventional pile bent design with **increased pile size** due to relatively large unbraced length under scour conditions.
- Pile encasement may be constructed during or after critical closure.
- Large pile section will require **special weld certification** for field splices.

SUPERSTRUCTURE MODULES

- Module consists of two beams with a section of precast deck.
- Module framing is standardized, but each module will have unique reinforcing layout and field haunch.
- Anticipated pick weights less than 100,000 lbs. **Contractor shall be responsible for lifting/handling design.**
- **Contractor shall be responsible for stability** of structure during all phases of assembly and construction.

PLAN DETAIL HIGHLIGHTS:

TRANSVERSE DECK JOINTS

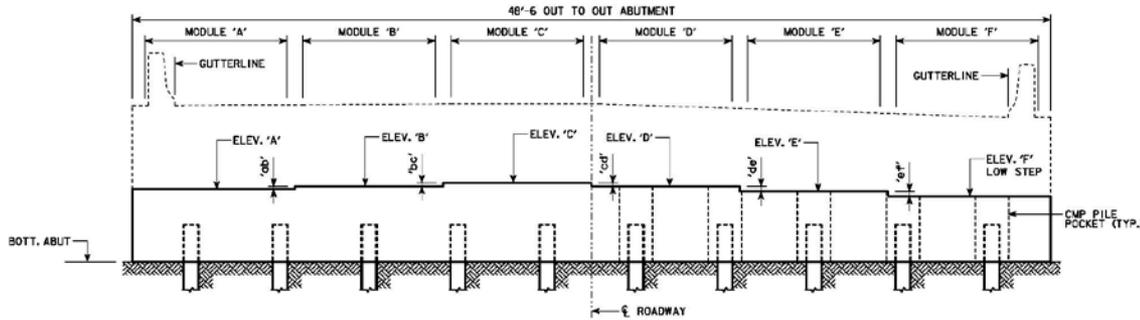
- Wide joints cast with **conventional (high performance) concrete**.
- Deck joint is monolithic with beam end diaphragm to provide secure transverse connection of modules.
- **Compression block detail** employed at piers in effort to develop live load continuity.

LONGITUDINAL DECK JOINTS

- Narrow (10") keyed **Ultra High Performance Concrete** joint.
- Special joint interface preparation is required (ICRI **Concrete Surface Profile 6** or rougher).
- Special **care required during forming and placement** of UHPC.

DECK GRINDING

- Entire deck surface shall be ground as to provide correct grade profile and smooth riding surface.
- Care shall be required in **selection of grinding equipment** to ensure compatibility with UHPC materials.



**HALF ELEVATION
CAST-IN-PLACE FOOTING OPTION SHOWN**
(LOOKING EAST, PREBORE NOT SHOWN)
(PILE ILLUSTRATED FOR W. ABUTMENT, E. ABUTMENT DIFFERS)

**HALF ELEVATION
PRECAST FOOTING OPTION SHOWN**
(LOOKING EAST, PREBORE NOT SHOWN)
(PILE ILLUSTRATED FOR W. ABUTMENT, E. ABUTMENT DIFFERS)

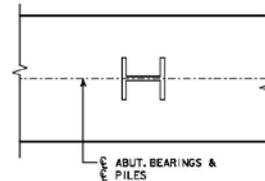
FOOTING ELEVATIONS		
LOCATION	W. ABUT.	E. ABUT.
LOW STEP (ELEV. 'F')	1103.60	1098.32
BOTTOM FOOTING	1100.10	1094.82
BOTTOM PREBORE	1090.10	1084.82

BEAM SEAT ELEV.		
LOCATION	W. ABUT.	E. ABUT.
ELEV. 'A'	1104.25	1098.43
ELEV. 'B'	1104.28	1098.56
ELEV. 'C'	1104.32	1098.70
ELEV. 'D'	1104.14	1098.67
ELEV. 'E'	1103.87	1098.49
ELEV. 'F'	1103.60	1098.32

FTG. STEP HEIGHT		
STEP	W. ABUT.	E. ABUT.
'ab'	1 1/2	1 1/2
'bc'	1 1/2	1 1/2
'cd'	2 1/2	3
'de'	3 1/2	2 1/2
'ef'	3 1/2	2 1/2

NOTE: BEAM SEAT ELEVATION AND FOOTING STEP HEIGHT ARE THE SAME FOR CAST-IN-PLACE AND PRECAST ABUTMENT FOOTINGS.

EST. QUANTITIES - TWO ABUT. FTGS.				
ITEM	UNIT	W. ABUT.	E. ABUT.	TOTAL
BRIDGE ABUTMENT FOOTING	LS	1.0	1.0	2.0
PREBORED HOLES	LF	120	100	220
PILES, STEEL, HP 10 x 57	LF	1200	1000	2200



PILE ORIENTATION DETAIL
(ORIENT PILE AS SHOWN)

ABUTMENT GENERAL NOTES:

ABUTMENTS FOR THIS PROJECT SHALL CONSIST OF INTEGRAL ABUTMENTS AS DETAILED IN THESE PLANS. THE CONTRACTOR MAY ELECT TO CONSTRUCT ABUTMENTS WITH CAST-IN-PLACE OR PRECAST CONCRETE FOOTINGS, AS DETAILED.

THE LUMP SUM PRICE BID FOR "BRIDGE ABUTMENT FOOTING" SHALL INCLUDE ALL COSTS OF MATERIALS AND LABOR FOR CONSTRUCTION OF ABUTMENT FOOTINGS, INCLUDING CAST-IN-PLACE AND PRECAST HIGH PERFORMANCE STRUCTURAL CONCRETE, SELF-CONSOLIDATING STRUCTURAL CONCRETE, REINFORCING STEEL, MECHANICAL SPLICE ASSEMBLIES, GALVANIZED STEEL CMP, LIFTING DEVICES, PREPARED BEARING PAD, LEVELING DEVICES, SUBDRAINS AND ABUTMENT BACKFILL, AS REQUIRED (REFER TO DESIGN SHEETS 54 AND 55 FOR SUBDRAIN AND BACKFILL DETAILS).

PILE NOTES:

THE CONTRACT LENGTH OF THE ABUTMENT PILES IS BASED ON THE DESIGN PARAMETERS LISTED IN THE "ABUTMENT PILE DESIGN (LRFD)" TABLE.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR ABUTMENT PILES AT END OF DRIVE (EOD) IS BASED ON THE PARAMETERS LISTED IN THE "ABUTMENT PILE CONST. CONTROL (LRFD)" TABLE. NOMINAL AXIAL BEARING RESISTANCE VALUES ARE BASED ON SOIL ELEVATION EQUAL TO THE BOTTOM OF FOOTING ELEVATION AT THE TIME OF PILE DRIVING.

ABUTMENT PILES SHALL BE DRIVEN UNTIL REQUIRED NOMINAL AXIAL BEARING RESISTANCE IS ACHIEVED AND THE PILES EXCEED THE MINIMUM DRIVING LENGTH NOTED IN THE TABLE MEASURED FROM TOP OF PILE, AS EMBEDDED IN FOOTING. THESE REQUIREMENTS SUPERSEDE THE REQUIREMENTS NOTED IN SECTION 2501.03.0,2 OF THE STANDARD SPECIFICATIONS. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH. PILE DRIVING OPERATIONS SHALL CEASE AND THE ENGINEER SHALL BE CONTACTED IF PILES REACH PRACTICAL REFUSAL PRIOR TO ACHIEVING THE MINIMUM DRIVING LENGTH.

ABUTMENT PILE DESIGN (LRFD)		
DESIGN PARAMETER	W. ABUT.	E. ABUT.
SOIL CLASSIFICATION	COHESIVE	COHESIVE
GEOTECH. RESIST. FACTOR, "PHI" - SOIL	0.65	0.65
TOTAL FACTORED AXIAL LOAD, "PUP" (KIPS)	137	137
NO. PILES	12	10
PILE TYPE (STEEL HP-SECTION)	HP 10 x 57	HP 10 x 57
CONTRACT LENGTH (FT)	100	100

ABUTMENT PILE CONST. CONTROL (LRFD)		
DESIGN PARAMETER	W. ABUT.	E. ABUT.
SOIL CLASSIFICATION	COHESIVE	COHESIVE
GEOTECH. RESIST. FACTOR, "PHI" - SOIL	0.65	0.65
NOMINAL AXIAL BEARING RESISTANCE (TONS)	105	105
MINIMUM DRIVING LENGTH (FT)	80	80

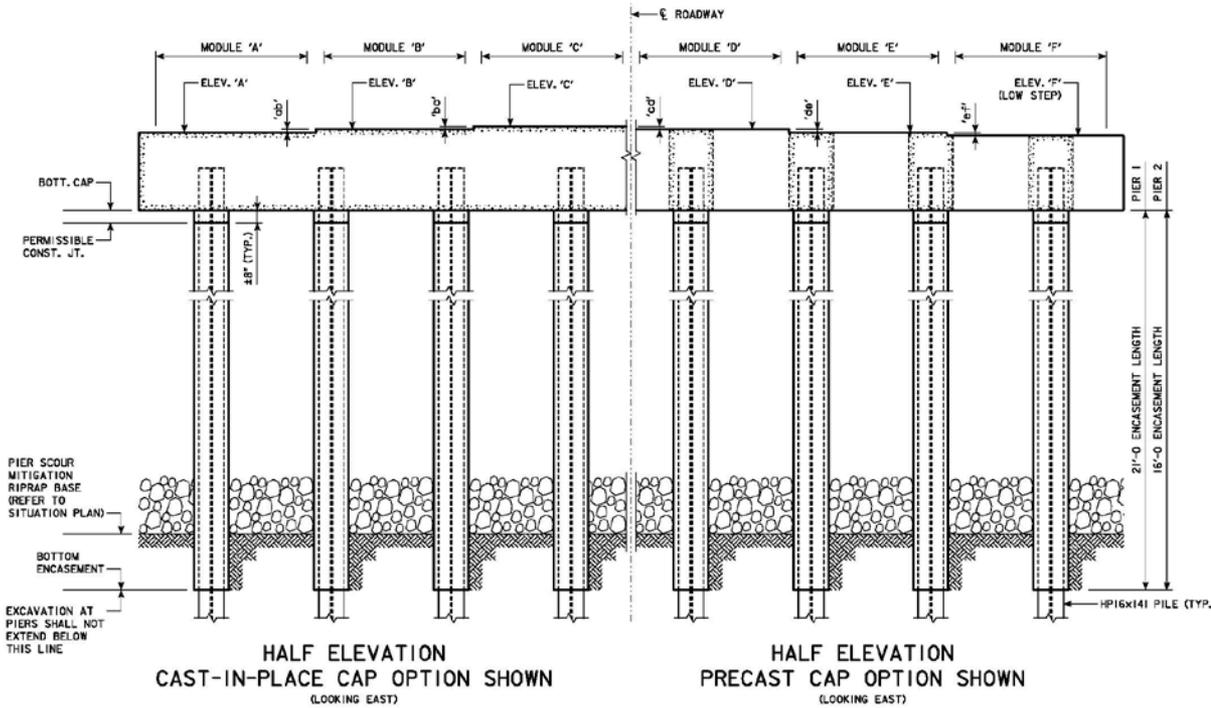
THIS PROJECT USES LOAD AND RESISTANCE FACTOR DESIGN (LRFD) METHODOLOGY FOR DETERMINING PILE CONTRACT LENGTH AND NOMINAL AXIAL BEARING RESISTANCE. NOMINAL AXIAL BEARING RESISTANCES WILL BE LARGER THAN BEARING VALUES IN THE PAST, BUT CONSTRUCTION CONTROL BLOW COUNTS WILL BE APPROXIMATELY THE SAME. A WEAP ANALYSIS AND BEARING GRAPH WILL BE PROVIDED BY THE OFFICE OF CONSTRUCTION THAT GIVES THE RELATIONSHIP BETWEEN REQUIRED NOMINAL AXIAL BEARING RESISTANCE AND BLOW COUNT.

FOR THE CONTRACTOR'S BIDDING PURPOSES, PARTICULARLY FOR SIZING OF THE PILE DRIVING HAMMER, THE APPROXIMATE PREVIOUS DESIGN METHODOLOGY BEARING VALUES AT END OF DRIVE (EOD) ARE GIVEN BELOW. THESE VALUES SHALL NOT BE USED FOR CONSTRUCTION CONTROL AND ARE GIVEN ONLY FOR COMPARATIVE PURPOSES.

APPROXIMATE BEARING USING PREVIOUS DESIGN METHODOLOGY:
W. ABUT: 47 TONS
E. ABUT: 47 TONS

DESIGN FOR 20° SKEW (R.A.)
**234'-0 x 44'-0 MODULAR
ROLLED STEEL BEAM BRIDGE**
91'-0 & 51'-0 END SPANS 92'-0 INTERIOR SPAN
ABUTMENT FOOTING DETAILS
STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 19 OF 57 FILE NO. 30846 DESIGN NO. 115

ABUTMENTS - PLAN DETAILS



HALF ELEVATION
CAST-IN-PLACE CAP OPTION SHOWN
(LOOKING EAST)

HALF ELEVATION
PRECAST CAP OPTION SHOWN
(LOOKING EAST)

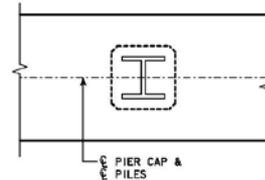
PIER ELEVATIONS		
LOCATION	PIER 1	PIER 2
LOW STEP (ELEV. 'F')	1100.59	1098.79
BOTTOM CAP	1096.59	1094.79
BOTTOM ENCASUREMENT	1075.59	1078.79

BEAM SEAT ELEV.		
LOCATION	PIER 1	PIER 2
ELEV. 'A'	1101.03	1099.02
ELEV. 'B'	1101.10	1099.13
ELEV. 'C'	1101.18	1099.24
ELEV. 'D'	1101.06	1099.18
ELEV. 'E'	1100.82	1098.99
ELEV. 'F'	1100.59	1098.79

CAP STEP HEIGHT		
STEP	PIER 1	PIER 2
'ab'	1 1/2	1 1/2
'bc'	1 1/2	1 1/2
'cd'	1 1/2	1 1/2
'de'	2 1/2	2 1/2
'ef'	2 1/2	2 1/2

NOTE: BEAM SEAT ELEVATION AND CAP STEP HEIGHT ARE THE SAME FOR CAST-IN-PLACE AND PRECAST PIER CAPS.

EST. QUANTITIES - TWO BRIDGE PIERS				
ITEM	UNIT	PIER 1	PIER 2	TOTAL
BRIDGE PIER CAP	LS	1.0	1.0	2.0
CONCRETE PILE ENCASUREMENT	LF	168	128	296
PILES, STEEL, HP 16 x 141	LF	960	920	1880



PILE ORIENTATION DETAIL
(ORIENT PILE AS SHOWN)

PIER GENERAL NOTES:

BRIDGE PIERS FOR THIS PROJECT SHALL CONSIST OF PILE BENT PIERS AS DETAILED IN THESE PLANS. THE CONTRACTOR MAY ELECT TO CONSTRUCT PIERS WITH CAST-IN-PLACE OR PRECAST CONCRETE CAPS, AS DETAILED.

NOTE THAT PIER STABILITY DURING CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. TEMPORARY SUPPORTS/BRACING MAY BE REQUIRED. REFER TO PROJECT SPECIAL PROVISIONS AND "TEMPORARY SUPPORTS/BRACING" NOTES WITH THE ASSEMBLY PLAN DETAILS IN THESE PLANS.

THE LUMP SUM PRICE BID FOR "BRIDGE PIER CAP" SHALL INCLUDE ALL COSTS OF MATERIALS AND LABOR FOR CONSTRUCTION OF PIER CAPS, INCLUDING CAST-IN-PLACE AND PRECAST HIGH PERFORMANCE STRUCTURAL CONCRETE, SELF-CONSOLIDATING STRUCTURAL CONCRETE, REINFORCING STEEL, GALVANIZED STEEL CWP, LIFTING DEVICES, LEVELING DEVICES, ANCHOR BOLT ASSEMBLIES AND ANCHOR BOLT GROUT, AS REQUIRED.

PILE NOTES:

THE CONTRACT LENGTH OF THE PIER PILES IS BASED ON THE DESIGN PARAMETERS LISTED IN THE "PIER PILE DESIGN (LRFD)" TABLE.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER PILES AT END OF DRIVE (EOD) IS BASED ON THE PARAMETERS LISTED IN THE "PIER PILE CONST. CONTROL (LRFD)" TABLE. NOMINAL AXIAL BEARING RESISTANCE VALUES ARE BASED ON SOIL ELEVATION EQUAL TO THE BOTTOM OF ENCASUREMENT ELEVATION AT THE TIME OF PILE DRIVING.

PIER PILES SHALL BE DRIVEN UNTIL REQUIRED NOMINAL AXIAL BEARING RESISTANCE IS ACHIEVED AND THE PILES EXCEED THE MINIMUM DRIVING LENGTH NOTED IN THE TABLE. MEASURED FROM "TOP" OF PILE, AS EMBEDDED IN CAP. THESE REQUIREMENTS SUPERSEDE THE REQUIREMENTS NOTED IN SECTION 2501.03.02 OF THE STANDARD SPECIFICATIONS. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH. PILE DRIVING OPERATIONS SHALL CEASE AND THE ENGINEER SHALL BE CONTACTED IF PILES REACH PRACTICAL REFUSAL PRIOR TO ACHIEVING THE MINIMUM DRIVING LENGTH.

PIER PILE DESIGN (LRFD)		
DESIGN PARAMETER	PIER 1	PIER 2
SOIL CLASSIFICATION	COHESIVE	COHESIVE
GEOTECH. RESIST. FACTOR, "PHI" - SOIL	0.65	0.65
TOTAL FACTORED AXIAL LOAD, "PLU" (KIPS)	295	295
NO. PILES	8	8
PILE TYPE (STEEL HP-SECTION)	HP 16 X 141	HP 16 X 141
CONTRACT LENGTH (FT)	120	115

PIER PILE CONST. CONTROL (LRFD)		
DESIGN PARAMETER	PIER 1	PIER 2
SOIL CLASSIFICATION	COHESIVE	COHESIVE
GEOTECH. RESIST. FACTOR, "PHI" - SOIL	0.65	0.65
NOMINAL AXIAL BEARING RESISTANCE (TONS)	233	235
MINIMUM DRIVING LENGTH (FT)	80	80

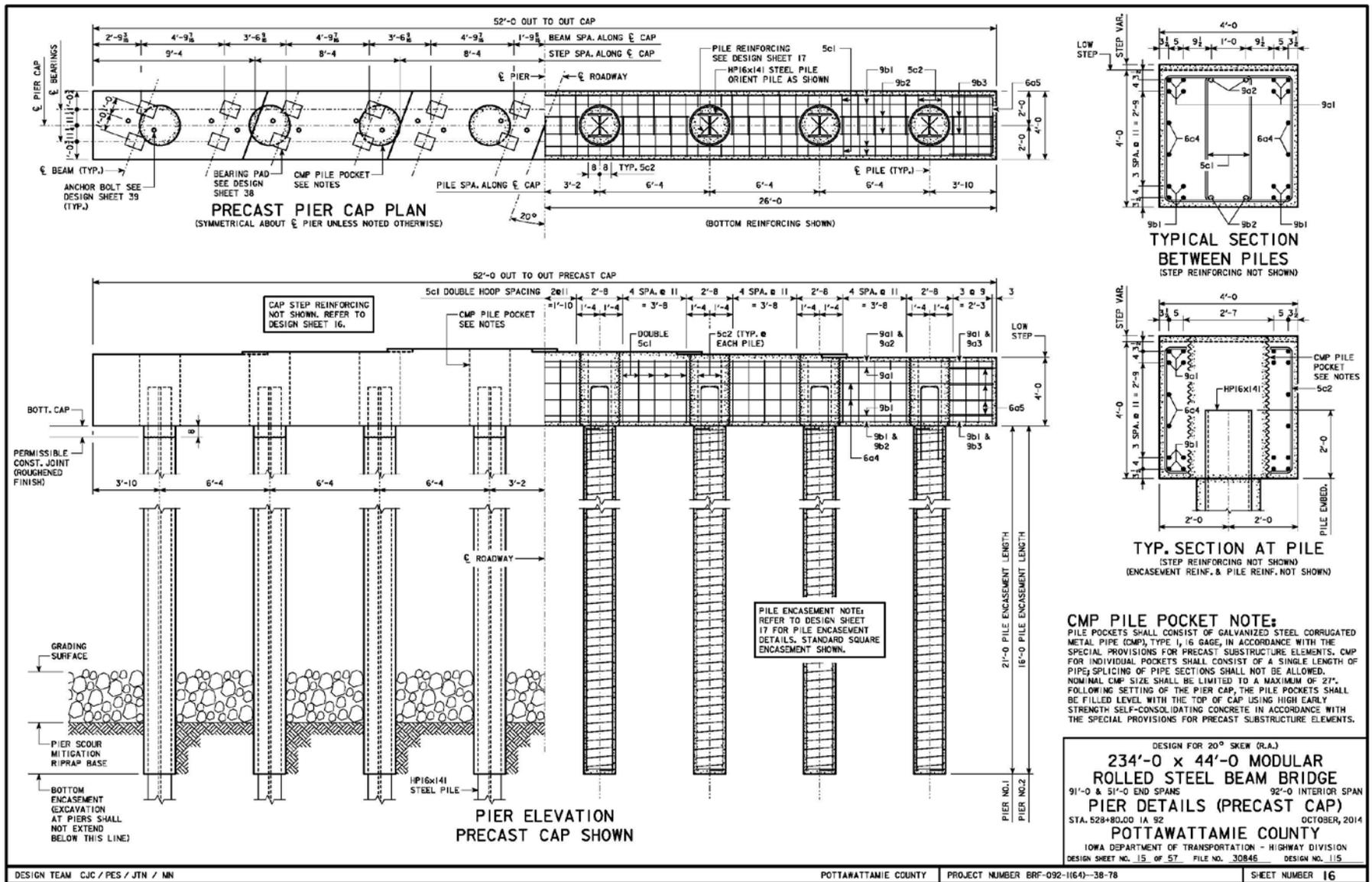
THIS PROJECT USES LOAD AND RESISTANCE FACTOR DESIGN (LRFD) METHODOLOGY FOR DETERMINING PILE CONTRACT LENGTH AND NOMINAL AXIAL BEARING RESISTANCE. NOMINAL AXIAL BEARING RESISTANCES WILL BE LARGER THAN BEARING VALUES IN THE PAST, BUT CONSTRUCTION CONTROL BLOW COUNTS WILL BE APPROXIMATELY THE SAME. A WEAP ANALYSIS AND BEARING GRAPH WILL BE PROVIDED BY THE OFFICE OF CONSTRUCTION THAT GIVES THE RELATIONSHIP BETWEEN REQUIRED NOMINAL AXIAL BEARING RESISTANCE AND BLOW COUNT.

FOR THE CONTRACTOR'S BIDDING PURPOSES, PARTICULARLY FOR SIZING OF THE PILE DRIVING HAMMER, THE APPROXIMATE PREVIOUS DESIGN METHODOLOGY BEARING VALUES AT END OF DRIVE (EOD) ARE GIVEN BELOW. THESE VALUES SHALL NOT BE USED FOR CONSTRUCTION CONTROL AND ARE GIVEN ONLY FOR COMPARATIVE PURPOSES.

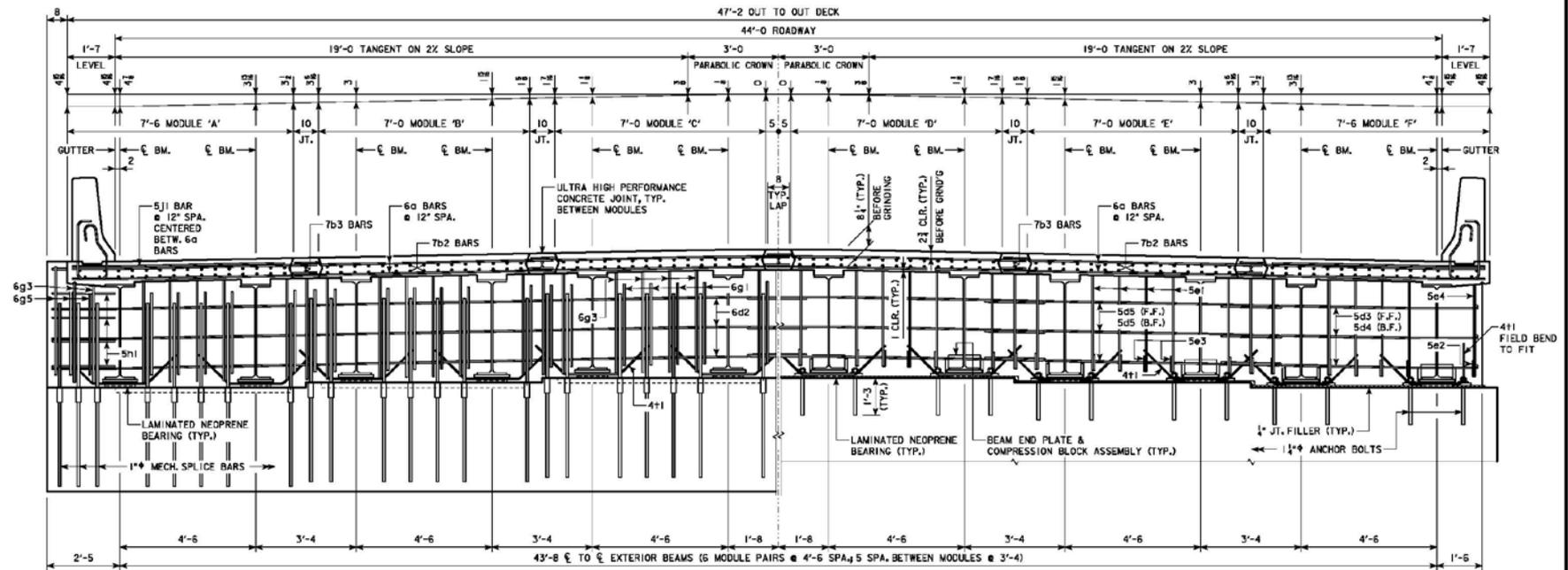
APPROXIMATE BEARING USING PREVIOUS DESIGN METHODOLOGY:
PIER 1: 102 TONS
PIER 2: 102 TONS

DESIGN FOR 20° SKEW (R.A.)
234'-0 x 44'-0 MODULAR ROLLED STEEL BEAM BRIDGE
91'-0 & 51'-0 END SPANS 92'-0 INTERIOR SPAN
PIER DETAILS
STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 12 OF 57 FILE NO. 30845 DESIGN NO. 115

PIERS - PLAN DETAILS



PIERS - PLAN DETAILS



HALF SECTION THROUGH MODULAR DECK NEAR ABUTMENT
(LOOKING EAST, STIFFENERS & STEEL DIAPHRAGMS NOT SHOWN)

HALF SECTION THROUGH MODULAR DECK NEAR PIER
(LOOKING EAST, STIFFENERS & STEEL DIAPHRAGMS NOT SHOWN)

SUPERSTRUCTURE NOTES:

THE BRIDGE DECK AS SHOWN INCLUDES 1/2" SACRIFICIAL SURFACE FOR DECK GRINDING, PLUS 1/2" INTEGRAL WEARING SURFACE.

THE ABUTMENT BACKWALL AND PIER DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHICALLY WITH THE TRANSVERSE BRIDGE DECK CLOSURES.

COST OF ALL PREFORMED JOINT FILLER MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "HIGH PERFORMANCE STRUCTURAL CONCRETE".

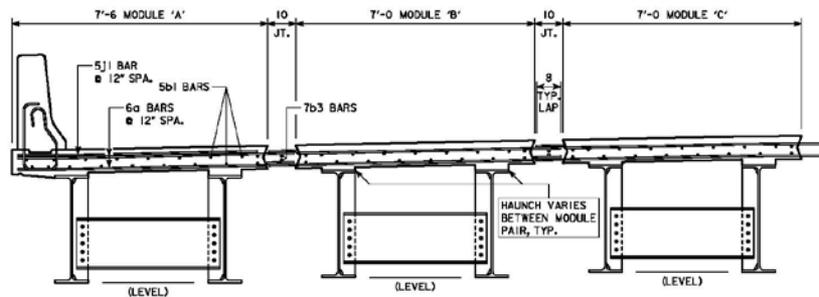
ALL BEAMS ARE TO BE SET VERTICAL

FORMS FOR THE BRIDGE DECK AND BARRIER RAIL ARE TO BE SUPPORTED BY THE STEEL BEAMS.

CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

ALL DECK AND DIAPHRAGM REINFORCING IS TO BE WIRED IN PLACE AND ADEQUATELY SUPPORTED BEFORE CONCRETE IS PLACED.

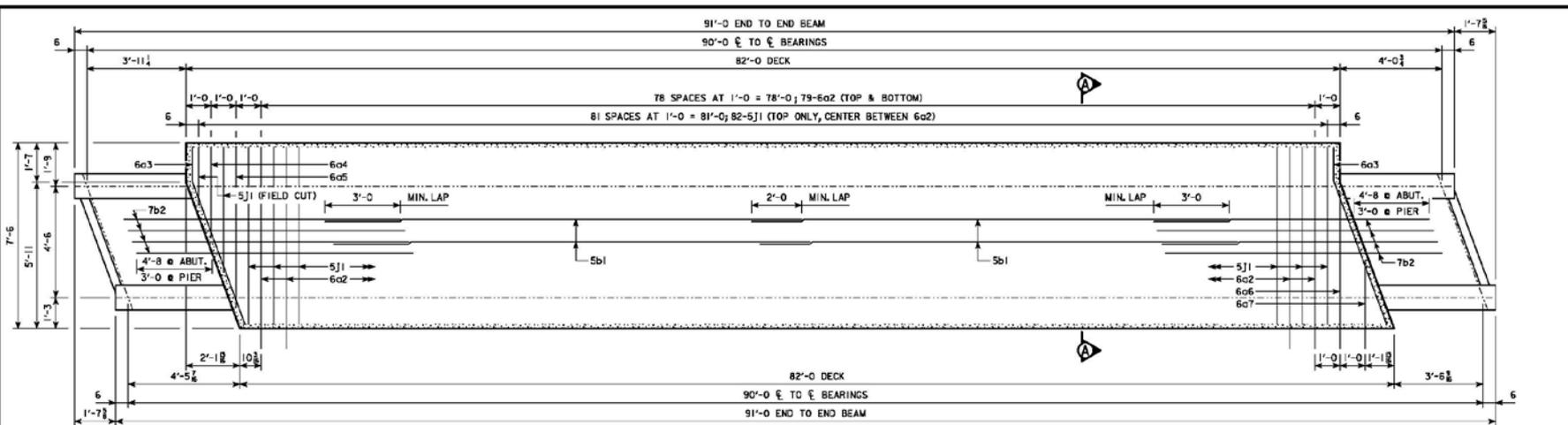
TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2" BELOW TOP OF DECK (BEFORE GRINDING). BOTTOM TRANS. REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF DECK. TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF BAR HIGH CHAIRS OR DECK BOLSTERS SPACED 4'-0" APART. I.A. 451.0 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, BAR HIGH CHAIRS, AND DECK BOLSTERS.



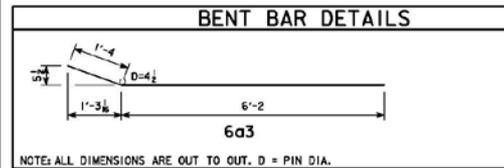
HALF SECTION NEAR MIDSPAN
(LOOKING EAST, UHPC NOT SHOWN)

DESIGN FOR 20° SKEW (R.A.)
234'-0" x 44'-0" MODULAR ROLLED STEEL BEAM BRIDGE
 91'-0" & 51'-0" END SPANS 92'-0" INTERIOR SPAN
SUPERSTRUCTURE DETAILS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 25 OF 57 FILE NO. 30846 DESIGN NO. 115

SUPERSTRUCTURE - PLAN DETAILS

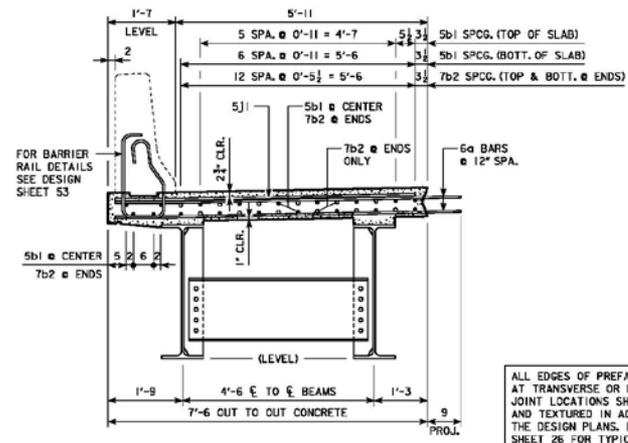


REINFORCING STEEL - ONE MODULE M90-A						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
6a2	TRANSVERSE		158	8'-1	1,930	
6a3	TRANSVERSE, SKEWED, DECK ENDS		4	7'-6	45	
6a4	TRANSVERSE, DECK END		2	3'-8	11	
6a5	TRANSVERSE, DECK END		2	6'-5	19	
6a6	TRANSVERSE, DECK END		2	6'-4	19	
6a7	TRANSVERSE, DECK END		2	3'-7	11	
5b1	LONGITUDINAL		36	37'-0	1,409	
7b2	LONGITUDINAL, DECK ENDS		60	12'-8	1,565	
5j1	TOP OF DECK, TRANSV., AT RAIL		82	7'-2	622	
TOTAL (LBS.)					5,631	



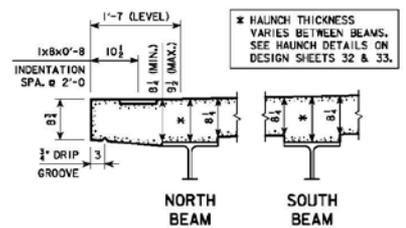
HIGH PERFORMANCE STRUCT. CONC.	
LOCATION	QTY.
MODULE DECK M90-A	16.6
TOTAL (CY)	16.6

MODULE DECK PLAN (M90-A)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)



SECTION A-A

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEVED AND TEXTURED IN ACCORDANCE WITH THE DESIGN PLANS. REFER TO DESIGN SHEET 26 FOR TYPICAL JOINT KEY PLAN AND DESIGN SHEET 28 FOR JOINT PREPARATION DETAIL.

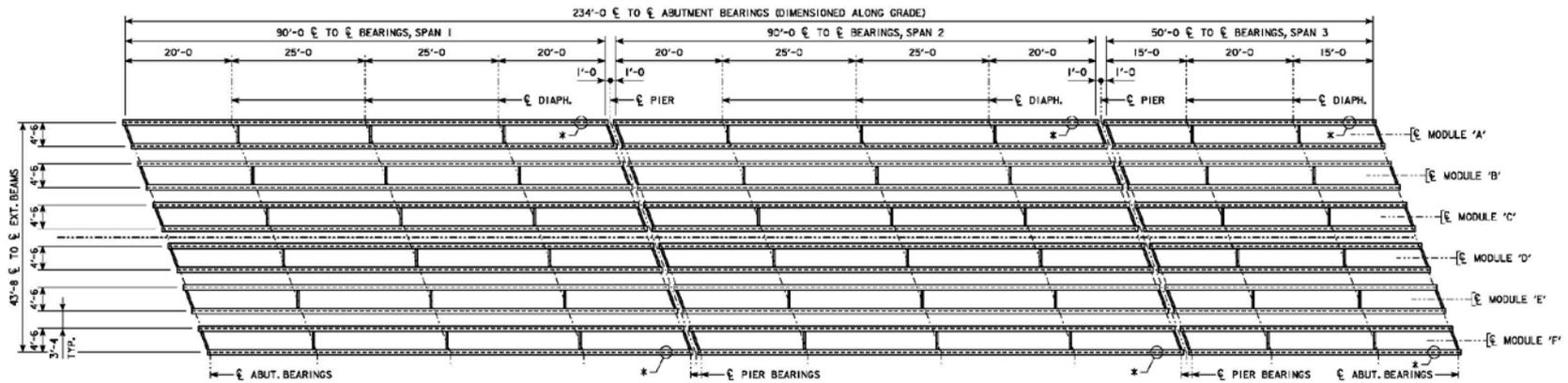


TYP. SLAB AND HAUNCH DETAIL
(SLAB THICKNESS SHOWN INCLUDES 1/4" SACRIFICIAL SURFACE FOR GRINDING.)



DESIGN FOR 20° SKEW (R.A.)
234'-0 x 44'-0 MODULAR ROLLED STEEL BEAM BRIDGE
 91'-0 & 51'-0 END SPANS 92'-0 INTERIOR SPAN
MODULE DETAILS (M90-A)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 40 OF 57 FILE NO. 30845 DESIGN NO. 115

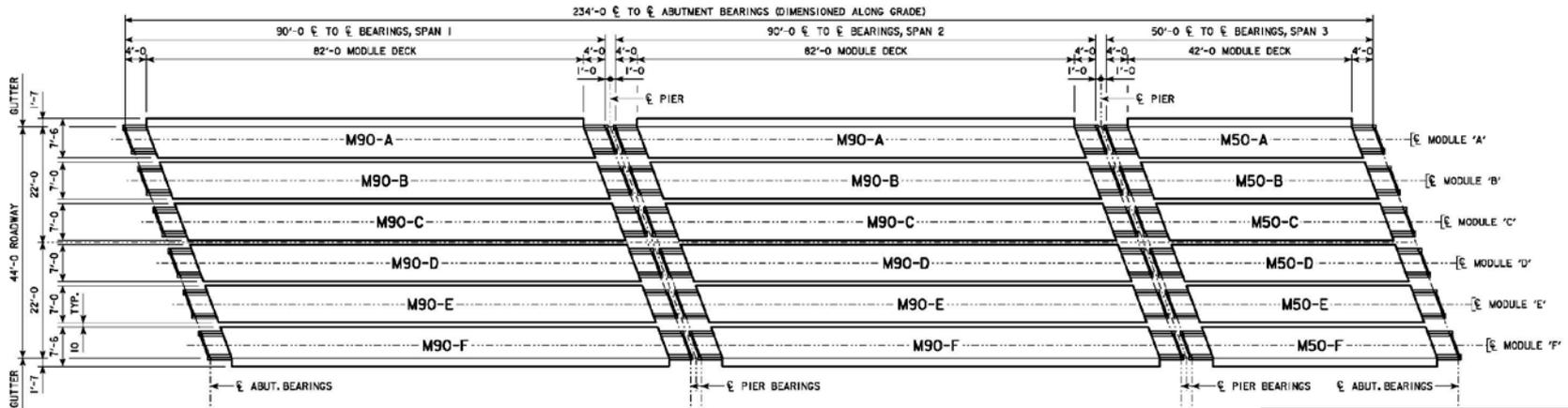
SUPERSTRUCTURE - PLAN DETAILS



FRAMING PLAN

(SEE "FRAMING PLAN - M90 MODULE" & "FRAMING PLAN - M50 MODULE" FOR ADDITIONAL DETAILS)

* APPROXIMATE LOCATION OF FLANGE DEFLECTORS. SEE DESIGN SHEET 37 FOR ADDITIONAL DETAILS.

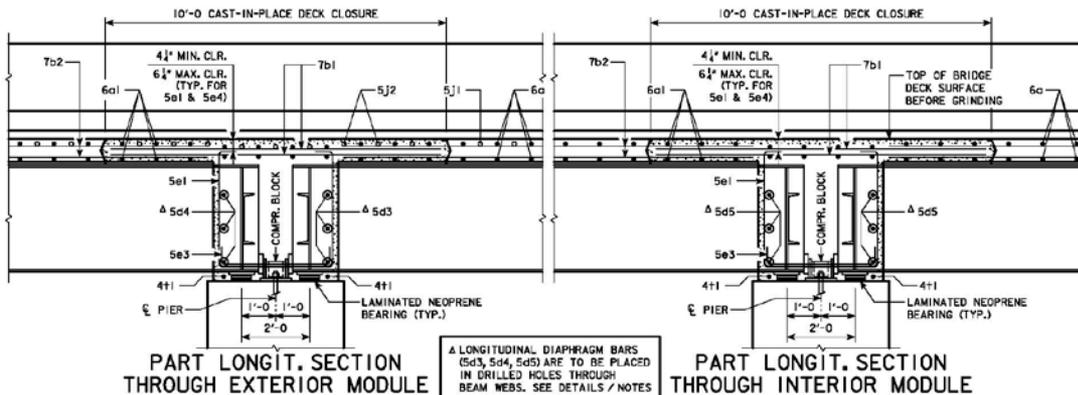


MODULE PLAN

MODULES SHALL BE MATCH MARKED AFTER DECK CASTING TO ENSURE PROPER PLACEMENT AND FIT DURING SUPERSTRUCTURE ASSEMBLY. CONTRACTOR SHALL NOTE THAT EACH MODULE WILL HAVE UNIQUE REINFORCING LAYOUT AND FIELD HAUNCH, AND MODULES ARE NOT INTERCHANGEABLE.

DESIGN FOR 20° SKEW (R.A.)
234'-0" x 44'-0" MODULAR ROLLED STEEL BEAM BRIDGE
 91'-0" & 51'-0" END SPANS 92'-0" INTERIOR SPAN
FRAMING PLAN & MODULE PLAN
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 34 OF 57 FILE NO. 30845 DESIGN NO. 115

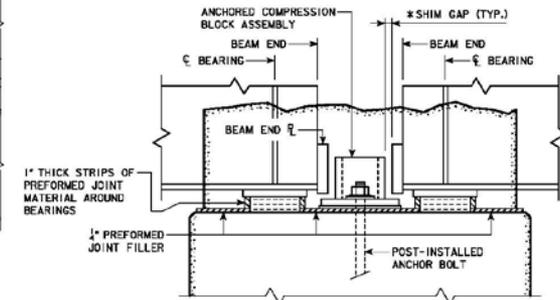
SUPERSTRUCTURE - PLAN DETAILS



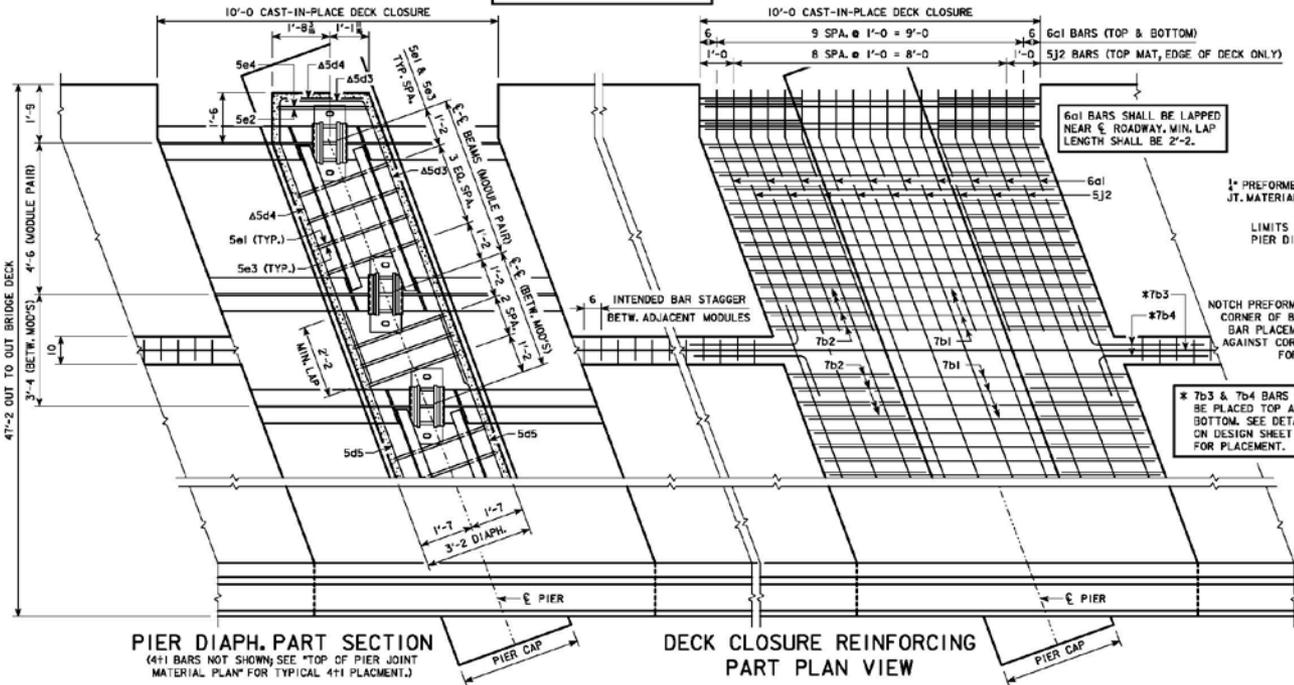
PART LONGIT. SECTION THROUGH EXTERIOR MODULE

PART LONGIT. SECTION THROUGH INTERIOR MODULE

4 LONGITUDINAL DIAPHRAGM BARS (5d3, 5d4, 5d5) ARE TO BE PLACED IN DRILLED HOLES THROUGH BEAM WEBS. SEE DETAILS / NOTES ON DESIGN SHEET 29.

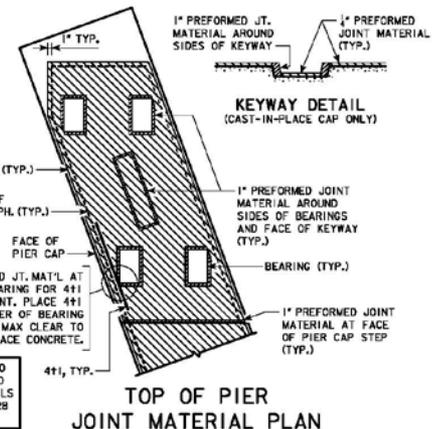


PART SECTION SHOWING JOINT MATERIAL
* COMPRESSION BLOCK SHIMS NOT SHOWN FOR CLARITY



PIER DIAPH. PART SECTION
(4t1 BARS NOT SHOWN; SEE *TOP OF PIER JOINT MATERIAL PLAN* FOR TYPICAL 4t1 PLACEMENT.)

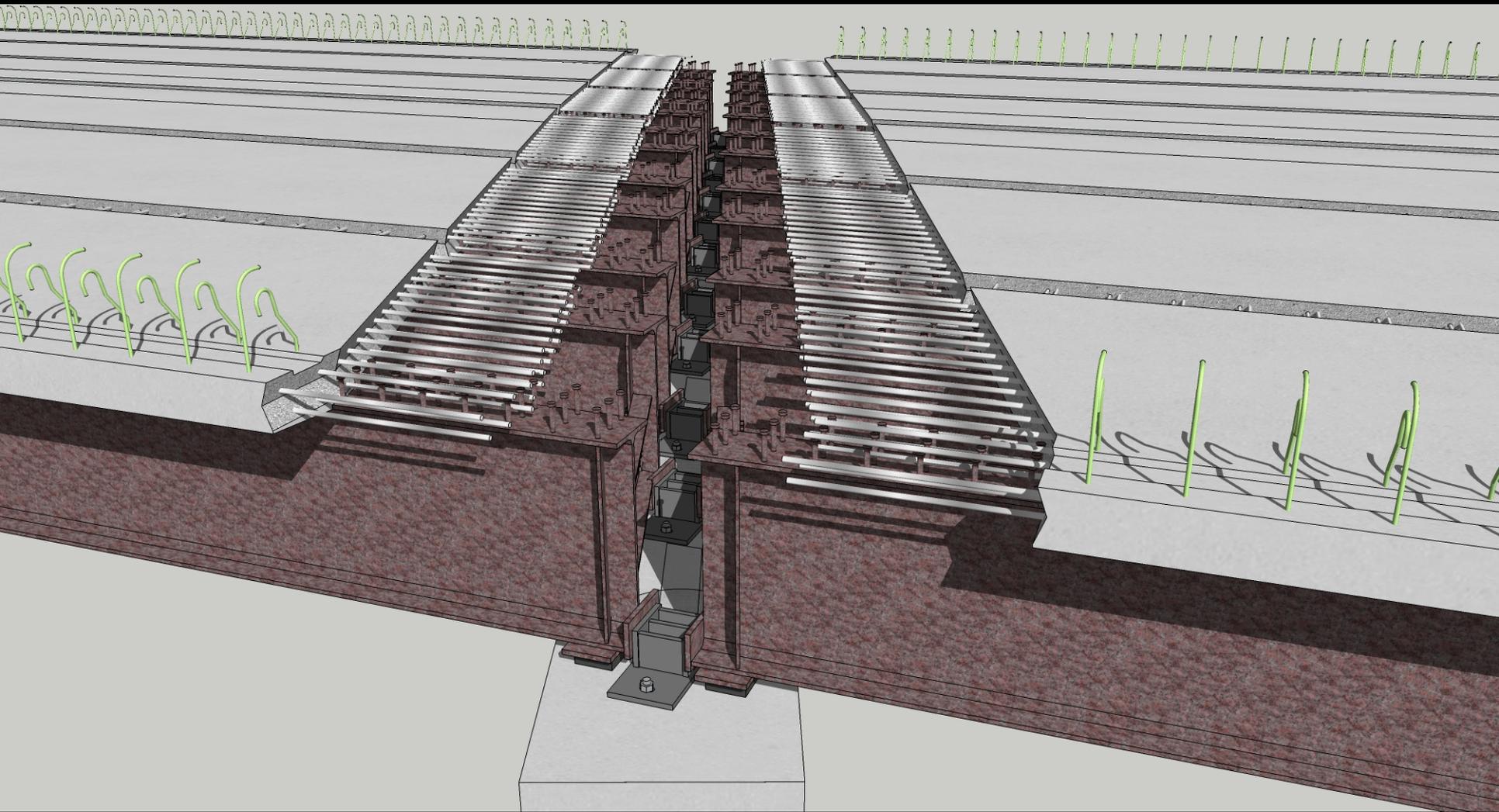
DECK CLOSURE REINFORCING PART PLAN VIEW



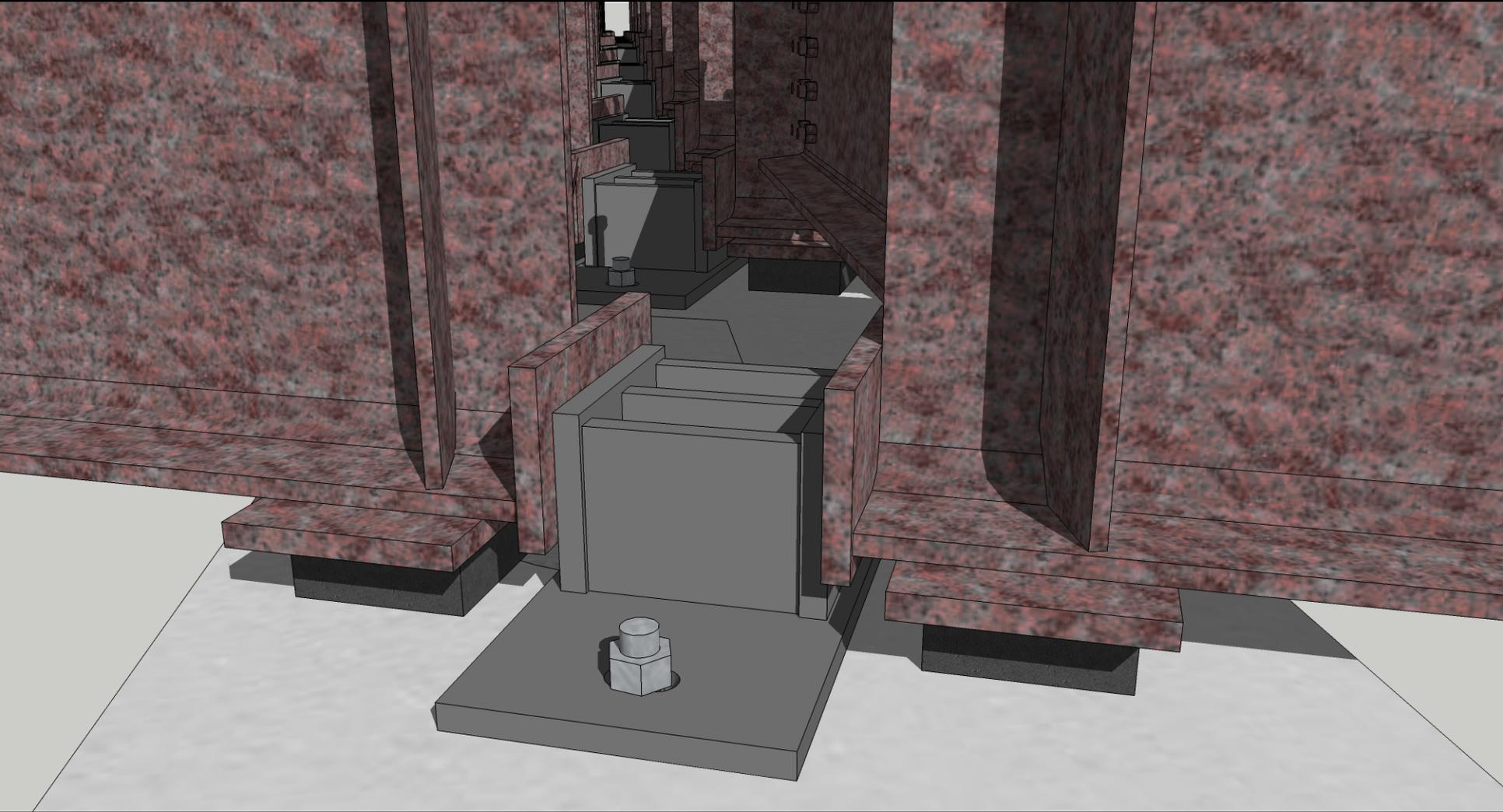
TOP OF PIER JOINT MATERIAL PLAN

DESIGN FOR 20° SKEW (R.A.)
234'-0" x 44'-0" MODULAR ROLLED STEEL BEAM BRIDGE
 91'-0" & 51'-0" END SPANS 92'-0" INTERIOR SPAN
SUPERSTRUCTURE DETAILS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 27 OF 57 FILE NO. 30845 DESIGN NO. 115

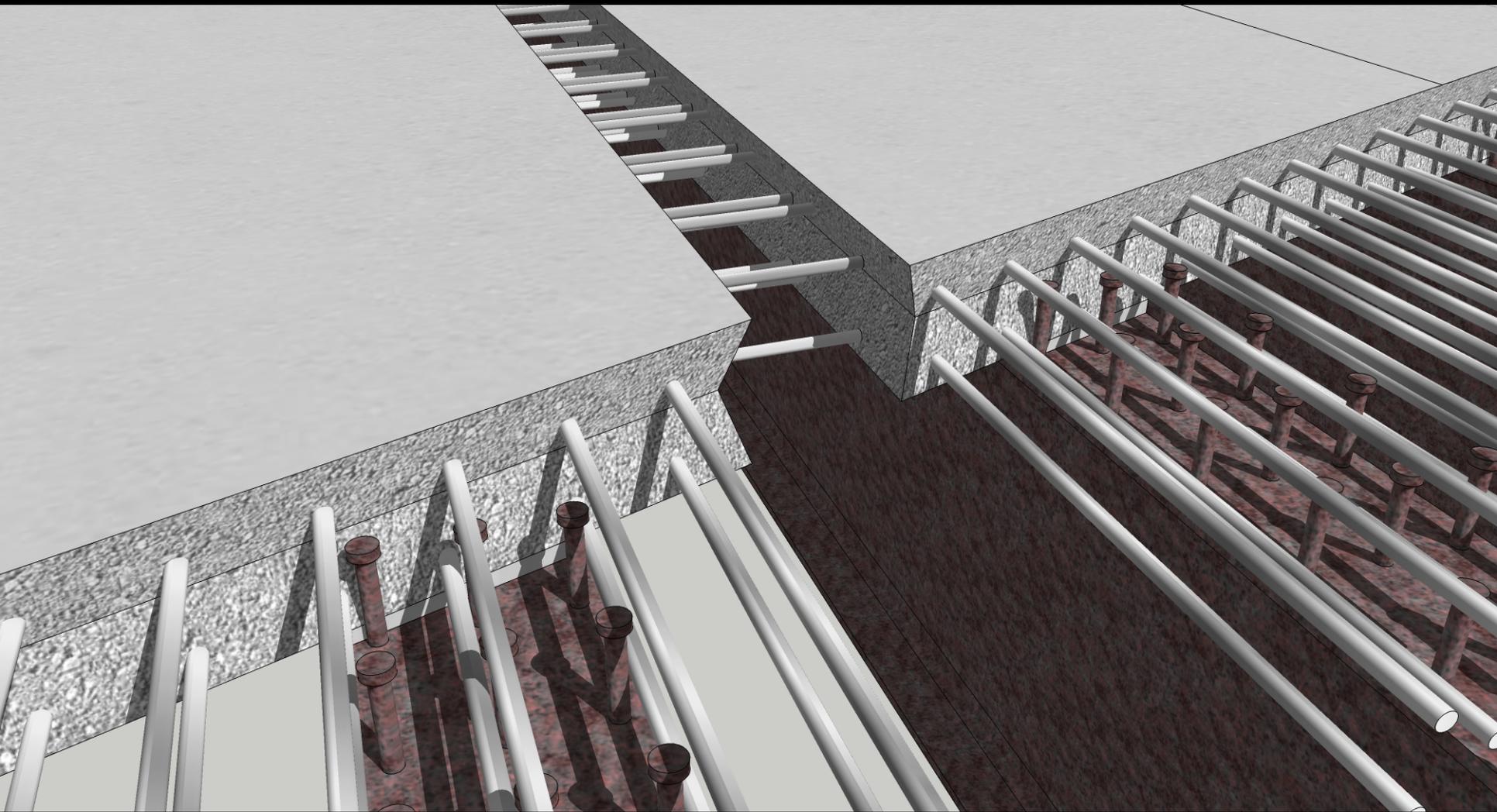
SUPERSTRUCTURE JOINTS - PLAN DETAILS



TRANSVERSE JOINT OVER PIER



SNUG-FIT COMPRESSION BLOCK AT PIER



TRANSVERSE & LONGIT. JOINT AT MODULE DECK



EXAMPLE JOINT TEXTURE
(PHOTO COURTESY OF BEN GRAYBEAL, FHWA)

TABLE 7.2: PREPARATION METHODS

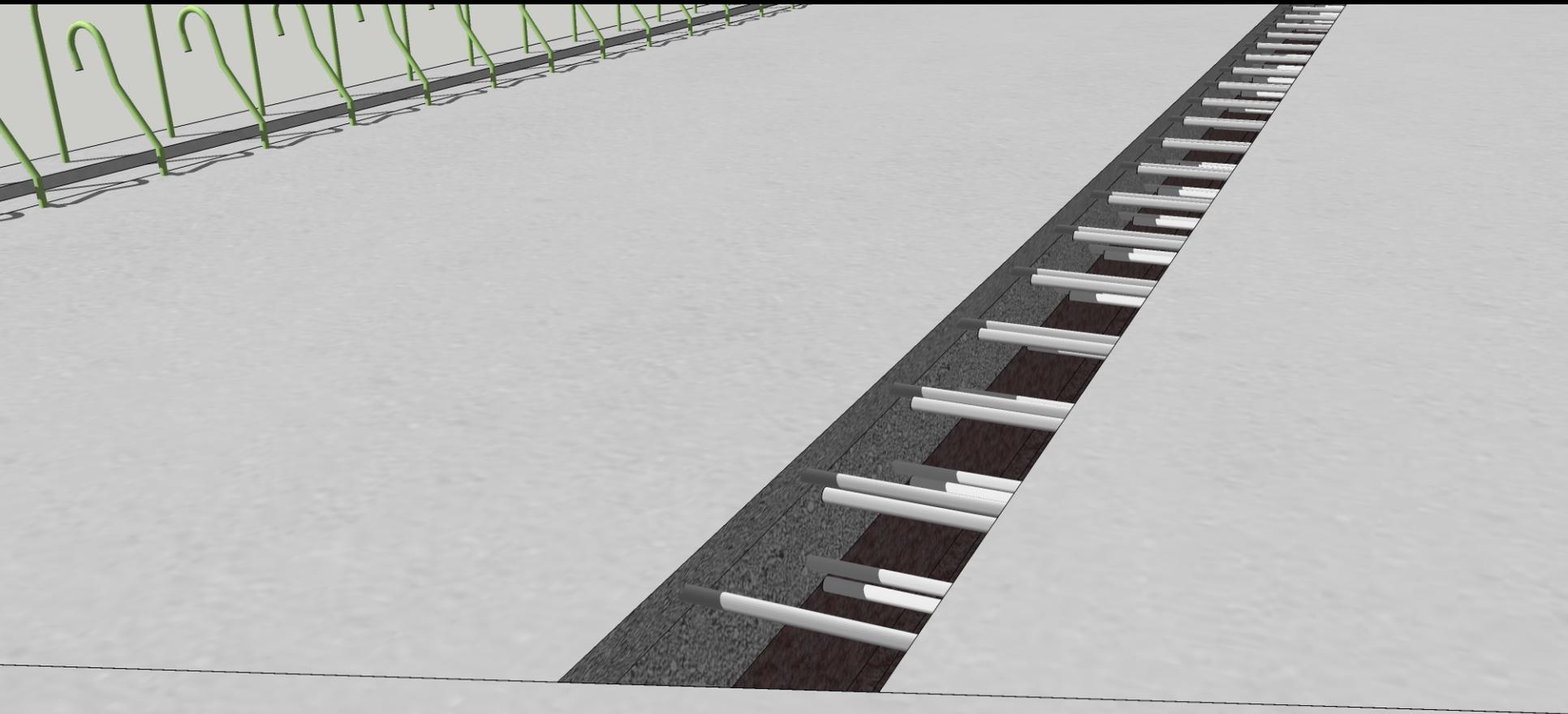
Surface preparation method	Concrete Surface Profile									
	CSP 1	CSP 2	CSP 3	CSP 4	CSP 5	CSP 6	CSP 7	CSP 8	CSP 9	CSP 10
Detergent scrubbing	■									
Low-pressure water cleaning	■									
Grinding	■	■								
Acid etching	■	■	■							
Needle scaling		■	■	■						
Abrasive blasting		■	■	■	■	■	■			
Shotblasting		■	■	■	■	■	■	■	■	
High- and ultra-high-pressure water jetting		■	■	■	■	■	■	■	■	■
Scarifying			■	■	■	■	■	■	■	■
Surface retarder (1)				■	■	■	■	■	■	■
Rotomilling					■	■	■	■	■	■
Scabbling						■	■	■	■	■
Handheld concrete breaker						■	■	■	■	■

(1) Only suitable for freshly placed cementitious materials

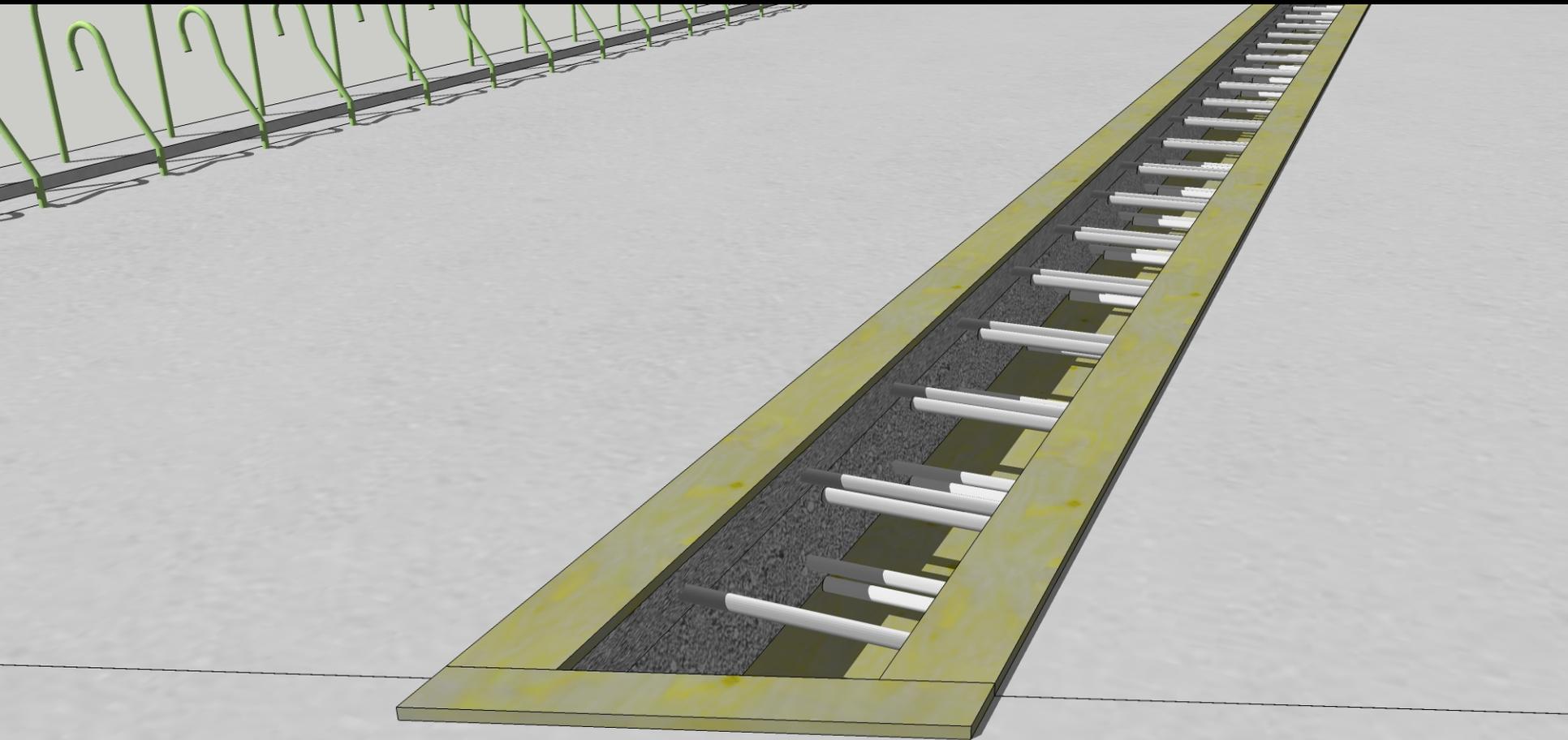


Fig. 6: CSP chips on prepared surface

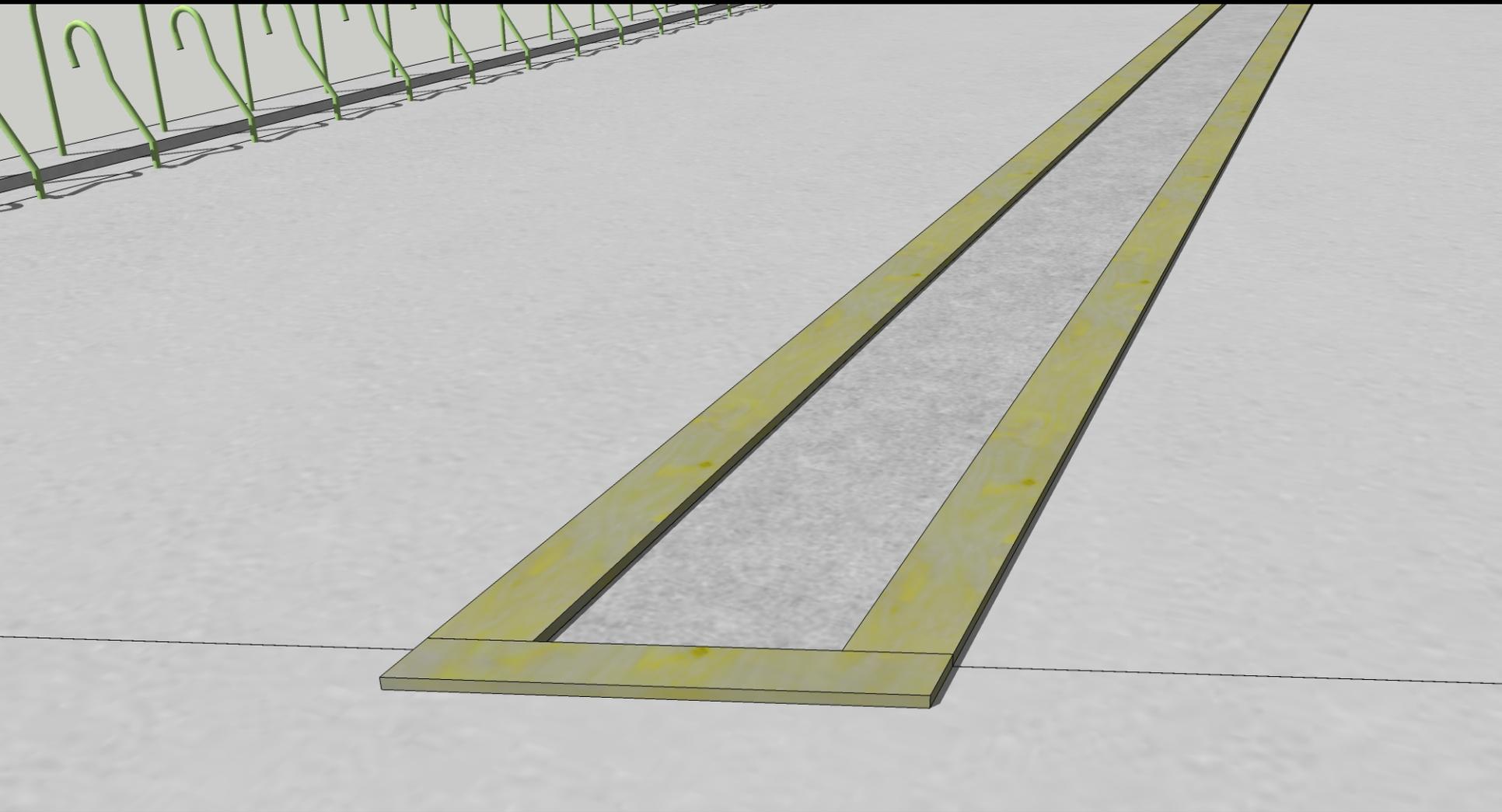
ICRI CONCRETE SURFACE PROFILE EXAMPLES



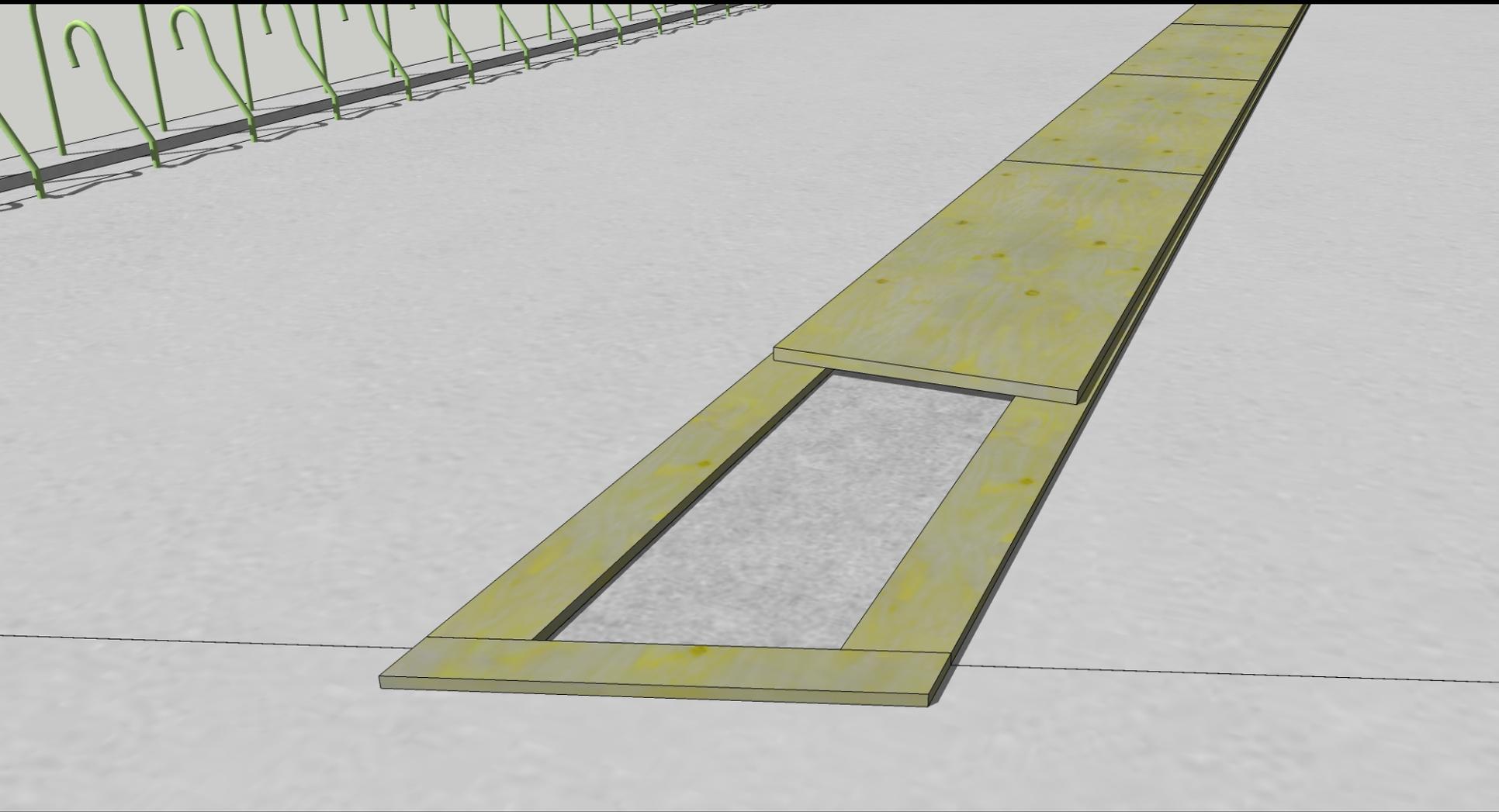
LONGITUDINAL JOINT



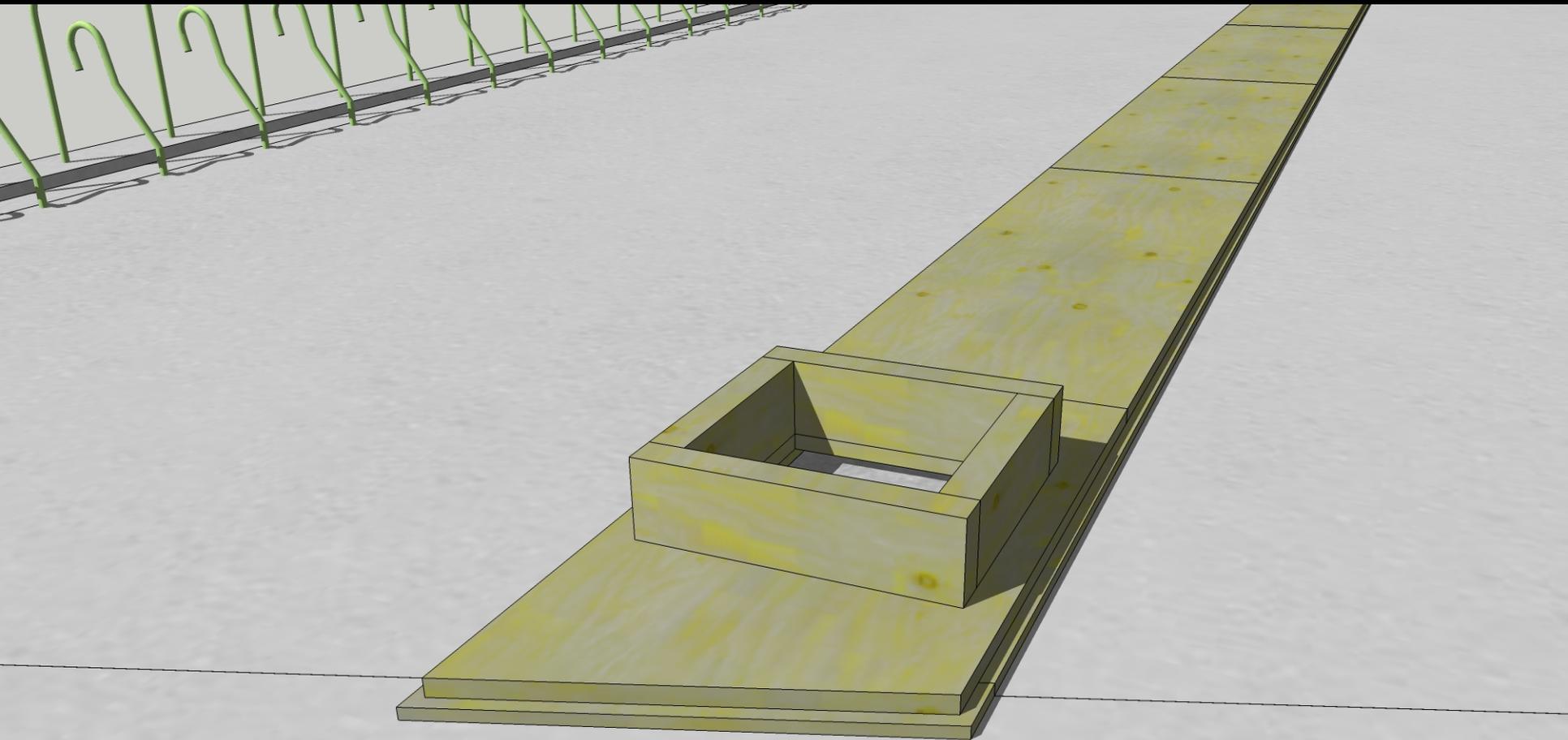
LONGITUDINAL JOINT BOTTOM AND SIDE FORMS



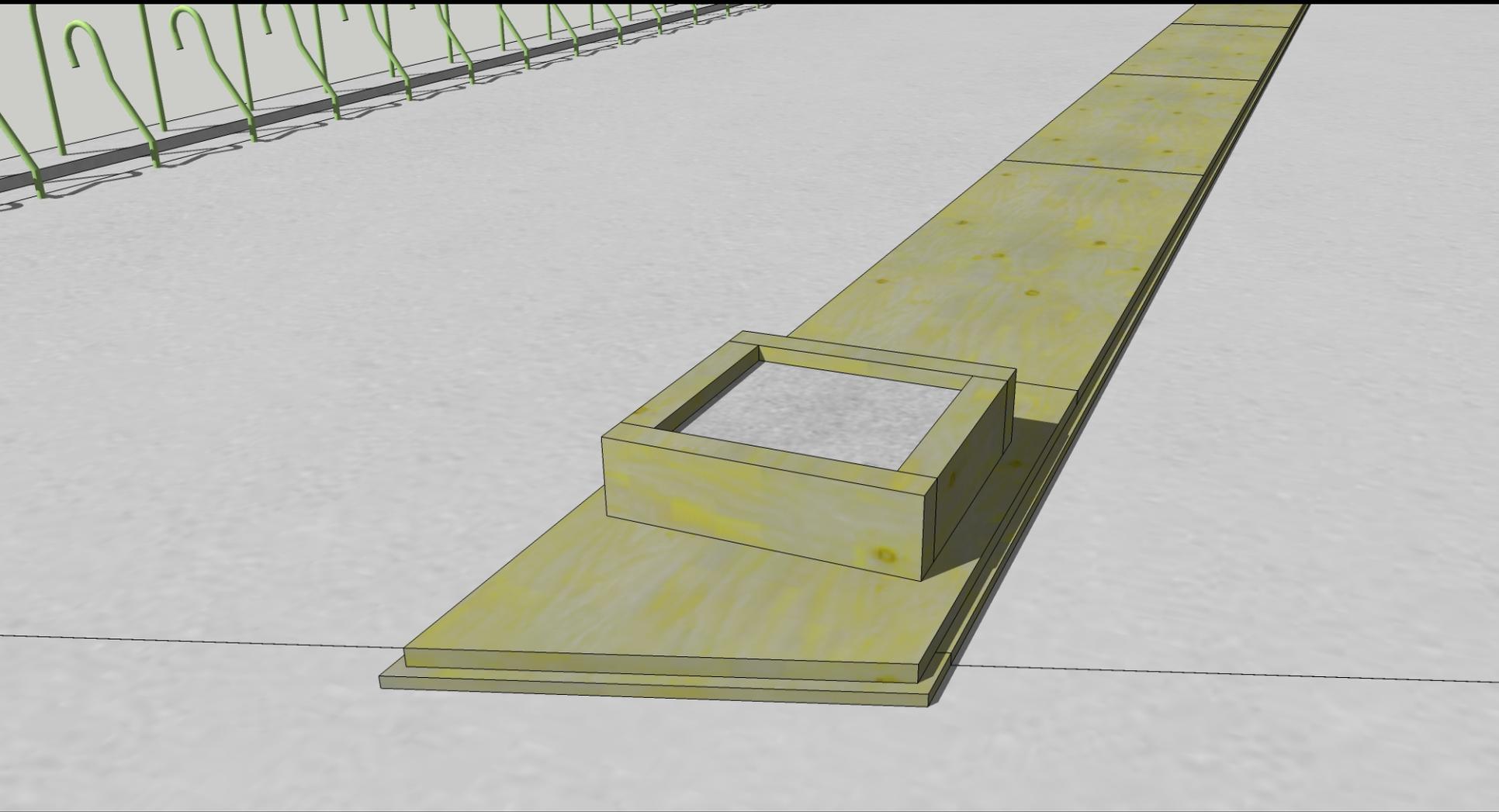
U.H.P.C. FILLED LONGITUDINAL JOINT



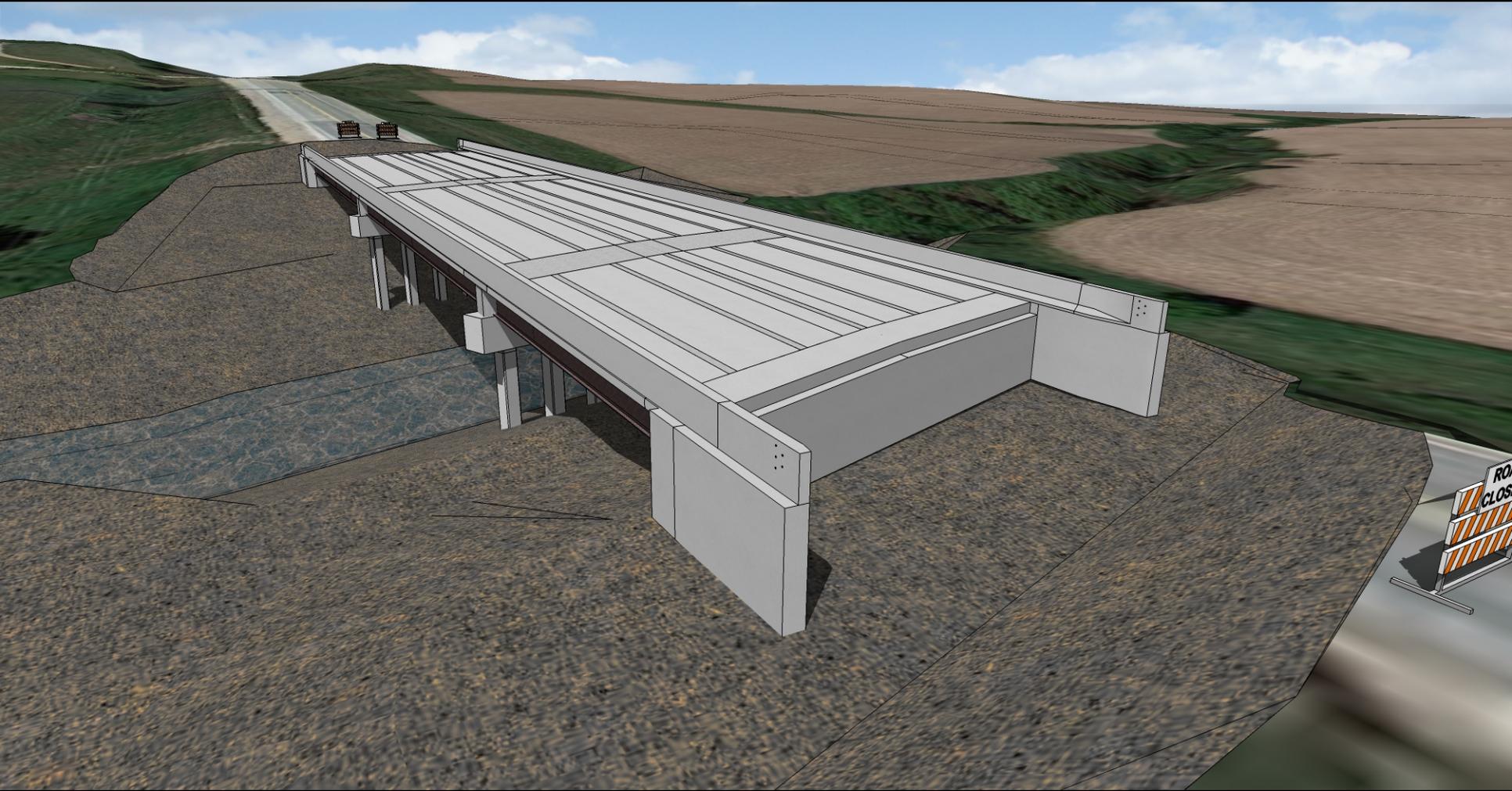
U.H.P.C. LONGITUDINAL JOINT WITH TOP FORMS



FORMED CHIMNEY AT HIGH END LONGIT. JOINT



U.H.P.C. SURCHARGE AT CHIMNEY



CONSTRUCTED BRIDGE



PLAN ADDENDUM HIGHLIGHTS

(PENDING ISSUE)



PLAN ADDENDUM HIGHLIGHTS:

(PENDING)

PROJECT COORDINATION

- Contractor will be required to coordinate with Project **HRRR-C078(168)--5R-78**
- Pottawattamie County safety project on route required for Little Silver Creek detour.
- County project will be let with **September 1, 2015 completion date.**

STAINLESS STEEL REINFORCING

- Special care shall be required during fabrication, handling and placement of stainless steel reinforcing to **prevent contamination of reinforcing steel.**
- Common for stainless steel processed/handled with carbon steel tools to become contaminated with carbon steel fragments/dust, which leads to appearance of rust on the reinforcing steel.
- Presence of contamination, oxidation or rust on stainless steel reinforcing bars will not be acceptable.
- **Plastic or stainless steel bar chairs will be required.**
- **Epoxy coated or stainless steel tie wire will be required.**

SPECIAL PROVISION HIGHLIGHTS

SP-120243, SP-120244, SP-120245

SPECIAL PROVISION HIGHLIGHTS:

- SP-120243 Prefabricated Superstructure Modules
- SP-120244 Precast Concrete Substructure Elements
- SP-120245 Ultra High Performance Concrete

SP-120243
(New)



Iowa Department of Transportation

SPECIAL PROVISIONS
FOR
PREFABRICATED SUPERSTRUCTURE MODULES

Pottawattamie County
BRF-092-1(64)-38-78

Effective Date
December 16, 2014

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

120243.01 DESCRIPTION.

- A. Furnish, erect, and install prefabricated superstructure modules including Superstructure Module, M50 – Exterior, Superstructure Module, M50 – Interior, Superstructure Module, M90 – Exterior, and Superstructure Module, M90 – Interior, herein referred to as module(s). This work includes all necessary materials and equipment to complete the work as shown in the plans. The modules shall be prefabricated using a concrete decked steel beam system as shown in the plans. Use of cast-in-place construction will not be considered for substitution.
- B. Apply Sections 2403, 2404, 2407, 2408, 2412, 2513, and Division 41 of the Standard Specifications with the following modifications.
- C. **Submittals.**
Submittals shall be provided to the Office of Bridges and Structures in electronic format, in accordance with Article 1105.03, F of the Standard Specifications.
- The submittals requiring written approval from the Engineer are as follows:

1. **Module Fabrication Plan.**
 - a. Submit the Module Fabrication Plan for approval 28 days before construction of modules.
 - b. The Module Fabrication Plan shall pertain to construction operations during assembly of the steel framing and construction of the precast deck. The Module Fabrication Plan shall include, but shall not necessarily be limited to, the following:
 - Name of firm(s) and associated personnel that will be supervising and performing module fabrication. Experience record of firm(s) and associated personnel relative to fabrication of decked steel modules, or similar products.
 - Location and description of fabrication site, including a diagram of the work area.
 - Details of all equipment that will be employed for the construction of the modules.
 - Details of temporary supports and bracing used during framing and deck placement.

SP-120244
(New)



Iowa Department of Transportation

SPECIAL PROVISIONS
FOR
PRECAST CONCRETE SUBSTRUCTURE ELEMENTS

Pottawattamie County
BRF-092-1(64)-38-78

Effective Date
December 16, 2014

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

120244.01 DESCRIPTION.

- A. Furnish, erect, and install precast concrete substructure elements including Bridge Abutment Footings and Bridge Pier Caps, herein referred to as precast element(s). This work includes all necessary materials and equipment to complete the work as shown in the contract documents. Use of alternate cast-in-place concrete will be allowed as shown in the design plans.
- B. Apply Sections 2403, 2404, 2407, and Division 41 of the Standard Specifications with the following modifications.
- C. **Submittals.**
Submittals shall be provided to the Office of Bridges and Structures in electronic format, in accordance with Article 1105.03, F of the Standard Specifications.
- The submittals requiring written approval from the Engineer are as follows:

1. **Assembly Plan.**
 - a. Prepare the Assembly Plan under the seal of a Professional Engineer licensed in the State of Iowa. Submit the Assembly Plan for approval 28 days before erection of modules.
 - b. The Assembly Plan shall pertain to construction operations including handling, lifting, placing, supporting and securing the precast elements. The Assembly Plan shall include, but not necessarily be limited to, the following:
 - A work area plan, depicting temporary and permanent structures, haul roads, utilities and other temporary or permanent site features relevant to precast substructure assembly.
 - Details of all equipment to be used to lift precast elements, including cranes, excavators, lifting slings, sling hooks, jacks, etc. Include crane locations, operation radii, lifting calculations, etc.

SP-120245
(New)



Iowa Department of Transportation

SPECIAL PROVISIONS
FOR
ULTRA HIGH PERFORMANCE CONCRETE

Pottawattamie County
BRF-092-1(64)-38-78

Effective Date
December 16, 2014

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

120245.01 DESCRIPTION.

- A. Furnish all materials, tools, and labor necessary for the performance of all work to form, prepare bonding surfaces, cast, finish, and cure Ultra High Performance Concrete (UHPC) where required per plan for Ultra High Performance Concrete Joints. Prior to casting UHPC for actual superstructure module joints, the Contractor shall construct a Demonstration UHPC Joint to demonstrate their ability to properly cast the UHPC in accordance with the design plans and these Special Provisions.
- All UHPC shall be produced using DUCTAL concrete materials manufactured by Lafarge North America.
- B. **Submittals.**
Provide submittals to the Office of Bridges and Structures in electronic format, in accordance with Article 1105.03, F of the Standard Specifications.
- The submittals requiring written approval from the Engineer are as follows:

1. **UHPC Placement Plan.**
 - a. Submit the UHPC Placement Plan for approval 28 days before placement of UHPC for longitudinal superstructure module connections.
 - b. The UHPC Placement Plan shall include, but not necessarily be limited to, the following:
 - Proof of prequalification for placement of DUCTAL by Lafarge North America.
 - Proposed method(s) of joint surface preparation to achieve the required concrete surface profile texture, as required in the design plans.
 - Proposed forming method(s).
 - Proposed batching sequence. The batching sequence shall include the order and time of introduction of the materials and the mixing time.
 - Proposed sequence and schedule for UHPC placement operations.
 - Details of all equipment to be used to batch and place UHPC materials, including mixers, pumps, concrete buggies, etc.

SP-120243

Prefabricated Superstructure Modules

INCLUDES REQUIREMENTS FOR:

- Fabrication Plan
- Assembly Plan
- Shop Drawings
- Material Specifications
- Quality Assurance
- Fabrication/Erection Procedures
- Basis of Payment

SP-120243
(New)



Iowa Department of Transportation

**SPECIAL PROVISIONS
FOR
PREFABRICATED SUPERSTRUCTURE MODULES**

Pottawattamie County
BRF-092-1(64)-38-78

Effective Date
December 16, 2014

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

120243.01 DESCRIPTION.

- A.** Furnish, erect, and install prefabricated superstructure modules including Superstructure Module, M50 – Exterior, Superstructure Module, M50 – Interior, Superstructure Module, M90 – Exterior, and Superstructure Module, M90 – Interior, herein referred to as module(s). This work includes all necessary materials and equipment to complete the work as shown in the plans. The modules shall be prefabricated using a concrete decked steel beam system as shown in the plans. Use of cast-in-place construction will not be considered for substitution.

- B.** Apply Sections 2403, 2404, 2407, 2408, 2412, 2513, and Division 41 of the Standard Specifications with the following modifications:

C. Submittals.

Submittals shall be provided to the Office of Bridges and Structures in electronic format, in accordance with Article 1105.03, F of the Standard Specifications.

The submittals requiring written approval from the Engineer are as follows:

1. Module Fabrication Plan.

- Submit the Module Fabrication Plan for approval 28 days before construction of modules.
- The Module Fabrication Plan shall pertain to construction operations during assembly of the steel framing and construction of the precast deck. The Module Fabrication Plan shall include, but shall not necessarily be limited to, the following:
 - Name of firm(s) and associated personnel that will be supervising and performing module fabrication. Experience record of firm(s) and associated personnel relative to fabrication of decked steel modules, or similar products.
 - Location and description of fabrication site, including a diagram of the work area.
 - Details of all equipment that will be employed for the construction of the modules.
 - Details of temporary supports and bracing used during framing and deck placement.

SP-120244

Precast Concrete Substructure

INCLUDES REQUIREMENTS FOR:

- Assembly Plan
- Shop Drawings
- Material Specifications
- Quality Assurance
- Fabrication/Erection Procedures
- Basis of Payment

SP-120244
(New)



Iowa Department of Transportation

SPECIAL PROVISIONS
FOR
PRECAST CONCRETE SUBSTRUCTURE ELEMENTS

Pottawattamie County
BRF-092-1(64)-38-78

Effective Date
December 16, 2014

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

120244.01 DESCRIPTION.

- Furnish, erect, and install precast concrete substructure elements including Bridge Abutment Footings and Bridge Pier Caps, herein referred to as precast element(s). This work includes all necessary materials and equipment to complete the work as shown in the contract documents. Use of alternate cast-in-place concrete will be allowed as shown in the design plans.
- Apply Sections 2403, 2404, 2407, and Division 41 of the Standard Specifications with the following modifications.
- Submittals.**
Submittals shall be provided to the Office of Bridges and Structures in electronic format, in accordance with Article 1105.03, F of the Standard Specifications.

The submittals requiring written approval from the Engineer are as follows:

1. Assembly Plan.

- Prepare the Assembly Plan under the seal of a Professional Engineer licensed in the State of Iowa. Submit the Assembly Plan for approval 28 days before erection of modules.
- The Assembly Plan shall pertain to construction operations including handling, lifting, placing, supporting and securing the precast elements. The Assembly Plan shall include, but not necessarily be limited to, the following:
 - A work area plan, depicting temporary and permanent structures, haul roads, utilities and other temporary or permanent site features relevant to precast substructure assembly.
 - Details of all equipment to be used to lift precast elements, including cranes, excavators, lifting slings, sling hooks, jacks, etc. Include crane locations, operation radii, lifting calculations, etc.

SP-120245

Ultra High Performance Concrete

INCLUDES REQUIREMENTS FOR:

- UHPC Placement Plan
- UHPC Mix Design
- Qualification Testing
- Quality Assurance
- Demonstration UHPC Joint
- Batching/Placement Procedures
- Watertight Integrity Testing
- Basis of Payment

SP-120245
(New)



Iowa Department of Transportation

SPECIAL PROVISIONS
FOR
ULTRA HIGH PERFORMANCE CONCRETE

Pottawattamie County
BRF-092-1(64)-38-78

Effective Date
December 16, 2014

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

120245.01 DESCRIPTION.

- A.** Furnish all materials, tools, and labor necessary for the performance of all work to form, prepare bonding surfaces, cast, finish, and cure Ultra High Performance Concrete (UHPC) where required per plan for Ultra High Performance Concrete Joints. Prior to casting UHPC for actual superstructure module joints, the Contractor shall construct a Demonstration UHPC Joint to demonstrate their ability to properly cast the UHPC in accordance with the design plans and these Special Provisions.

All UHPC shall be produced using DUCTAL concrete materials manufactured by Lafarge North America.

B. Submittals.

Provide submittals to the Office of Bridges and Structures in electronic format, in accordance with Article 1105.03, F of the Standard Specifications.

The submittals requiring written approval from the Engineer are as follows:

1. UHPC Placement Plan.

- a.** Submit the UHPC Placement Plan for approval 28 days before placement of UHPC for longitudinal superstructure module connections.
- b.** The UHPC Placement Plan shall include, but not necessarily be limited to, the following:
- Proof of prequalification for placement of DUCTAL by Lafarge North America.
 - Proposed method(s) of joint surface preparation to achieve the required concrete surface profile texture, as required in the design plans.
 - Proposed forming method(s).
 - Proposed batching sequence. The batching sequence shall include the order and time of introduction of the materials and the mixing time.
 - Proposed sequence and schedule for UHPC placement operations.
 - Details of all equipment to be used to batch and place UHPC materials, including mixers, pumps, concrete buggies, etc.

REQUIRED SUBMITTALS

Shop Drawings, Fab/Assembly Plans, Calcs

REQUIRED SUBMITTALS:

- **Shop Drawings**
- **Construction Schedule**
- **Fabrication Plan**
 - Fabrication Site Location & Description
 - Fabrication Sequence & Schedule
 - Temporary Supports & Bracing
- **Assembly Plan**
 - Assembly Sequence & Schedule
 - Construction Load Analysis
 - Lifting Device Design
 - Temporary Supports & Bracing
- **UHPC Placement Plan**
 - UHPC Placement Sequence & Schedule
 - Joint Surface Preparation Methods
 - Joint Forming Methods
- **UHPC Joint Mockup**
 - DOT visual inspection before and after UHPC placement

CONSTRUCTION SCHEDULE

21-Day Critical Closure

CONSTRUCTION SCHEDULE:

SINGLE LANE CLOSURE – 40 WORKING DAYS

- 8/31/15 Late Start Date
- Working days charged only when TC-213 (single lane closure) is in place
- Single lane closures will be permitted before and after the critical closure. Working days will not be charged during the critical closure.
- \$1,500 per day Liquidated Damages

CRITICAL ROAD CLOSURE – 21 CALENDAR DAYS

- 10/5/15 Estimated Start Date
- \$9,000 per day Incentive/Disincentive

EXAMPLE SCHEDULE

21 Day ABC Timeline

CONSTRUCTION ACTIVITY	21 DAY CLOSURE PERIOD																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
CLOSE IA 92	█																				
BRIDGE DEMOLITION	█	█	█																		
GRADING & RIP-RAP PLACEMENT UNDER BRIDGE		█	█	█																	
DRIVE PIER PILING			█	█	█																
PIER PILE ENCASEMENT CONSTRUCTION					█	█	█	█													
DRIVE ABUTMENT PILING						█	█	█	█												
CONSTRUCT PIER CAP								█	█	█											
CONSTRUCT ABUTMENT SEAT										█	█	█									
ERECT DECK MODULES											█	█	█	█							
CONSTRUCT ABUT. BACKWALLS & WINGS												█	█	█							
CONSTRUCT PIER CAP DIAPHRAGMS													█	█	█						
PLACE UHPC LONGITUDINAL JOINTS															█	█	█				
CONSTRUCT APPROACHES																█	█	█			
CONSTRUCT BARRIER RAIL																	█	█	█		
GRINDING & LONGITUDINAL GROOVING OF DECK																			█	█	█
FINISH GRADING & WING ARMORING																				█	█
GUARDRAIL & PAINT																					█
OPEN IA 92																					█

QUESTIONS??

THANK YOU FOR YOUR TIME!!