

POTTAWATTAMIE COUNTY
 ACCELERATED BRIDGE REPLACEMENT - MODULAR STEEL BEAM
 BRF-092-1(64)--38-78
 12/16/2014
 LETTING DATE

LEGEND

INTERSTATE HIGHWAY	
PRIMARY HIGHWAY-DIVIDED	
PRIMARY HIGHWAY	
PORTLAND CEMENT CONCRETE ROAD	
ASPHALT ROAD	
BITUMINOUS ROAD	
GRAVEL ROAD	
EARTHEN ROAD	
INTERSTATE HIGHWAY	
UNITED STATES HIGHWAY	
STATE HIGHWAY	
COUNTY HIGHWAY	
RAILROAD	
PIPELINE	
AIRPORT	
HYDROLOGY	
BRIDGE	
STATE BOUNDARY	
COUNTY BOUNDARY	
CORPORATE BOUNDARY	
TOWNSHIP LINE	
SECTION LINE	
ROAD NAMES	
UNINCORPORATED PLACE	



PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

POTTAWATTAMIE COUNTY

ACCELERATED BRIDGE REPLACEMENT - MODULAR STEEL BEAM

IA 92 OVER LITTLE SILVER CREEK, 0.3 MILE W.OF CO.RD.L-55

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

TOTAL SHEETS	104
PROJECT NUMBER	BRF-092-1(64)--38-78
R.O.W. PROJECT NUMBER	--
PROJECT IDENTIFICATION NUMBER	10-78-092-010

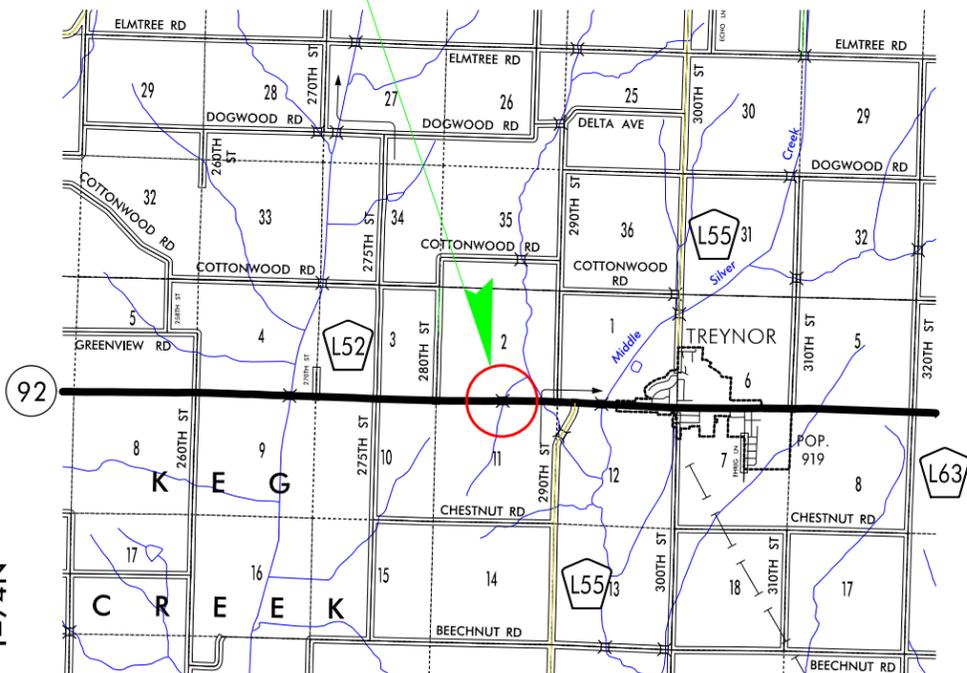
INDEX OF SHEETS	
NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET - DESIGN 115
2-58	DESIGN 115
SPS.1-SPS.2	SOIL PROFILE SHEET
C.1	ESTIMATE SHEET FOR ROADWAY
A.1-X.4	ROADWAY SHEETS

REVISIONS

1-800-292-8989
www.iowaonecall.com

Know what's below. Call before you dig.

DESIGN NO. 115



R-42W

LOCATION MAP



STANDARD ROAD PLANS
STANDARD ROAD PLANS ARE LISTED ON SHEET NUMBER C.5

DESIGN DATA RURAL		
2015 AADT	5,200	V.P.D.
2035 AADT	6,900	V.P.D.
202? DHV	--	V.P.H.
TRUCKS	9	%
Total Design ESALS	--	

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
I	CURTIS J. CARTER	STRUCTURAL DESIGN
I	PATRICIA G. SCHWARZ	HYDRAULIC DESIGN
SPS.1, CS.1	ROBERT L. STANLEY	GEOTECHNICAL DESIGN
A.1	JASON HOLST	ROADWAY DESIGN

HYDRAULIC DESIGN	
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.
Signature: <i>Patricia G. Schwarz</i>	Date: 10/6/2014
Printed or Typed Name: Patricia G. Schwarz	
My license renewal date is December 31, 2014	
Pages or sheets covered by this seal: SHEETS 7 THRU 8 OF 104	

STRUCTURAL DESIGN	
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.
Signature: <i>Curtis J. Carter</i>	Date: 10/6/2014
Printed or Typed Name: Curtis J. Carter	
My license renewal date is December 31, 2014	
Pages or sheets covered by this seal: SHEETS 1 THRU 58 OF 104	

STRUCTURAL CONCRETE SUMMARY		
ITEM	EST. QTY	BID QTY.
PIER 1 PILE ENCASEMENT	AS REQ'D	INCIDENTAL
PIER 2 PILE ENCASEMENT	AS REQ'D	INCIDENTAL
BARRIER RAIL	54.6	INCIDENTAL
TOTAL (CY)	54.6	INCIDENTAL

HIGH PERFORMANCE STRUCT. CONC. SUMMARY		
ITEM	EST. QTY	BID QTY.
WEST ABUTMENT FOOTING (CIP @ 26.6, PRECAST @ 23.0 CY)	VARIES	INCIDENTAL
EAST ABUTMENT FOOTING (CIP @ 24.8, PRECAST @ 22.1 CY)	VARIES	INCIDENTAL
PIER 1 CAP (CIP @ 29.8, PRECAST @ 28.5 CY)	VARIES	INCIDENTAL
PIER 2 CAP (CIP @ 29.0, PRECAST @ 27.8 CY)	VARIES	INCIDENTAL
WEST ABUTMENT BACKWALL, WINGS & DECK CLOSURE	45.2	45.2
EAST ABUTMENT BACKWALL, WINGS & DECK CLOSURE	44.1	44.1
PIER 1 DIAPHRAGM & DECK CLOSURE	33.6	33.6
PIER 2 DIAPHRAGM & DECK CLOSURE	33.6	33.6
M90 EXTERIOR MODULES (4 @ 16.6 CY)	66.4	INCIDENTAL
M90 INTERIOR MODULES (8 @ 15.1 CY)	120.8	INCIDENTAL
M50 EXTERIOR MODULES (2 @ 8.4 CY)	16.8	INCIDENTAL
M50 INTERIOR MODULES (4 @ 7.7 CY)	30.8	INCIDENTAL
TOTAL (CY)	VARIES	156.5

SELF-CONSOLIDATING STRUCT. CONC. SUMMARY		
ITEM	EST. QTY	BID QTY.
WEST ABUTMENT FOOTING, PILE POCKETS (PRECAST OPTION)	3.5	INCIDENTAL
EAST ABUTMENT FOOTING, PILE POCKETS (PRECAST OPTION)	2.6	INCIDENTAL
PIER 1 CAP, PILE POCKETS (PRECAST OPTION)	5.2	INCIDENTAL
PIER 2 CAP, PILE POCKETS (PRECAST OPTION)	5.0	INCIDENTAL
TOTAL (CY)	16.3	INCIDENTAL

ULTRA HIGH PERFORMANCE CONC. SUMMARY		
ITEM	EST. QTY	BID QTY.
LONGITUDINAL JOINTS, SPAN 1 (5 @ 82 LF)	410	410
LONGITUDINAL JOINTS, SPAN 2 (5 @ 82 LF)	410	410
LONGITUDINAL JOINTS, SPAN 3 (5 @ 42 LF)	210	210
TOTAL (LF)	1,030	1,030

STRUCTURAL STEEL SUMMARY		
ITEM	EST. QTY	BID QTY.
PIER COMPRESSION BLOCKS (24 @ 163 LB)	3,912	3,912
COMPRESSION BLOCKS WEDGE SHIMS (12 @ 27 LB, 12 @ 22 LB)	588	588
PIER COMPRESSION BLOCK SHIM PACKS (24 @ 113 LB)	2,712	2,712
PIER ANCHOR BOLT ASSEMBLIES (48 @ 10.0 LB)	480	INCIDENTAL
BEAM SOLE PLATES (48 @ 36, 12 @ 49, 12 @ 58 LB)	3,012	INCIDENTAL
BEAM END PLATES (48 @ 25 LB)	1,200	INCIDENTAL
M90 EXTERIOR MODULES (4 @ 29,393 LB)	117,572	INCIDENTAL
M90 INTERIOR MODULES (8 @ 29,393 LB)	235,114	INCIDENTAL
M50 EXTERIOR MODULES (2 @ 16,891 LB)	33,782	INCIDENTAL
M50 INTERIOR MODULES (4 @ 16,891 LB)	67,564	INCIDENTAL
FLANGE DEFLECTORS (6 @ 6.8 LB)	41	INCIDENTAL
DECK DRAINS (10 @ 81 LB)	810	INCIDENTAL
TOTAL (LB)	466,787	7,212

REINF. STEEL SUMMARY		
ITEM	EST. QTY	BID QTY.
PIER 1 CAP (CIP @ 4146, PRECAST @ 5681 LB)	VARIES	INCIDENTAL
PIER 2 CAP (CIP @ 4146, PRECAST @ 5681 LB)	VARIES	INCIDENTAL
TOTAL (LB)	VARIES	INCIDENTAL

REINF. STEEL, EPOXY COATED SUMMARY		
ITEM	EST. QTY	BID QTY.
WEST ABUT. FOOTING (CIP @ 3403, PRECAST @ 4168 LB)	VARIES	INCIDENTAL
EAST ABUT. FOOTING (CIP @ 3436, PRECAST @ 4263 LB)	VARIES	INCIDENTAL
WEST ABUTMENT FOOTING MECH. SPLICES (EXCL. COUPLER WT.)	1,528	INCIDENTAL
EAST ABUTMENT FOOTING MECH. SPLICES (EXCL. COUPLER WT.)	1,528	INCIDENTAL
WEST ABUTMENT BACKWALL, WINGS & DECK CLOSURE	2,719	2,719
EAST ABUTMENT BACKWALL, WINGS & DECK CLOSURE	2,719	2,719
PIER 1 DIAPHRAGM & DECK CLOSURE	1,097	1,097
PIER 2 DIAPHRAGM & DECK CLOSURE	1,097	1,097
TOTAL (LB)	VARIES	7,632

REINF. STEEL, STAINLESS SUMMARY		
ITEM	EST. QTY	BID QTY.
WEST ABUTMENT BACKWALL & DECK CLOSURE	1,927	1,927
EAST ABUTMENT BACKWALL & DECK CLOSURE	1,927	1,927
PIER 1 DECK CLOSURE	5,664	5,664
PIER 2 DECK CLOSURE	5,664	5,664
LONGITUDINAL DECK JOINTS (5 @ 1050 LB)	5,250	5,250
M90 EXTERIOR MODULES (4 @ VARIES)	11,262	INCIDENTAL
M90 INTERIOR MODULES (8 @ VARIES)	20,144	INCIDENTAL
M50 EXTERIOR MODULES (2 @ VARIES)	7,101	INCIDENTAL
M50 INTERIOR MODULES (4 @ VARIES)	13,015	INCIDENTAL
BARRIER RAIL	13,143	13,143
TOTAL (LB)	85,097	33,575

PILES, STEEL, HP 10 X 57 SUMMARY		
ITEM	EST. QTY	BID QTY.
WEST ABUTMENT (12 @ 100 LF)	1,200	1,200
EAST ABUTMENT (10 @ 100 LF)	1,000	1,000
TOTAL (LF)	2,200	2,200

PILES, STEEL, HP 16 X 141 SUMMARY		
ITEM	EST. QTY	BID QTY.
PIER 1 (8 @ 120 LF)	960	960
PIER 2 (8 @ 115 LF)	920	920
TOTAL (LF)	1,880	1,880

EXCAVATION, CLASS 20 SUMMARY		
ITEM	EST. QTY	BID QTY.
WEST ABUTMENT	125	125
EAST ABUTMENT	125	125
PIER 1 PILE ENCASEMENT	AS REQ'D.	INCIDENTAL
PIER 2 PILE ENCASEMENT	AS REQ'D.	INCIDENTAL
TOTAL (CY)	250	250

SUMMARY OF FOUNDATIONS	
LOCATION	SUBSTRUCTURE TYPE
WEST ABUTMENT	INTEGRAL ABUTMENT (MOVEABLE)
EAST ABUTMENT	INTEGRAL ABUTMENT (MOVEABLE)
PIER 1	PILE BENT (FIXED)
PIER 2	PILE BENT (FIXED)

SUMMARY OF BEARINGS	
LOCATION	BEARING TYPE
WEST ABUTMENT	TAPERED LAMINATED NEOPRENE
EAST ABUTMENT	LAMINATED NEOPRENE
PIER 1	TAPERED LAMINATED NEOPRENE
PIER 2	TAPERED LAMINATED NEOPRENE

INDEX OF BRIDGE SHEETS	
SHEET DESCRIPTIONS	SHEET NUMBER
ESTIMATED QUANTITIES	2
ITEMIZED QUANTITIES	4
GENERAL NOTES	5
SITUATION PLAN	7
SITE PLAN	8
GEOMETRIC CONTROL PLAN	9
CRITICAL CLOSURE PLAN	10
FABRICATION PLAN DETAILS	11
ASSEMBLY PLAN DETAILS	12
PIER DETAILS	13
PIER DETAILS (CAST-IN-PLACE CAP)	14
PIER DETAILS (PRECAST CAP)	16
PILE ENCASEMENT DETAILS	18
ABUTMENT FOOTING DETAILS	19
ABUTMENT FOOTING (CAST-IN-PLACE)	20
ABUTMENT FOOTING (PRECAST)	22
ABUTMENT DETAILS	24
ABUTMENT WING DETAILS	25
SUPERSTRUCTURE TRANSVERSE SECTIONS	26
SUPERSTRUCTURE LONGITUDINAL SECTIONS	27
UHPC JOINT DETAILS	29
SUPERSTRUCTURE DETAILS	30
SLAB ELEVATION TABLES	32
HAUNCH DATA TABLES	33
FRAMING PLAN & DETAILS	35
BEARING DETAILS	39
SUPERSTRUCTURE MODULES - M90	41
SUPERSTRUCTURE MODULES - M50	47
BARRIER RAIL DETAILS	53
SUBDRAIN DETAILS	55
BACKFILL DETAILS	56
WING ARMORING DETAILS	57
DEMONSTRATION UHPC JOINT	58

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
SUMMARY OF ITEMIZED QUANTITIES
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 3 OF 57 FILE NO. 30846 DESIGN NO. 115

GENERAL NOTES:

THIS DESIGN IS FOR REPLACEMENT OF THE EXISTING 150'-0 X 28'-0 CONTINUOUS CONCRETE GIRDER BRIDGE (DESIGN 5152) WITH A 234'-0 X 44'-0 MODULAR ROLLED STEEL BEAM BRIDGE.

IA-92 SHALL REMAIN OPEN TO THROUGH-TRAFFIC EXCEPT DURING THE CRITICAL CLOSURE PERIOD. THE ROADWAY WILL BE CLOSED TO THROUGH-TRAFFIC DURING THE CRITICAL CLOSURE. IT IS THE INTENT OF THIS PROJECT TO COMPLETE CONSTRUCTION ON AN ACCELERATED SCHEDULE AND LIMIT THE CRITICAL CLOSURE TO A MAXIMUM OF 21 CALENDAR DAYS.

THIS BRIDGE IS DESIGNED FOR HL-93 LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE REMOVAL OF THE EXISTING BRIDGE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS. PLANS OF THE EXISTING STRUCTURE WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS - HIGHWAY DIVISION - IOWA D.O.T. - AMES.

THE BRIDGE CONTRACTOR WILL BE THE ONLY CONTRACTOR AT THE SITE AND IS RESPONSIBLE FOR THE COMPLETION OF ALL WORK AS DETAILED AND NOTED IN THESE PLANS.

UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR ARE KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE BRIDGE CONTRACTOR OF THE STARTING DATE.

THE BRIDGE CONTRACTOR IS TO CLEAR AND / OR SHAPE THE CHANNEL WITHIN THE APPROXIMATE LIMITS SHOWN ON THE "SITUATION PLAN", "LONGITUDINAL SECTION ALONG $\frac{1}{2}$ ROADWAY", AND "SITE PLAN" ON DESIGN SHEETS 6 AND 7.

CLASS 20 EXCAVATION QUANTITIES ARE BASED ON THE ASSUMPTION THAT THE BERM CONSTRUCTION IS COMPLETED PRIOR TO STARTING CONSTRUCTION OF THE ABUTMENTS AND PIERS.

IT SHALL BE THE BRIDGE CONTRACTOR'S RESPONSIBILITY TO PROVIDE SITES FOR EXCESS EXCAVATED MATERIAL. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

THE BRIDGE CONTRACTOR SHALL PREBORE HOLES FOR ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON DESIGN SHEET 6. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING AND MINIMUM DRIVING LENGTH.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (50) IS $\frac{5}{8}$ INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11
BAR DESIGNATION	10	13	16	19	22	25	29	32	36

ALL REINFORCING BARS AND BARS NOTED AS DOWELS SUPPLIED FOR THIS STRUCTURE SHALL BE DEFORMED REINFORCEMENT UNLESS OTHERWISE NOTED OR SHOWN.

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO 10° FROM VERTICAL UNLESS OTHERWISE NOTED OR SHOWN.

THIS STRUCTURE SHALL BE BUILT WITH WEATHERING STEEL. ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709 GRADE 50W. PAINTING REQUIREMENTS FOR THIS STRUCTURE SHALL BE IN ACCORDANCE WITH ARTICLE 2408.02, Q, OF THE STANDARD SPECIFICATIONS, AND AS NOTED IN THE DESIGN PLANS. THIS PROJECT INCLUDES NON-STANDARD COMPONENTS TO BE PAINTED, INCLUDING BUT NOT LIMITED TO BEAM ENDS AT PIER DIAPHRAGMS, SOLE PLATES, END PLATES, COMPRESSION BLOCK ASSEMBLIES AND COMPRESSION BLOCK SHIMS.

NO TORCHWORK, CUTTING, GRINDING OR DRILLING OF HOLES ON THE STRUCTURAL STEEL OF THE BRIDGE SHALL BE PERFORMED WHEN THE AIR TEMPERATURE AND STEEL TEMPERATURE ARE BELOW 40°F.

CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USE OF CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 2513.03, A, 2, OF THE STANDARD SPECIFICATIONS. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. CLASS D CONCRETE IS NOT PERMITTED FOR CONCRETE BARRIER RAILS (CAST-IN-PLACE OR SLIPFORMED METHOD).

ACCELERATED BRIDGE CONST. NOTES:

THE ACCELERATED BRIDGE CONSTRUCTION (ABC) CONCEPT FOR THIS PROJECT WAS SELECTED IN PART TO FURTHER DEVELOP IOWA D.O.T.'S EXPERIENCE WITH DESIGN AND CONSTRUCTION OF SIMPLE-SPAN, MODULAR ROLLED STEEL BEAM BRIDGES USING ULTRA-HIGH-PERFORMANCE CONCRETE (UHPC) JOINT CLOSURES. THE FOLLOWING ABC TECHNOLOGIES SHALL BE CONSIDERED REQUISITE IN THE DESIGN AND CONSTRUCTION OF THIS PROJECT:

- SIMPLE-SPAN MADE CONTINUOUS STRUCTURAL STEEL DESIGN
- PRECAST DECKED BEAM MODULAR CONSTRUCTION
- ULTRA HIGH PERFORMANCE CONCRETE (UHPC) LONGITUDINAL JOINT CLOSURES

IN ADDITION TO THE REQUISITE ABC TECHNOLOGIES NOTED ABOVE, THE DESIGN PLANS DETAIL THE FOLLOWING OPTIONAL ABC TECHNOLOGIES:

- PRECAST PIER CAPS
- PRECAST ABUTMENT FOOTINGS

THE CONTRACTOR MAY DEVELOP ALTERNATE CONSTRUCTION PROPOSALS, IN ACCORDANCE WITH SECTION 1105.15 OF THE STANDARD SPECIFICATIONS, ALLOWING THE STATE TO BENEFIT FROM REDUCED COST, WHILE MAINTAINING THE SAME OR REDUCED CONSTRUCTION SCHEDULE. TO BE CONSIDERED FOR APPROVAL, ALTERNATE CONSTRUCTION PROPOSALS DEVELOPED BY THE CONTRACTOR MUST INCLUDE THE REQUISITE ABC TECHNOLOGIES NOTED IN THE PLANS AND MUST MEET OR EXCEED THE PERFORMANCE, RELIABILITY, QUALITY AND CONSTRUCTABILITY OF THE DETAILS INCLUDED IN THE PLANS. PROPOSED DESIGN MODIFICATIONS THAT AFFECT THE STRUCTURAL BEHAVIOR AND/OR PERFORMANCE OF THE STRUCTURE MUST BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF IOWA.

REQUIRED SUBMITTALS:

SHOP DRAWINGS -

SHOP DRAWINGS SHALL BE SUBMITTED FOR THE FOLLOWING ITEMS SHOWN IN THE TABLE BELOW. (NOTE ADDITIONAL SHOP DRAWINGS MAY BE REQUIRED IN ACCORDANCE WITH ARTICLE 1105.03 OF THE STANDARD SPECIFICATIONS.)

SUBMITTAL REQUIREMENTS FOR SHOP DRAWINGS SHALL BE IN ACCORDANCE WITH ARTICLE 1105.03, OF THE STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION OF THE IOWA DEPARTMENT OF TRANSPORTATION, EXCEPT AS OTHERWISE NOTED IN THE APPLICABLE SPECIAL PROVISIONS.

1	PREFABRICATED SUPERSTRUCTURE MODULES
2	PRECAST SUBSTRUCTURE ELEMENTS, AS REQUIRED
3	COMPRESSION BLOCK ASSEMBLIES
4	ANCHOR BOLT ASSEMBLIES AND ANCHOR BOLT GROUT SPECS
5	DECK DRAINS

OTHER SUBMITTALS -

THE CONTRACTOR SHALL PROVIDE SUBMITTALS FOR THE FOLLOWING ITEMS SHOWN IN THE TABLE BELOW.

REQUIREMENTS FOR THE FOLLOWING SUBMITTALS SHALL BE IN ACCORDANCE WITH THE DESIGN PLANS AND APPLICABLE SPECIAL PROVISIONS.

1	CONSTRUCTION SCHEDULE
2	SUPERSTRUCTURE MODULE FABRICATION PLAN *
3	SUPERSTRUCTURE MODULE ASSEMBLY PLAN *
4	PRECAST SUBSTRUCTURE ELEMENT ASSEMBLY PLAN *
5	UHPC JOINT MOCKUP AND UHPC PLACEMENT PLAN
6	WELD PREQUALIFICATIONS AND PROCEDURES
*	THE CONTRACTOR SHALL NOTE THAT FABRICATION PLANS AND ASSEMBLY PLANS SHALL INCLUDE SUBMITTALS OF CONSTRUCTION LOAD ANALYSES, LIFTING AND HANDLING CALCULATIONS, LIFTING DEVICE / ATTACHMENT POINT DESIGN, AND TEMPORARY SUPPORT / BRACING DESIGN.

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE CLOSED TO THROUGH TRAFFIC DURING THE CRITICAL CLOSURE. IA-92 SHALL REMAIN OPEN TO THROUGH TRAFFIC BEFORE AND AFTER THE CRITICAL CLOSURE. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

POLLUTION PREVENTION PLAN

NOTE: POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

SPECIFICATIONS:

DESIGN: AASHTO LRFD 6th Ed., SERIES OF 2012, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.

CONSTRUCTION: IOWA DOT STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DEVELOPMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS APPLICABLE TO THIS PROJECT INCLUDE, BUT ARE NOT LIMITED TO:

- DEVELOPMENTAL SPECIFICATIONS FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES
- SPECIAL PROVISIONS FOR PREFABRICATED SUPERSTRUCTURE MODULES
- SPECIAL PROVISIONS FOR PRECAST SUBSTRUCTURE ELEMENTS
- SPECIAL PROVISIONS FOR ULTRA HIGH PERFORMANCE CONCRETE

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6th Ed., SERIES OF 2012, UNLESS OTHERWISE NOTED:

REINFORCING STEEL (NON-COATED & EPOXY COATED) IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60.

REINFORCING STEEL (STAINLESS) IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60 OR 75.

STRUCTURAL CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, $f'c = 4.0$ KSI.

SELF-CONSOLIDATING STRUCTURAL CONCRETE (HIGH EARLY STRENGTH) IN ACCORDANCE WITH SPECIAL PROVISIONS FOR PRECAST SUBSTRUCTURE ELEMENTS, $f'c = 5.0$ KSI.

HIGH PERFORMANCE STRUCTURAL CONCRETE IN ACCORDANCE WITH DS-12050, EXCEPT AS PERMITTED IN SPECIAL PROVISIONS FOR PREFABRICATED SUPERSTRUCTURE MODULES AND SPECIAL PROVISIONS FOR PRECAST SUBSTRUCTURE ELEMENTS, $f'c = 5.0$ KSI.

ULTRA HIGH PERFORMANCE CONCRETE IN ACCORDANCE WITH SPECIAL PROVISIONS FOR ULTRA HIGH PERFORMANCE CONCRETE.

STRUCTURAL STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 6, ASTM A709 GRADE 36, GRADE 50 AND GRADE 50W (AASHTO M270 GRADE 36, GRADE 50 AND GRADE 50W).

BRIDGE DECK DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	236.1
2	MINIMUM DECK WIDTH	L.F.	47.2
3	MAXIMUM DECK WIDTH	L.F.	47.2
4	DECK AREA	S.F.	11,144

1. DECK LENGTH IS MEASURED FROM FACE-TO-FACE OF PAVING NOTCHES ALONG THE CENTERLINE OF THE ROADWAY.
- 2, 3. DECK WIDTHS ARE MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE CENTERLINE OF ROADWAY.
4. DECK AREA IS TO BE BASED ON THE FACE-TO-FACE PAVING NOTCH DISTANCE AND OUT-TO-OUT DECK DIMENSIONS.

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
GENERAL NOTES	
STA. 528+80.00 IA 92	OCTOBER, 2014
POTTAWATTAMIE COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. <u>4</u> OF <u>57</u>	FILE NO. <u>30846</u> DESIGN NO. <u>115</u>

FABRICATION PLAN NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A FABRICATION PLAN FOR PREFABRICATED SUPERSTRUCTURE MODULES, IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS. REFER TO PROJECT SPECIAL PROVISIONS AND DESIGN SHEET IO FOR ADDITIONAL FABRICATION PLAN DETAILS.

ALL COSTS ASSOCIATED WITH DESIGN AND IMPLEMENTATION OF THE FABRICATION PLANS SHALL BE INCIDENTAL TO THE PRICE BIDS FOR THE COMPONENTS BEING PREFABRICATED.

ASSEMBLY PLAN NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT AN ASSEMBLY PLAN FOR PREFABRICATED SUPERSTRUCTURE MODULES AND PRECAST SUBSTRUCTURE ELEMENTS, IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS. THE ASSEMBLY PLAN SHALL BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF IOWA. REFER TO PROJECT SPECIAL PROVISIONS AND DESIGN SHEET II FOR ADDITIONAL ASSEMBLY PLAN DETAILS.

ALL COSTS ASSOCIATED WITH DESIGN AND IMPLEMENTATION OF THE ASSEMBLY PLAN(S) SHALL BE INCIDENTAL TO THE PRICE BIDS FOR THE PREFABRICATED AND/OR PRECAST COMPONENTS BEING ASSEMBLED.

PRECASTING GENERAL NOTES:

PRECASTING MATERIALS AND PROCEDURES SHALL CONFORM TO SECTION 2407 OF THE STANDARD SPECIFICATIONS AND MATERIALS I.M. 570 LRFD, EXCEPT AS PERMITTED IN THE ALTERNATE SITE CASTING NOTES IN THE DESIGN PLANS. THE FOLLOWING PRECASTING GENERAL NOTES APPLY TO ALL PLANT CAST AND ALTERNATE SITE CAST PRECAST CONCRETE COMPONENTS:

REMOVAL AND STORAGE:

ALL PRECAST ELEMENTS SHALL BE REMOVED FROM THE FORMS IN SUCH A MANNER THAT NO DAMAGE OCCURS TO THE ELEMENT. FORM REMOVAL SHALL CONFORM TO THE REQUIREMENTS OF ARTICLE 2407.03.F OF THE STANDARD SPECIFICATIONS. ANY MATERIALS FORMING BLOCKOUTS IN THE PRECAST ELEMENTS SHALL BE REMOVED SUCH THAT DAMAGE DOES NOT OCCUR TO THE PRECAST ELEMENTS OR THE BLOCKOUT. PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER THAT ADEQUATE SUPPORT IS PROVIDED TO PREVENT CRACKING OR CREEP-INDUCED DEFORMATION (SAGGING). DURING STORAGE FOR LONG PERIODS OF TIME (LONGER THAN ONE MONTH), ALL PRECAST ELEMENTS SHALL BE CHECKED AT LEAST ONCE PER MONTH TO ENSURE CREEP-INDUCED DEFORMATION DOES NOT OCCUR.

LIFTING AND HANDLING:

LIFTING AND HANDLING CALCULATIONS DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF IOWA SHALL BE SUBMITTED AS A PART OF THE ASSEMBLY PLAN(S), IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS. THE CONTRACTOR SHALL SUBMIT LIFTING LOCATIONS AND LIFTING DEVICE AND/OR ATTACHMENT POINT DETAILS FOR APPROVAL BY ENGINEER PRIOR TO USE. LIFTING DEVICES AND/OR ATTACHMENT POINTS SHALL BE REMOVED AND PATCHED AFTER USE, BY MEANS APPROVED BY THE ENGINEER.

ALL PRECAST ELEMENTS SHALL BE HANDLED IN SUCH A MANNER AS NOT TO DAMAGE OR OVERSTRESS THE PRECAST ELEMENTS DURING LIFTING OR MOVING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT PRECAST ELEMENTS AND THEIR LIFTING DEVICES AND/OR ATTACHMENT POINTS HAVE SUFFICIENT CAPACITY TO RESIST THE PROPOSED LIFTING AND HANDLING STRESSES.

TRANSPORTATION:

ALL PRECAST ELEMENTS SHALL BE TRANSPORTED IN SUCH A MANNER THAT THE PRECAST ELEMENTS WILL NOT BE DAMAGED OR OVERSTRESSED DURING TRANSPORTATION. PRECAST ELEMENTS SHALL BE PROPERLY SUPPORTED DURING TRANSPORTATION SUCH THAT CRACKING OR DEFORMATION (SAGGING) DOES NOT OCCUR. IF MORE THAN ONE PRECAST ELEMENT IS TRANSPORTED PER VEHICLE, PROPER SUPPORT AND SEPARATION MUST BE PROVIDED BETWEEN THE INDIVIDUAL PRECAST ELEMENTS. PRECAST ELEMENTS SHALL LIE HORIZONTAL DURING TRANSPORTATION, UNLESS OTHERWISE APPROVED.

REPAIRS:

REPAIRS OF DAMAGE CAUSED TO THE PRECAST ELEMENTS DURING FABRICATION, LIFTING AND HANDLING, OR TRANSPORTATION SHALL BE ADDRESSED ON A CASE-BY-CASE BASIS. DAMAGE WITHIN ACCEPTABLE LIMITS OF THE PRECAST ELEMENTS SHALL BE REPAIRED IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS AT THE EXPENSE OF THE CONTRACTOR. REPETITIVE DAMAGE TO PRECAST ELEMENTS SHALL BE CAUSE FOR STOPPAGE OF FABRICATION OPERATIONS UNTIL THE CAUSE OF THE DAMAGE CAN BE REMEDIED. ALL PROPOSED REPAIRS SHALL BE APPROVED BY THE ENGINEER IN ADVANCE.

ALTERNATE SITE CASTING NOTES:

THE CONTRACTOR MAY ELECT TO FABRICATE PRECAST CONCRETE COMPONENTS AT AN ALTERNATE SITE (TO BE DETERMINED BY CONTRACTOR), IN LIEU OF CONSTRUCTING THESE COMPONENTS AT A PREQUALIFIED FABRICATION PLANT. ALTERNATE SITE CASTING SHALL COMPLY WITH SECTION 2403 OF THE STANDARD SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS FOR HIGH PERFORMANCE STRUCTURAL CONCRETE, AND THE PROVISIONS LISTED BELOW (ADAPTED FROM SECTION 2407 OF THE STANDARD SPECIFICATIONS):

A. EQUIPMENT.

USE EQUIPMENT MEETING THE REQUIREMENTS OF SECTION 2001 AND THE FOLLOWING:

1. CASTING BEDS.

FOR PRECAST CONCRETE, USE CASTING BEDS RIGIDLY CONSTRUCTED AND SUPPORTED SO THAT UNDER THE WEIGHT (MASS) OF THE CONCRETE THERE WILL BE NO VERTICAL DEFORMATION OF THE BED.

2. FORMS.

USE FORMS FOR PRECAST TRUE TO THE DIMENSIONS AS SHOWN IN THE CONTRACT DOCUMENTS, TRUE TO LINE, MORTAR TIGHT, AND OF SUFFICIENT RIGIDITY TO NOT SAG OR BULGE OUT OF SHAPE UNDER PLACEMENT AND VIBRATION OF CONCRETE. ENSURE INSIDE SURFACES ARE SMOOTH AND FREE OF ANY PROJECTIONS, INDENTATIONS, OR OFFSETS THAT MIGHT RESTRICT DIFFERENTIAL MOVEMENTS OF FORMS AND CONCRETE.

B. CURING.

1. USE A METHOD OF CURING THAT PREVENTS LOSS OF MOISTURE AND MAINTAINS AN INTERNAL CONCRETE TEMPERATURE OF AT LEAST 40°F (4°C) DURING THE CURING PERIOD. OBTAIN THE ENGINEER'S APPROVAL FOR THIS METHOD.

2. WHEN USING ACCELERATED HEAT CURING, DO SO UNDER A SUITABLE ENCLOSURE. USE EQUIPMENT AND PROCEDURES THAT WILL ENSURE UNIFORM CONTROL AND DISTRIBUTION OF HEAT AND PREVENT LOCAL OVERHEATING. ENSURE THE CURING PROCESS IS UNDER THE DIRECT SUPERVISION AND CONTROL OF COMPETENT OPERATORS.

3. WHEN ACCELERATED HEAT IS USED TO OBTAIN TEMPERATURES ABOVE 100°F (38°C):

a. RECORD THE TEMPERATURE OF THE INTERIOR OF THE CONCRETE USING A SYSTEM CAPABLE OF AUTOMATICALLY PRODUCING A TEMPERATURE RECORD AT INTERVALS OF NO MORE THAN 15 MINUTES DURING THE ENTIRE CURING PERIOD.

b. SPACE THE SYSTEMS AT A MINIMUM OF ONE LOCATION PER 100 FEET (30 M) OF LENGTH PER UNIT OR FRACTION THEREOF, WITH A MAXIMUM OF THREE LOCATIONS ALONG EACH LINE OF UNITS BEING CURED.

c. ENSURE ALL UNITS, WHEN CALIBRATED INDIVIDUALLY, ARE ACCURATE WITHIN ±5°F (3°C).

d. DO NOT ARTIFICIALLY RAISE THE TEMPERATURE OF THE CONCRETE ABOVE 100°F (38°C) FOR A MINIMUM OF 2 HOURS AFTER THE UNITS HAVE BEEN CAST. AFTER THE 2 HOUR PERIOD, THE TEMPERATURE OF THE CONCRETE MAY BE RAISED TO A MAXIMUM TEMPERATURE OF 160°F (71°C) AT A RATE NOT TO EXCEED 25°F (15°C) PER HOUR.

e. LOWER THE TEMPERATURE OF THE CONCRETE AT A RATE NOT TO EXCEED 40°F (22°C) PER HOUR BY REDUCING THE AMOUNT OF HEAT APPLIED UNTIL THE INTERIOR OF THE CONCRETE HAS REACHED THE TEMPERATURE OF THE SURROUNDING AIR.

4. IN ALL CASES, COVER THE CONCRETE AND LEAVE COVERED UNTIL CURING IS COMPLETED. SIDE FORMS AND PANS FORMING THE UNDERSIDE OF CHANNEL SHAPES MAY BE REMOVED DURING THIS PERIOD IF THE COVER IS IMMEDIATELY REPLACED. DO NOT, UNDER ANY CIRCUMSTANCES, REMOVE UNITS FROM THE CASTING BED UNTIL THE STRENGTH REQUIREMENTS ARE MET.

C. REMOVAL OF FORMS.

IF FORMS ARE REMOVED BEFORE THE CONCRETE HAS ATTAINED THE STRENGTH WHICH WILL PERMIT THE UNITS TO BE MOVED OR STRESSED, REMOVE PROTECTION ONLY FROM THE IMMEDIATE SECTION FROM WHICH FORMS ARE BEING REMOVED. IMMEDIATELY REPLACE THE PROTECTION AND RESUME CURING AFTER THE FORMS ARE REMOVED. DO NOT REMOVE PROTECTION ANY TIME BEFORE THE UNITS ATTAIN THE SPECIFIED COMPRESSIVE STRENGTH WHEN THE SURROUNDING AIR TEMPERATURE IS BELOW 20°F (-7°C).

ALT. SITE CASTING NOTES (CONT'D):

D. TOLERANCES.

LIMIT VARIATION FROM DIMENSIONS SHOWN IN THE CONTRACT DOCUMENTS TO NO MORE THAN $\frac{1}{8}$ INCH (3 MM). FOR OVERRUNS, GREATER DEVIATION MAY BE ACCEPTED IF, IN THE ENGINEER'S OPINION, IT DOES NOT IMPAIR THE SUITABILITY OF THE MEMBER FOR ITS INTENDED USE, UNLESS SHOWN ELSEWHERE IN THESE PLANS.

E. HANDLING AND STORAGE.

1. WHEN LIFTING AND HANDLING PRECAST UNITS, SUPPORT THEM AT OR NEAR THE POINTS DESIGNATED IN THE APPROVED SHOP/WORKING DRAWINGS.

2. DO NOT LIFT OR STRAIN UNITS IN ANY WAY BEFORE THEY HAVE DEVELOPED THE STRENGTH SPECIFIED. IN STORAGE, SUPPORT UNITS AT POINTS ADJACENT TO THE BEARINGS.

3. DURING FABRICATION, STORAGE, HANDLING, AND HAULING TAKE CARE TO PREVENT CRACKING, TWISTING, UNNECESSARY ROUGHNESS, OR OTHER DAMAGE. IN PARTICULAR, DO NOT ALLOW TIEDOWNS TO COME IN DIRECT CONTACT WITH CONCRETE SURFACES. DO NOT SUBJECT UNITS TO EXCESSIVE IMPACT. REPLACE AT NO ADDITIONAL COST TO THE CONTRACTING AUTHORITY UNITS THAT ARE, IN THE ENGINEER'S OPINION, DAMAGED IN A WAY TO IMPAIR THEIR STRENGTH OR SUITABILITY FOR THEIR INTENDED USE.

F. FINISH.

FINISH ALL SURFACES WHICH WILL BE EXPOSED IN THE FINISHED STRUCTURE AS PROVIDED IN ARTICLE 2403.03, P, 2, B, AND ENSURE THEY ARE FREE OF HONEYCOMB OR SURFACE DEFECTS. SUBMIT STRUCTURAL REPAIR PROCEDURES TO THE ENGINEER FOR APPROVAL.

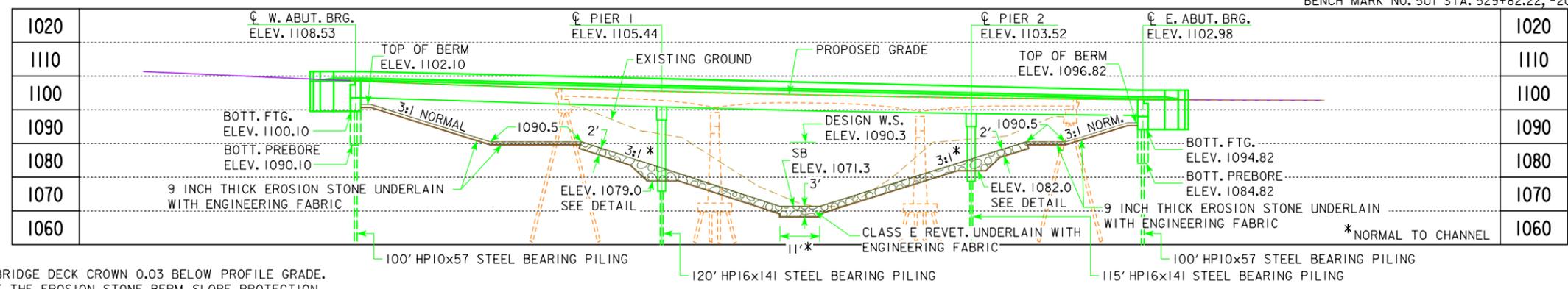
ACCELERATED INNOVATION DEPLOYMENT DEMONSTRATION PROJECT:

THIS PROJECT IS DESIGNATED AS A FEDERAL HIGHWAY ASSOCIATION (FHWA) ACCELERATED INNOVATION DEPLOYMENT (AID) DEMONSTRATION PROJECT. THIS PROJECT WILL SERVE AS THE BASIS FOR RESEARCH AND EVALUATION EFFORTS BEFORE, DURING AND AFTER CONSTRUCTION. THE CONTRACTOR SHALL NOTE THAT THE FOLLOWING MAY BE IMPLEMENTED AS A PART OF THIS PROJECT:

- SCHEDULED SITE VISITS BY IOWA DOT, FHWA, AND/OR RESEARCH PERSONNEL TO WITNESS AND DOCUMENT CONSTRUCTION ACTIVITIES.
- INSTALLATION AND MAINTENANCE OF ONE OR MORE JOB SITE CAMERAS TO RECORD CONSTRUCTION ACTIVITIES.
- INSTRUMENTATION AND MONITORING OF STRUCTURAL MEMBERS DURING AND AFTER CONSTRUCTION.

THE CONTRACTOR SHALL BE REQUIRED TO ACCOMMODATE ACCESS BY IOWA DOT, FHWA AND RESEARCH PERSONNEL. ACTIVITIES BY IOWA DOT, FHWA AND/OR RESEARCH PERSONNEL ARE ANTICIPATED TO HAVE MINIMAL IMPACT ON THE CONTRACTOR'S OPERATIONS.

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
GENERAL NOTES	
STA. 528+80.00 IA 92	OCTOBER, 2014
POTTAWATTAMIE COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. 5 OF 57	FILE NO. 30846
DESIGN NO. 115	



G1 = -5.870% G2 = +4.980%

VPI STA = 530+15.00 VC = 760.00'

VPI ELEV = 1092.60

PROPOSED PROFILE GRADE IA 92

HYDRAULIC DATA

DRAINAGE AREA = 16.6 SQ. MI.
 STREAM SLOPE = 10.6 FT./MI.
 AVG. LOW WATER STAGE = 1072.3

Q₅₀ = 4530 CFS
 STAGE = 1090.3
 BACKWATER = 0.03 FT.
 AVG. BRIDGE VELOCITY = 3.7 FPS

Q₁₀₀ = 5460 CFS
 STAGE = 1091.3
 BACKWATER = 0.06 FT.

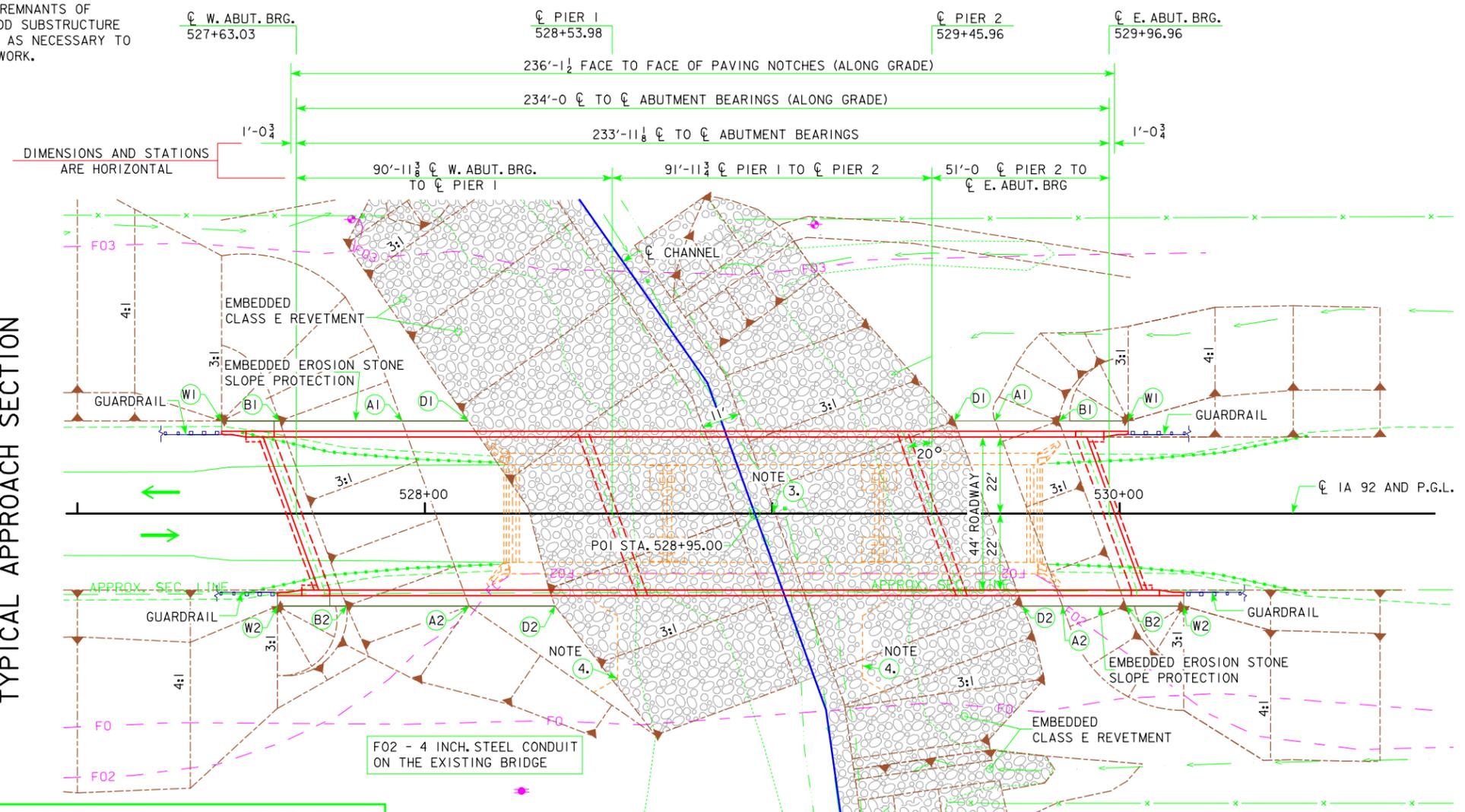
Q₂₀₀ = 6290 CFS
 STAGE = 1092.0
 CALCULATED DESIGN SCOUR = 1068.3

Q₅₀₀ = 7330 CFS
 STAGE = 1092.7
 CALCULATED CHECK SCOUR = 1068.3

ROADWAY OVERTOP 1102.84
 STA. 530+46.17

- NOTES:
- TOP OF BRIDGE DECK CROWN 0.03 BELOW PROFILE GRADE.
 - CONTINUE THE EROSION STONE BERM SLOPE PROTECTION ALONG THE BENCH TO THE TOP OF REVETMENT.
 - STA. 529+00.06 150' X 28' CONT. CONC. GIRDER BRIDGE (DESIGN NO. 5152) TO BE REMOVED.
 - ANY ENCOUNTERED REMNANTS OF OLD BRIDGE WOOD SUBSTRUCTURE TO BE REMOVED AS NECESSARY TO COMPLETE THE WORK.

LONGITUDINAL SECTION ALONG CL APPROACH ROADWAY



- ### UTILITIES LEGEND:
- ◆ - POWER POLE - MIDAMERICAN ENERGY COMPANY
 - F0 - FIBER OPTIC - AT&T TRANSMISSION
 - F02 - FIBER OPTIC - MCI
 - F03 - FIBER OPTIC - FRONTIER COMMUNICATIONS OF IOWA
 - NOT SHOWN - FIBER OPTIC - LIGHTCORE (DIGITAL TELEPORT-A)

LOCATION

IA 92 OVER LITTLE SILVER CREEK
 T-74N R-42W
 SECTION 2&11
 KEG CREEK TOWNSHIP
 POTTAWATTAMIE COUNTY
 FHWA NO. 43821
 BRIDGE MAINT. NO. 7816.6S092
 LATITUDE 41.232779°
 LONGITUDE -95.634139°

BERM SLOPE LOCATION TABLE

POINTS	WEST ABUTMENT			EAST ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	527+93.39	26.58' LT	1090.50	529+64.20	26.58' LT	1090.50
A2	528+12.74	26.58' RT	1090.50	529+83.55	26.58' RT	1090.50
B1	527+58.14	26.58' LT	1102.10	529+82.50	26.58' LT	1096.82
B2	527+77.49	26.58' RT	1102.10	530+01.85	26.58' RT	1096.82
W1	527+41.52	26.58' LT	1108.87	530+02.45	26.58' LT	1102.38
W2	527+57.54	26.58' RT	1108.19	530+18.47	26.58' RT	1102.30
D1	528+12.51	26.58' LT	1090.50	529+52.44	26.58' LT	1090.50
D2	528+37.49	26.58' RT	1090.50	529+72.15	26.58' RT	1090.50

BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE

SITUATION PLAN

DESIGN FOR 20° SKEW (R.A.)

234'-0" x 44'-0" MODULAR ROLLED STEEL BEAM BRIDGE

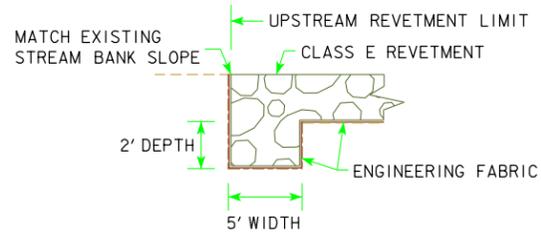
91'-0" & 51'-0" END SPANS 92'-0" INTERIOR SPAN

SITUATION PLAN

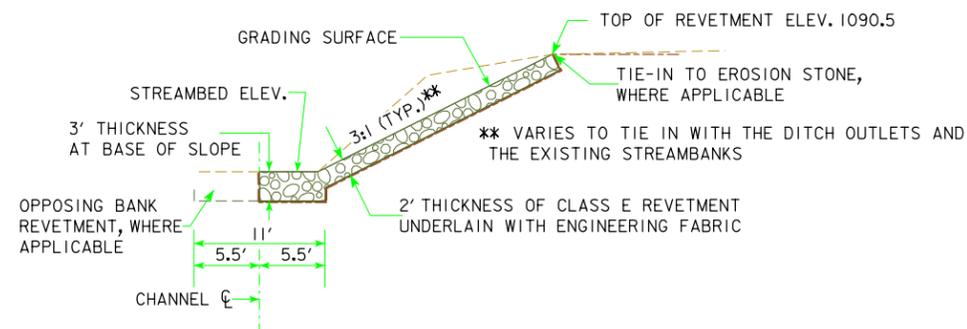
STA. 528+80.00 IA 92 OCTOBER, 2014

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 6 OF 57 FILE NO. 30846 DESIGN NO. 115



SECTION THROUGH KEY-IN TRENCH



TYPICAL CROSS SECTION EMBEDDED RIPRAP BANK PROTECTION

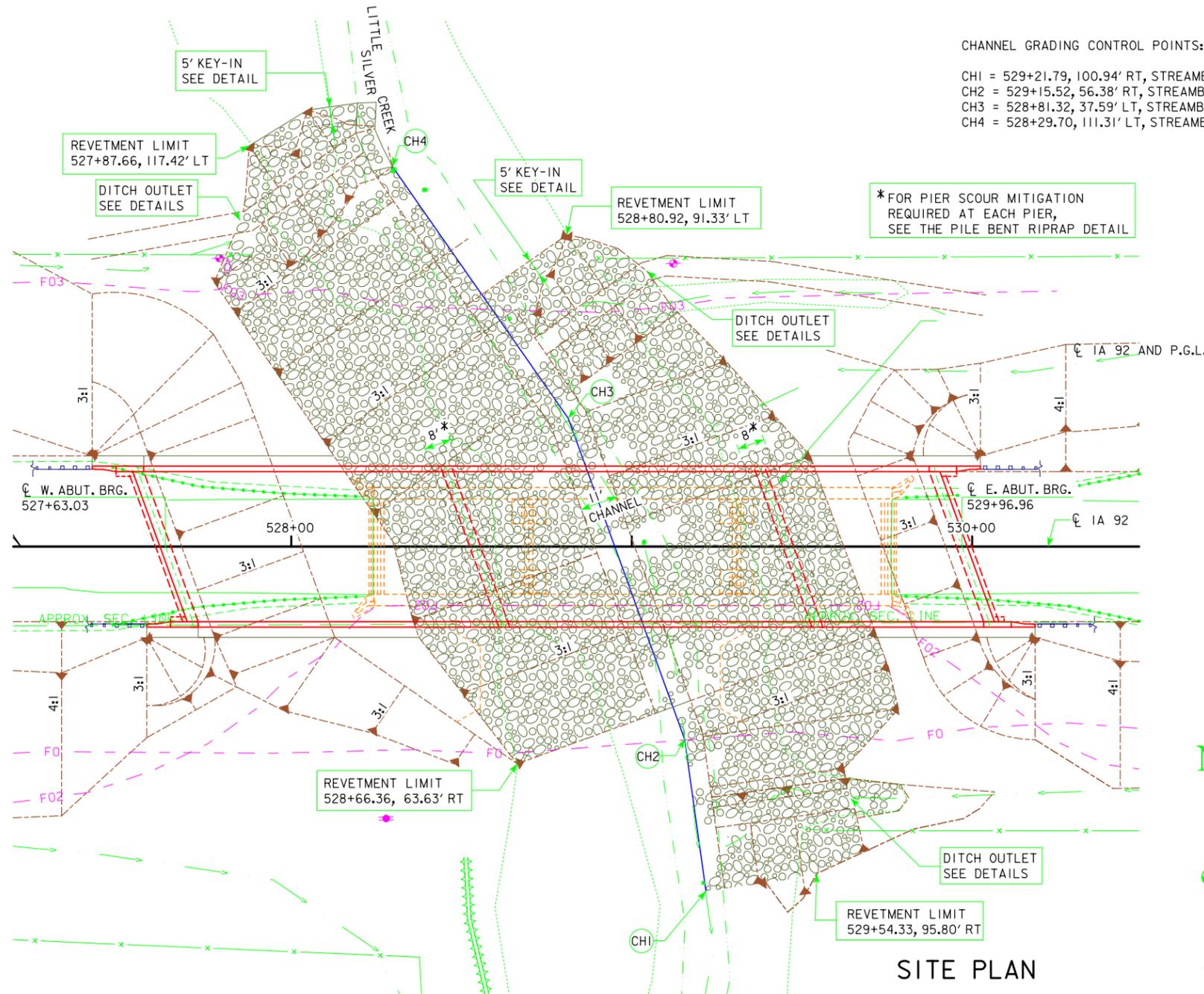
ESTIMATED BERM ARMORING QUANTITIES				
LOCATION	REVETMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
BERM/BANK LINING - WEST	1623.2	155.1	1858.9	1111.3
BERM/BANK LINING - EAST	1533.3	81.4	1625.2	1008.6
TOTALS	3156.5	236.5	3484.1	2119.9

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

CHANNEL GRADING CONTROL POINTS:

- CH1 = 529+21.79, 100.94' RT, STREAMBED ELEV. = 1071.09
- CH2 = 529+15.52, 56.38' RT, STREAMBED ELEV. = 1071.18
- CH3 = 528+81.32, 37.59' LT, STREAMBED ELEV. = 1071.38
- CH4 = 528+29.70, 111.31' LT, STREAMBED ELEV. = 1071.56

*FOR PIER SCOUR MITIGATION REQUIRED AT EACH PIER, SEE THE PILE BENT RIPRAP DETAIL



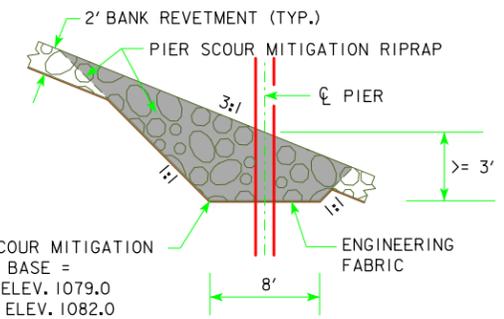
SITE PLAN

PIER SCOUR MITIGATION NOTES:

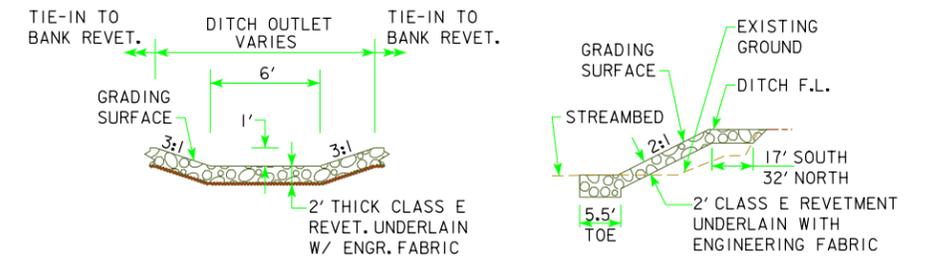
PIER SCOUR MITIGATION RIPRAP PROVIDED. LOCAL PIER SCOUR NOT INCLUDED IN DESIGN/CHECK SCOUR ELEVATIONS.

NBIS INSPECTION SHOULD VERIFY INTEGRITY OF RIPRAP.

CARRY PIER SCOUR MITIGATION RIPRAP 4 FEET BEYOND THE EDGE OF PILING UPSTREAM AND DOWNSTREAM.

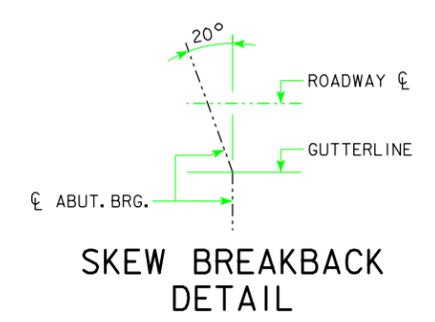
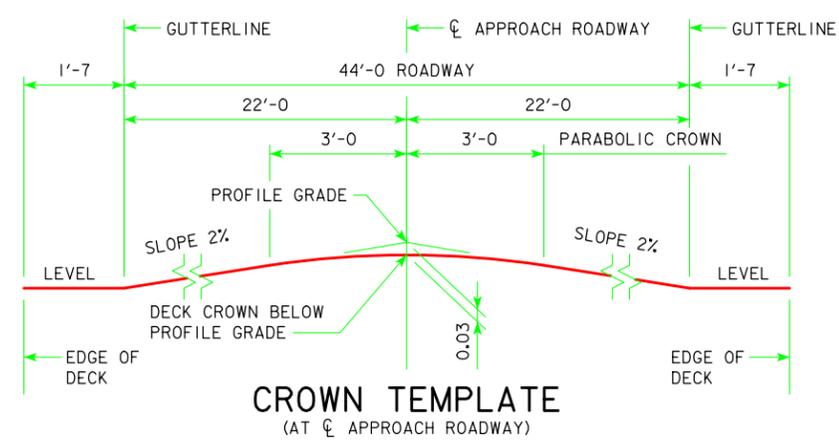
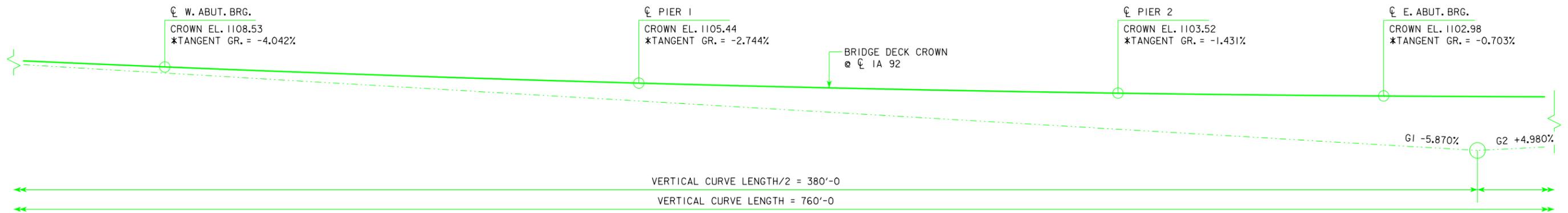
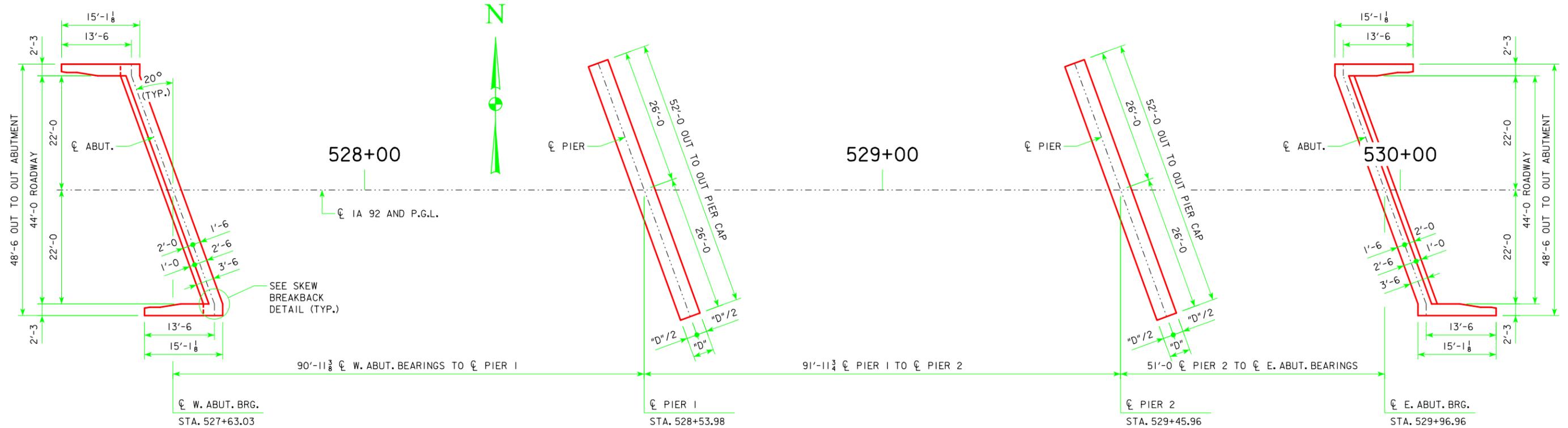


TYPICAL PILE BENT RIPRAP CROSS SECTION



TYPICAL SECTIONS AT DITCH OUTLET

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
SITUATION PLAN - SITE
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 7 OF 57 FILE NO. 30846 DESIGN NO. 115



SKEW BREAKBACK NOTE:
FOR PURPOSES OF DIMENSIONING ELSEWHERE IN THE PLANS, THE " CL ABUT. BRG. " LINE IS CONSIDERED TO EXTEND ALONG THE SKEW FOR THE 44'-0" WIDTH OF THE ROADWAY, AND EXTEND PERPENDICULAR TO THE CENTERLINE OF ROADWAY BEGINNING AT THE GUTTER LINE AND CONTINUING AWAY FROM THE CENTERLINE OF ROADWAY. REFER TO SKEW BREAKBACK DETAIL.

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

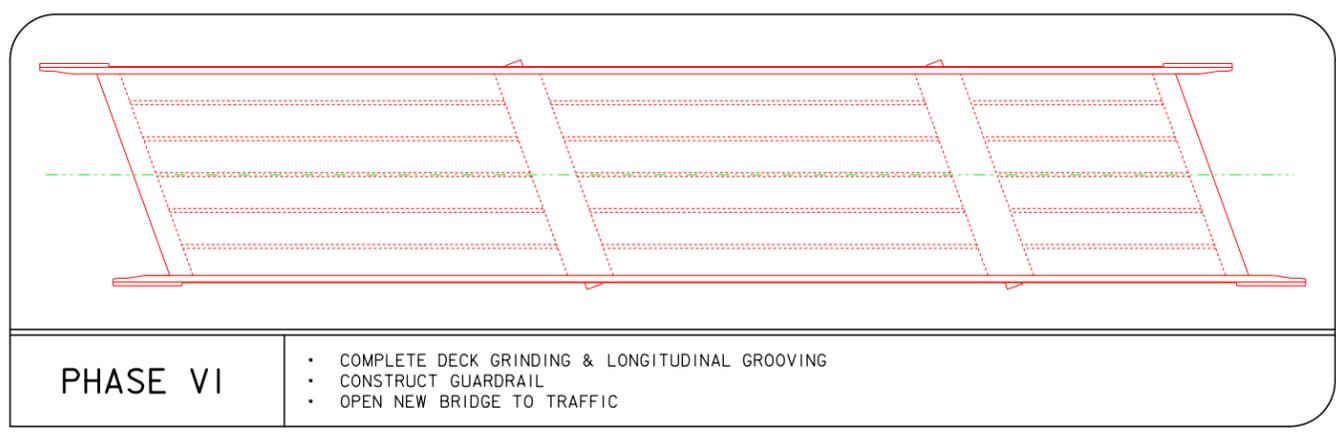
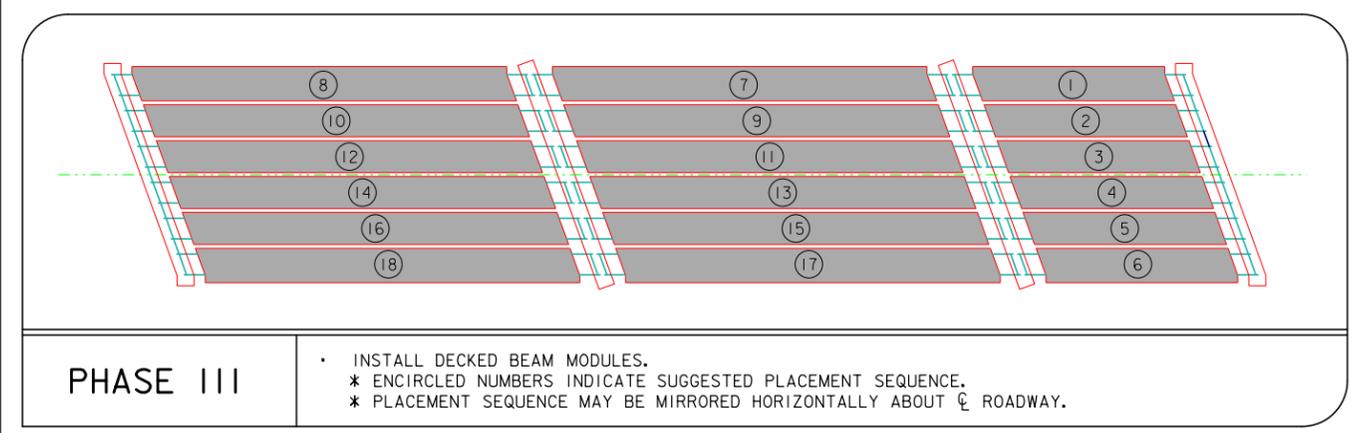
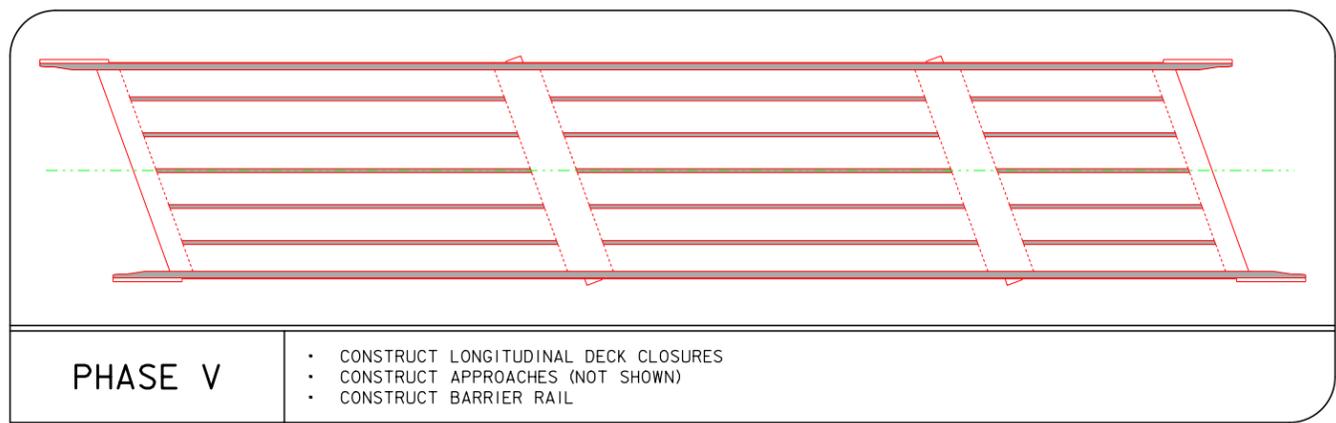
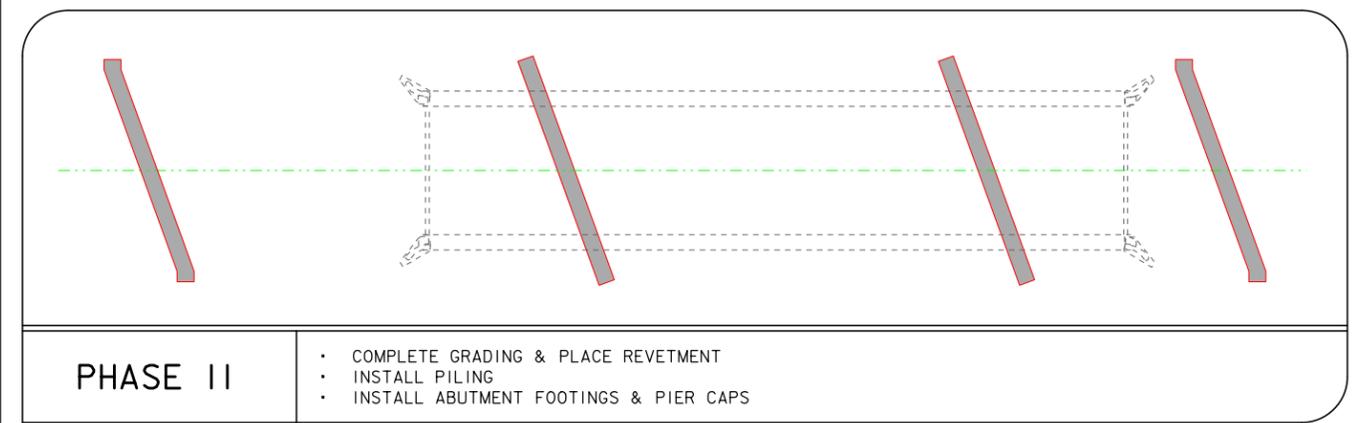
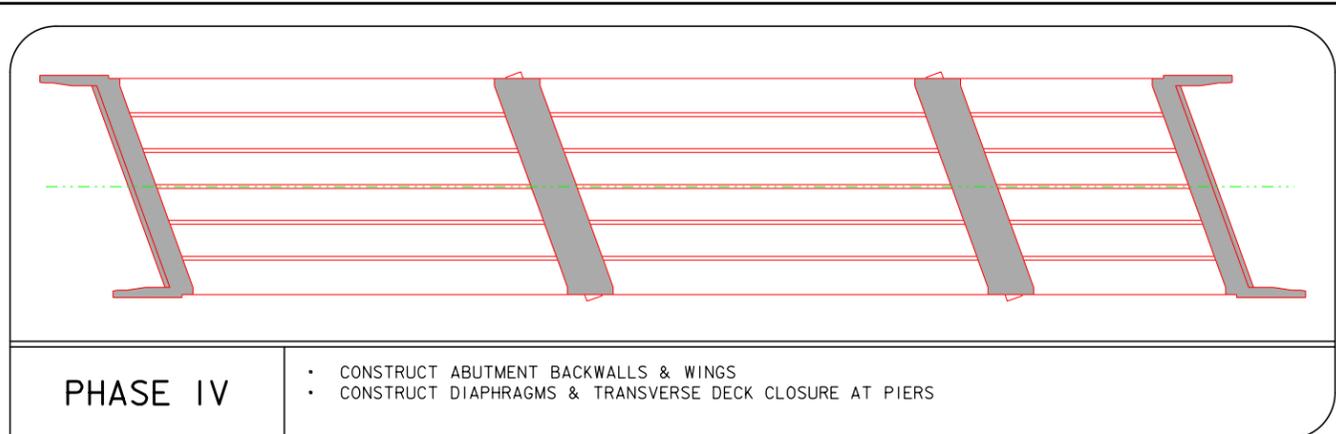
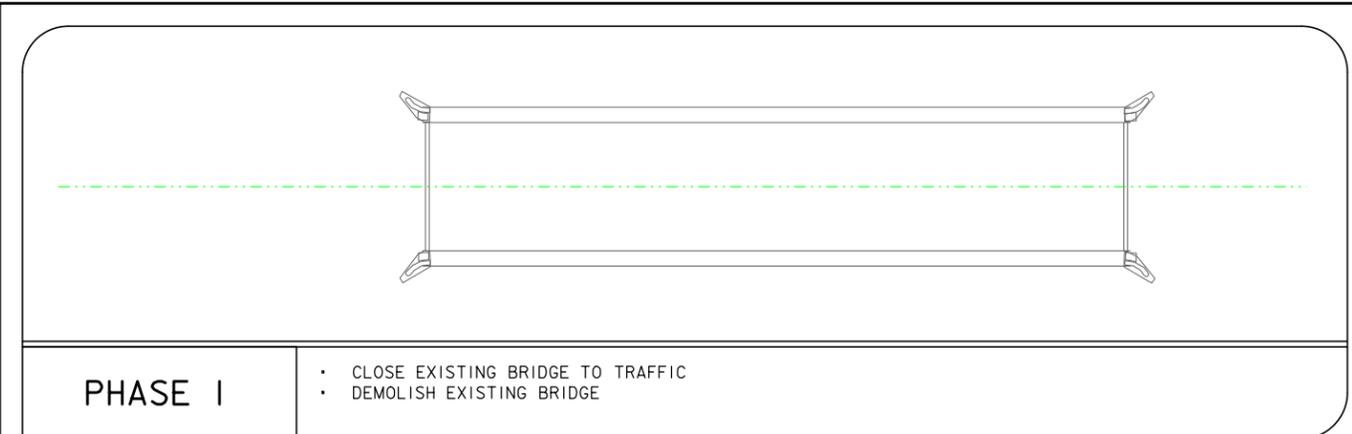
GEOMETRIC CONTROL PLAN

STA. 528+80.00 IA 92 OCTOBER, 2014

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 8 OF 57 FILE NO. 30846 DESIGN NO. 115



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

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

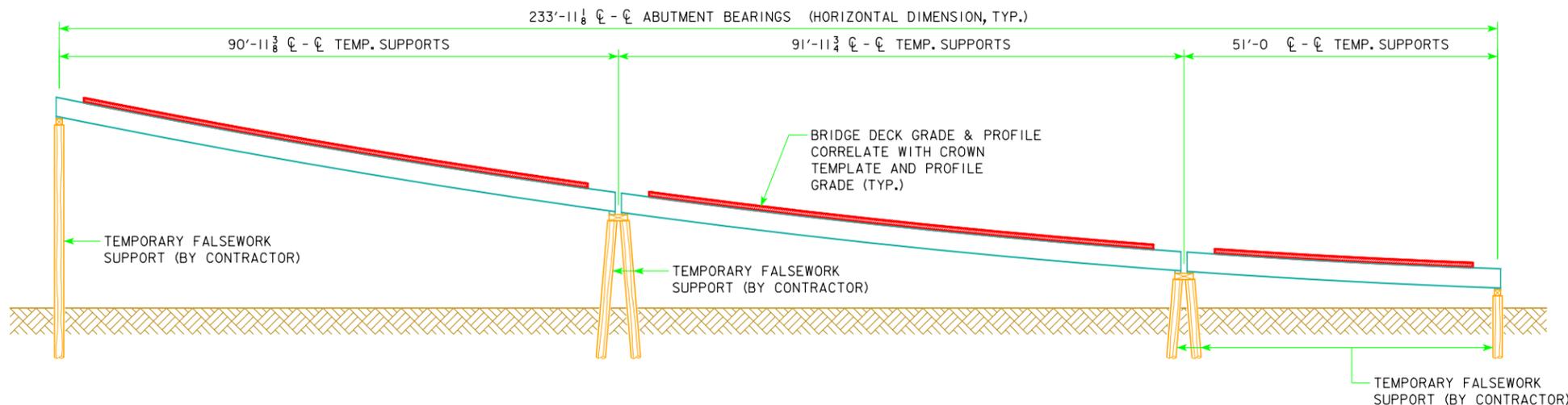
THE CONTRACTOR IS STRONGLY ENCOURAGED TO COMBINE FRAMING / CASTING OPERATIONS FOR ALL MODULES SIMULTANEOUSLY, UNDER TEMPORARY SUPPORT CONDITIONS THAT CORRESPOND WITH THE RELATIVE POSITION (LOCATION AND ELEVATION) OF THE DESIGN BRIDGE SUBSTRUCTURE SEATS. IOWA DOT HAS COMPLETED A MODULAR BRIDGE PROJECT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

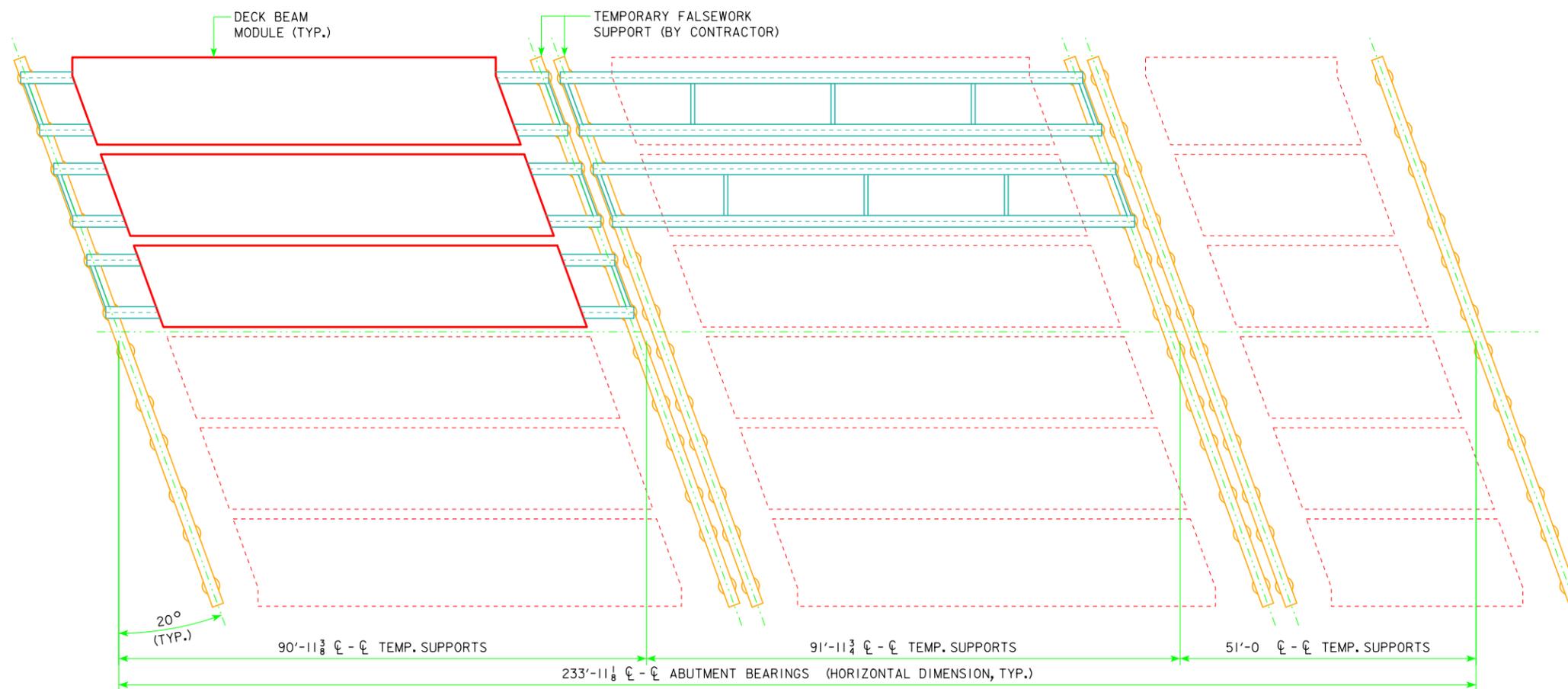
ALL COSTS ASSOCIATED WITH FURNISHING SUPERSTRUCTURE MODULES, INCLUDING TEMPORARY SUPPORTS, FABRICATION, STORAGE AND DELIVERY, SHALL BE INCIDENTAL TO THE INDIVIDUAL PRICE BIDS FOR "SUPERSTRUCTURE MODULE".



MODULE FABRICATION PROFILE (SUGGESTED)

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

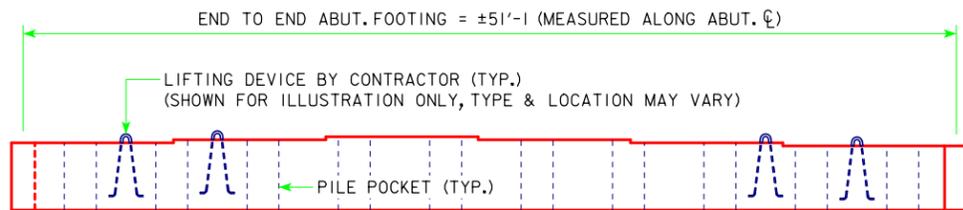
REFER TO "GEOMETRIC CONTROL PLAN" FOR PROFILE GRADE AND CROWN TEMPLATE DATA



MODULE FABRICATION LAYOUT (SUGGESTED)

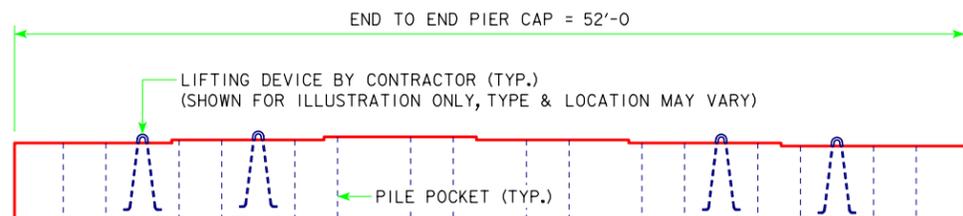
(TEMPORARY SUPPORTS SHOWN FOR ILLUSTRATION ONLY)

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. 10 OF 57 FILE NO. 30846 DESIGN NO. 115



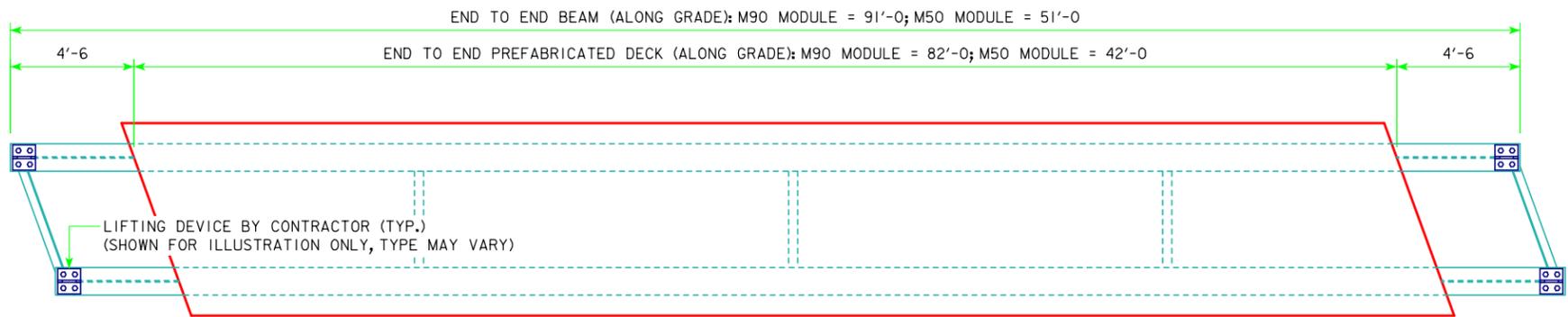
PRECAST ABUTMENT FOOTING - ELEV. VIEW
(WEST ABUTMENT SHOWN)

COMPONENT WEIGHT - ABUT. FTG.'S	
COMPONENT	WEIGHT (KIPS)
WEST ABUT. PRECAST FOOTING	±94
EAST ABUT. PRECAST FOOTING	±90



PRECAST PIER CAP - ELEV. VIEW

COMPONENT WEIGHT - PIER CAPS	
COMPONENT	WEIGHT (KIPS)
PIER 1 PRECAST CAP	±116
PIER 2 PRECAST CAP	±113



PREFABRICATED SUPERSTRUCTURE MODULE - PLAN VIEW
(M90 MODULE SHOWN)



PREFABRICATED SUPERSTRUCTURE MODULE - ELEV. VIEW
(M90 MODULE SHOWN)

MODULE LIFTING DEVICE NOTES:

IT IS THE INTENT OF THESE PLANS FOR THE MODULE LIFTING DEVICES TO BE POSITIONED NEAR THE STIFFENED BEARING LOCATIONS AT THE ENDS OF THE BEAMS (ALTERNATE LIFTING DETAILS MAY BE PROPOSED BY THE CONTRACTOR). SHEAR STUDS THAT INTERFERE WITH THE PROPOSED LIFTING DEVICE LOCATIONS MAY BE FIELD-INSTALLED AFTER REMOVAL OF THE LIFTING DEVICE(S).

INTERMEDIATE LIFTING DEVICE LOCATIONS THAT REQUIRE FORMED POCKETS WITHIN THE PREFABRICATED DECK SHALL BE AVOIDED TO THE EXTENT PRACTICABLE. IN NO CASE SHALL FULL-DEPTH LIFTING POCKETS BE PERMITTED WITHIN 18 INCHES OF A BEAM CENTERLINE. DESIGN SUBMITTALS FOR LIFTING DEVICES THAT REQUIRE FORMED POCKETS WITHIN THE BRIDGE DECK SHALL DETAIL A METHOD FOR PATCHING AND SEALING THE POCKET FOLLOWING REMOVAL OF THE LIFTING DEVICE.

COMPONENT WEIGHT - SUPERSTR. MODULES	
COMPONENT	WEIGHT (KIPS)
SUPERSTRUCTURE MODULE, M50-EXTERIOR (EACH)	±52
SUPERSTRUCTURE MODULE, M50-INTERIOR (EACH)	±49
SUPERSTRUCTURE MODULE, M90-EXTERIOR (EACH)	±97
SUPERSTRUCTURE MODULE, M90-INTERIOR (EACH)	±91

ASSEMBLY PLAN NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT ASSEMBLY PLAN(S) FOR PREFABRICATED SUPERSTRUCTURE MODULES AND PRECAST SUBSTRUCTURE ELEMENTS, FOR REVIEW AND APPROVAL BY THE ENGINEER. THE ASSEMBLY PLAN(S) SHALL MEET THE REQUIREMENTS NOTED IN THE PROJECT SPECIAL PROVISIONS. KEY COMPONENTS OF THE ASSEMBLY PLAN(S) SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO THE FOLLOWING:

CONSTRUCTION LOAD ANALYSIS:

THE SUPERSTRUCTURE AND SUBSTRUCTURE ELEMENTS FOR THIS PROJECT WERE DESIGNED TO SUPPORT THE FACTORED DESIGN LOADS IN THE FINAL CONSTRUCTED CONDITION. CONSTRUCTION LOADS WILL BE DEPENDENT ON THE MEANS AND METHODS UTILIZED FOR CONSTRUCTION, AND ANALYSIS OF CONSTRUCTION LOADS WAS NOT INCLUDED AS A PART OF THIS DESIGN.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT CONSTRUCTION LOADS DO NOT EXCEED THE DESIGN CAPACITY OF ANY COMPONENT OF THE STRUCTURE AT ANY STAGE OF CONSTRUCTION. CONSTRUCTION LOAD ANALYSES, DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF IOWA, SHALL BE REQUIRED AS A PART OF THE ASSEMBLY PLAN(S).

CONSTRUCTION LOADS THAT SHOULD BE CONSIDERED IN THE CONSTRUCTION LOAD ANALYSIS INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

- DECK FORM AND PAVING MACHINE LOADS FOR MODULE DECK CASTING
- LIFTING REACTIONS AND HANDLING STRESSES
- ECCENTRIC AND/OR UNBALANCED PIER LOADS DUE TO MODULE PLACEMENT
- CONSTRUCTION LIVE LOADS ON MODULE DECK PRIOR TO DEVELOPMENT OF MODULE CONNECTIONS
- OTHER CONSTRUCTION FORCES

IF REQUIRED, THE CONTRACTOR MAY PROPOSE MODIFICATION (STRENGTHENING) OF COMPONENTS OF THE DESIGN TO ACCOMMODATE SPECIFIC CONSTRUCTION LOADS. DESIGN OF COMPONENT STRENGTHENING SHALL INCLUDE ENGINEERING ANALYSIS BY THE CONTRACTOR AND SHALL BE SUBJECT TO DOT REVIEW AND APPROVAL. ALL COSTS ASSOCIATED WITH DESIGN AND IMPLEMENTATION OF COMPONENT STRENGTHENING FOR THE PURPOSES OF FACILITATING CONSTRUCTION SHALL BE BORNE BY THE CONTRACTOR.

LIFTING DEVICE DESIGN:

DESIGN OF LIFTING DEVICES AND/OR ATTACHMENT POINTS SHALL BE SUBMITTED AS A PART OF THE ASSEMBLY PLAN. LIFTING DEVICES AND/OR ATTACHMENT POINTS SHALL BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF IOWA. THE ASSEMBLY PLAN SUBMITTAL SHALL INCLUDE DESIGN OF THE SPECIFIC LIFTING DEVICES AND/OR ATTACHMENT POINTS, AND STRUCTURAL ANALYSIS OF THE COMPONENT TO BE LIFTED TO DETERMINE IF AUXILIARY REINFORCING AND/OR BRACING ARE REQUIRED TO FACILITATE LIFTING OPERATIONS. DESIGN OF THE LIFTING DEVICES AND/OR ATTACHMENT POINTS SHALL INCLUDE A SUFFICIENT DEGREE OF CONSERVATISM AND/OR REDUNDANCY AS APPROPRIATE FOR SAFE, ACCELERATED CONSTRUCTION. THE ASSEMBLY PLAN SUBMITTAL SHALL INCLUDE A DESCRIPTION OF PERMISSIBLE LIFTING EQUIPMENT COMPATIBLE WITH THE PROPOSED DESIGN, ALONG WITH REQUIREMENTS AND PARAMETERS FOR RIGGING, AS REQUIRED.

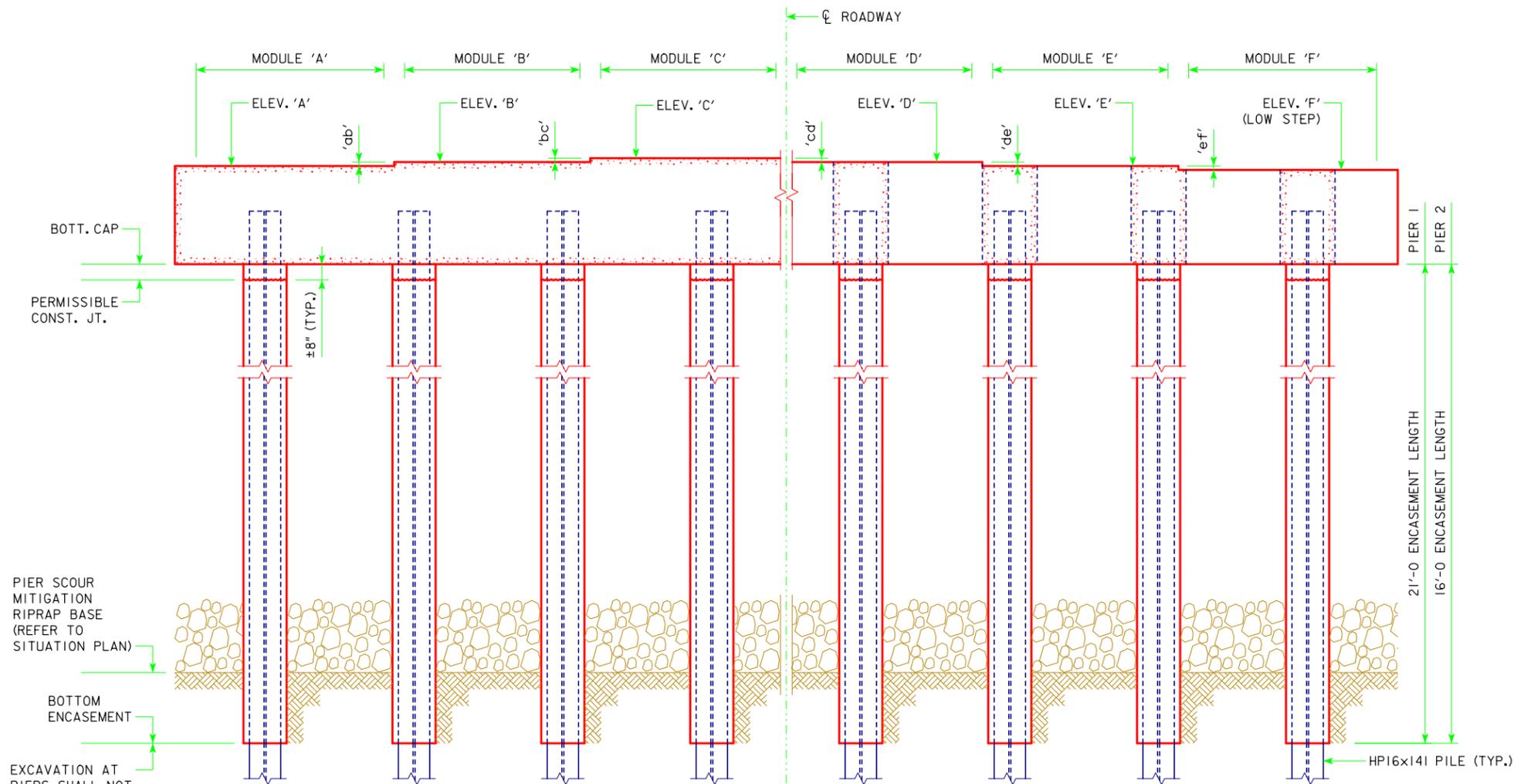
LIFTING DEVICES AND/OR ATTACHMENT POINTS SHALL BE REMOVED AFTER LIFTING, IN A MANNER APPROVED BY THE ENGINEER.

ALL COSTS ASSOCIATED WITH LIFTING DEVICES AND LIFTING OPERATIONS SHALL BE INCIDENTAL TO THE INDIVIDUAL PRICE BIDS FOR THE PREFABRICATED COMPONENTS BEING LIFTED.

TEMPORARY SUPPORTS/BRACING:

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ENSURING THE SAFETY, STABILITY, AND INTEGRITY OF STRUCTURAL COMPONENTS DURING FABRICATION, TRANSPORT, LIFTING AND CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORTS AND/OR BRACING AS REQUIRED TO SATISFY THIS REQUIREMENT. TEMPORARY SUPPORTS AND BRACING SHALL BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF IOWA AND SHALL BE SUBJECT TO DOT REVIEW AND APPROVAL.

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
ASSEMBLY PLAN DETAILS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 11 OF 57 FILE NO. 30846 DESIGN NO. 115



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

**HALF ELEVATION
PRECAST CAP OPTION SHOWN**
(LOOKING EAST)

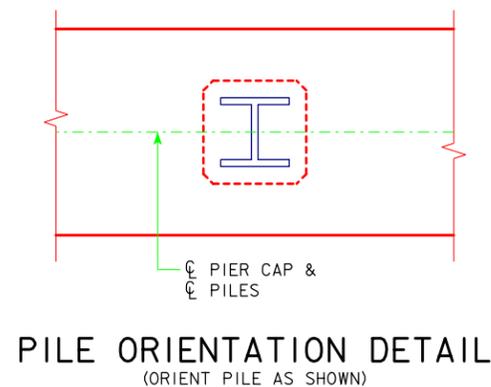
PIER ELEVATIONS		
LOCATION	PIER 1	PIER 2
LOW STEP (ELEV. 'F')	1100.59	1098.79
BOTTOM CAP	1096.59	1094.79
BOTTOM ENCASEMENT	1075.59	1078.79

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	1098.98
ELEV. 'F'	1100.59	1098.79

CAP STEP HEIGHT		
STEP	PIER 1	PIER 2
'ab'	1 ³ / ₁₆	1 ⁵ / ₁₆
'bc'	1 ⁵ / ₁₆	1 ⁵ / ₁₆
'cd'	1 ⁷ / ₁₆	3 ³ / ₄
'de'	2 ⁷ / ₈	2 ³ / ₈
'ef'	2 ³ / ₄	2 ¹ / ₄

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 ENCASEMENT	LF	168	128	296
PILES, STEEL, HP 16 x 141	LF	960	920	1880



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 CMP, 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 ENCASEMENT 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 2501.03,0,2 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.

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, "PU" (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

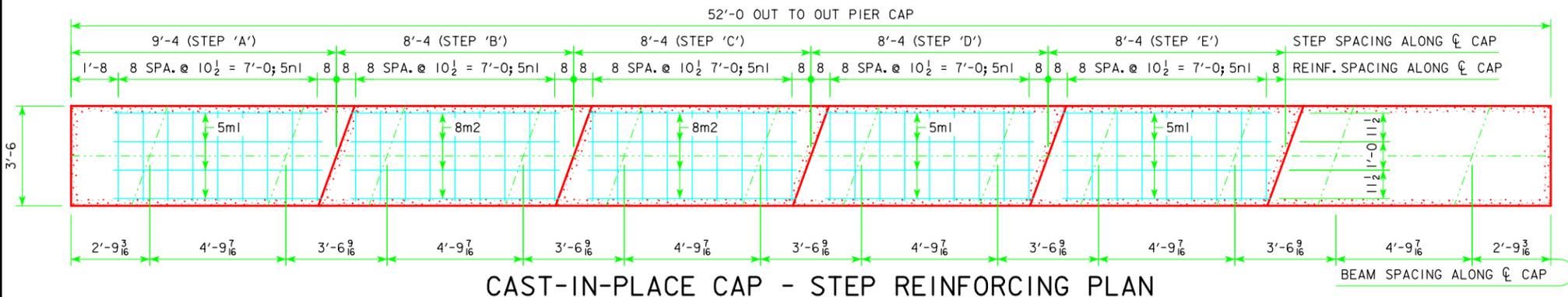
THIS PROJECT USES LOAD AND RESISTANCE FACTOR DESIGN (LRFD) METHODOLOGY FOR DETERMINING PILE CONTRACT LENGTH AND NOMINAL AXIAL BEARING RESISTANCE. NOMINAL AXIAL BEARING RESISTANCES WILL BE LARGER THAN BEARING VALUES IN THE PAST, BUT CONSTRUCTION CONTROL BLOW COUNTS WILL BE APPROXIMATELY THE SAME. A WEAP 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 COMPARITIVE PURPOSES.

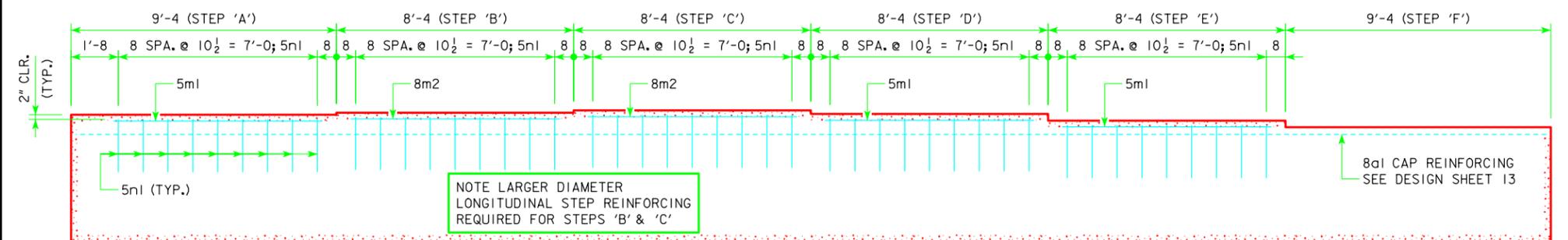
APPROXIMATE BEARING USING PREVIOUS DESIGN METHODOLOGY:

PIER 1: 102 TONS
PIER 2: 102 TONS

DESIGN FOR 20° SKEW (R.A.)
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PIER DETAILS
STA. 528+80.00 IA 92 OCTOBER, 2014
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IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 12 OF 57 FILE NO. 30846 DESIGN NO. 115



CAST-IN-PLACE CAP - STEP REINFORCING PLAN



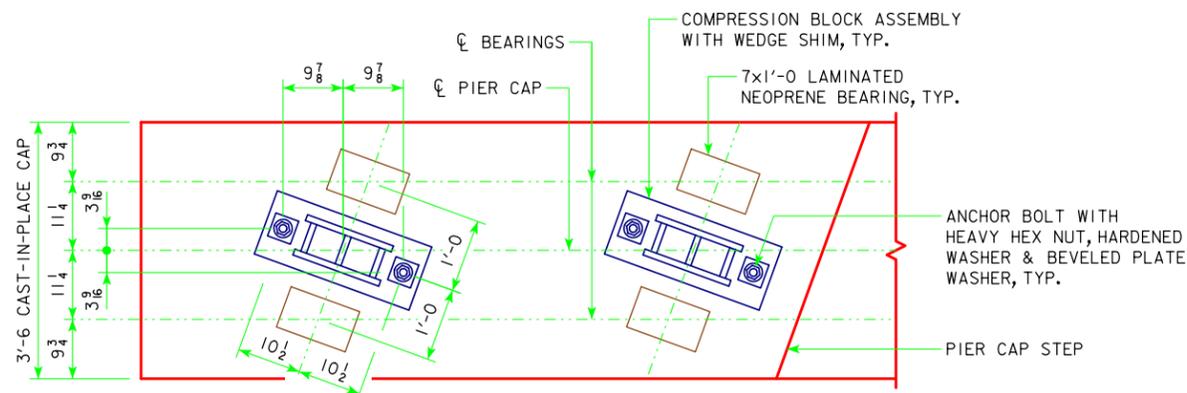
CAST-IN-PLACE CAP - STEP REINFORCING PART SECTION

CAST-IN-PLACE CAP NOTES:

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

REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED.

THE CONTRACTOR SHALL NOTE THAT PIER PILES ARE ORIENTED WITH FLANGES PARALLEL TO THE CENTERLINE OF PIER CAP. THIS ORIENTATION DIFFERS FROM THE STANDARD ORIENTATION FOR DOT PROJECTS. THE CONTRACTOR SHALL NOTE THAT ATTACHMENT OF BRACKETS TO THE PILE BY FIELD WELDING SHALL NOT BE PERMITTED FOR PURPOSES OF SUPPORTING PIER CAP FORMS. HOLES SHALL NOT BE DRILLED IN THE PILE FLANGES WITHOUT WRITTEN APPROVAL FROM THE ENGINEER.



PART CAP PLAN SHOWING ANCHOR BOLT PLACEMENT
(PREFORMED JOINT FILLER NOT SHOWN)

NOTE: ANCHOR BOLTS ARE TO BE INSTALLED IN DRILLED HOLES. PLAN LOCATION OF CAP REINFORCING IS DESIGNED TO PROVIDE A MINIMUM OF 1 1/4" CLEAR FROM EDGE OF ANCHOR TO NEAREST REINFORCING BAR. CONTRACTOR SHALL NOTE THAT CAREFUL PLACEMENT OF REINFORCING STEEL SHALL BE REQUIRED FOR SUCCESSFUL PLACEMENT OF ANCHOR BOLTS. DRILLED HOLES FOR ANCHOR BOLTS SHALL NOT BE PERMITTED TO DAMAGE REINFORCING STEEL.

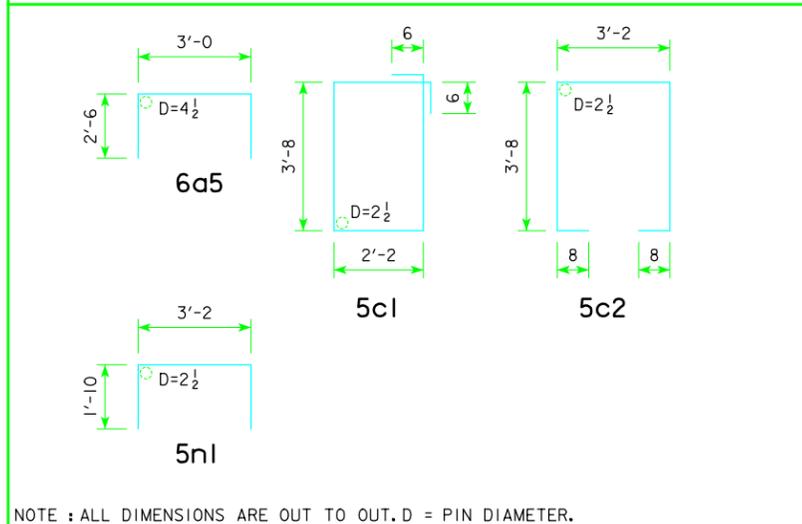
REFER TO DESIGN SHEET 38 FOR BEARING DETAILS AND DESIGN SHEET 39 FOR COMPRESSION BLOCK DETAILS

REFER TO DESIGN SHEET 27 FOR PREFORMED JOINT FILLER DETAILS

REINFORCING BAR LIST - ONE C.I.P. CAP (*)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8a1	CAP, LONGITUDINAL, TOP	—	6	51'-8"	828
6a4	CAP, LONGITUDINAL, SIDES	—	6	51'-8"	466
6a5	CAP, ENDS	⌈	10	8'-0"	120
8b1	CAP, LONGITUDINAL, BOTTOM	—	4	51'-8"	552
8b2	CAP, BOTTOM, BETWEEN PILES	—	14	4'-4"	162
8b3	CAP, BOTTOM, ENDS	—	4	2'-8"	28
5c1	CAP HOOPS	⊠	100	12'-8"	1,321
5c2	CAP HOOPS AT PILES	⊠	8	11'-10"	99
5m1	CAP STEPS, LONGITUDINAL (A, D, E)	—	12	7'-4"	92
8m2	CAP STEPS, LONGITUDINAL (B, C)	—	8	7'-4"	157
5n1	CAP STEP, TRANSVERSE	⌈	45	6'-10"	321
				TOTAL (LBS.)	4,146

BENT BAR DETAILS



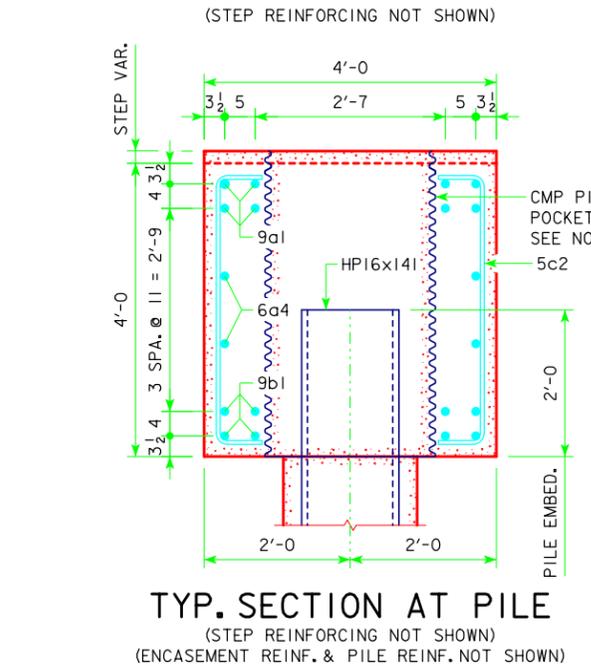
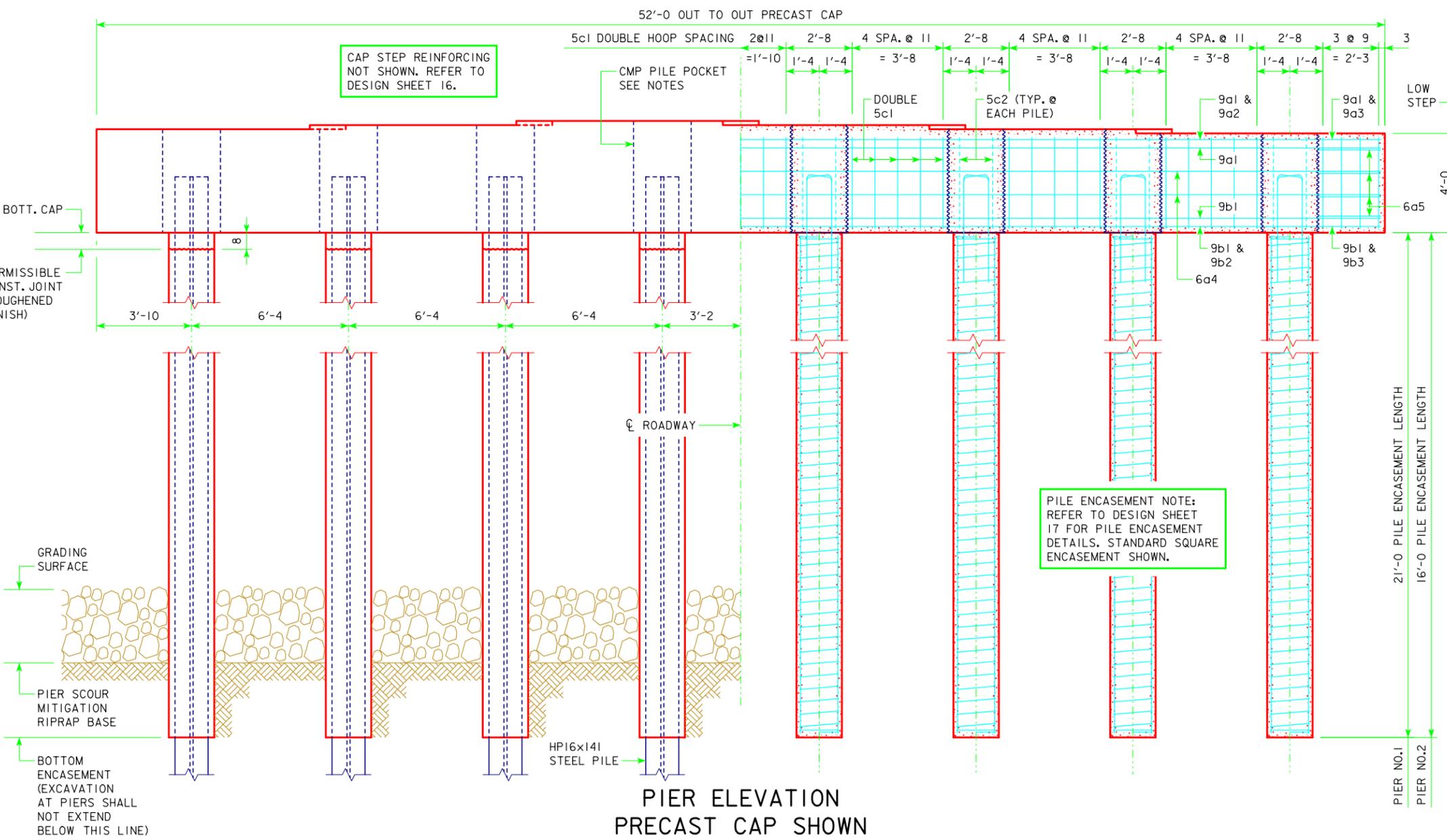
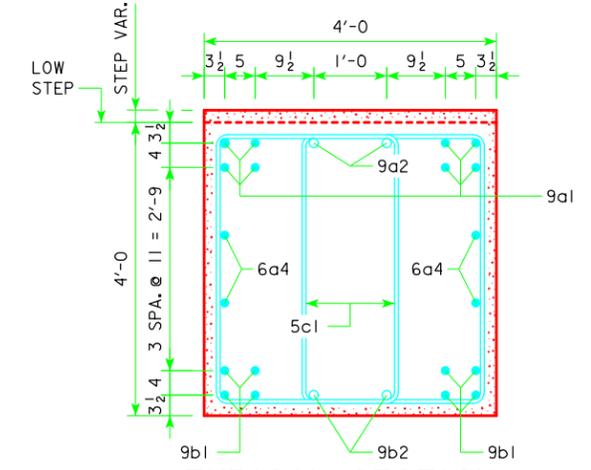
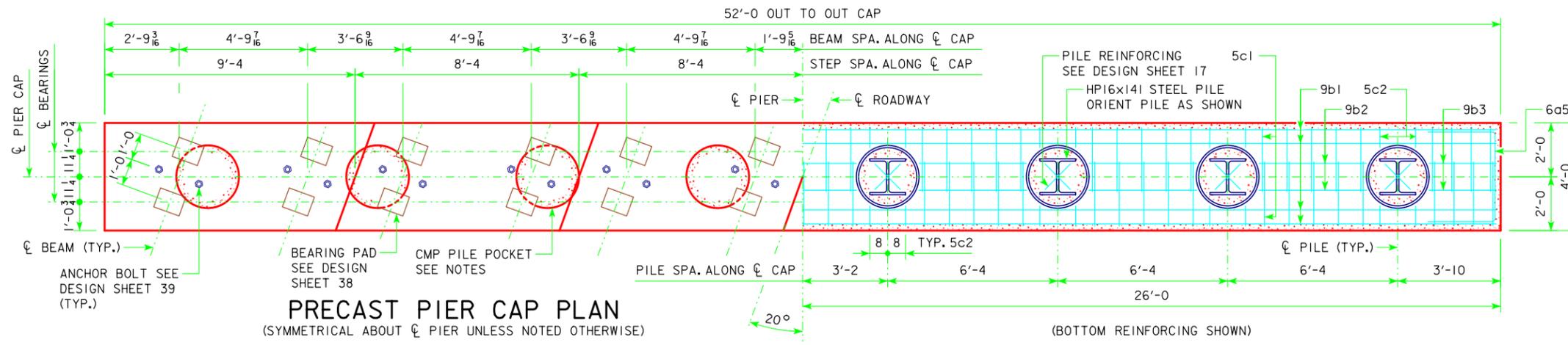
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

CONCRETE PLACEMENT SUMMARY (*)

LOCATION	UNIT	PIER 1	PIER 2	TOTAL
PIER CAP (HIGH PERFORMANCE CONC.)	CY	29.8	29.0	58.8

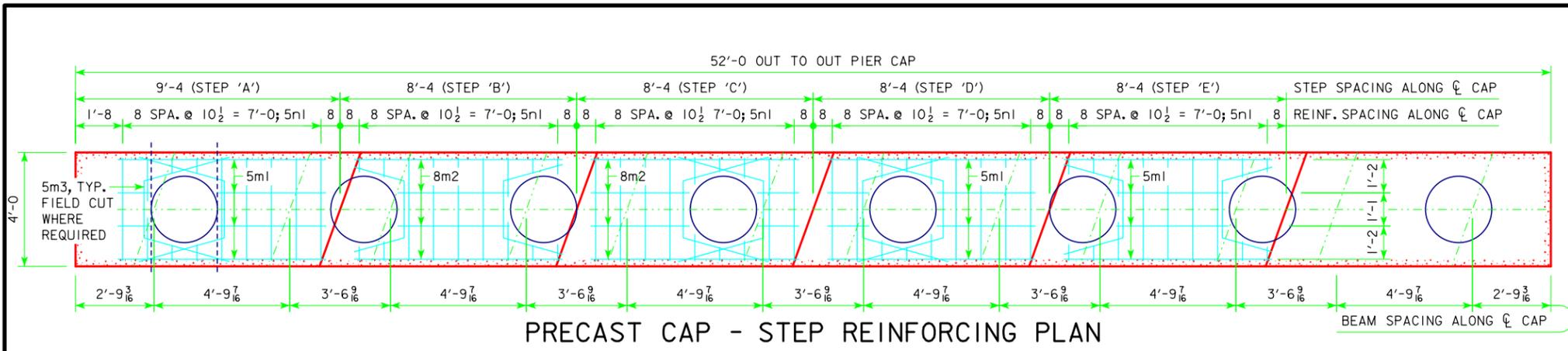
(*) REINFORCING STEEL AND CONCRETE FOR PIER CAP SHALL INCIDENTAL TO PRICE BID FOR "BRIDGE PIER CAP".

DESIGN FOR 20° SKEW (R.A.)
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PIER DETAILS (CAST-IN-PLACE CAP)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 14 OF 57 FILE NO. 30846 DESIGN NO. 115

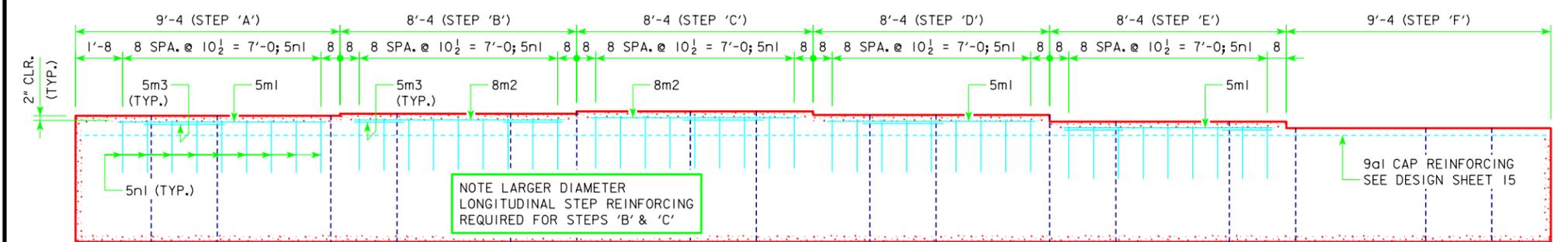


CMP PILE POCKET NOTE:
 PILE POCKETS SHALL CONSIST OF GALVANIZED STEEL CORRUGATED METAL PIPE (CMP), TYPE 1, 16 GAGE, IN ACCORDANCE WITH THE SPECIAL PROVISIONS FOR PRECAST SUBSTRUCTURE ELEMENTS. CMP FOR INDIVIDUAL POCKETS SHALL CONSIST OF A SINGLE LENGTH OF PIPE; SPLICING OF PIPE SECTIONS SHALL NOT BE ALLOWED. NOMINAL CMP SIZE SHALL BE LIMITED TO A MAXIMUM OF 27". FOLLOWING SETTING OF THE PIER CAP, THE PILE POCKETS SHALL BE FILLED LEVEL WITH THE TOP OF CAP USING HIGH EARLY STRENGTH SELF-CONSOLIDATING CONCRETE IN ACCORDANCE WITH THE SPECIAL PROVISIONS FOR PRECAST SUBSTRUCTURE ELEMENTS.

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 (PRECAST CAP)
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 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 15 OF 57 FILE NO. 30846 DESIGN NO. 115



PRECAST CAP - STEP REINFORCING PLAN



PRECAST CAP - STEP REINFORCING PLAN

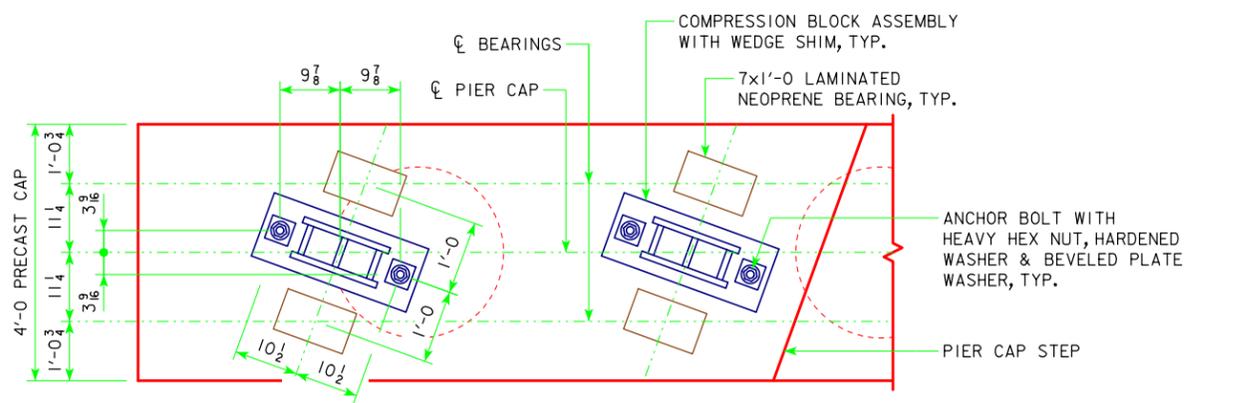
PRECAST CAP NOTES:
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED.

THE CONTRACTOR SHALL NOTE THAT PIER PILES ARE ORIENTED WITH FLANGES PARALLEL TO THE CENTERLINE OF PIER CAP. THIS ORIENTATION DIFFERS FROM THE STANDARD ORIENTATION FOR DOT PROJECTS. THE CONTRACTOR SHALL NOTE THAT ATTACHMENT OF BRACKETS TO THE PILE BY FIELD WELDING SHALL NOT BE PERMITTED FOR PURPOSES OF SUPPORTING THE PRECAST PIER CAP. HOLES SHALL NOT BE DRILLED IN THE PILE FLANGES WITHOUT WRITTEN APPROVAL FROM THE ENGINEER.

PILE TOLERANCE NOTE:
THE CONTRACTOR SHALL NOTE THAT TIGHTER PILE LOCATION TOLERANCE SHALL BE REQUIRED FOR USE WITH THE PRECAST PIER CAP OPTION. THE MAXIMUM CMP PILE POCKET SIZE NOTED IN THE PLANS IS BASED ON MAXIMUM PILE DEVIATION OF 2" FROM PLAN VALUE, MEASURED AT THE LOCATION OF THE PILE POCKET. USE OF A PILE DRIVING TEMPLATE IS STRONGLY ENCOURAGED. THE CONTRACTOR SHALL BE PERMITTED TO MAKE MINOR ADJUSTMENTS TO POSITION OF THE TOP OF PILE BY JACKING OR OTHER APPROVED MEANS, TO FACILITATE PROPER FITUP OF THE PRECAST CAP. ADJUSTMENT METHODS THAT DAMAGE OR PERMANENTLY DEFORM THE PILE OR PILE ENCASEMENT SHALL NOT BE PERMITTED.

STEP REINFORCING NOTE:
IT IS THE INTENT OF THESE PLANS FOR STEP REINFORCING "m" BARS AND "n" BARS TO BE PLACED/TIED IN A GRID PATTERN AS DETAILED, AND FIELD CUT AS NECESSARY TO AVOID CONFLICT WITH CMP PILE POCKETS. TYPICAL CLEARANCE FROM FIELD CUT BAR TO CMP POCKET SHALL BE 2". 5m3 REINFORCING BARS SHALL BE PROVIDED AS SUPPLEMENTAL REINFORCEMENT AT PILE POCKETS: ONE 5m3 BAR SHALL BE REQUIRED PER EACH PILE POCKET LOCATED AT THE EDGE OF A CAP STEP; TWO 5m3 BARS (ONE EACH SIDE) SHALL BE REQUIRED PER EACH PILE POCKET LOCATED WITHIN THE CENTER OF A CAP STEP.



PART CAP PLAN SHOWING ANCHOR BOLT PLACEMENT
(PERFORMED JOINT FILLER NOT SHOWN)

NOTE: ANCHOR BOLTS ARE TO BE INSTALLED IN DRILLED HOLES. PLAN LOCATION OF CAP REINFORCING IS DESIGNED TO PROVIDE A MINIMUM OF 1 1/4" CLEAR FROM EDGE OF ANCHOR TO NEAREST REINFORCING BAR. CONTRACTOR SHALL NOTE THAT CAREFUL PLACEMENT OF REINFORCING STEEL SHALL BE REQUIRED FOR SUCCESSFUL PLACEMENT OF ANCHOR BOLTS. DRILLED HOLES FOR ANCHOR BOLTS SHALL NOT BE PERMITTED TO DAMAGE REINFORCING STEEL.

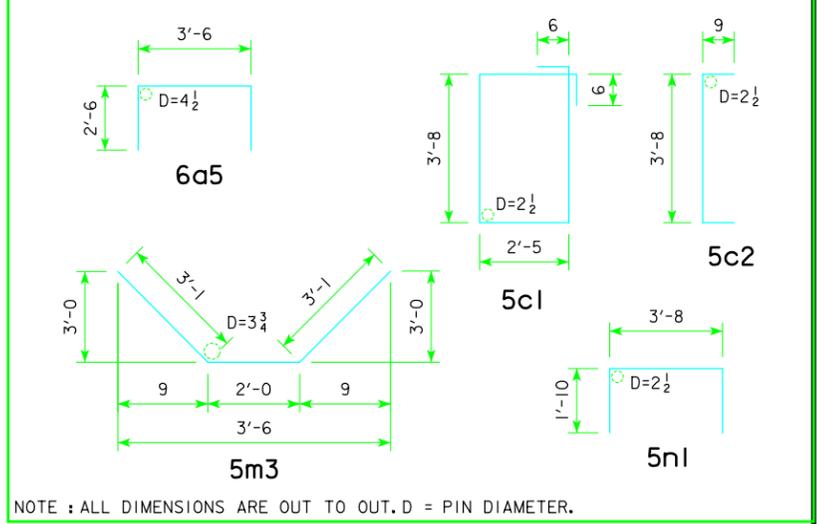
REFER TO DESIGN SHEET 38 FOR BEARING DETAILS AND DESIGN SHEET 39 FOR COMPRESSION BLOCK DETAILS

REFER TO DESIGN SHEET 27 FOR PREFORMED JOINT FILLER DETAILS

REINF. BAR LIST - ONE PRECAST CAP (*)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
9a1	CAP, LONGITUDINAL, TOP	—	8	51'-8"	1,405
9a2	CAP, TOP, BETWEEN PILES	—	14	3'-10"	182
9a3	CAP, TOP, ENDS	—	4	2'-4"	32
6a4	CAP, LONGITUDINAL, SIDES	—	4	51'-8"	310
6a5	CAP, ENDS	—	8	8'-6"	102
9b1	CAP, LONGITUDINAL, BOTTOM	—	8	51'-8"	1,405
9b2	CAP, BOTTOM, BETWEEN PILES	—	14	3'-10"	182
9b3	CAP, BOTTOM, ENDS	—	4	2'-4"	32
5c1	CAP, HOOPS	□	86	13'-2"	1,181
5c2	CAP, TIE AT PILES	—	32	5'-2"	172
5m1	CAP STEPS, LONGITUDINAL (A,D,E)	—	12	7'-4"	92
8m2	CAP STEPS, LONGITUDINAL (B,C)	—	8	7'-4"	157
5m3	CAP STEP, POCKET REINFORCING	—	10	8'-2"	85
5n1	CAP STEP, TRANSVERSE	—	45	7'-4"	344
				TOTAL (LBS.)	5,681

BENT BAR DETAILS

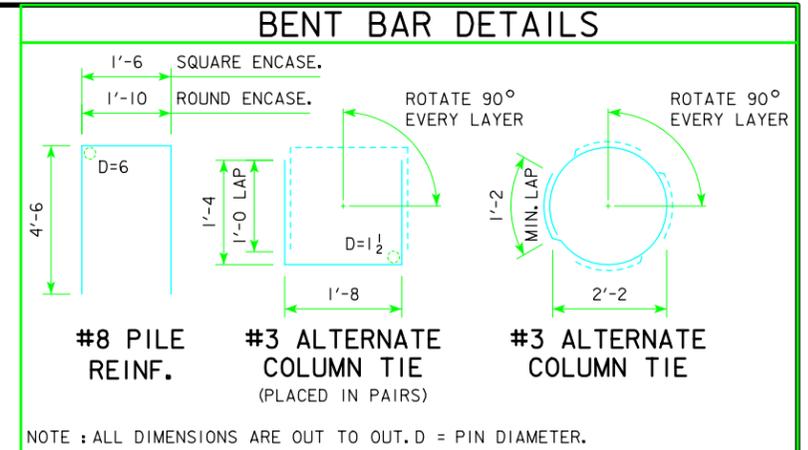
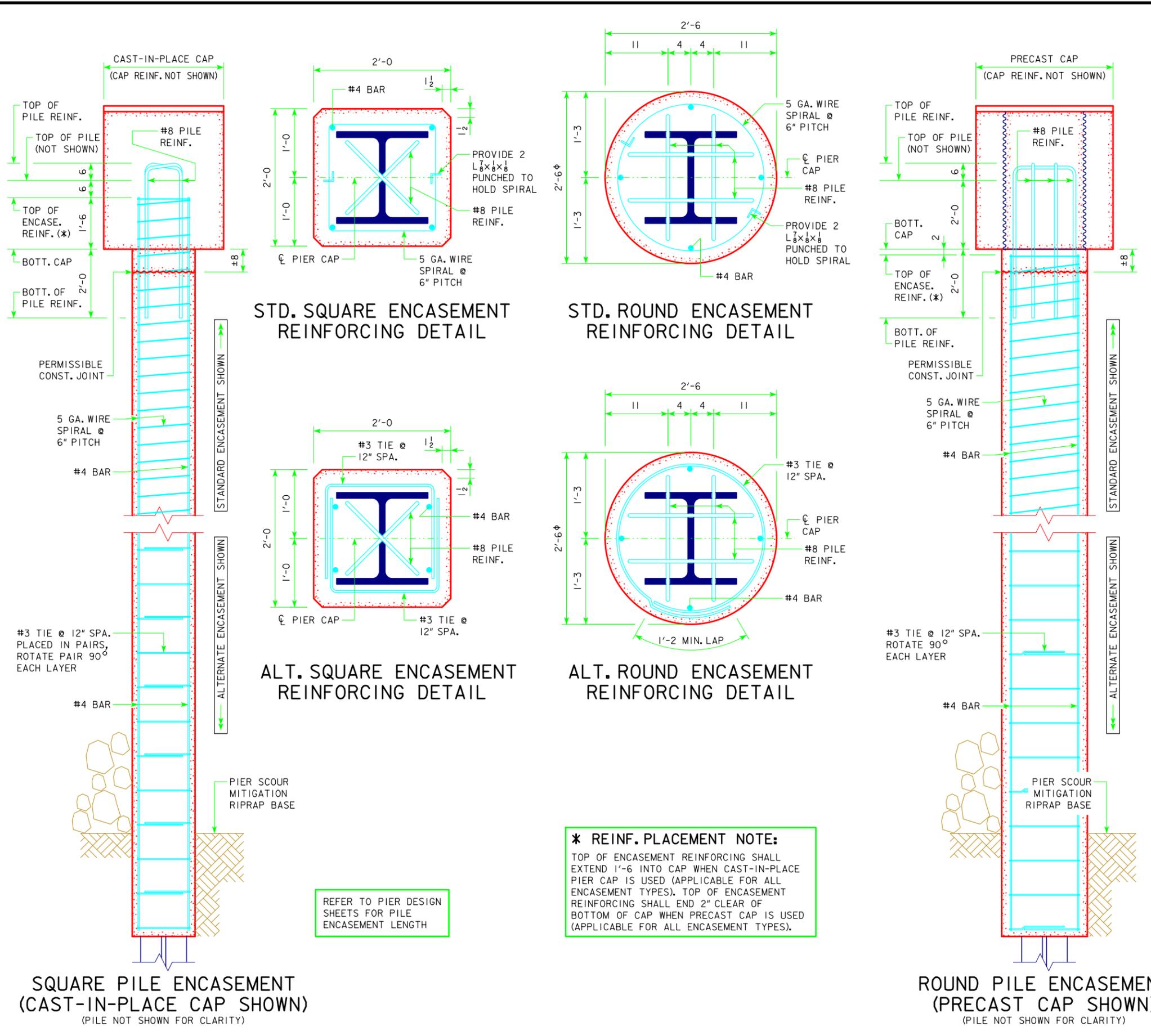


CONCRETE PLACEMENT SUMMARY (*)

LOCATION	UNIT	PIER 1	PIER 2	TOTAL
PIER CAP (HIGH PERFORMANCE CONC.)	CY	28.5	27.8	56.3
PILE POCKETS (SELF-CONSOLIDATING)	CY	5.2	5.0	10.2

(*) REINFORCING STEEL AND CONCRETE FOR PIER CAP SHALL INCIDENTAL TO PRICE BID FOR "BRIDGE PIER CAP".

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 (PRECAST CAP)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 16 OF 57 FILE NO. 30846 DESIGN NO. 115



PILE ENCASEMENT NOTES:
 PIER PILE ENCASEMENT MAY CONSIST OF SQUARE ENCASEMENT OR ROUND ENCASEMENT, AS DETAILED. EITHER ENCASEMENT TYPE MAY BE USED WITH CAST-IN-PLACE OR PRECAST PIER CAPS. THE SELECTED ENCASEMENT TYPE SHALL BE THE SAME FOR ALL PIER PILES FOR THE PROJECT.

CONSTRUCTION OF PILE ENCASEMENT SHALL BE PERMITTED AFTER PLACEMENT OF THE PIER CAPS. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A TEMPORARY SUPPORT PLAN FOR PIER CAPS THAT ARE CONSTRUCTED PRIOR TO FULL MATURITY OF THE PILE ENCASEMENT CONCRETE, SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. FIELD WELDING OF BRACKETS TO THE PILES SHALL NOT BE PERMITTED AS A MEANS OF TEMPORARY PIER CAP SUPPORT.

PILE ENCASEMENT MAY BE CONSTRUCTED WITH A PERMISSIBLE CONSTRUCTION JOINT NEAR THE TOP OF THE ENCASEMENT. THE INTENT OF THE PERMISSIBLE CONSTRUCTION JOINT IS TO FACILITATE CONCRETE PLACEMENT WITHIN THE ENCASEMENT FORMS AFTER THE PILE CAPS HAVE BEEN SET. THE CONSTRUCTION JOINT SURFACE SHALL RECEIVE A ROUGH CONCRETE FINISH. CONCRETE TO BE USED TO FILL THE SPACE BETWEEN THE PERMISSIBLE CONSTRUCTION JOINT AND THE BOTTOM OF THE CAP SHALL BE IN ACCORDANCE WITH SECTION 2426.02, B, 2, a OF THE STANDARD SPECIFICATIONS, AND SHALL RECEIVE A SMOOTH FINISH MATCHING THE DESIGN SHAPE OF THE ENCASEMENT.

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

PRICE BID FOR "PILE ENCASEMENT" SHALL INCLUDE FULL PAYMENT FOR NECESSARY EXCAVATION AND FURNISHING AND PLACING ALL MATERIAL, INCLUDING ALL ENCASEMENT CONCRETE, PATCHING CONCRETE, AND REINFORCING STEEL.

ENCASEMENT REINFORCING NOTES:
 ENCASEMENT REINF. MAY CONSIST OF STANDARD REINF. OR ALTERNATE REINF., AS DETAILED. WIRE SPIRAL SHALL CONFORM TO ASTM A82.

#8 PILE REINF. BARS ARE REQUIRED TO BE EMBEDDED INTO THE CAP CONCRETE AND ENCASEMENT CONCRETE. THESE BARS SHALL BE PLACED WITH THE CAP CONCRETE OR THE ENCASEMENT CONCRETE, WHICHEVER COMES FIRST.

THE CONTRACTOR SHALL NOTE THAT, FOR ALL ENCASEMENT REINF. OPTIONS EXCLUDING ALTERNATE SQUARE OPTION, THE TRANSVERSE ENCASEMENT REINF. MUST BE POSITIONED OVER THE PILING BEFORE THE PIER CAPS ARE SET.

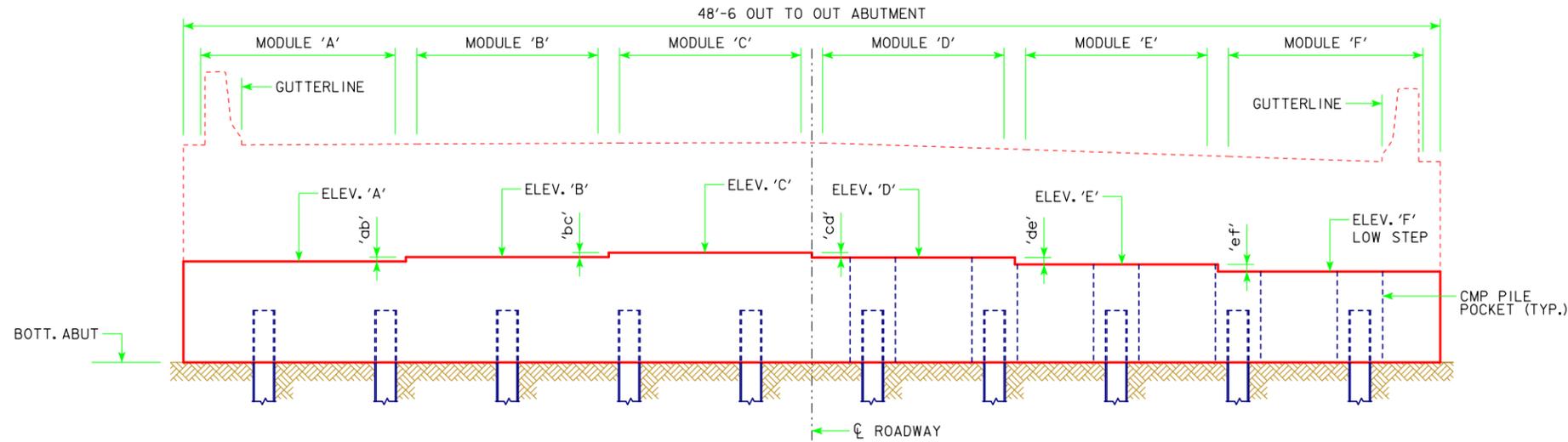
VERTICAL ENCASEMENT REINFORCING MAY INCLUDE ONE LAP SPLICE. MINIMUM LAP LENGTH SHALL BE 1'-6".

STANDARD WIRE SPIRAL REINF. FOR EACH PILE MAY BE PLACED AS ONE CONTINUOUS SEGMENT, OR AS TWO SEPARATE SEGMENTS SPLICED TOGETHER. EACH SPIRAL SEGMENT SHALL HAVE AN ADDITIONAL 1 1/2 TURNS AT THE TOP AND BOTTOM OF THE SEGMENT.

*** REINF. PLACEMENT NOTE:**
 TOP OF ENCASEMENT REINFORCING SHALL EXTEND 1'-6" INTO CAP WHEN CAST-IN-PLACE PIER CAP IS USED (APPLICABLE FOR ALL ENCASEMENT TYPES). TOP OF ENCASEMENT REINFORCING SHALL END 2" CLEAR OF BOTTOM OF CAP WHEN PRECAST CAP IS USED (APPLICABLE FOR ALL ENCASEMENT TYPES).

REFER TO PIER DESIGN SHEETS FOR PILE ENCASEMENT LENGTH

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
PILE ENCASEMENT DETAILS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
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 DESIGN SHEET NO. 17 OF 57 FILE NO. 30846 DESIGN NO. 115



**HALF ELEVATION
CAST-IN-PLACE 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'	$\frac{3}{8}$	$1\frac{9}{16}$
'bc'	$\frac{1}{2}$	$1\frac{11}{16}$
'cd'	$2\frac{3}{16}$	$\frac{3}{8}$
'de'	$3\frac{1}{4}$	$2\frac{3}{16}$
'ef'	$3\frac{1}{4}$	$2\frac{1}{16}$

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

**HALF ELEVATION
PRECAST FOOTING OPTION SHOWN**

(LOOKING EAST, PREBORE NOT SHOWN)
(PILE ILLUSTRATED FOR W. ABUTMENT, E. ABUTMENT DIFFERS)

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, "PU" (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)

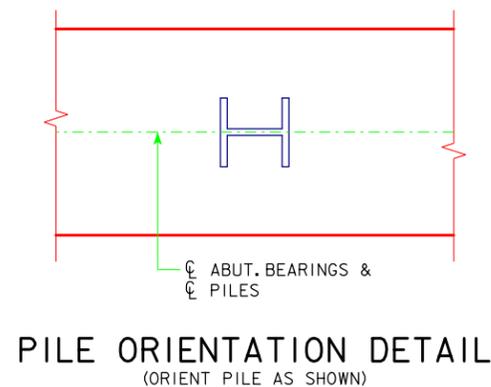
DESIGN PARAMETER	W. ABUT.	E. ABUT.
SOIL CLASSIFICATION	COHESIVE	COHESIVE
GEOTECH. RESIST. FACTOR, "PHI" - SOIL	0.65	0.65
NOMINAL AXIAL BEARING RESISTANCE (TONS)	105	105
MINIMUM DRIVING LENGTH (FT)	80	80

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 COMPARITIVE PURPOSES.

APPROXIMATE BEARING USING PREVIOUS DESIGN METHODOLOGY:

W. ABUT: 47 TONS
E. ABUT: 47 TONS



PILE ORIENTATION DETAIL
(ORIENT PILE AS SHOWN)

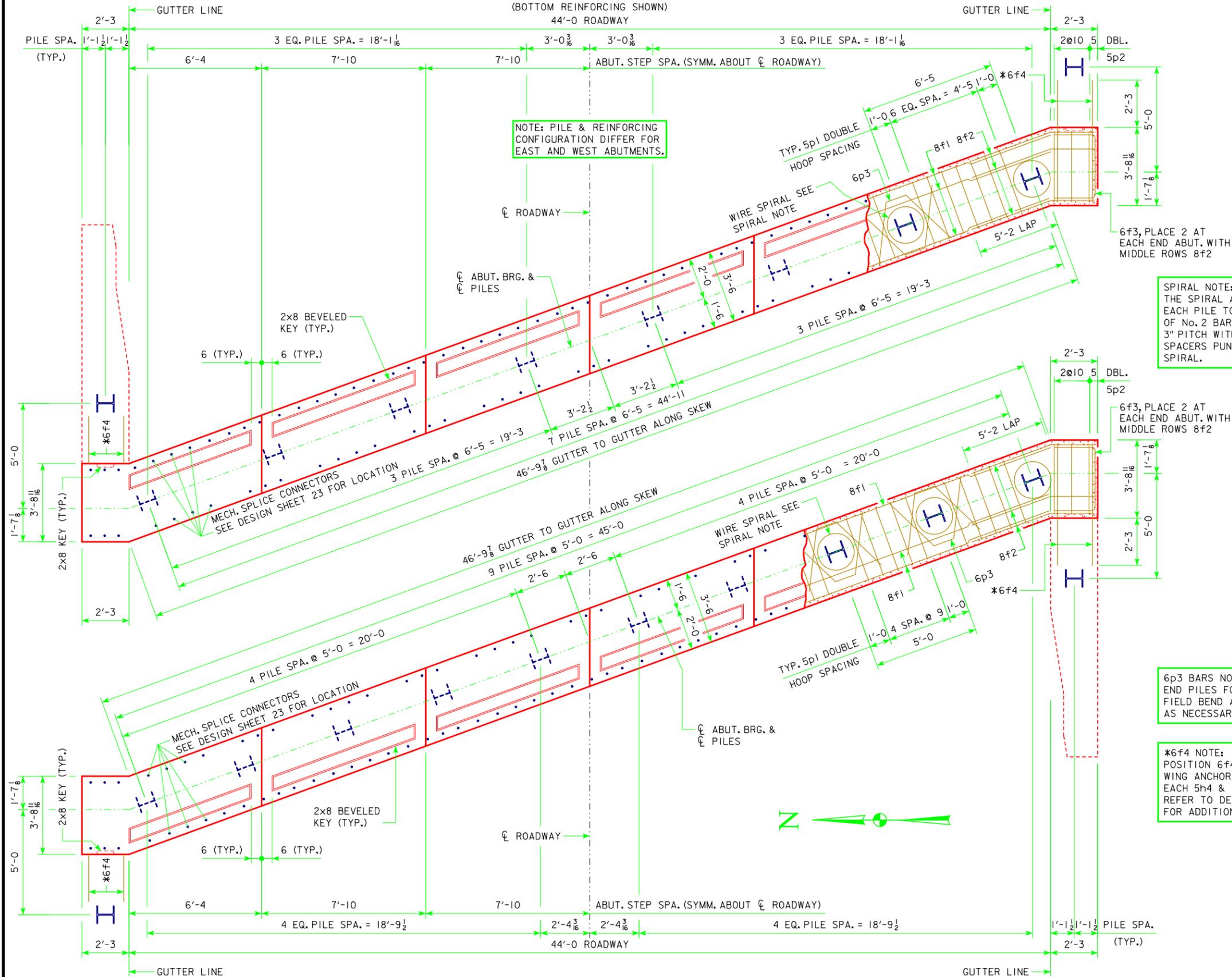
EST. QUANTITIES - TWO ABUT. FTGS.

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

DESIGN FOR 20° SKEW (R.A.)
**234'-0 x 44'-0 MODULAR
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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. 18 OF 57 FILE NO. 30846 DESIGN NO. 115

EAST ABUTMENT CAST-IN-PLACE FOOTING PLAN

(BOTTOM REINFORCING SHOWN)
44'-0 ROADWAY

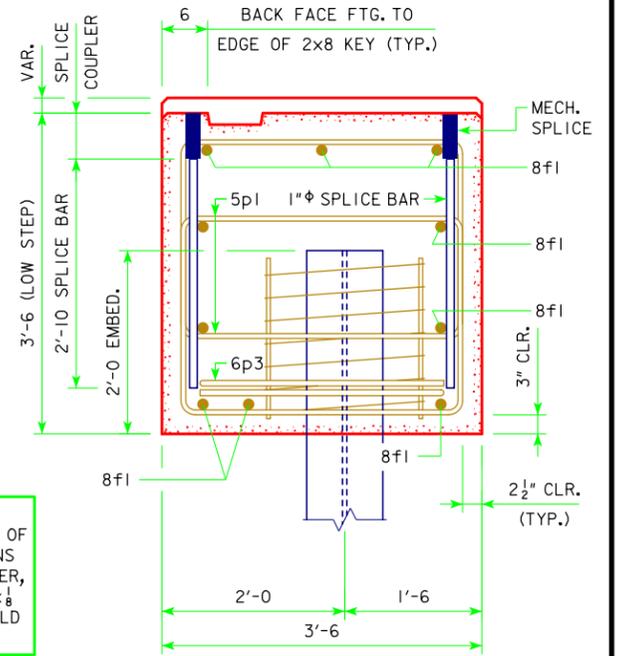


NOTE: PILE & REINFORCING CONFIGURATION DIFFER FOR EAST AND WEST ABUTMENTS.

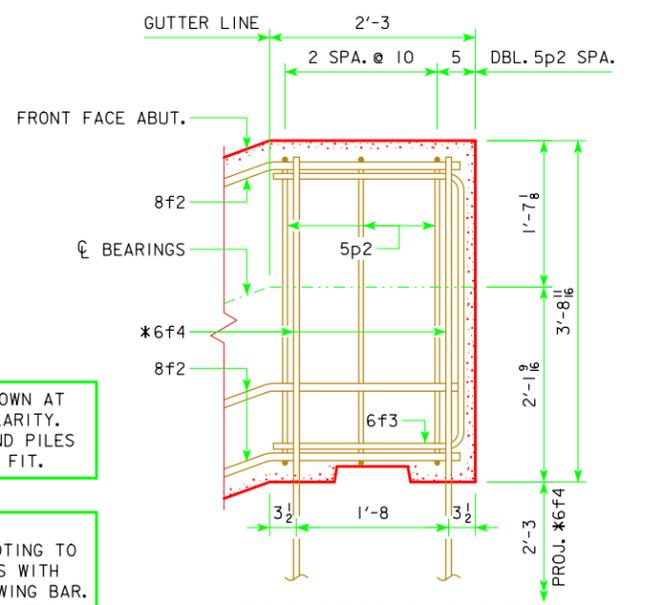
SPIRAL NOTE:
THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 21" DIAMETER, 3" PITCH WITH 3 - 1/8" x 1/8" SPACERS PUNCHED TO HOLD SPIRAL.

6p3 BARS NOT SHOWN AT END PILES FOR CLARITY. FIELD BEND AT END PILES AS NECESSARY TO FIT.

*6f4 NOTE:
POSITION 6f4 FOOTING TO WING ANCHOR BARS WITH EACH 5h4 & 5h5 WING BAR. REFER TO DESIGN SHEET 24 FOR ADDITIONAL DETAILS.



TYP. SECTION THROUGH ABUTMENT FOOTING



CAP END DETAIL
(WEST ABUT. SOUTH END SHOWN; OTHER ENDS SIMILAR)

WEST ABUTMENT CAST-IN-PLACE FOOTING PLAN

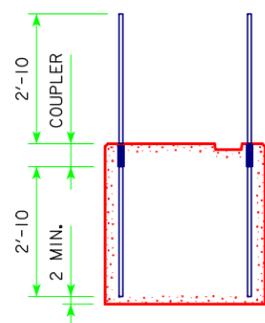
(BOTTOM REINFORCING SHOWN)

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
ABUT. FOOTING (CAST-IN-PLACE)
 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

CAST-IN-PLACE FOOTING NOTES:

MINIMUM DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED.



MECHANICAL SPLICE DETAIL
(TYPICAL ALL VERTICAL SPLICES)

MECHANICAL SPLICE NOTES:

MECHANICAL SPLICE ASSEMBLIES SHALL BE PLACED AT EACH LOCATION OF EACH VERTICAL LEG OF 6g1, 6g2 AND 6g5 ABUTMENT BACKWALL BARS. REFER TO DESIGN SHEET 23 FOR LOCATION OF MECHANICAL SPLICE ASSEMBLIES.

MECHANICAL SPLICE ASSEMBLIES CONSIST OF A MECHANICAL SPLICE COUPLER AND A PAIR OF REINFORCING SPLICE BARS TO BE COUPLED. THE MECHANICAL SPLICE ASSEMBLIES SHALL MEET THE REQUIREMENTS OF MATERIALS IM 451 APPENDIX E, EXCEPT THE COUPLER PORTION OF THE MECHANICAL SPLICE ASSEMBLY IS REQUIRED TO BE EMBEDDED ON THE ABUTMENT FOOTING SIDE OF THE CONSTRUCTION JOINT. REINFORCING SPLICE BARS SHALL BE A MINIMUM OF 1 INCH DIAMETER.

MECHANICAL SPLICE ASSEMBLIES SHALL BE EPOXY COATED.

THE SPECIFIED LENGTH OF REINFORCING SPLICE BAR THAT IS TO PROJECT FROM THE SPLICE COUPLER IS BASED ON A MAXIMUM COUPLER LENGTH OF 6 INCHES. LONGER APPROVED COUPLERS MAY BE UTILIZED, HOWEVER THE REINFORCING SPLICE BAR LENGTH MAY NEED TO BE SHORTENED TO MAINTAIN THE REQUIRED MINIMUM CLEARANCE TO FACE OF CONCRETE.

THE COST OF ALL SPLICE ASSEMBLIES IS TO BE INCIDENTAL TO THE PRICE BID FOR "BRIDGE ABUTMENT FOOTING". WEIGHT OF THE PORTIONS OF REINFORCING SPLICE BARS THAT PROJECT FROM THE SPLICE COUPLERS ARE TABULATED FOR INFORMATIONAL PURPOSES. WEIGHT OF THE PORTIONS OF THE SPLICE BAR WITHIN THE COUPLER, AND WEIGHT OF THE SPLICE COUPLER, ARE NOT TABULATED.

A TOTAL OF 101 EPOXY COATED SPLICE ASSEMBLIES WILL BE REQUIRED PER ABUTMENT FOOTING.

REINF. BAR LIST - WEST C.I.P. FOOTING (*)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8f1	FOOTING, LONGITUDINAL	—	10	46'-9"	1,248
8f2	FOOTING, LONGITUDINAL, ENDS	—	20	7'-5"	396
6f3	FOOTING, ENDS	⌈	4	7'-1"	43
6f4	FOOTING TO WING ANCHOR	—	20	5'-10"	175
5p1	FOOTING, HOOPS	□	90	11'-6"	1,080
5p2	FOOTING, HOOPS, ENDS	□	12	11'-10"	148
6p3	FOOTING, BOTTOM AT PILES	∨	20	7'-0"	210
#2	Δ PILE SPIRAL	⌀	10	38'-6"	65
	Δ SPIRAL SPACERS, L ₈ × 7/8 × 7/8 × 0.70	—	30	1'-10"	38
TOTAL (LBS.)					3,403

MECH. SPLICE LIST - WEST C.I.P. FTG. (*)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
1"φ	ABUT. FOOTING, VERTICAL	—	101	2'-10"	764
1"φ	ABUT. BACKWALL, VERTICAL	—	101	2'-10"	764
	SPLICE COUPLER	⌈	101	--	--
TOTAL (LBS.)					1,528

Δ NOTE:
AT CONTRACTOR'S OPTION, EPOXY COATING MAY BE OMITTED FOR PILE SPIRAL REINF. AND SPIRAL SPACERS.

CONCRETE PLACEMENT SUMMARY (*)

LOCATION	UNIT	WEST	EAST	TOTAL
ABUT. FTG. (HIGH PERFORMANCE CONC.)	CY	26.6	24.8	51.4

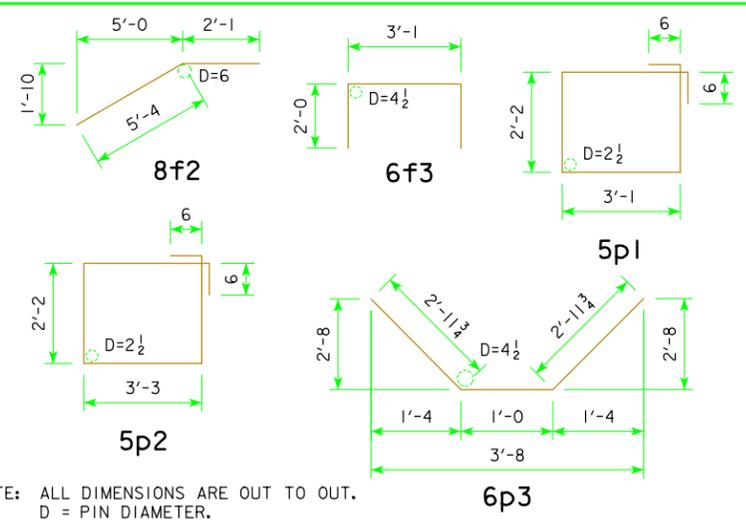
REINF. BAR LIST - EAST C.I.P. FOOTING (*)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8f1	FOOTING, LONGITUDINAL	—	10	46'-9"	1,248
8f2	FOOTING, LONGITUDINAL, ENDS	—	20	7'-5"	396
6f3	FOOTING, ENDS	⌈	4	7'-1"	43
6f4	FOOTING TO WING ANCHOR	—	20	5'-10"	175
5p1	FOOTING, HOOPS	□	98	11'-6"	1,175
5p2	FOOTING, HOOPS, ENDS	□	12	11'-10"	148
6p3	FOOTING, BOTTOM AT PILES	∨	16	7'-0"	168
#2	Δ PILE SPIRAL	⌀	8	38'-6"	52
	Δ SPIRAL SPACERS, L ₈ × 7/8 × 7/8 × 0.70	—	24	1'-10"	31
TOTAL (LBS.)					3,436

MECH. SPLICE LIST - EAST C.I.P. FTG. (*)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
1"φ	ABUT. FOOTING, VERTICAL	—	101	2'-10"	764
1"φ	ABUT. BACKWALL, VERTICAL	—	101	2'-10"	764
	SPLICE COUPLER	⌈	101	--	--
TOTAL (LBS.)					1,528

BENT BAR DETAILS



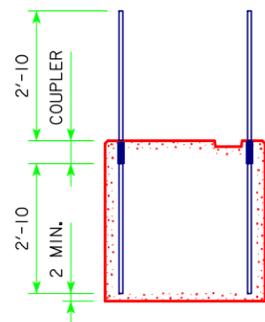
(*) REINFORCING STEEL AND CONC. FOR ABUT. FOOTING SHALL BE INCIDENTAL TO PRICE BID FOR "BRIDGE ABUTMENT FOOTING".

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
ABUT. FOOTING (CAST-IN-PLACE)
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POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 20 OF 57 FILE NO. 30846 DESIGN NO. 115

PRECAST FOOTING NOTES:

MINIMUM DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED.



MECHANICAL SPLICE DETAIL
(TYPICAL ALL VERTICAL SPLICES)

MECHANICAL SPLICE NOTES:

MECHANICAL SPLICE ASSEMBLIES SHALL BE PLACED AT EACH LOCATION OF EACH VERTICAL LEG OF 6g1, 6g2 AND 6g5 ABUTMENT BACKWALL BARS. REFER TO DESIGN SHEET 23 FOR LOCATION OF MECHANICAL SPLICE ASSEMBLIES.

MECHANICAL SPLICE ASSEMBLIES CONSIST OF A MECHANICAL SPLICE COUPLER AND A PAIR OF REINFORCING SPLICE BARS TO BE COUPLED. THE MECHANICAL SPLICE ASSEMBLIES SHALL MEET THE REQUIREMENTS OF MATERIALS IM 451 APPENDIX E, EXCEPT THE COUPLER PORTION OF THE MECHANICAL SPLICE ASSEMBLY IS REQUIRED TO BE EMBEDDED ON THE ABUTMENT FOOTING SIDE OF THE CONSTRUCTION JOINT. REINFORCING SPLICE BARS SHALL BE A MINIMUM OF 1 INCH DIAMETER.

MECHANICAL SPLICE ASSEMBLIES SHALL BE EPOXY COATED.

THE SPECIFIED LENGTH OF REINFORCING SPLICE BAR THAT IS TO PROJECT FROM THE SPLICE COUPLER IS BASED ON A MAXIMUM COUPLER LENGTH OF 6 INCHES. LONGER APPROVED COUPLERS MAY BE UTILIZED, HOWEVER THE REINFORCING SPLICE BAR LENGTH MAY NEED TO BE SHORTENED TO MAINTAIN THE REQUIRED MINIMUM CLEARANCE TO FACE OF CONCRETE.

THE COST OF ALL SPLICE ASSEMBLIES IS TO BE INCIDENTAL TO THE PRICE BID FOR "BRIDGE ABUTMENT FOOTING". WEIGHT OF THE PORTIONS OF REINFORCING SPLICE BARS THAT PROJECT FROM THE SPLICE COUPLERS ARE TABULATED FOR INFORMATIONAL PURPOSES. WEIGHT OF THE PORTIONS OF THE SPLICE BAR WITHIN THE COUPLER, AND WEIGHT OF THE SPLICE COUPLER, ARE NOT TABULATED.

A TOTAL OF 101 EPOXY COATED SPLICE ASSEMBLIES WILL BE REQUIRED PER ABUTMENT FOOTING.

REINF. BAR LIST - WEST PRECAST FTG. (*)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
9f1	FOOTING, LONGITUDINAL	—	13	46'-9"	2,066
9f2	FOOTING, LONGITUDINAL, ENDS	—	26	7'-5"	656
6f3	FOOTING, ENDS	—	4	7'-1"	43
6f4	FOOTING TO WING ANCHOR	—	20	5'-10"	175
5p1	FOOTING, HOOPS	□	90	11'-6"	1,080
5p2	FOOTING, HOOPS, ENDS	□	12	11'-10"	148
TOTAL (LBS.)					4,168

MECH. SPLICE LIST - WEST PRECAST FTG. (*)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
1"φ	ABUT. FOOTING, VERTICAL	—	101	2'-10"	764
1"φ	ABUT. BACKWALL, VERTICAL	—	101	2'-10"	764
SPLICE COUPLER					--
TOTAL (LBS.)					1,528

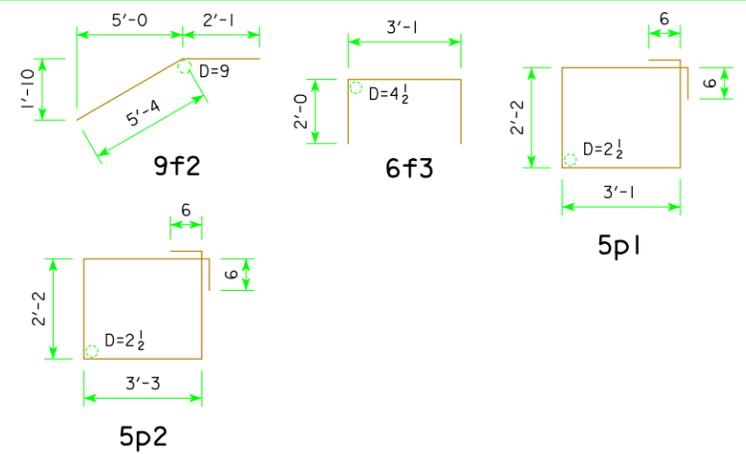
REINF. BAR LIST - EAST PRECAST FTG. (*)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
9f1	FOOTING, LONGITUDINAL	—	13	46'-9"	2,066
9f2	FOOTING, LONGITUDINAL, ENDS	—	26	7'-5"	656
6f3	FOOTING, ENDS	—	4	7'-1"	43
6f4	FOOTING TO WING ANCHOR	—	20	5'-10"	175
5p1	FOOTING, HOOPS	□	98	11'-6"	1,175
5p2	FOOTING, HOOPS, ENDS	□	12	11'-10"	148
TOTAL (LBS.)					4,263

MECH. SPLICE LIST - EAST PRECAST FTG. (*)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
1"φ	ABUT. FOOTING, VERTICAL	—	101	2'-10"	764
1"φ	ABUT. BACKWALL, VERTICAL	—	101	2'-10"	764
SPLICE COUPLER					--
TOTAL (LBS.)					1,528

BENT BAR DETAILS



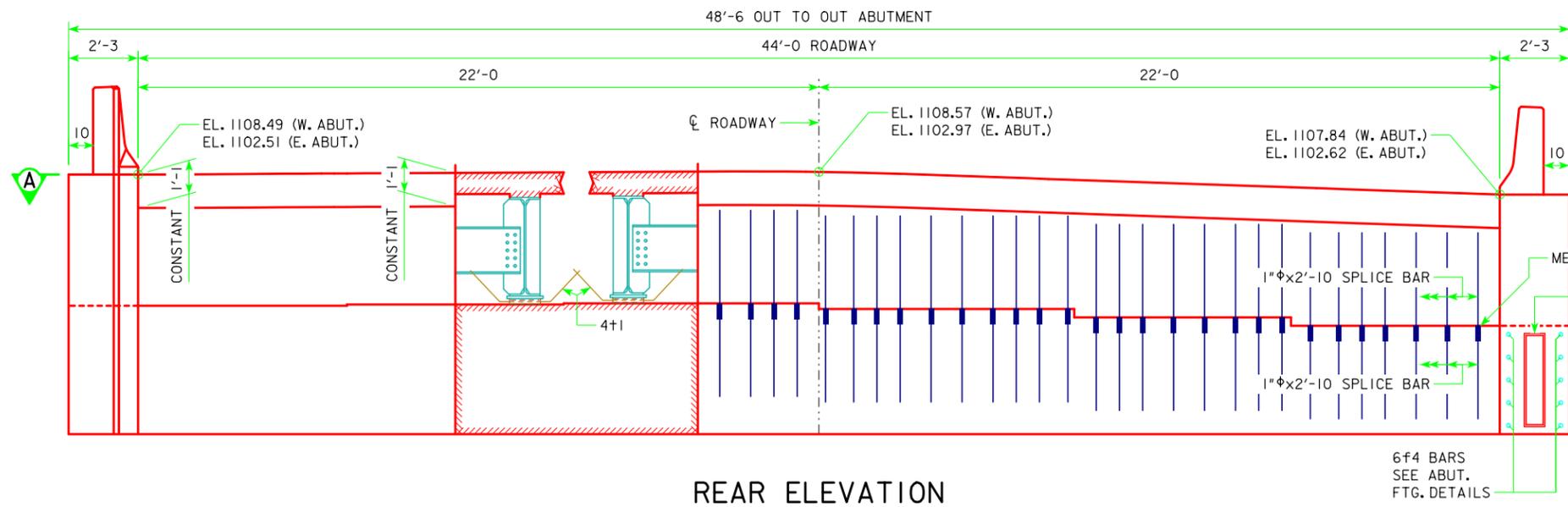
NOTE : ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

CONCRETE PLACEMENT SUMMARY (*)

LOCATION	UNIT	WEST	EAST	TOTAL
ABUT. FTG. (HIGH PERFORMANCE CONC.)	CY	23.0	22.1	45.1
PILE POCKET (SELF-CONSOLIDATING)	CY	3.5	2.6	6.1

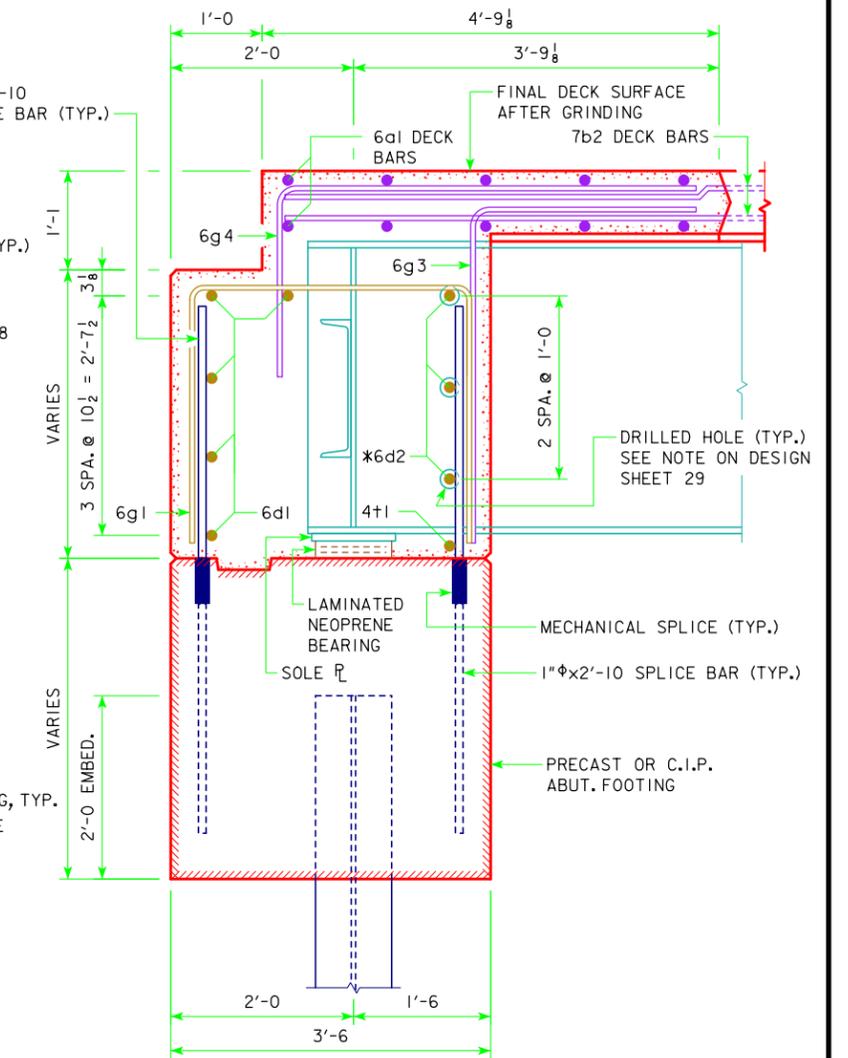
(*) REINFORCING STEEL AND CONC. FOR ABUT. FOOTING SHALL BE INCIDENTAL TO PRICE BID FOR "BRIDGE ABUTMENT FOOTING".

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
ABUT. FOOTING (PRECAST)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 22 OF 57 FILE NO. 30846 DESIGN NO. 115

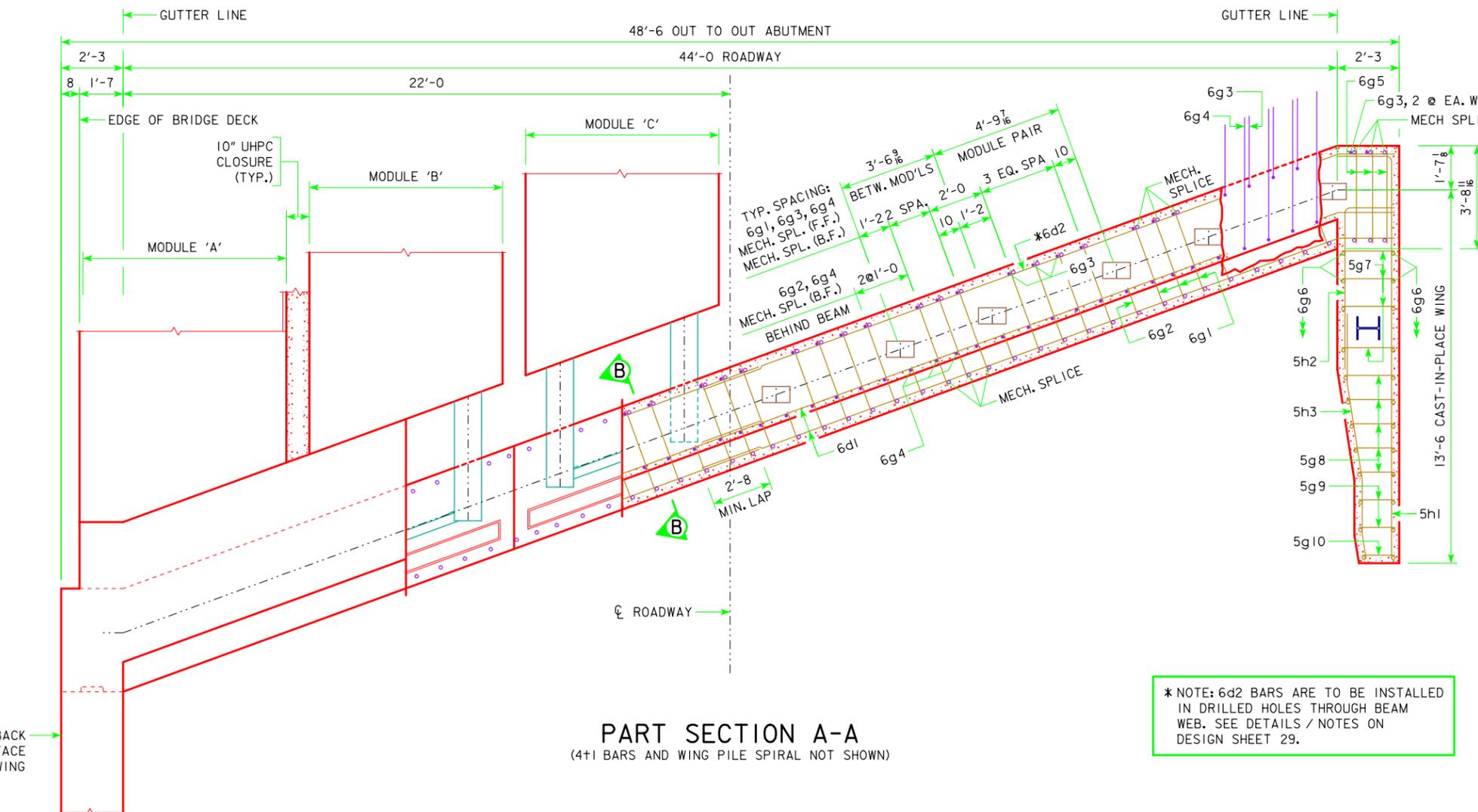


REAR ELEVATION

DECK ELEVATIONS PROVIDED ARE AT END OF BRIDGE DECK AND REPRESENT FINAL DECK SURFACE AFTER GRINDING. AS-CAST DECK SURFACE WILL EXCEED NOTED ELEVATIONS BY APPROX. 0.02' (1/4") TO ACCOUNT FOR SACRIFICIAL SURFACE.



PART SECTION B-B
(SECTION CUT PERPENDICULAR TO SKEW)

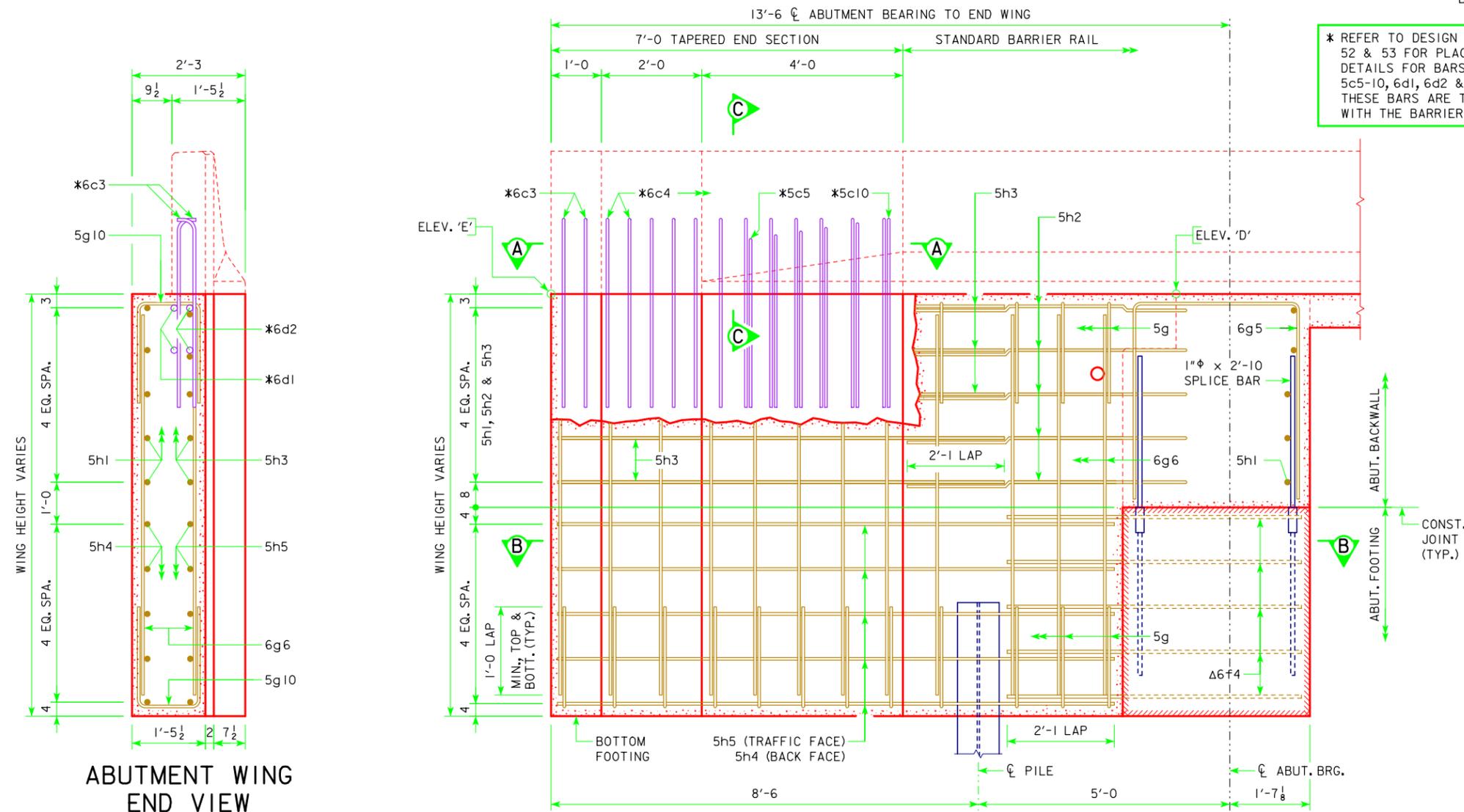


PART SECTION A-A
(4+1 BARS AND WING PILE SPIRAL NOT SHOWN)

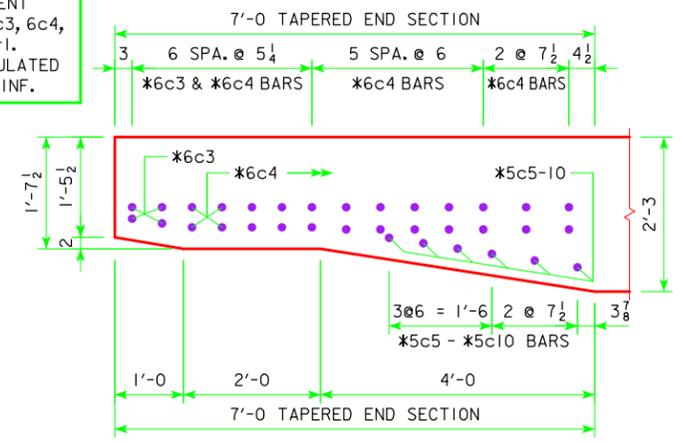
* NOTE: 6d2 BARS ARE TO BE INSTALLED IN DRILLED HOLES THROUGH BEAM WEB. SEE DETAILS / NOTES ON DESIGN SHEET 29.

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 DETAILS
STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 23 OF 57 FILE NO. 30846 DESIGN NO. 115

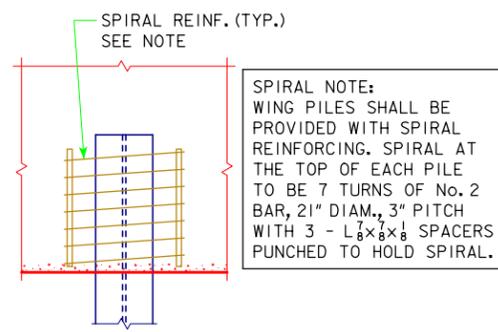
* REFER TO DESIGN SHEETS 52 & 53 FOR PLACEMENT DETAILS FOR BARS 6c3, 6c4, 5c5-10, 6d1, 6d2 & 4t1. THESE BARS ARE TABULATED WITH THE BARRIER REINF.



ABUTMENT WING - ELEVATION VIEW AT GUTTER
(PILE SPIRAL NOT SHOWN)

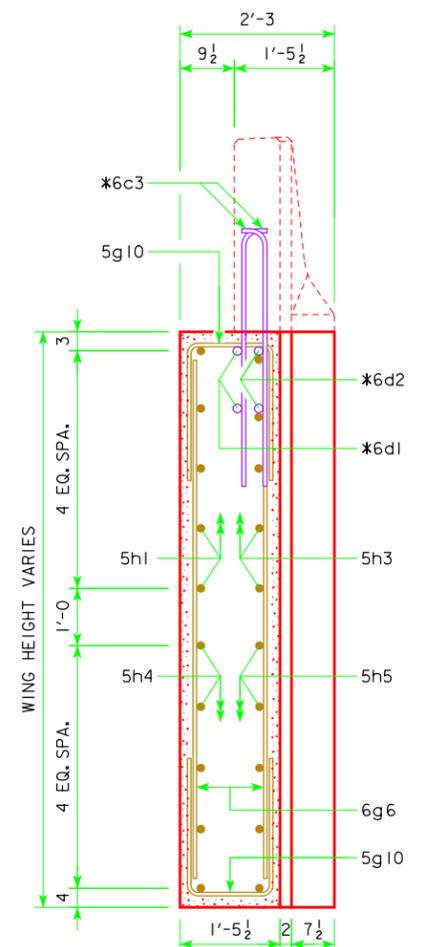


PART VIEW A-A AT TOP OF WING
(BARS SHOWN ARE TO BE PLACED WITH ABUTMENT WING)

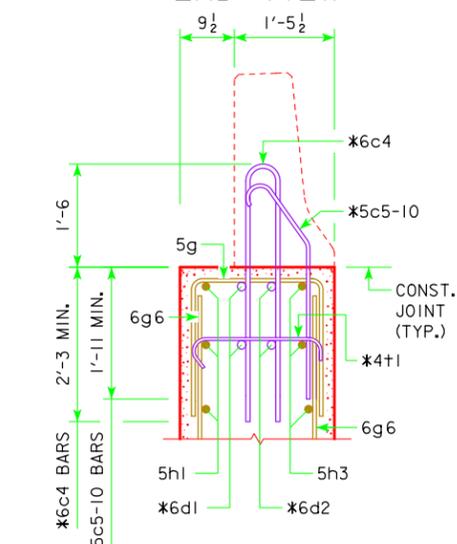


PILE SPIRAL DETAIL

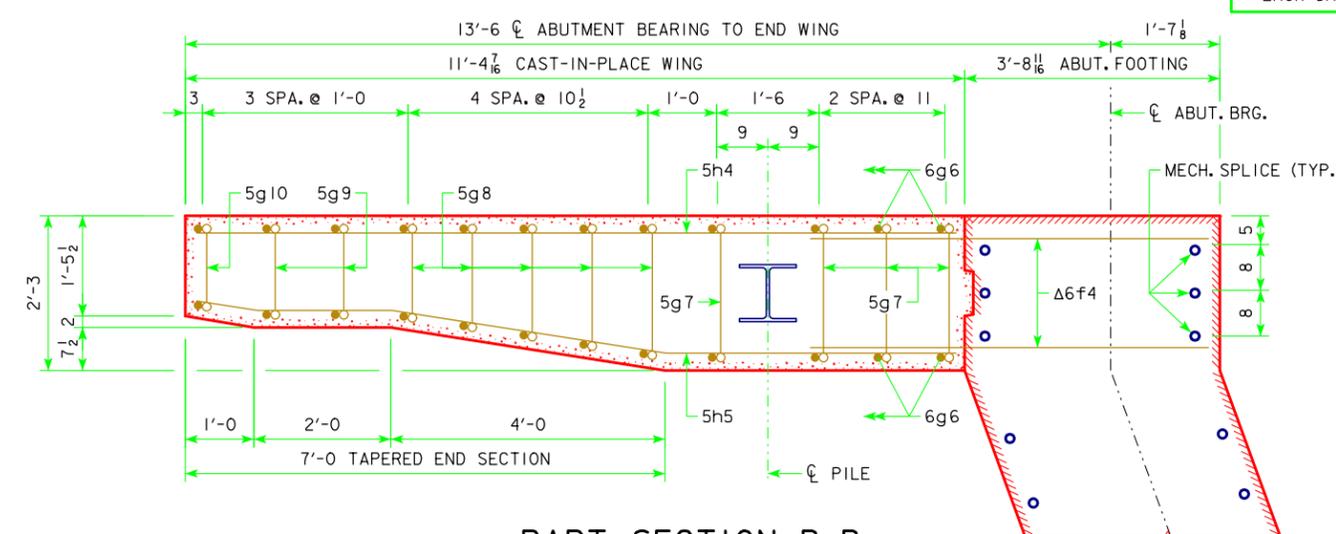
	BOTT. FOOT.	ELEV. 'D'	ELEV. 'E'
NORTHWEST WING	1100.10	1108.49	1109.02
SOUTHWEST WING	1100.10	1107.84	1108.34
NORTHEAST WING	1094.82	1102.62	1102.53
SOUTHEAST WING	1094.82	1102.51	1102.45



ABUTMENT WING END VIEW



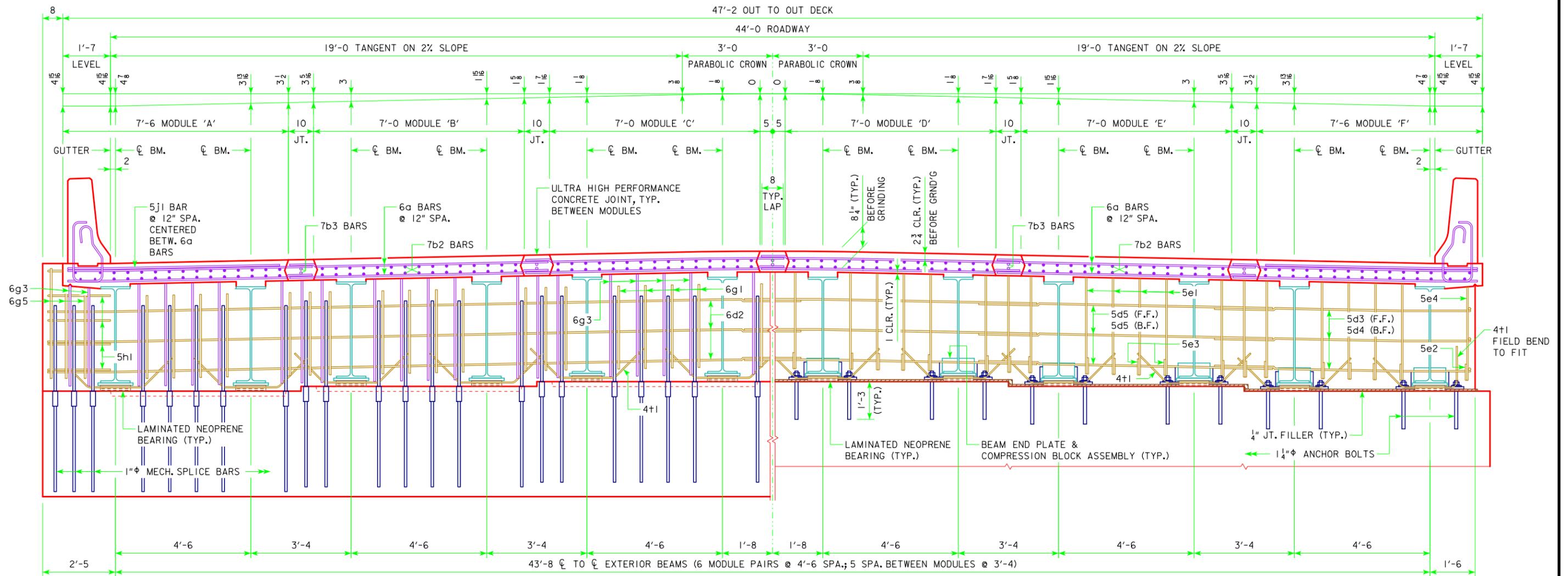
SECTION C-C AT BARRIER RAIL



PART SECTION B-B
(PILE SPIRAL NOT SHOWN)

Δ 6f4 BARS ARE INCLUDED WITH ABUTMENT FOOTING QUANTITIES. PLACE WITH EACH 5h4 AND 5h5 BAR.

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 91'-0 & 51'-0 END SPANS 92'-0 INTERIOR SPAN
ABUTMENT WING DETAILS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 24 OF 57 FILE NO. 30846 DESIGN NO. 115



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 1/4" 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

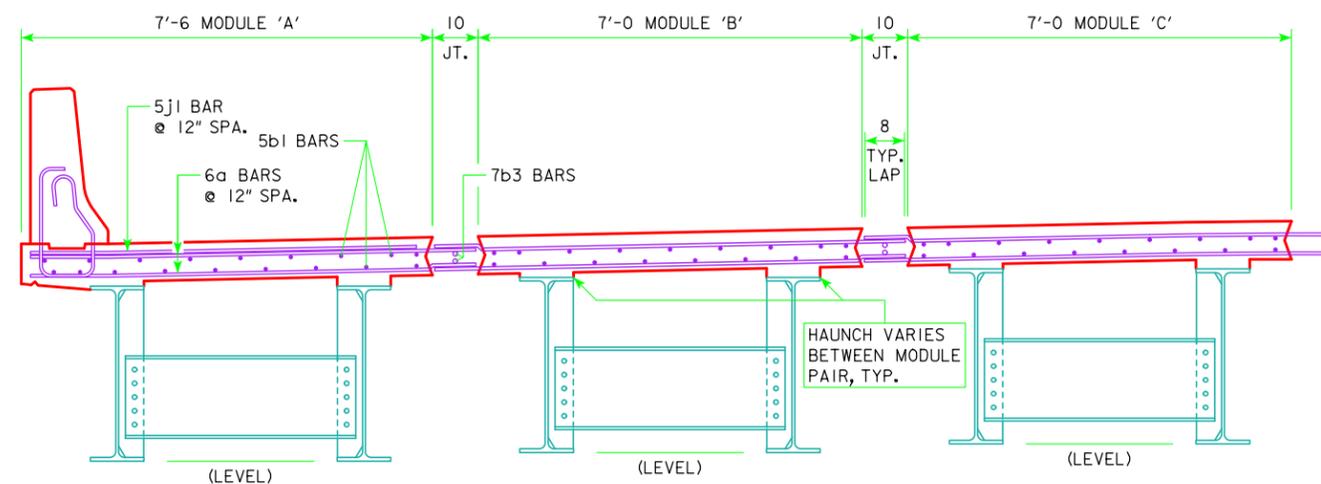
FORMS FOR THE BRIDGE DECK AND BARRIER RAIL ARE TO BE SUPPORTED BY THE STEEL BEAMS.

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

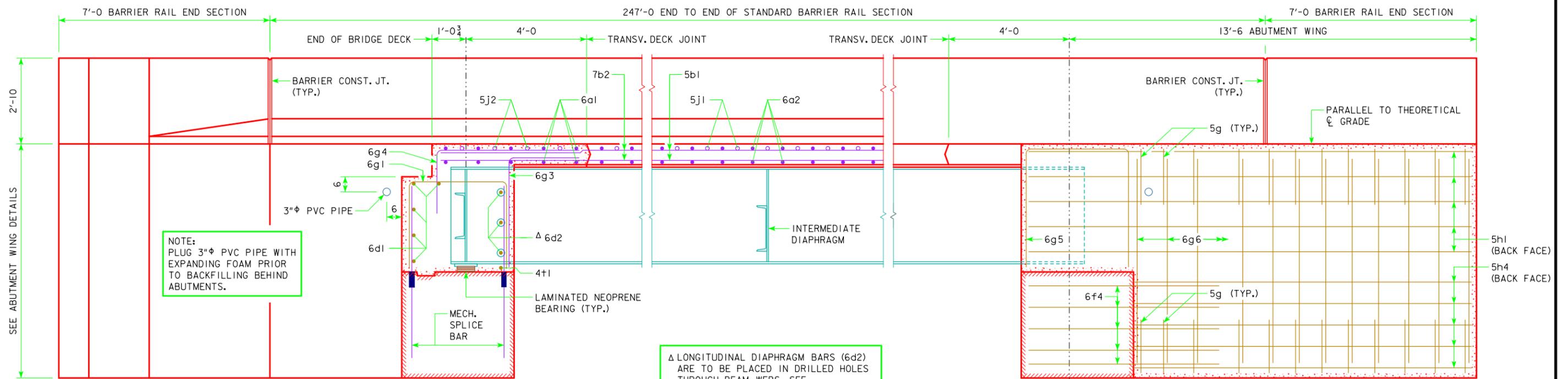
ALL DECK AND DIAPHRAGM REINFORCING IS TO BE WIRED IN PLACE AND ADEQUATELY SUPPORTED BEFORE CONCRETE IS PLACED.

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2 3/4" BELOW TOP OF DECK (BEFORE GRINDING). BOTTOM TRANSV. 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.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, BAR HIGH CHAIRS, AND DECK BOLSTERS.

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 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

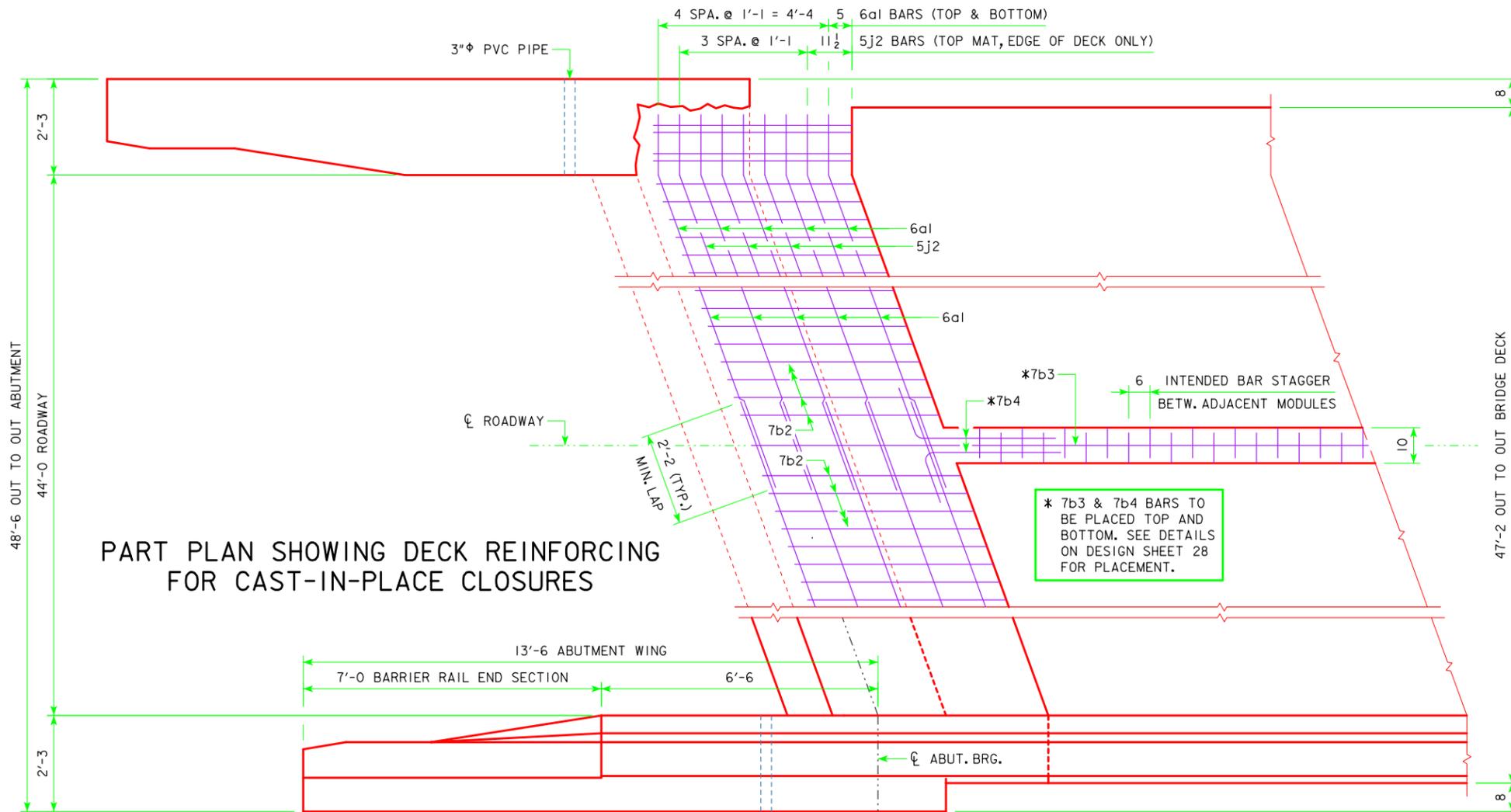


HALF SECTION NEAR MIDSPAN
(LOOKING EAST, UHPC NOT SHOWN)

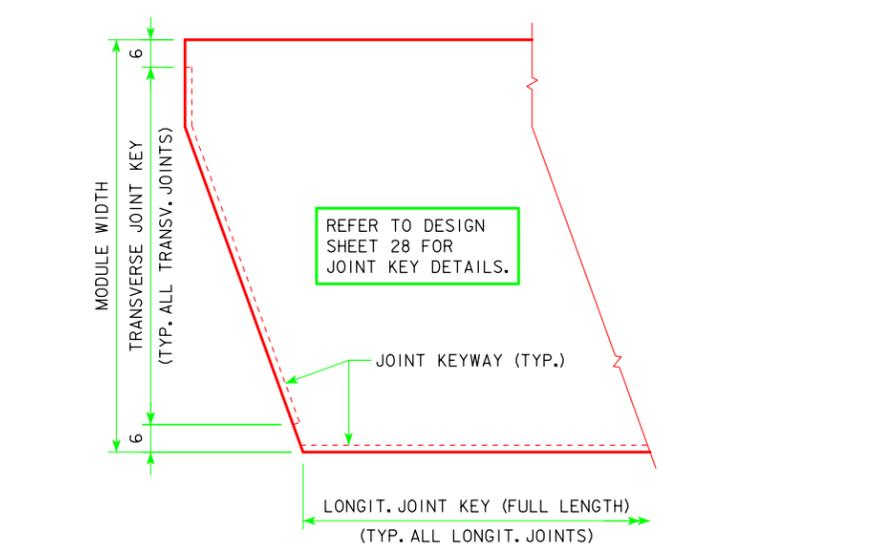


PART LONGITUDINAL SECTION NEAR GUTTER

PART END VIEW AT ABUTMENT

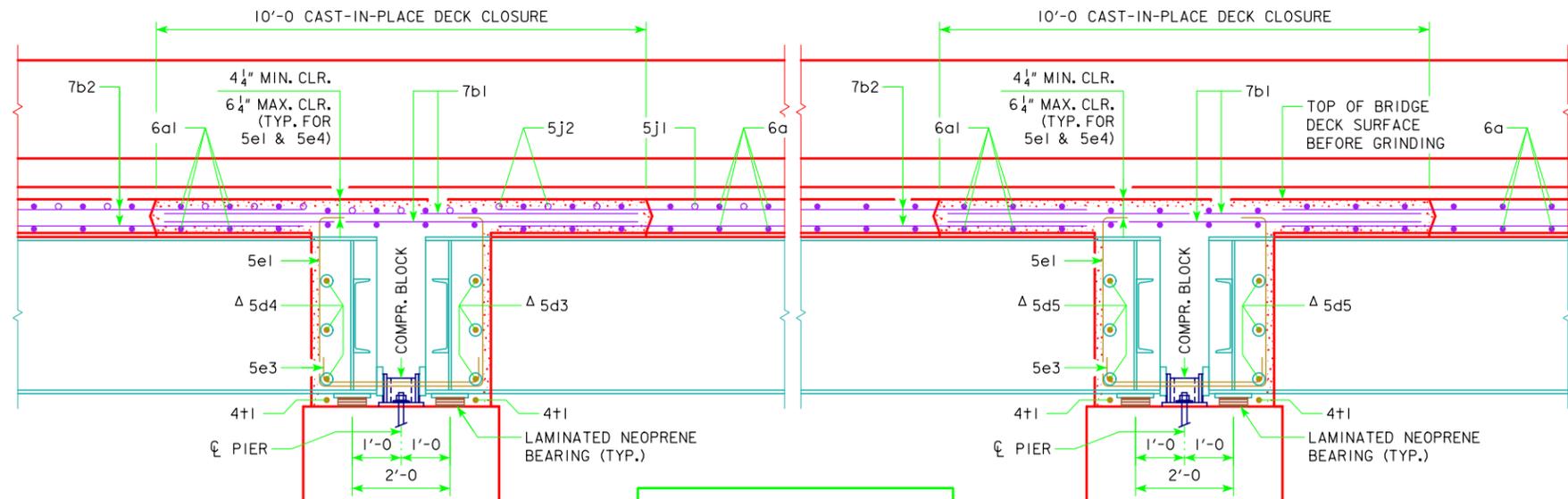


PART PLAN SHOWING DECK REINFORCING FOR CAST-IN-PLACE CLOSURES



TYPICAL MODULE JOINT KEY PLAN
(EXT. MODULE SHOWN, INT. MODULE SIMILAR WITH LONGIT. JOINTS BOTH SIDES)

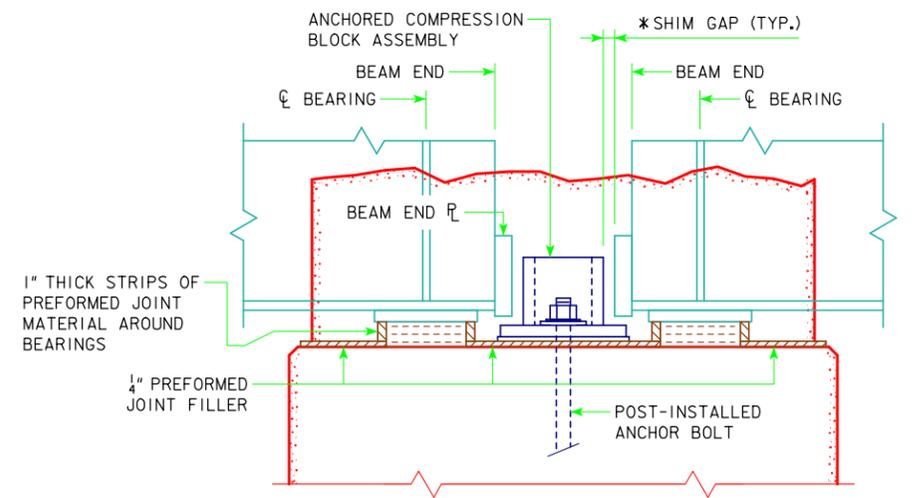
DESIGN FOR 20° SKEW (R.A.)
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POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 26 OF 57 FILE NO. 30846 DESIGN NO. 115



PART LONGIT. SECTION THROUGH EXTERIOR MODULE

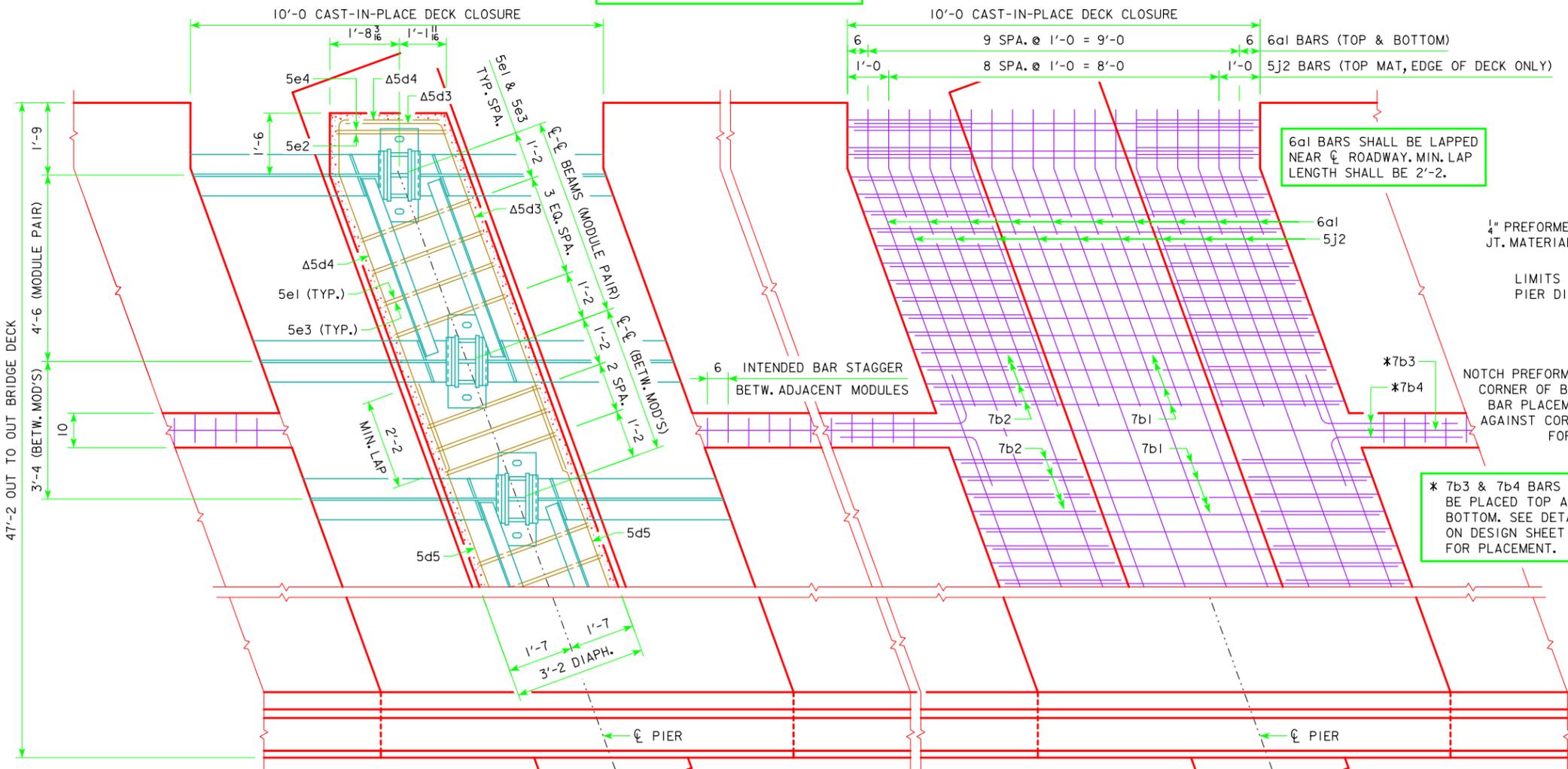
PART LONGIT. SECTION THROUGH INTERIOR MODULE

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



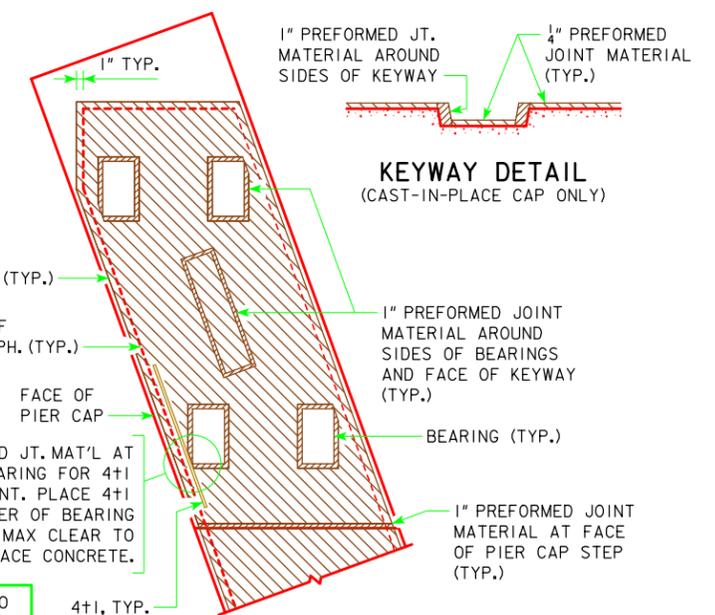
PART SECTION SHOWING JOINT MATERIAL

* COMPRESSION BLOCK SHIMS NOT SHOWN FOR CLARITY



PIER DIAPH. PART SECTION
(4+1 BARS NOT SHOWN; SEE "TOP OF PIER JOINT MATERIAL PLAN" FOR TYPICAL 4+1 PLACEMENT.)

DECK CLOSURE REINFORCING PART PLAN VIEW



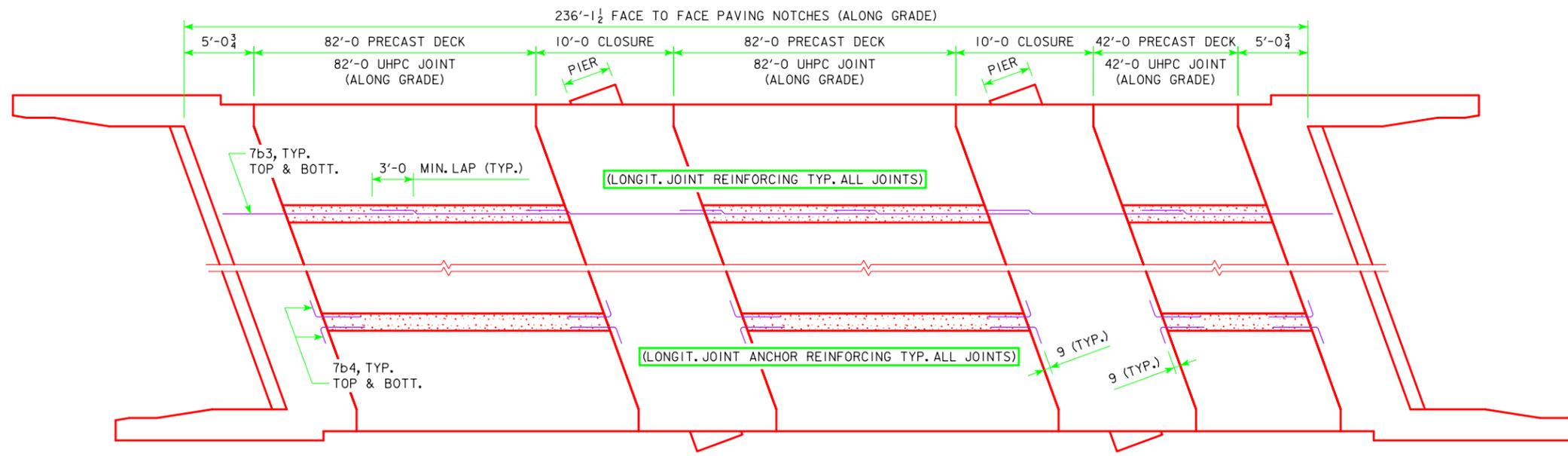
KEYWAY DETAIL (CAST-IN-PLACE CAP ONLY)

TOP OF PIER JOINT MATERIAL PLAN

6a1 BARS SHALL BE LAPPED NEAR CL ROADWAY. MIN. LAP LENGTH SHALL BE 2'-2."

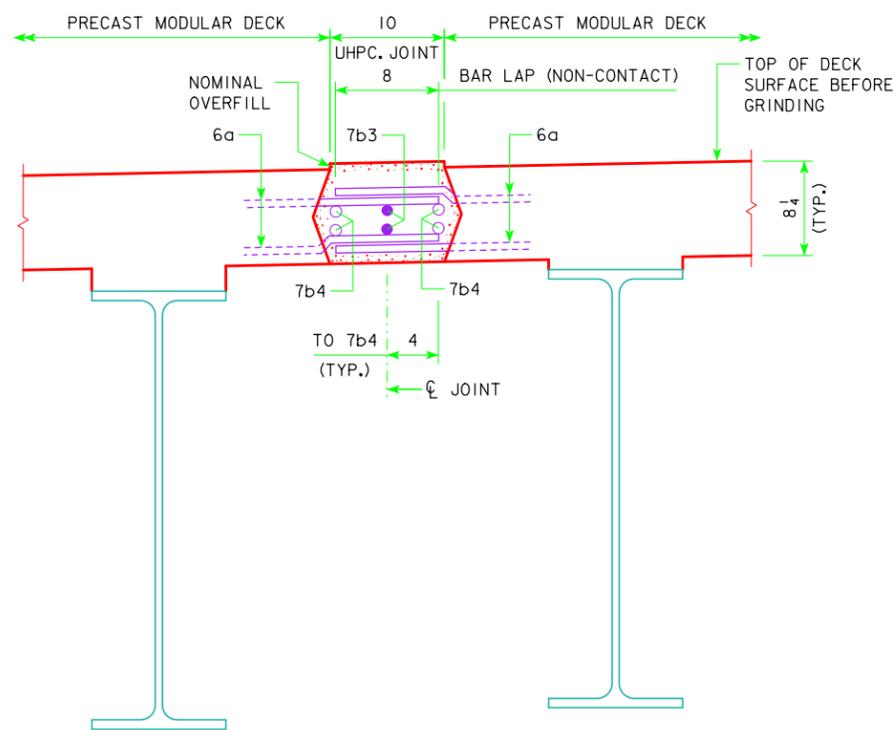
* 7b3 & 7b4 BARS TO BE PLACED TOP AND BOTTOM. SEE DETAILS ON DESIGN SHEET 28 FOR PLACEMENT.

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POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 27 OF 57 FILE NO. 30846 DESIGN NO. 115

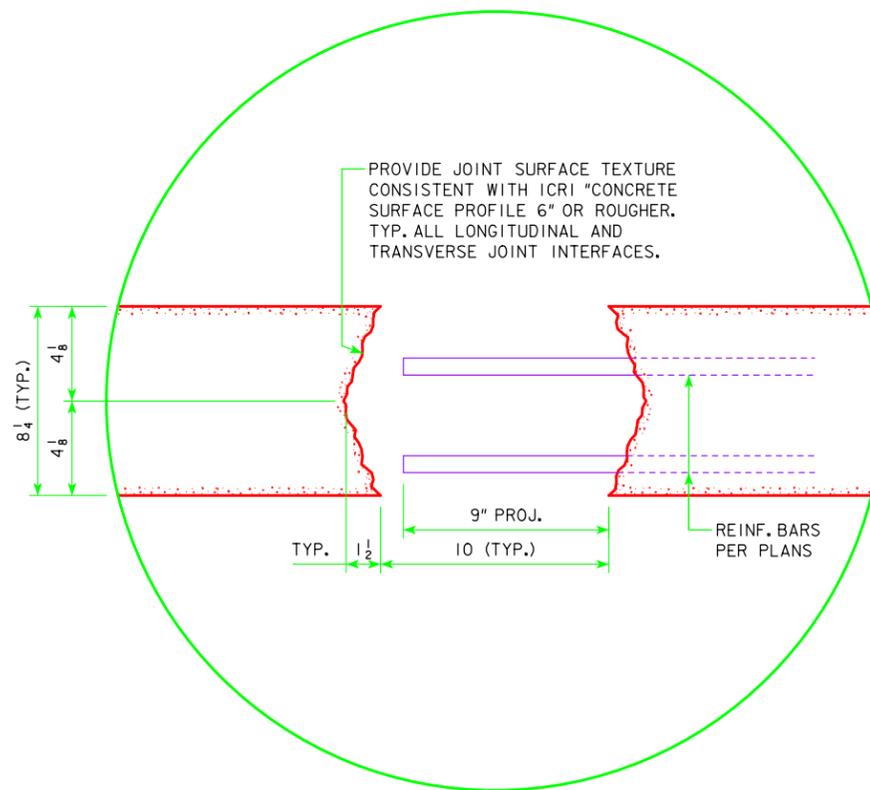


DECK PART SECTION SHOWING LONGITUDINAL JOINTS

(NOT TO SCALE; BAR LAP LOCATIONS SHOWN ARE NOT REPRESENTATIVE OF ACTUAL LOCATION)
(TRANSVERSE BARS NOT SHOWN FOR CLARITY)



TYPICAL SECTION AT LONGITUDINAL JOINT



TYPICAL JOINT PREPARATION DETAIL

(LONGITUDINAL JOINT SHOWN; TRANSVERSE JOINT SIMILAR)

UHPC LONGITUDINAL JOINT NOTES:

LONGITUDINAL JOINTS BETWEEN DECK MODULES SHALL BE CONSTRUCTED OF ULTRA HIGH PERFORMANCE CONCRETE (UHPC). REFER TO SPECIAL PROVISIONS FOR ULTRA HIGH PERFORMANCE CONCRETE. THE CONTRACTOR SHALL BE REQUIRED TO BATCH AND PLACE ALL UHPC MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A REPRESENTATIVE OF THE MANUFACTURER ON-SITE DURING ALL UHPC PLACEMENT OPERATIONS.

MATERIAL PROPERTIES OF UHPC VARY CONSIDERABLY FROM CONVENTIONAL CONCRETE, BOTH DURING THE PLASTIC STATE AND HARDENED STATE. THE CONTRACTOR SHALL NOTE THAT ADDITIONAL FORMING EFFORT WILL BE REQUIRED TO ENSURE FORMS ARE PROPERLY SEALED AND ARE CAPABLE OF RESISTING THE ANTICIPATED FORM PRESSURES. THE CONTRACTOR SHALL NOTE THAT UHPC PLACEMENT ON GRADE TYPICALLY REQUIRES TOP FORMS FOR CONTAINMENT OF THE MATERIAL WITHIN THE DESIGNATED PLACEMENT AREA. TOP FORMS COMMONLY REQUIRE APPLICATION OF MECHANICAL FASTENERS AND/OR DEAD WEIGHT TO RESIST PRESSURES CREATED BY THE FLUID UHPC MATERIALS.

THE CONTRACTOR SHALL NOTE THAT CONCRETE SCREW ANCHORS SHALL NOT BE CONSIDERED AN ACCEPTABLE MEANS OF SECURING TOP FORMS TO THE CONCRETE BRIDGE DECK SURFACE, DUE TO THE ANTICIPATED DETRIMENTAL IMPACTS OF THE ANCHOR HOLES ON DECK SERVICE LIFE. SHALLOW CONCRETE NAILS WITH A MAXIMUM EMBEDMENT OF 3/4" MAY BE CONSIDERED AN ACCEPTABLE MEANS OF FASTENING JOINT FORMS. ALTERNATE METHODS FOR SECURING JOINT FORMS MAY BE PROPOSED BY THE CONTRACTOR, SUBJECT TO THE ENGINEER'S REVIEW AND APPROVAL.

THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A UHPC PLACEMENT PLAN AND A DEMONSTRATION UHPC JOINT MOCKUP IN ACCORDANCE WITH THE SPECIAL PROVISIONS FOR ULTRA HIGH PERFORMANCE CONCRETE, FOR REVIEW AND APPROVAL BY THE ENGINEER. THE UHPC PLACEMENT PLAN SHALL DETAIL THE PROPOSED METHOD OF JOINT SURFACE PREPARATION, THE PROPOSED FORMING METHOD(S), AND THE PROPOSED SEQUENCE AND SCHEDULE OF PLACEMENT OPERATIONS. THE UHPC DEMONSTRATION JOINT MOCKUP SHALL BE AS DETAILED IN THESE PLANS AND SHALL BE CONSTRUCTED USING METHODS AND PROCEDURES REPRESENTATIVE OF THE UHPC PLACEMENT FOR BRIDGE LONGITUDINAL JOINTS.

JOINT PREPARATION NOTES:

KEYED JOINT SURFACES FOR LONGITUDINAL UHPC JOINTS AND TRANSVERSE DECK CLOSURES SHALL RECEIVE A TEXTURED FINISH CONSISTING OF MICRO- AND MACRO-TEXTURE.

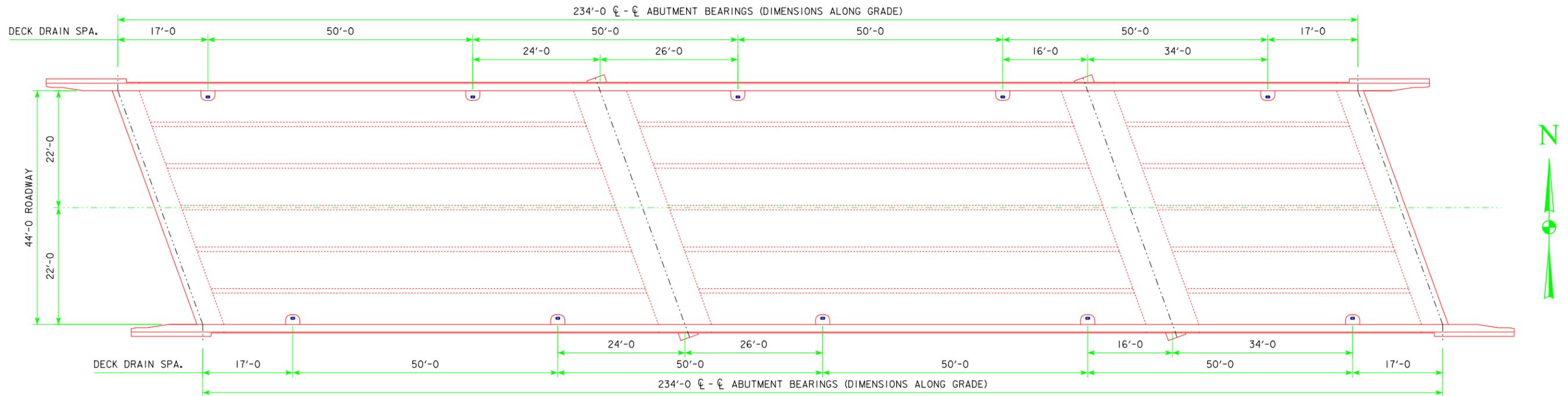
JOINT SURFACES SHALL BE TEXTURED TO "CONCRETE SURFACE PROFILE 6" OR ROUGHER, AS ESTABLISHED BY THE INTERNATIONAL CONCRETE REPAIR INSTITUTE (ICRI). JOINT TEXTURE MAY BE ACHIEVED BY ONE OR MORE OF THE FOLLOWING MEANS:

- MEDIA BLASTING
- USE OF A TEXTURED FORMLINER
- USE OF A FORM RETARDER AT THE JOINT SURFACE, FOLLOWED BY PRESSURE WASHING AFTER INITIAL SET TO PROVIDE AN EXPOSED AGGREGATE FINISH
- OTHER MEANS, SUBJECT TO ENGINEER'S APPROVAL

IN ADDITION TO THE JOINT PREPARATION REQUIREMENTS ABOVE, THE REQUIREMENTS OF SECTION 2403.03,1,1 OF THE STANDARD SPECIFICATIONS SHALL APPLY (INCLUDES SANDBLAST AND AIR BLAST CLEANING OF JOINT SURFACES).

ALL WORK FOR PREPARATION AND TEXTURING OF KEYED JOINT SURFACES FOR LONGITUDINAL AND TRANSVERSE DECK MODULE CONNECTIONS SHALL BE INCLUDED IN THE PRICE BID FOR "ULTRA HIGH PERFORMANCE CONCRETE JOINT".

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POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 28 OF 57 FILE NO. 30846 DESIGN NO. 115



DECK DRAIN PLAN

DECK GRINDING NOTES:

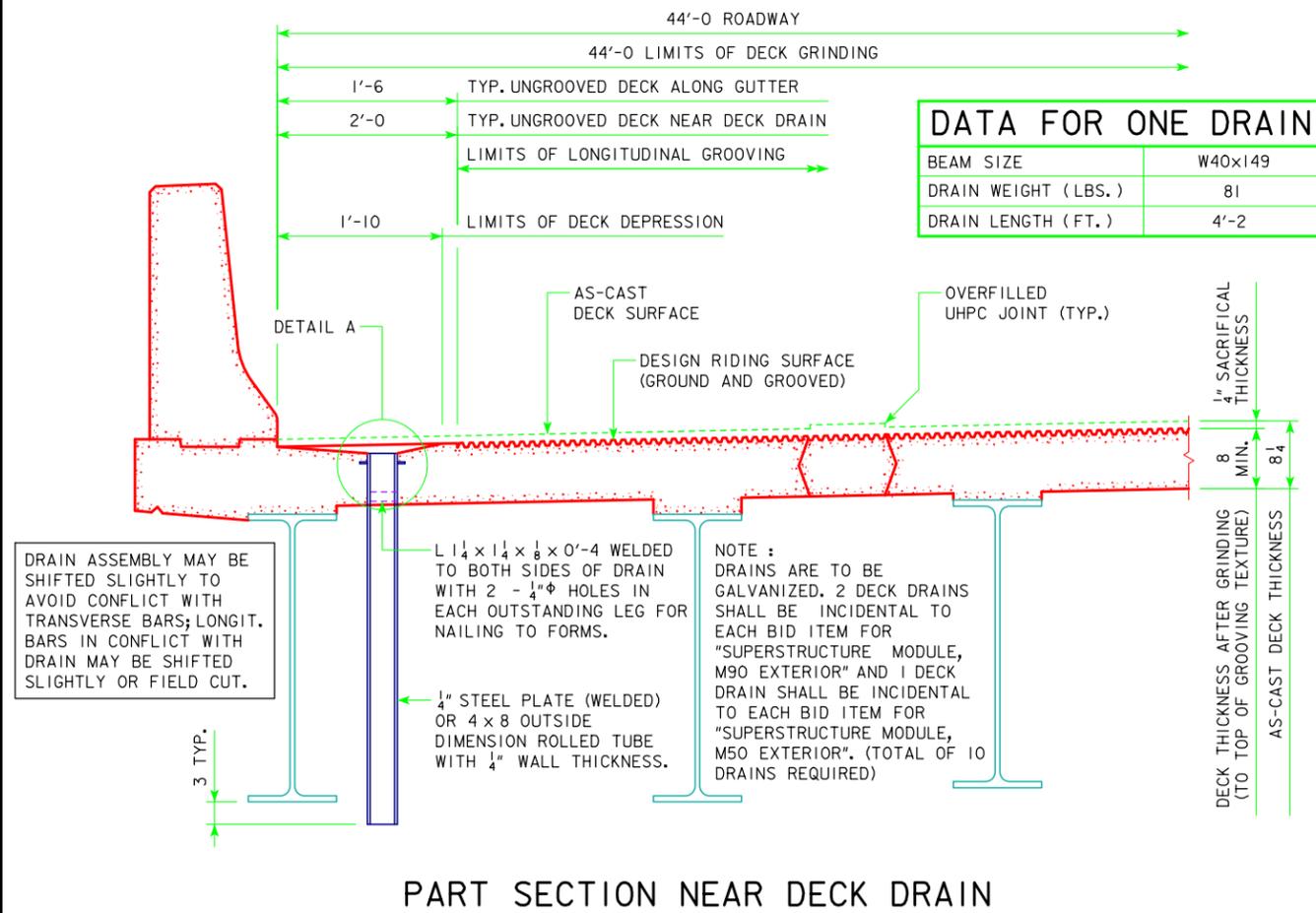
AFTER THE DECK MODULES HAVE BEEN SET AND STRENGTH IS ATTAINED IN THE LONGITUDINAL AND TRANSVERSE CLOSURE POUR CONCRETE/UHPC IN ACCORDANCE WITH THE SPECIAL PROVISIONS FOR PREFABRICATED SUPERSTRUCTURE MODULES, THE DECK SURFACE SHALL BE DIAMOND GROUND IN ACCORDANCE WITH SECTIONS 2532.01 THROUGH 2532.04 OF THE STANDARD SPECIFICATIONS TO ACHIEVE A UNIFORM PROFILE AND SMOOTH RIDING SURFACE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

THE BRIDGE DECK MODULES HAVE BEEN DESIGNED WITH A 1/4" SACRIFICIAL SURFACE. NOMINAL DEPTH OF DECK GRINDING SHALL NOT EXCEED 1/4". THE CONTRACTOR SHALL NOT BE REQUIRED TO REMOVE THE FULL 1/4" SACRIFICIAL SURFACE IF THEY CAN PROVIDE A FINISHED RIDING SURFACE THAT MEETS THE PROFILE AND SMOOTHNESS OF THE CONTRACT DOCUMENTS.

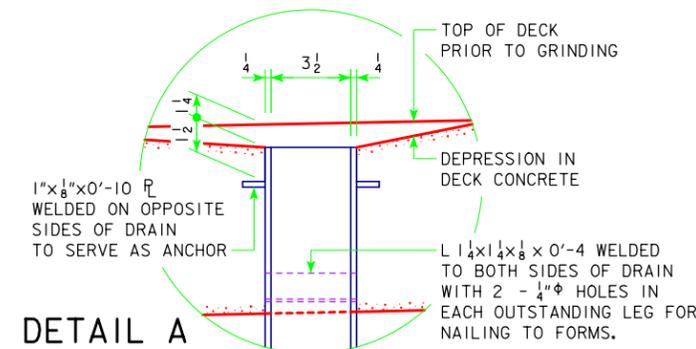
THE CONTRACTOR SHALL BE REQUIRED TO COORDINATE WITH THE MANUFACTURER OF THE UHPC MATERIALS TO DETERMINE THE OPTIMUM TIMEFRAME FOR GRINDING OF THE UHPC. SPECIALIZED GRINDING EQUIPMENT MAY BE REQUIRED TO GRIND THE UHPC MATERIALS. BID PRICE FOR DECK GRINDING SHALL BE BASED ON THE STRENGTH AND COMPOSITION OF THE HIGH PERFORMANCE CONCRETE AND UHPC TO BE USED BY THE CONTRACTOR. BASIS OF PAYMENT FOR DECK GRINDING SHALL BE THE CONTRACT UNIT PRICE PER SQUARE YARD FOR DECK GRINDING.

LONGITUDINAL GROOVING OF THE BRIDGE DECK SHALL BE PROVIDED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT LIMITS OF LONGITUDINAL GROOVING SHALL BE MAINTAINED AT 2'-0" FROM GUTTER LINE IMMEDIATELY ADJACENT TO DECK DRAINS (LIMITS MAINTAINED AT 1'-6" ELSEWHERE). LONGITUDINAL GROOVING QUANTITIES ARE TABULATED WITH THE ROAD PLANS FOR THIS PROJECT.

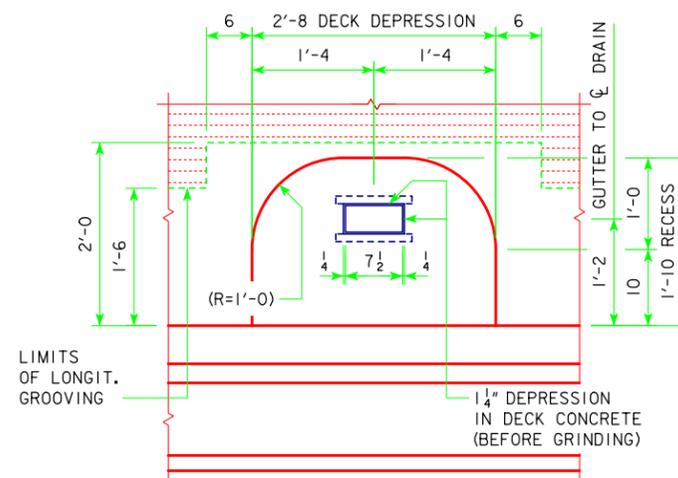
DESIGN FOR 20° SKEW (R.A.)
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 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 30 OF 57 FILE NO. 30846 DESIGN NO. 115



PART SECTION NEAR DECK DRAIN



DETAIL A

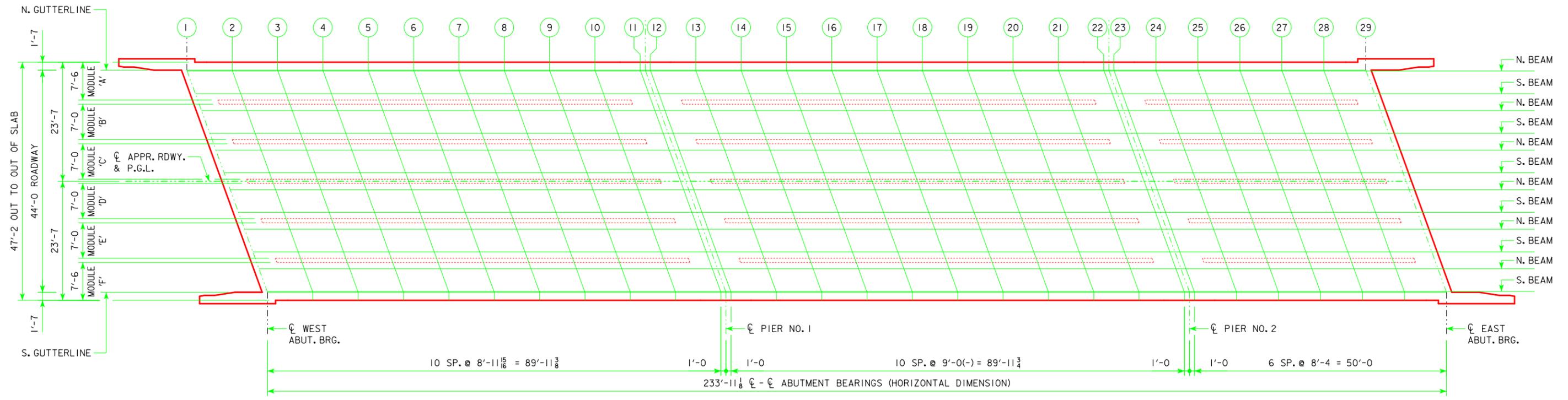


PART PLAN AT DECK DRAIN

TOP OF SLAB ELEVATIONS

LOCATION	CL WEST ABUT. BRG.										CL PIER NO. 1 BEAM BRGS.										CL PIER NO. 2 BEAM BRGS.										CL EAST ABUT. BRG.
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27	LINE 28	LINE 29		
N. GUTTERLINE	1108.45	1108.08	1107.72	1107.38	1107.05	1106.72	1106.41	1106.11	1105.83	1105.55	1105.29	1105.23	1104.98	1104.74	1104.51	1104.30	1104.09	1103.90	1103.72	1103.55	1103.39	1103.25	1103.22	1103.10	1102.98	1102.88	1102.79	1102.70	1102.63		
MODULE 'A'	N. BEAM	1108.45	1108.08	1107.72	1107.38	1107.05	1106.72	1106.41	1106.11	1105.83	1105.55	1105.29	1105.23	1104.98	1104.74	1104.52	1104.30	1104.10	1103.90	1103.72	1103.55	1103.40	1103.25	1103.22	1103.10	1102.98	1102.88	1102.79	1102.71	1102.63	
	S. BEAM	1108.47	1108.11	1107.75	1107.41	1107.08	1106.76	1106.45	1106.15	1105.87	1105.59	1105.33	1105.27	1105.03	1104.79	1104.56	1104.35	1104.15	1103.96	1103.78	1103.61	1103.46	1103.32	1103.28	1103.16	1103.05	1102.95	1102.86	1102.78	1102.71	
MODULE 'B'	N. BEAM	1108.49	1108.12	1107.77	1107.43	1107.10	1106.78	1106.47	1106.18	1105.90	1105.62	1105.36	1105.31	1105.06	1104.83	1104.60	1104.39	1104.19	1104.00	1103.83	1103.66	1103.51	1103.36	1103.33	1103.21	1103.11	1103.01	1102.92	1102.84	1102.77	
	S. BEAM	1108.51	1108.15	1107.80	1107.46	1107.13	1106.81	1106.51	1106.22	1105.94	1105.67	1105.41	1105.35	1105.11	1104.87	1104.65	1104.44	1104.25	1104.06	1103.88	1103.72	1103.57	1103.43	1103.40	1103.28	1103.18	1103.08	1102.99	1102.91	1102.85	
MODULE 'C'	N. BEAM	1108.53	1108.17	1107.82	1107.48	1107.15	1106.84	1106.54	1106.25	1105.97	1105.70	1105.44	1105.38	1105.14	1104.91	1104.69	1104.48	1104.29	1104.10	1103.93	1103.77	1103.62	1103.48	1103.45	1103.33	1103.23	1103.13	1103.05	1102.97	1102.90	
	S. BEAM	1108.55	1108.19	1107.84	1107.50	1107.18	1106.87	1106.57	1106.28	1106.00	1105.73	1105.48	1105.42	1105.18	1104.95	1104.74	1104.53	1104.34	1104.15	1103.98	1103.82	1103.67	1103.54	1103.51	1103.40	1103.29	1103.20	1103.11	1103.04	1102.98	
ROADWAY CL	1108.53	1108.17	1107.83	1107.49	1107.17	1106.86	1106.56	1106.27	1105.99	1105.72	1105.47	1105.42	1105.18	1104.95	1104.73	1104.53	1104.33	1104.15	1103.98	1103.82	1103.67	1103.54	1103.51	1103.40	1103.29	1103.20	1103.12	1103.04	1102.98		
MODULE 'D'	N. BEAM	1108.50	1108.14	1107.79	1107.46	1107.14	1106.83	1106.53	1106.24	1105.96	1105.70	1105.45	1105.39	1105.15	1104.92	1104.71	1104.50	1104.31	1104.13	1103.96	1103.80	1103.66	1103.52	1103.49	1103.38	1103.28	1103.19	1103.10	1103.03	1102.97	
	S. BEAM	1108.35	1107.99	1107.65	1107.32	1107.00	1106.69	1106.39	1106.10	1105.83	1105.57	1105.32	1105.26	1105.03	1104.80	1104.59	1104.38	1104.19	1104.01	1103.85	1103.69	1103.55	1103.41	1103.39	1103.28	1103.17	1103.08	1103.00	1102.93	1102.87	
MODULE 'E'	N. BEAM	1108.23	1107.88	1107.54	1107.21	1106.89	1106.58	1106.28	1106.00	1105.73	1105.47	1105.22	1105.16	1104.93	1104.70	1104.49	1104.29	1104.10	1103.92	1103.76	1103.60	1103.46	1103.33	1103.30	1103.19	1103.09	1103.00	1102.93	1102.86	1102.80	
	S. BEAM	1108.08	1107.73	1107.39	1107.06	1106.74	1106.43	1106.14	1105.86	1105.59	1105.33	1105.08	1105.03	1104.80	1104.57	1104.36	1104.17	1103.98	1103.80	1103.64	1103.49	1103.35	1103.22	1103.19	1103.08	1102.99	1102.90	1102.82	1102.75	1102.70	
MODULE 'F'	N. BEAM	1107.96	1107.61	1107.27	1106.95	1106.63	1106.33	1106.04	1105.76	1105.49	1105.23	1104.98	1104.93	1104.70	1104.48	1104.27	1104.07	1103.89	1103.71	1103.55	1103.40	1103.26	1103.13	1103.11	1103.00	1102.91	1102.82	1102.74	1102.68	1102.62	
	S. BEAM	1107.81	1107.46	1107.12	1106.80	1106.49	1106.18	1105.89	1105.62	1105.35	1105.09	1104.85	1104.80	1104.57	1104.35	1104.14	1103.95	1103.76	1103.59	1103.43	1103.28	1103.15	1103.02	1102.99	1102.89	1102.80	1102.71	1102.64	1102.58	1102.52	
S. GUTTERLINE	1107.80	1107.45	1107.12	1106.79	1106.48	1106.18	1105.89	1105.61	1105.34	1105.09	1104.84	1104.79	1104.56	1104.34	1104.14	1103.94	1103.76	1103.59	1103.43	1103.28	1103.14	1103.02	1102.99	1102.89	1102.79	1102.71	1102.64	1102.57	1102.52		

NOTE:
TOP OF SLAB ELEVATIONS REPRESENT INTENDED DECK SURFACE AFTER GRINDING.
DECK SURFACE IMMEDIATELY AFTER MODULE ERECTION AND JOINT CASTING SHOULD THEORETICALLY EXCEED THE TABULATED VALUES BY 1/4" (0.02').



LOCATION OF TOP OF SLAB ELEVATIONS



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
TOP OF SLAB ELEVATIONS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 31 OF 57 FILE NO. 30846 DESIGN NO. 115

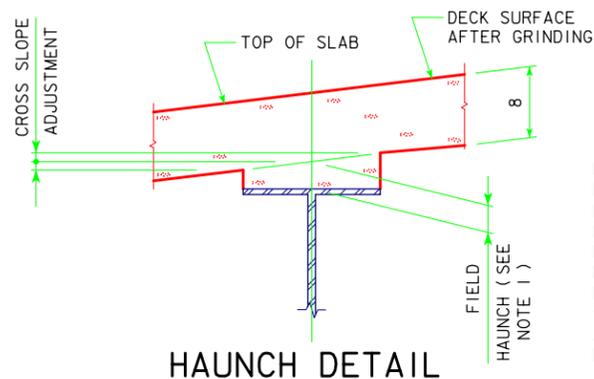
TABLE OF BEAM LINE HAUNCH ELEVATIONS

LOCATION		CL WEST ABUT. BRG.										CL PIER NO. 1 BEAM BRGS.										CL PIER NO. 2 BEAM BRGS.										CL EAST ABUT. BRG.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
MODULE 'A'	N. BEAM	1107.78	1107.47	1107.16	1106.84	1106.53	1106.21	1105.90	1105.58	1105.26	1104.94	1104.62	1104.37	1104.18	1103.98	1103.78	1103.59	1103.39	1103.19	1102.99	1102.79	1102.58	1102.55	1102.44	1102.33	1102.23	1102.14	1102.05	1101.97			
	S. BEAM	1107.80	1107.50	1107.18	1106.87	1106.56	1106.25	1105.93	1105.62	1105.30	1104.98	1104.66	1104.41	1104.22	1104.03	1103.84	1103.64	1103.44	1103.25	1103.05	1102.85	1102.65	1102.62	1102.51	1102.40	1102.30	1102.21	1102.12	1102.04			
MODULE 'B'	N. BEAM	1107.82	1107.51	1107.20	1106.89	1106.58	1106.27	1105.96	1105.64	1105.33	1105.01	1104.70	1104.45	1104.26	1104.07	1103.87	1103.68	1103.49	1103.29	1103.09	1102.90	1102.70	1102.67	1102.56	1102.45	1102.35	1102.26	1102.18	1102.10			
	S. BEAM	1107.84	1107.54	1107.23	1106.92	1106.61	1106.30	1105.99	1105.68	1105.37	1105.06	1104.74	1104.48	1104.31	1104.12	1103.93	1103.74	1103.54	1103.35	1103.15	1102.96	1102.76	1102.73	1102.62	1102.52	1102.43	1102.34	1102.25	1102.18			
MODULE 'C'	N. BEAM	1107.86	1107.56	1107.25	1106.95	1106.64	1106.33	1106.02	1105.71	1105.40	1105.09	1104.77	1104.53	1104.34	1104.16	1103.97	1103.78	1103.59	1103.39	1103.20	1103.01	1102.81	1102.78	1102.67	1102.57	1102.48	1102.39	1102.31	1102.24			
	S. BEAM	1107.88	1107.58	1107.27	1106.97	1106.66	1106.36	1106.05	1105.74	1105.43	1105.12	1104.81	1104.57	1104.39	1104.20	1104.01	1103.83	1103.64	1103.45	1103.26	1103.06	1102.87	1102.84	1102.74	1102.64	1102.55	1102.46	1102.38	1102.31			
MODULE 'D'	N. BEAM	1107.83	1107.53	1107.23	1106.93	1106.62	1106.32	1106.01	1105.70	1105.40	1105.09	1104.78	1104.54	1104.36	1104.17	1103.99	1103.80	1103.61	1103.43	1103.24	1103.05	1102.85	1102.83	1102.72	1102.62	1102.53	1102.45	1102.37	1102.30			
	S. BEAM	1107.68	1107.38	1107.08	1106.78	1106.48	1106.18	1105.87	1105.57	1105.26	1104.96	1104.65	1104.41	1104.23	1104.05	1103.87	1103.68	1103.50	1103.31	1103.12	1102.94	1102.75	1102.72	1102.62	1102.52	1102.43	1102.35	1102.27	1102.21			
MODULE 'E'	N. BEAM	1107.57	1107.27	1106.97	1106.67	1106.37	1106.07	1105.77	1105.46	1105.16	1104.86	1104.55	1104.32	1104.14	1103.96	1103.77	1103.59	1103.41	1103.22	1103.04	1102.85	1102.66	1102.63	1102.53	1102.44	1102.35	1102.27	1102.20	1102.13			
	S. BEAM	1107.41	1107.11	1106.82	1106.52	1106.22	1105.92	1105.62	1105.32	1105.02	1104.72	1104.42	1104.36	1104.19	1104.01	1103.83	1103.65	1103.47	1103.29	1103.10	1102.92	1102.74	1102.55	1102.52	1102.42	1102.33	1102.25	1102.17	1102.10	1102.03		
MODULE 'F'	N. BEAM	1107.29	1107.00	1106.71	1106.41	1106.12	1105.82	1105.52	1105.22	1104.92	1104.62	1104.32	1104.26	1104.09	1103.91	1103.73	1103.56	1103.38	1103.20	1103.02	1102.83	1102.65	1102.47	1102.44	1102.34	1102.25	1102.17	1102.09	1102.02	1101.96		
	S. BEAM	1107.14	1106.85	1106.56	1106.26	1105.97	1105.67	1105.38	1105.08	1104.78	1104.48	1104.18	1104.13	1103.96	1103.78	1103.61	1103.43	1103.25	1103.08	1102.90	1102.72	1102.54	1102.35	1102.33	1102.23	1102.14	1102.06	1101.99	1101.92	1101.86		

MISCELLANEOUS DATA TABLE

BEAM LINE		CL WEST ABUT. BRG.										CL PIER NO. 1 BEAM BRGS.										CL PIER NO. 2 BEAM BRGS.										CL EAST ABUT. BRG.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL	0	1/16	1/16	1/16	1/16	1/8	1/16	1/16	1/16	1/16	0	0	1/16	1/16	1/16	1/8	1/16	1/16	1/16	1/16	0	0	1/8	3/16	3/16	3/16	1/8	0			
CROSS SLOPE ADJUSTMENTS (IN.)	ALL EXCEPT AS NOTED	± 1/8" (0.010)																														
	MOD-C NORTH MOD-D SOUTH	± 1/16" (0.005)																														
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX. ALL	3 1/2" (0.292)																														
	MIN. ALL	1/2" (0.042)																														

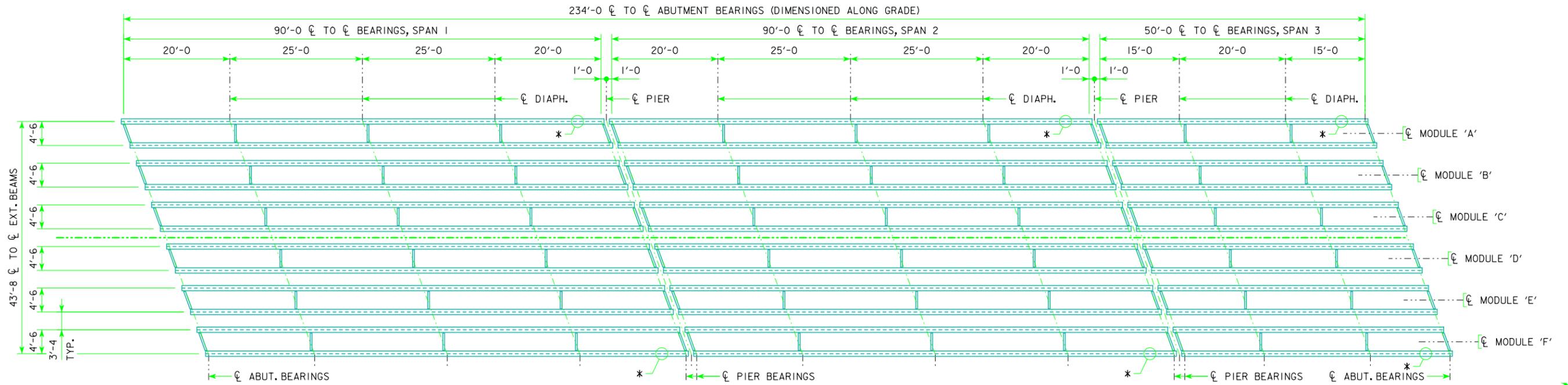
NOTE:
HAUNCH LOCATIONS ARE AT THE SAME LOCATION AS TOP OF SLAB ELEVATIONS AS SHOWN ON DESIGN SHEET 31.



NOTE:
BRIDGE SEAT ELEVATIONS ARE SET BASED ON THEORETICAL CAMBER AND BEAM DEFLECTIONS. THESE BRIDGE SEATS WILL PROVIDE A THEORETICAL BEAM HAUNCH WITHIN DESIGN PARAMETERS. FIELD HAUNCHES ARE DETERMINED USING SURVEYED TOP OF BEAM ELEVATIONS AND "BEAM LINE HAUNCH ELEVATION" DATA. ALLOWABLE MAXIMUM AND MINIMUM "FIELD HAUNCH" VALUES ARE GIVEN IN INCHES AND DECIMALS OF FEET IN THE "MISCELLANEOUS DATA" TABLE. "CROSS SLOPE ADJUSTMENT" VALUES WILL AID THE CONTRACTOR IN DETERMINING ACTUAL FORMED HAUNCH DIMENSIONS AT THE EDGES OF THE TOP FLANGE.

NOTE 1:
TO CALCULATE FIELD HAUNCH REQUIRED AT EACH LOCATION, SURVEY THE BEAM TOPS CONSISTENT WITH THE SPACINGS SHOWN ON THE "TOP OF SLAB ELEVATIONS LAYOUT". SUBTRACT THE SURVEYED BEAM SHOT FROM THE "BEAM LINE HAUNCH ELEVATION". THIS VALUE WILL BE THE HAUNCH NEEDED (SEE "FIELD HAUNCH" IN HAUNCH DETAIL). THE "BEAM LINE HAUNCH ELEVATION" INCLUDES ADJUSTMENTS FOR SLAB THICKNESSES AND ANTICIPATED DEFLECTIONS. NO ADDITIONAL CALCULATIONS ARE REQUIRED. IF THE FIELD HAUNCH EXCEEDS THE MAXIMUMS AND MINIMUMS SHOWN IN THE MISCELLANEOUS DATA TABLE, ADJUSTMENTS TO THE GRADE OR ADDITIONAL HAUNCH REINFORCEMENT WILL BE REQUIRED.

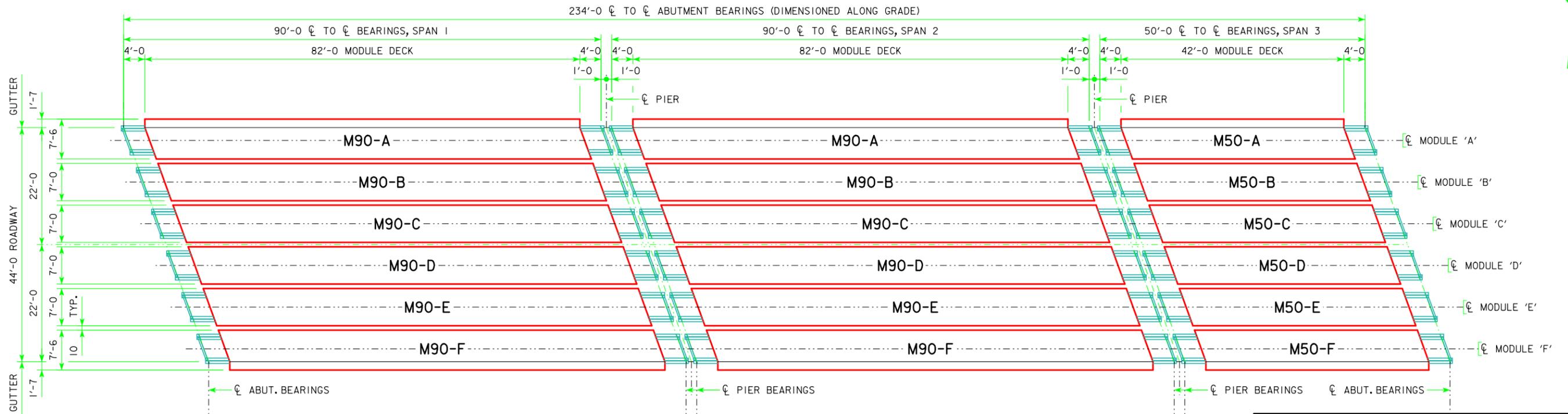
DESIGN FOR 20° SKEW (R.A.)
234'-0 x 44'-0 MODULAR ROLLED STEEL BEAM BRIDGE
 91'-0 & 51'-0 END SPANS 92'-0 INTERIOR SPAN
HAUNCH ELEVATIONS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 32 OF 57 FILE NO. 30846 DESIGN NO. 115



FRAMING PLAN

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

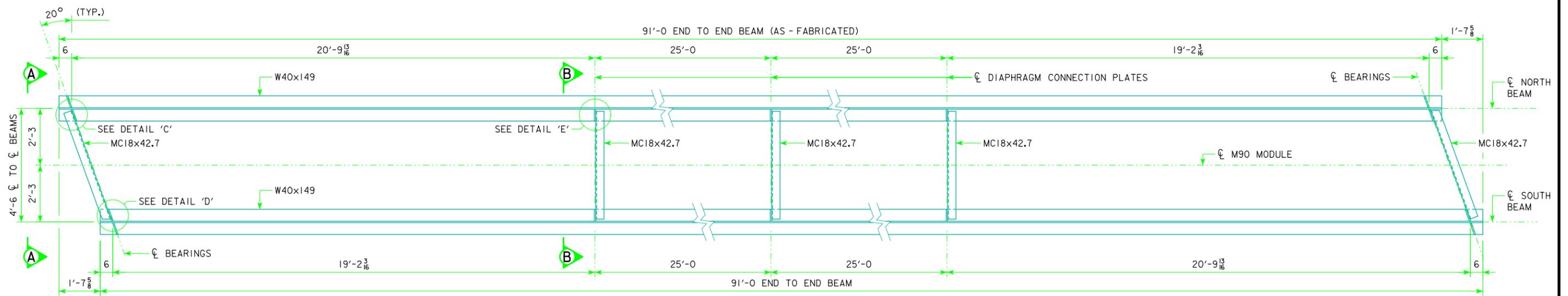
* APPROXIMATE LOCATION OF FLANGE DEFLECTORS. SEE DESIGN SHEET 37 FOR ADDITIONAL DETAILS.



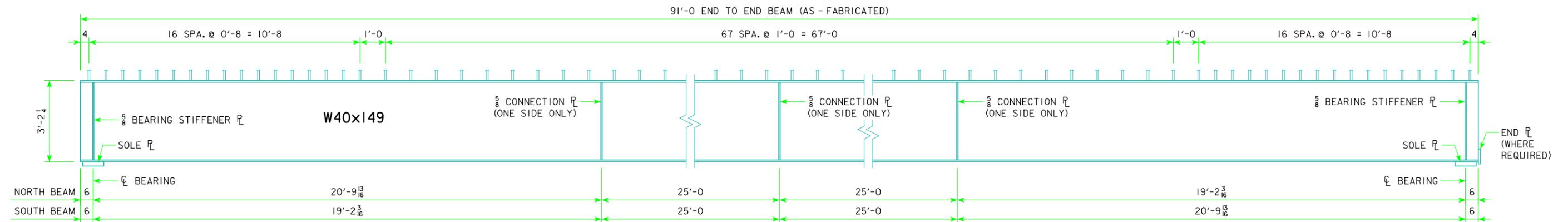
MODULE PLAN

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.

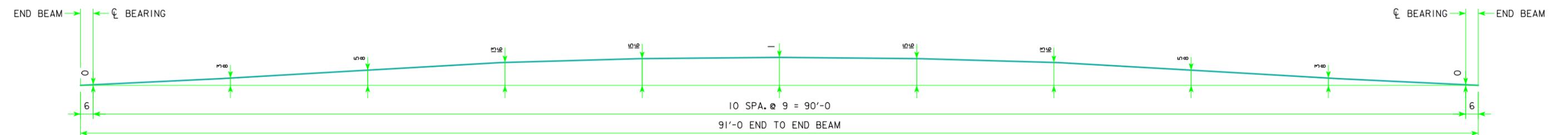
DESIGN FOR 20° SKEW (R.A.)
234'-0" x 44'-0" MODULAR ROLLED STEEL BEAM BRIDGE
 91'-0" & 51'-0" END SPANS 92'-0" INTERIOR SPAN
FRAMING PLAN & MODULE PLAN
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 34 OF 57 FILE NO. 30846 DESIGN NO. 115



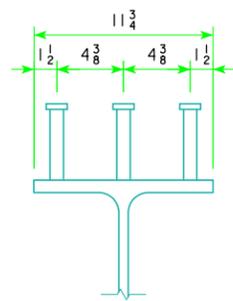
FRAMING PLAN - M90 MODULE (TYP.)
 (W40x149 TOP FLANGE NOT SHOWN FOR CLARITY, SOLE PLATE AND END PLATE NOT SHOWN)



M90 BEAM DETAIL - W40x149
 (DRILLED HOLES AT BEAM ENDS FOR DIAPHRAGM REINFORCING NOT SHOWN)



M90 CAMBER DIAGRAM - W40x149
 (BEAM AS FABRICATED HORIZONTALLY)



NOTE: ALL STUDS TO BE 6" x 7/8" Φ

SHEAR STUD DETAIL (TYP.)

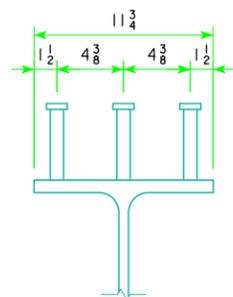
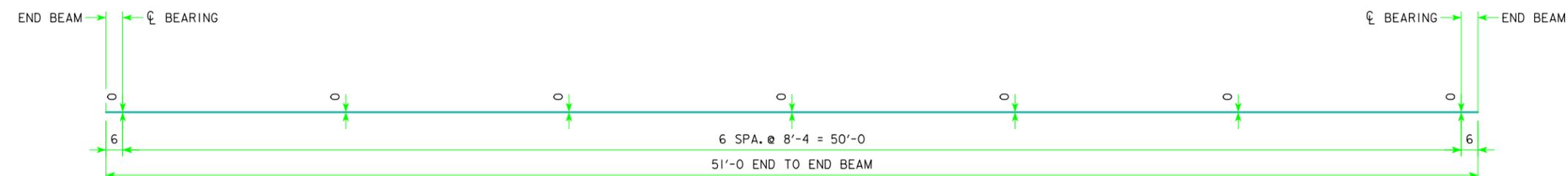
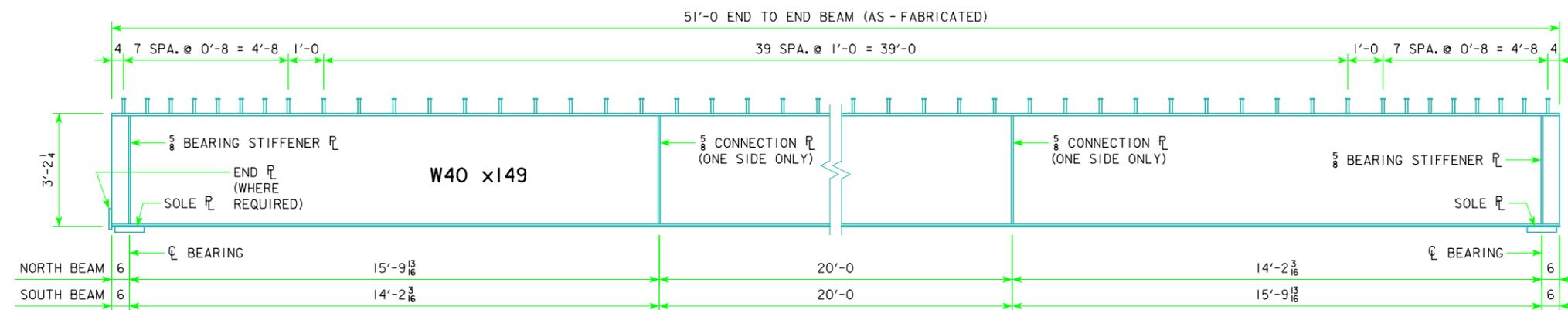
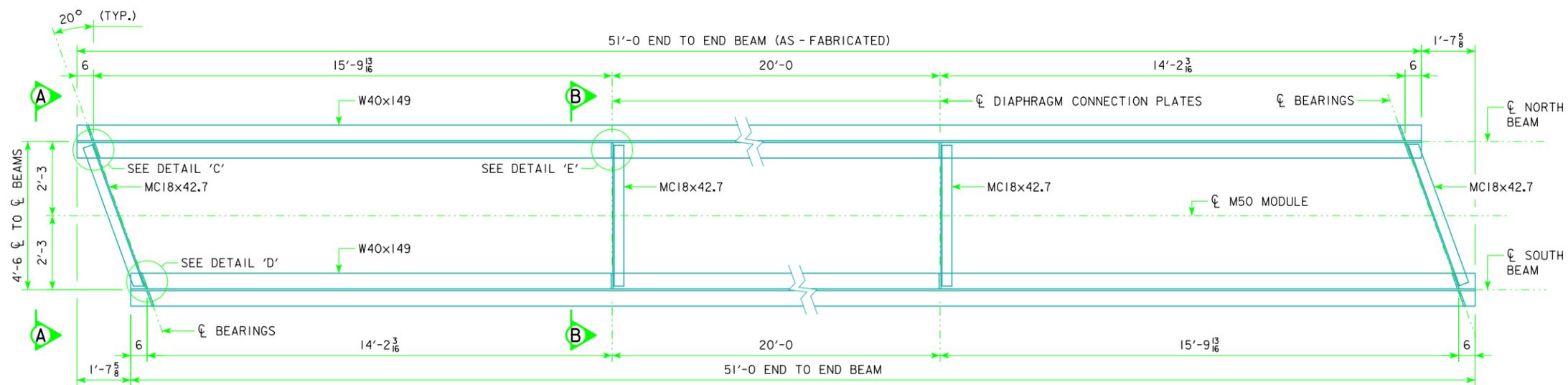
DEAD LOAD DEFLECTION @ CL SPAN	
COMPONENT	EST. DEFLECTION (IN.)
STEEL FRAMING	7/8
MODULAR DECK CONCRETE	17/8
CAST-IN-PLACE DECK JOINTS	1/16
CAST-IN-PLACE BARRIER RAIL	1/8

STRUCT. STEEL - (1) M90 MODULE	
LOCATION	QTY. (LB)
BEAMS	27,118
DIAPHRAGMS	919
STIFFENERS & CONNECTION PLATES	564
FASTENERS, WELDS & STUDS (SOLE PLATE & END PLATE INCLUDED ELSEWHERE)	792
TOTAL (LB)	29,393

REFER TO DESIGN SHEET 36 FOR WEATHERING STEEL NOTES

REFER TO DESIGN SHEET 37 FOR SECTIONS A-A & B-B, AND DETAILS C, D & E

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 (M90)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 35 OF 57 FILE NO. 30846 DESIGN NO. 115



NOTE: ALL STUDS TO BE 6" x 7/8" φ

DEAD LOAD DEFLECTION @ CL SPAN	
COMPONENT	EST. DEFLECTION (IN.)
STEEL FRAMING	1/16
MODULAR DECK CONCRETE	3/16
CAST-IN-PLACE DECK JOINTS	0
CAST-IN-PLACE BARRIER RAIL	0

STRUCT. STEEL - (1) M50 MODULE	
LOCATION	QTY. (LB)
BEAMS	15,198
DIAPHRAGMS	740
STIFFENERS & CONNECTION PLATES	492
FASTENERS, WELDS & STUDS	461
(SOLE PLATE & END PLATE INCLUDED ELSEWHERE)	
TOTAL (LB)	16,891

WEATHERING STEEL NOTES:
 ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709 GRADE 50W. THE MINIMUM YIELD POINT FOR GRADE 50W IS 50 ksi FOR PLATES 4" AND UNDER, AND ALL STRUCTURAL SHAPES. THE GRADE 50W STEEL IS A WEATHERING STEEL AND IS TO REMAIN UNPAINTED, EXCEPT AS NOTED. CVN TESTING IS REQUIRED FOR MAIN BEAMS.

ALL STRUCTURAL STEEL PIECES COMPRISING THE ABUTMENT SOLE PLATES AND END PLATES SHALL COMPLY WITH THE REQUIREMENTS AS STATED IN THE NOTES IN THIS SECTION. REFER TO DESIGN SHEET 38 FOR LOCATION AND DETAILS OF SOLE PLATES AND END PLATES.

FLANGE DEFLECTORS ARE TO BE ASTM A709 GRADE 50W OR 36.

SHEAR STUDS ARE TO BE AN APPROVED TYPE LISTED IN MATERIALS I.M. 453.10, APPENDIX A.

THE PAINTED FINISH ON BEAM SOLE PLATES, END PLATES, FLANGE DEFLECTORS AND WEATHERING STEEL SHALL BE IN ACCORDANCE WITH THE PLAN NOTES AND ARTICLE 2408.02, Q, OF THE STANDARD SPECIFICATIONS. ALL WEATHERING STEEL EMBEDDED INTO AN INTEGRAL ABUTMENT OR CONCRETE PIER DIAPHRAGM SHALL BE PAINTED TO A DISTANCE OF 1'-0" FROM THE CONCRETE FACE AND SEALED BY CAULKING AT THE CONCRETE AND STEEL INTERFACE.

THE STEEL FOR THE EXTERIOR BEAMS OF THE BRIDGE SHALL BE OF THE SAME TYPE AND FROM THE SAME SOURCE.

BOLTS FOR USE WITH WEATHERING STEEL SHALL BE A325 TYPE III WITH A563 GRADE DH3 NUTS AND F436 TYPE III WASHERS.

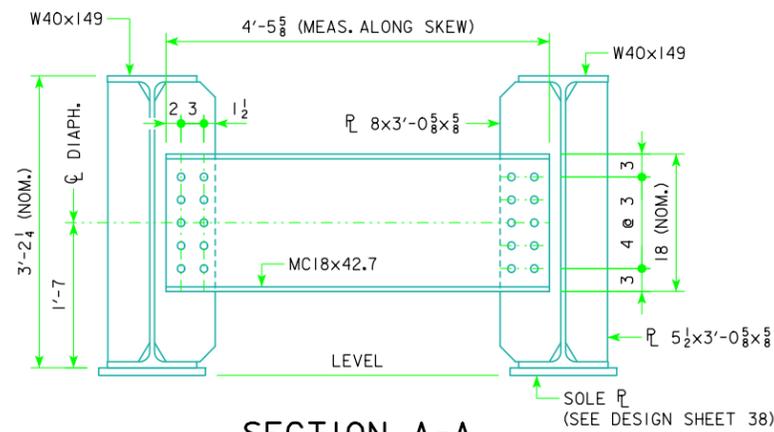
THE STEEL SHALL BE KEPT FREE OF OIL, GREASE, DIRT, CRAYON OR CHALK MARKS, CONCRETE SPATTER AND ANY OTHER FOREIGN MATTER THAT MAY AFFECT THE NATURAL OXIDATION OF THE STEEL. ANY FOREIGN MATTER REMAINING ON THE STEEL AFTER COMPLETION OF BRIDGE CONSTRUCTION SHALL BE REMOVED BY THE BRIDGE CONTRACTOR AS DIRECTED BY THE ENGINEER. THE RESULTANT SURFACE SHALL BE FREE OF ALL VISIBLE RESIDUES. ALL COSTS ASSOCIATED WITH CLEANING STEEL SURFACES SHALL BE BORNE BY THE BRIDGE CONTRACTOR.

SEAL MATERIAL FOR CAULKING SHALL BE NEUTRAL CURE AND NON SAG SILICONE. TWO PRODUCTS MEETING THESE CRITERIA ARE DOW 888, CSL342 JOINT SEALANT AND CRAFCO ROAD SAVER SILICONE.

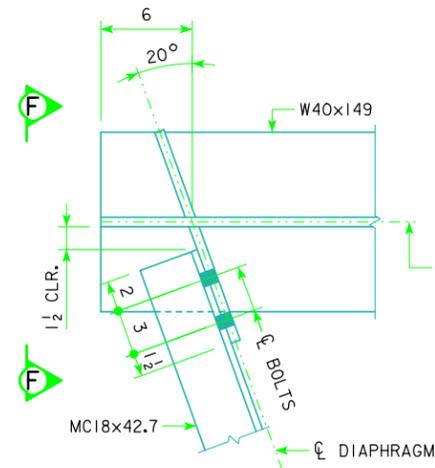
ALL FIELD CONNECTIONS ARE TO BE BOLTED USING "HIGH TENSILE STRENGTH BOLTS". UNLESS NOTED OTHERWISE, ALL OPEN HOLES ARE TO BE 1/8" φ AND ALL BOLTS ARE TO BE 7/8" φ.

REFER TO DESIGN SHEET 37 FOR SECTIONS A-A & B-B, AND DETAILS C, D & E

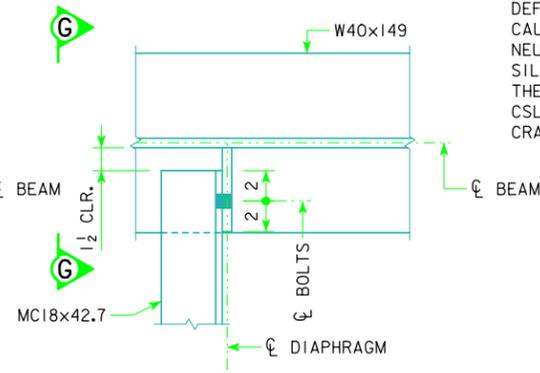
DESIGN FOR 20° SKEW (R.A.)
234'-0" x 44'-0" MODULAR ROLLED STEEL BEAM BRIDGE
 91'-0" & 51'-0" END SPANS 92'-0" INTERIOR SPAN
FRAMING PLAN (M50)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 36 OF 57 FILE NO. 30846 DESIGN NO. 115



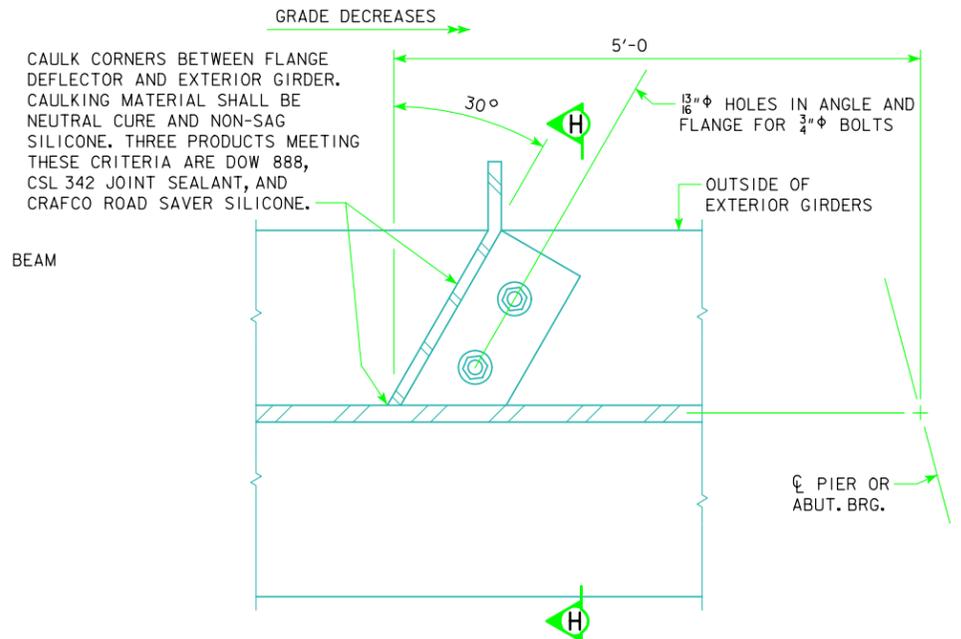
SECTION A-A
(TYP. AT ABUT. AND PIER DIAPHRAGMS)



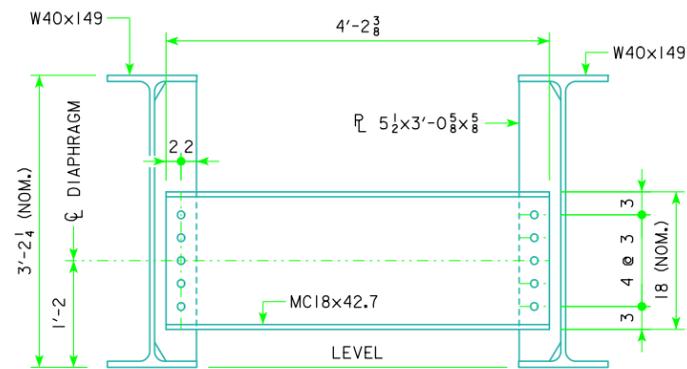
DETAIL 'C'
(TYP. AT ABUT. AND PIER DIAPHRAGMS)



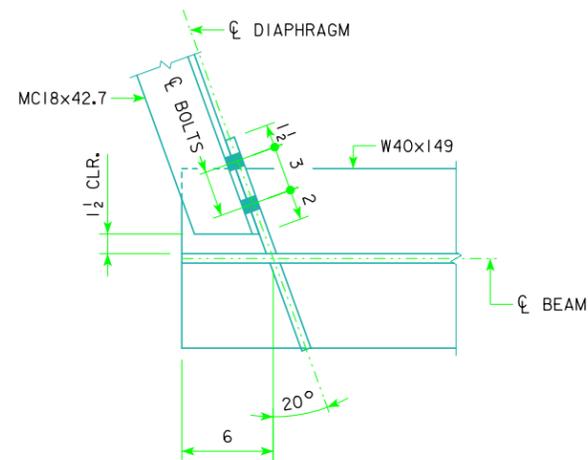
DETAIL 'E'
(TYP. AT INTERMEDIATE DIAPHRAGMS)



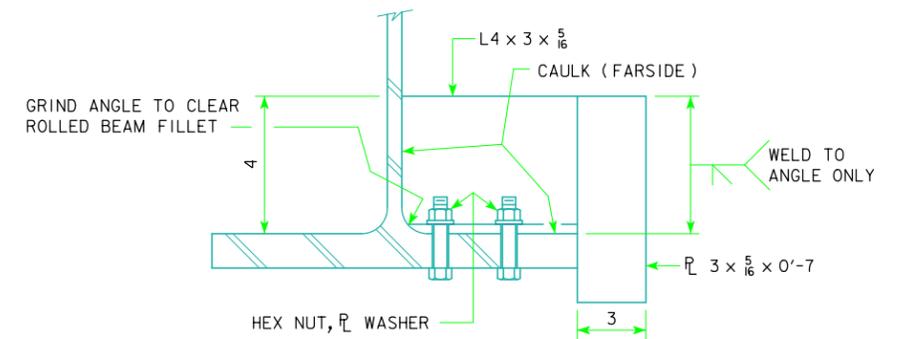
FLANGE DEFLECTOR DETAILS
(6 REQUIRED PER BRIDGE)



SECTION B-B
(TYP. AT INTERMEDIATE DIAPHRAGMS)

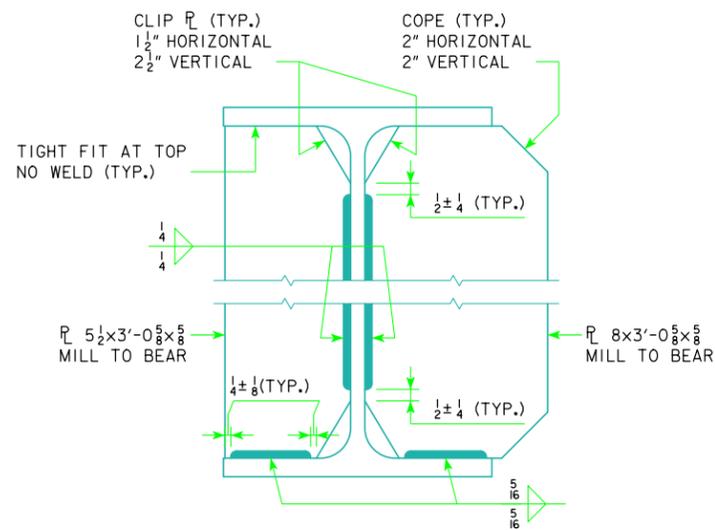


DETAIL 'D'
(TYP. AT ABUT. AND PIER DIAPHRAGM)

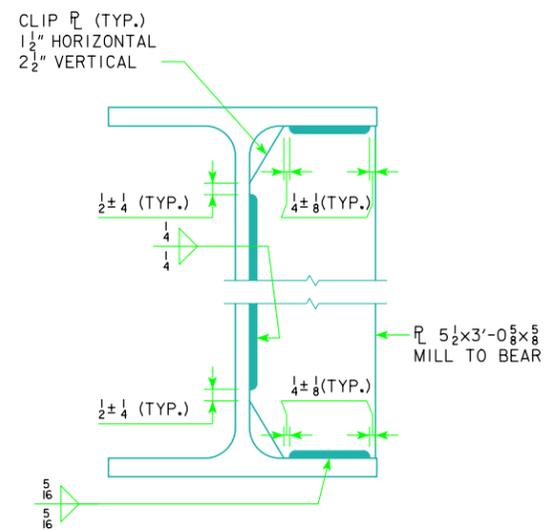


SECTION H-H

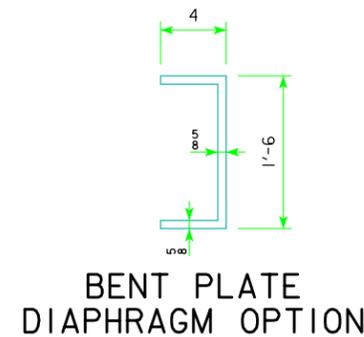
FLANGE DEFLECTORS ARE REQUIRED ON THE OUTSIDE OF THE EXTERIOR GIRDERS AT THE EAST ABUTMENTS AND THE WEST SIDE OF ALL PIERS. SEE DESIGN SHEET 34 FOR LOCATIONS.



SECTION F-F
(AT BEARING STIFFENER)



SECTION G-G
(AT INTERMEDIATE DIAPHRAGM)



BENT PLATE DIAPHRAGM OPTION

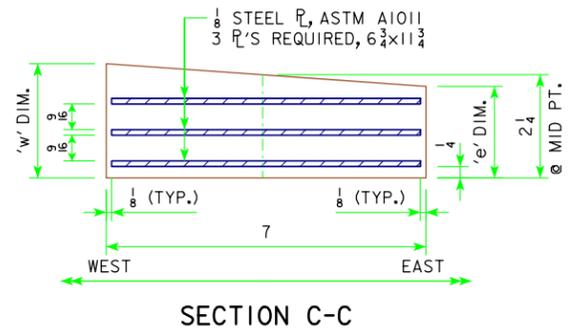
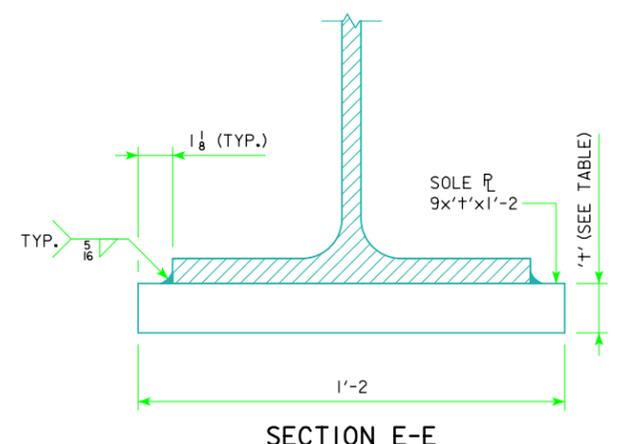
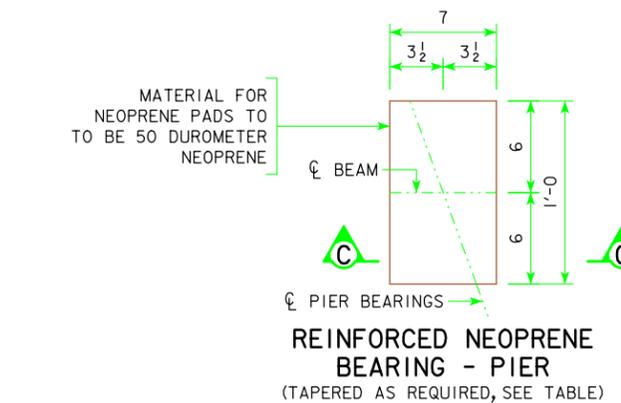
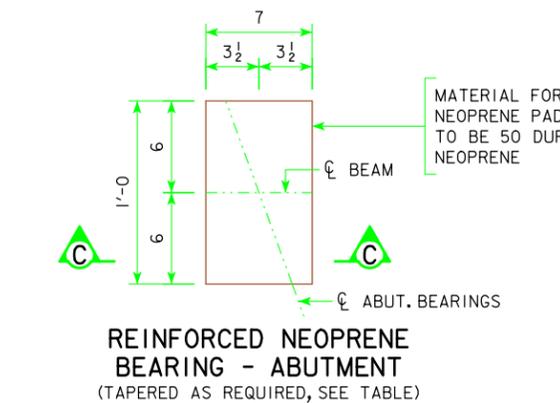
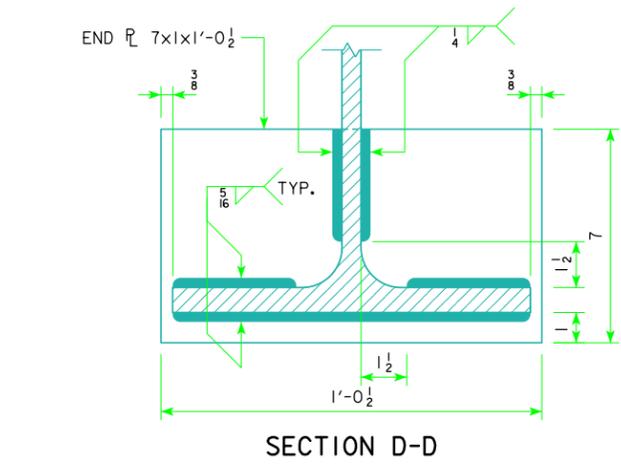
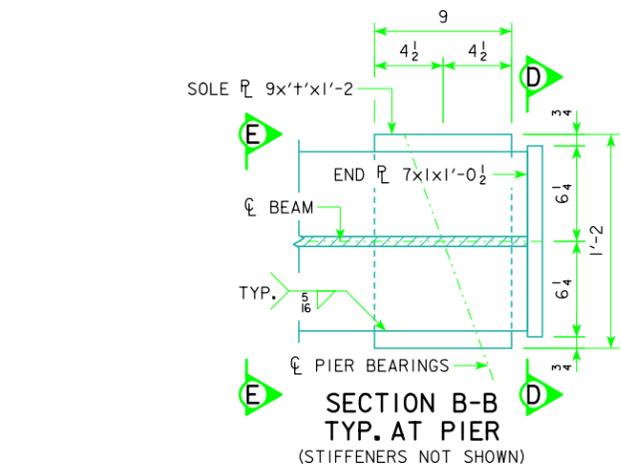
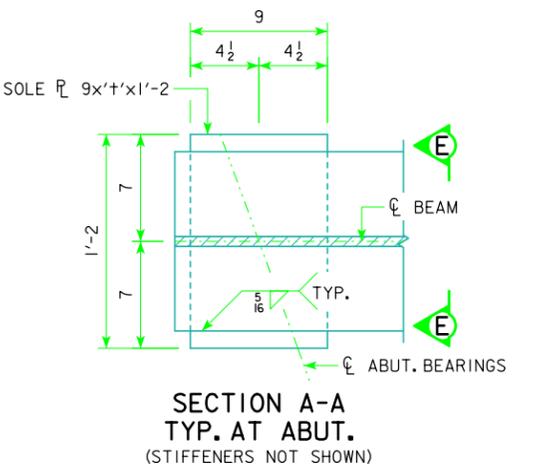
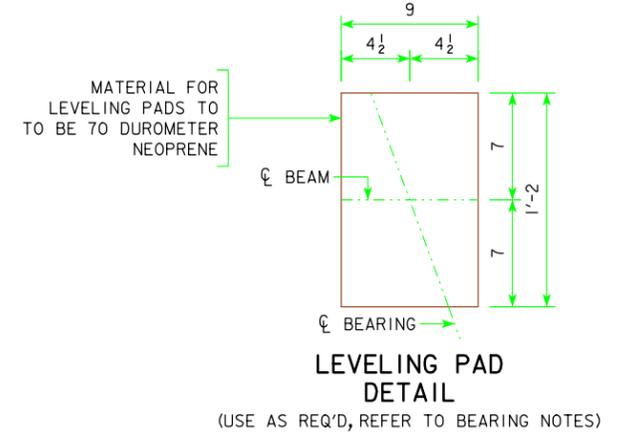
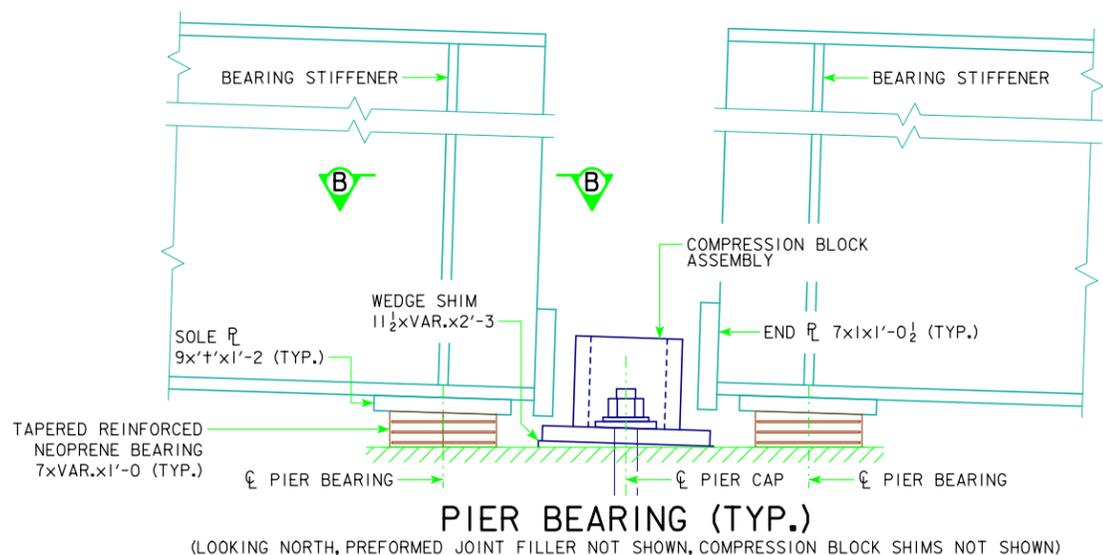
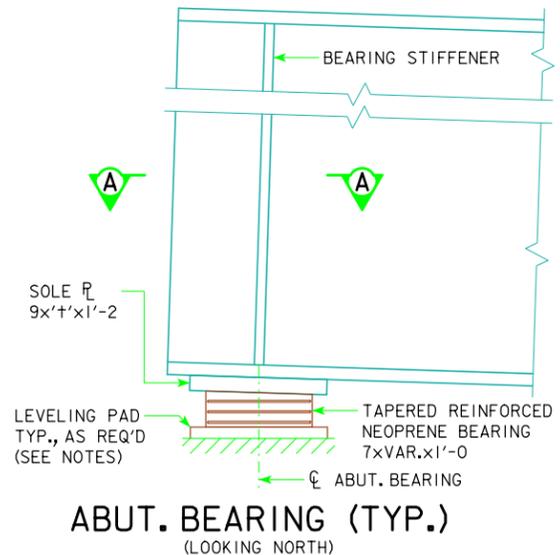
MC18x42.7 CHANNEL MAY BE SUBSTITUTED FOR BENT PLATE AS DETAILED, AT CONTRACTOR'S OPTION. BENT PLATE SUBSTITUTION IS PERMISSIBLE FOR ABUTMENTS, PIERS AND INTERMEDIATE DIAPHRAGMS. NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR BENT PLATE SUBSTITUTION.

NOTE:
THIS SHEET IS PRIMARILY FOR THE USE OF FABRICATOR'S WORKMEN AND IOWA DEPARTMENT OF TRANSPORTATION INSPECTORS IN INTERPRETING PLAN DETAILS. IT COVERS THE LOCATIONS OF WELD TERMINI THAT ARE NOT SPECIFIED BY TYPICAL WELD SYMBOLS.

REFER TO DESIGN SHEETS 36 & 37 FOR SECTION LOCATIONS.

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 DETAILS
STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 37 OF 57 FILE NO. 30846 DESIGN NO. 115

LOCATION	BEARING TAPER DIMENSIONS		
	SOLE PLATE 't' DIM.	BEARING EDGE THICKNESS 'w' DIM.	'e' DIM.
WEST ABUTMENT	1	2 3/8	2 1/8
PIER 1 WEST	1 5/8	2 3/8	2 1/8
PIER 1 EAST	1	2 5/16	2 3/16
PIER 2 WEST	1 3/8	2 5/16	2 3/16
PIER 2 EAST	1	2 1/4	2 1/4
EAST ABUTMENT	1	2 1/4	2 1/4



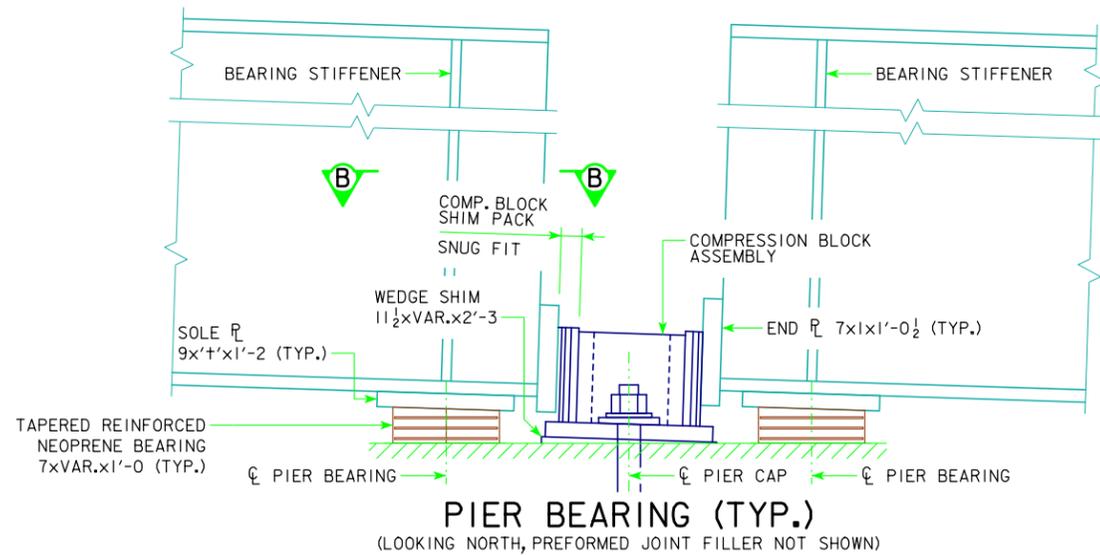
BEARING NOTES:
 BEAMS SHALL BE SET ON REINFORCED NEOPRENE BEARINGS. REINFORCED NEOPRENE BEARINGS SHALL BE TAPERED AS DETAILED TO ACCOMMODATE BEAM SLOPE. THE COST OF BEARINGS SHALL BE INCIDENTAL TO THE INDIVIDUAL PRICE BIDS FOR "SUPERSTRUCTURE MODULE".

SOLE PLATES AND END PLATES SHALL BE INCIDENTAL TO THE INDIVIDUAL PRICE BIDS FOR "SUPERSTRUCTURE MODULE." MATERIALS FOR SOLE PLATES AND END PLATES SHALL CONSIST OF ASTM A709 GR. 50W WEATHERING STEEL. SOLE PLATES AND END PLATES SHALL BE PAINTED WITH THE BEAM ENDS IN ACCORDANCE WITH ARTICLE 2408.02,Q OF THE STANDARD SPECIFICATIONS. REFER TO DESIGN SHEET 36 FOR ADDITIONAL WEATHERING STEEL NOTES.

TO AID CONSTRUCTABILITY, THE CONTRACTOR SHALL BE PERMITTED TO USE NEOPRENE LEVELING PADS, BETWEEN THE CONCRETE BRIDGE SEAT AND THE REINFORCED NEOPRENE BEARINGS AT ABUTMENTS AND/OR PIERS, AS REQUIRED TO ADJUST THE PREFABRICATED SUPERSTRUCTURE MODULE(S) TO THE INTENDED DECK ELEVATION.

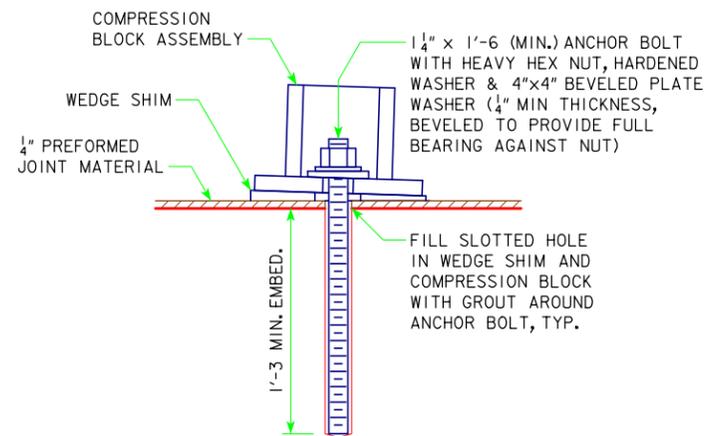
MATERIAL FOR NEOPRENE LEVELING PADS IS TO BE 70 DUROMETER NEOPRENE. LEVELING PADS SHALL BE 9" X 1'-2" IN PLAN DIMENSIONS AND SHALL BE CENTERED BELOW THE REINFORCED NEOPRENE BEARINGS. NO MORE THAN TWO LEVELING PADS MAY BE PLACED BELOW ANY SINGLE BEARING, AND TOTAL THICKNESS OF LEVELING PADS SHALL NOT EXCEED 3/4". THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE QUANTITY AND THICKNESS OF LEVELING PADS TO BE PROVIDED FOR THE PROJECT. ALL COSTS ASSOCIATED WITH THE NEOPRENE LEVELING PADS SHALL BE INCIDENTAL TO THE INDIVIDUAL PRICE BIDS FOR "SUPERSTRUCTURE MODULE".

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
BEARING DETAILS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 38 OF 57 FILE NO. 30846 DESIGN NO. 115

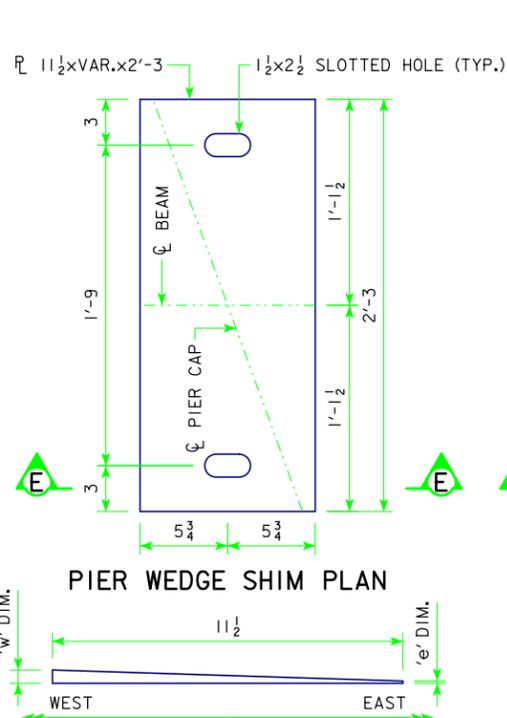


PIER BEARING (TYP.)

(LOOKING NORTH, PREFORMED JOINT FILLER NOT SHOWN)

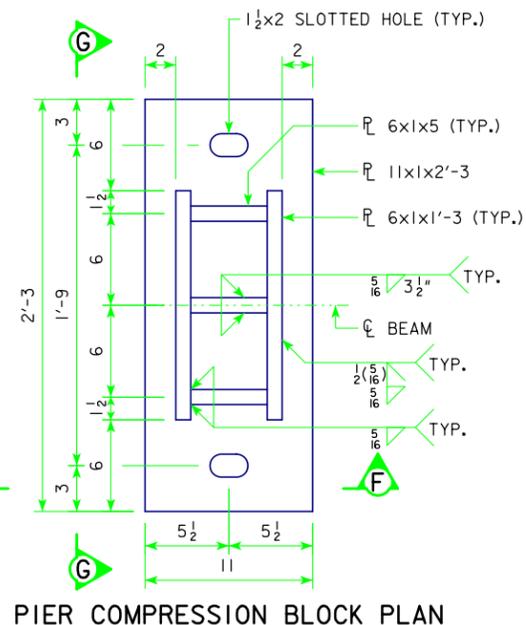


ANCHOR BOLT DETAIL

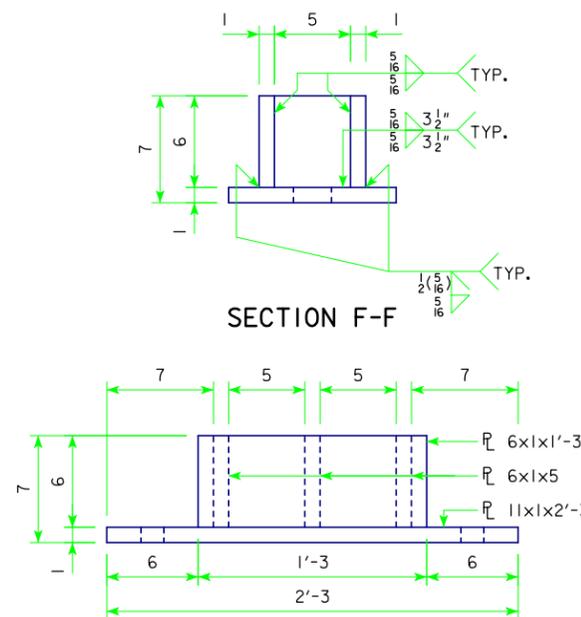


PIER WEDGE SHIM PLAN

SECTION E-E



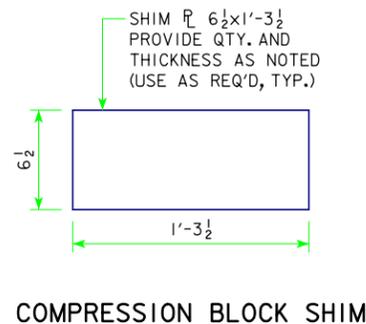
PIER COMPRESSION BLOCK PLAN



SECTION F-F

SECTION G-G

WEDGE SHIM DIMENSIONS		
LOCATION	TAPER DIMENSIONS	
	'w' DIM.	'e' DIM.
PIER 1	1/2	1/8
PIER 2	3/8	1/8



COMPRESSION BLOCK SHIM

COMPRESSION BLOCK SHIM PACK TABLE	
(MIN. REQ'D PER BLOCK)	
THICKNESS	QTY.
1/2"	3
3/8"	3
1/4"	3
1/8"	3
1/16"	3

COMPRESSION BLOCK NOTES:

THIS DESIGN INCORPORATES THE USE OF COMPRESSION BLOCK ASSEMBLIES TO PERMIT TRANSFER OF COMPRESSIVE FORCES BETWEEN BEAM SPANS. COMPRESSION BLOCK ASSEMBLIES SHALL BE POSITIONED BETWEEN BEAM ENDS FOR EACH BEAM LINE AT PIERS 1 AND 2.

FOLLOWING PLACEMENT OF THE SUPERSTRUCTURE MODULES AND FINAL POSITIONING OF THE COMPRESSION BLOCK ASSEMBLY, THE COMPRESSION BLOCK ASSEMBLY SHALL BE SHIMMED BETWEEN THE BEAM ENDS FOR A SNUG FIT. SHIMS SHOULD BE PLACED WITH SUFFICIENT EFFORT SUCH THAT GAPS BETWEEN THE BEAM END PLATES, SHIM PACKS, AND COMPRESSION BLOCK ASSEMBLY ARE MINIMIZED TO THE EXTENT PRACTICABLE, WITHOUT DAMAGE TO THE BEAM ENDS AND/OR COMPRESSION BLOCK ASSEMBLY.

THE COMPRESSION BLOCK SHALL BE PROVIDED WITH A WEDGE SHIM, AS DETAILED, TO POSITION THE SIDES OF THE ASSEMBLY NEARLY PARALLEL TO THE BEAM END PLATES. THE COMPRESSION BLOCK ASSEMBLY SHALL BE PLACED ON 1/4" PREFORMED JOINT MATERIAL TO FACILITATE MINOR ROTATION DURING SHIMMING.

THE COMPRESSION BLOCK ASSEMBLY SHALL BE FABRICATED FROM ASTM A709 GR. 50 STEEL. WEDGE SHIMS AND COMPRESSION BLOCK SHIM PACKS SHALL CONSIST OF ASTM A709 GR. 36 OR GR. 50 STEEL. THE COMPRESSION BLOCK ASSEMBLY AND REQUIRED SHIMS SHALL REQUIRE PAINTING (PRIME COAT ONLY) IN ACCORDANCE WITH SECTION 2408.02,Q OF THE STANDARD SPECIFICATIONS.

AFTER COMPRESSION BLOCKS ARE SET, FILL SLOTTED HOLES AROUND ANCHOR BOLTS WITH A HYDRAULIC CEMENT OR POLYMER GROUT IN ACCORDANCE WITH ARTICLE 2405.03,H, OF THE STANDARD SPECIFICATIONS.

ANCHOR BOLT NOTES:

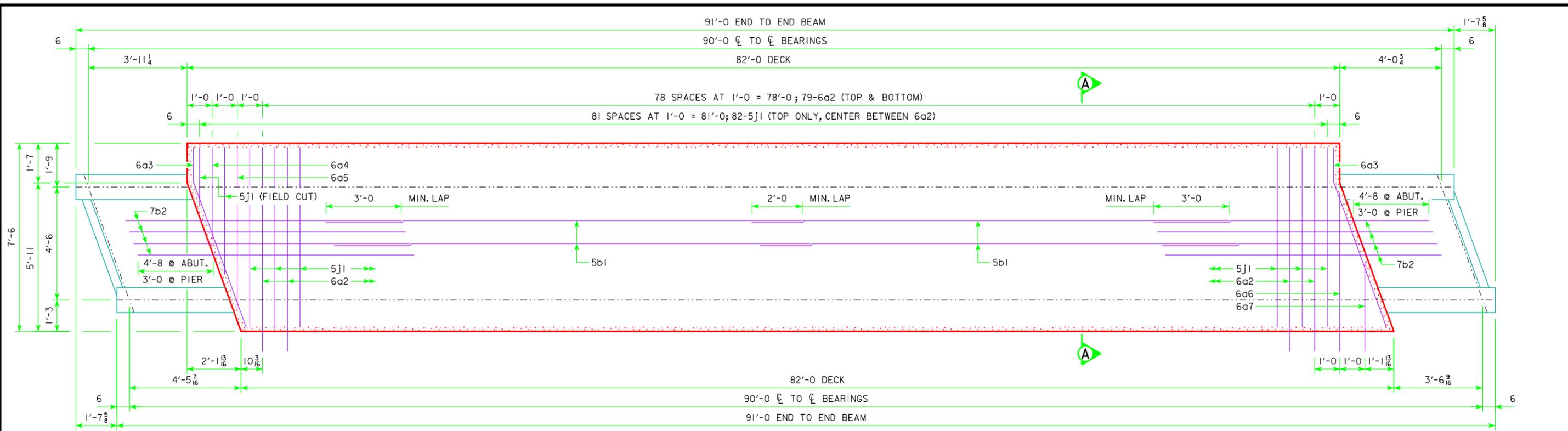
ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH SECTION 2405.03,H,1 OF THE STANDARD SPECIFICATIONS, EXCEPT BOLTS SHALL BE FULLY THREADED ASTM F1554, GRADE 55, AND THE ENDS OF THE ANCHOR BOLTS SHALL BE COLOR CODED YELLOW TO IDENTIFY GRADE. ANCHOR BOLTS SHALL BE OF AN APPROVED TYPE IN ACCORDANCE WITH MATERIALS I.M. 453.08.

ANCHOR BOLTS SHALL BE INSTALLED IN DRILLED HOLES. HOLES ARE TO BE 1'-3 DEEP. THE ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE FOLLOWING SYSTEMS MAY BE USED AS BONDING AGENTS FOR ANCHOR BOLTS:

- POLYMER GROUT SYSTEM. HOLE SIZE SHALL BE 1/8" LARGER THAN BOLT DIAMETER. HOLE PREPARATION AND CLEANOUT SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND SHALL INCLUDE, AT A MINIMUM, BLAST CLEANING WITH COMPRESSED AIR. POLYMER GROUT MATERIALS SHALL BE IN ACCORDANCE WITH MATERIALS I.M. 491.11, CLASSIFIED FOR USE AS A CHEMICAL ANCHOR PER APPENDIX D.
- HYDRAULIC CEMENT GROUT SYSTEM. HOLE SIZE SHALL BE 1/2" LARGER THAN BOLT DIAMETER. HOLE PREPARATION AND CLEANOUT SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND SHALL INCLUDE, AT A MINIMUM, BLAST CLEANING WITH COMPRESSED AIR. HYDRAULIC CEMENT GROUT MATERIALS SHALL BE IN ACCORDANCE WITH MATERIALS I.M.491.13.

ALL COSTS ASSOCIATED WITH ANCHOR BOLTS, INCLUDING ALL MATERIALS AND LABOR FOR FURNISHING AND INSTALLING ANCHOR BOLTS AND ANCHOR BOLT GROUT MATERIALS (INCLUDING GROUT TO BE USED TO FILL SLOTTED HOLES IN WEDGE SHIMS AND COMPRESSION BLOCKS) SHALL BE INCIDENTAL THE INDIVIDUAL PRICE BIDS FOR "BRIDGE PIER CAP."

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
COMPRESSION BLOCK DETAILS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 39 OF 57 FILE NO. 30846 DESIGN NO. 115

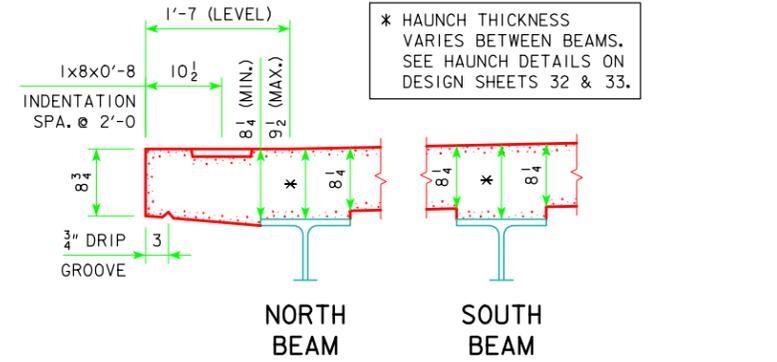


MODULE DECK PLAN (M90-A)

(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

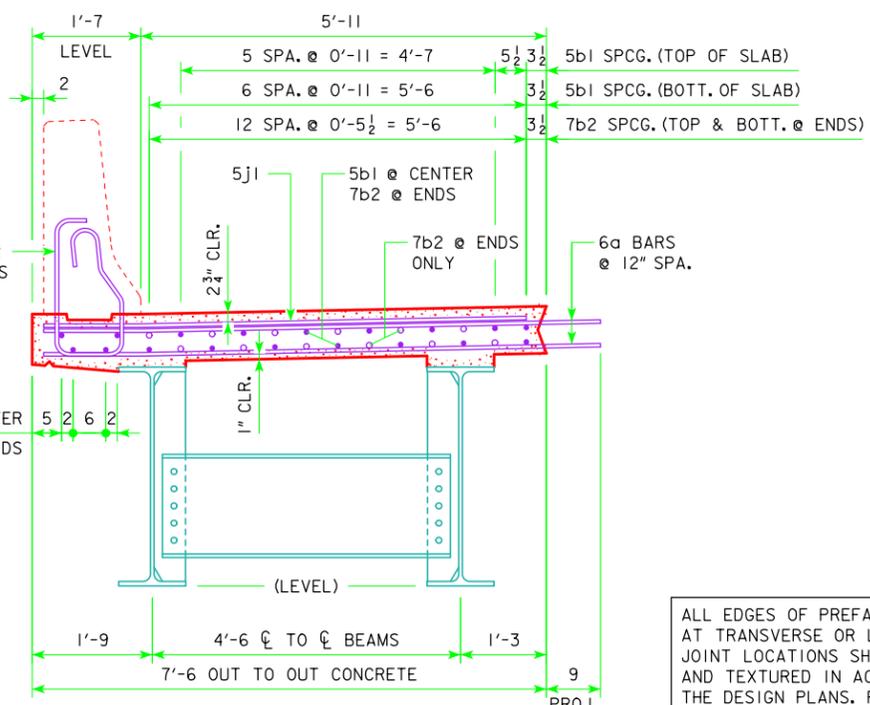
REINFORCING STEEL - ONE MODULE M90-A

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



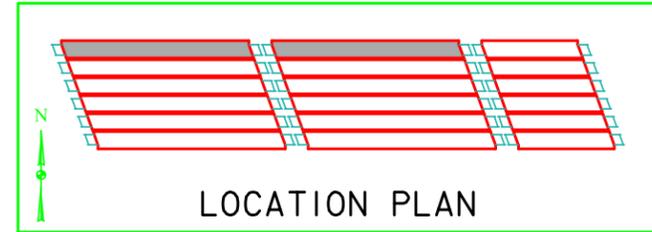
TYP. SLAB AND HAUNCH DETAIL

(SLAB THICKNESS SHOWN INCLUDES 1/4" SACRIFICIAL SURFACE FOR GRINDING.)

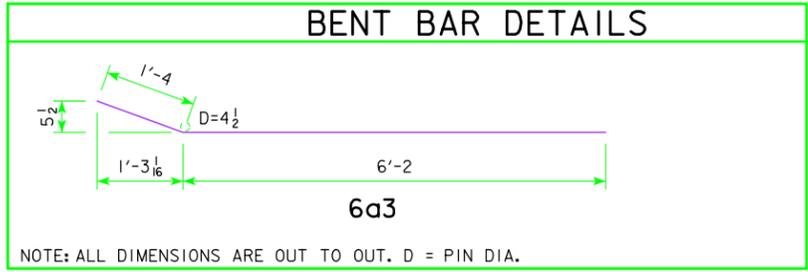


SECTION A-A

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEED 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.



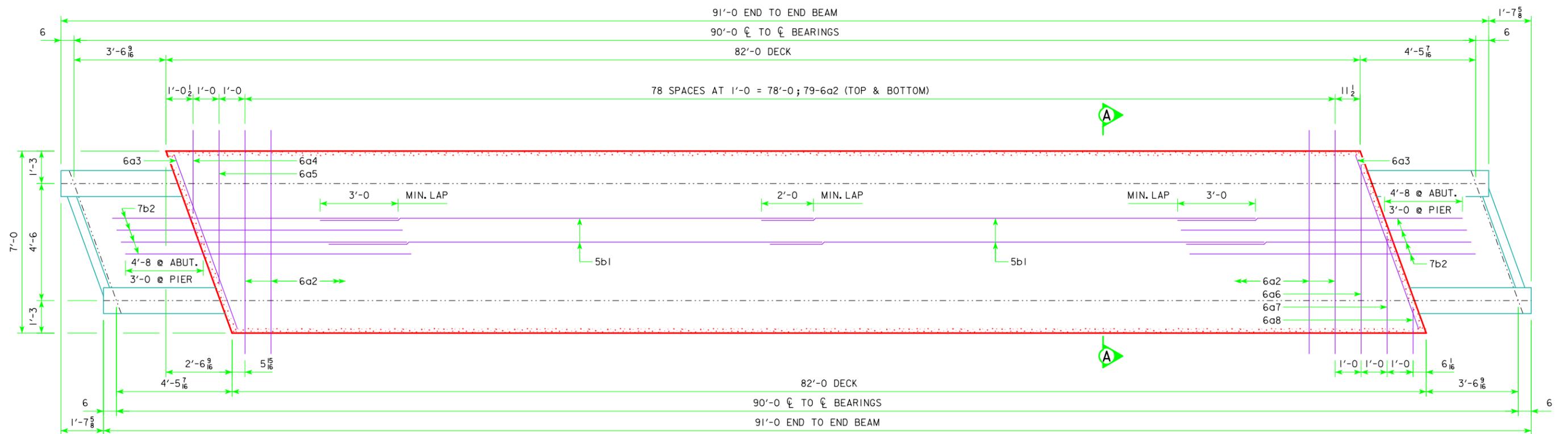
LOCATION PLAN



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIA.

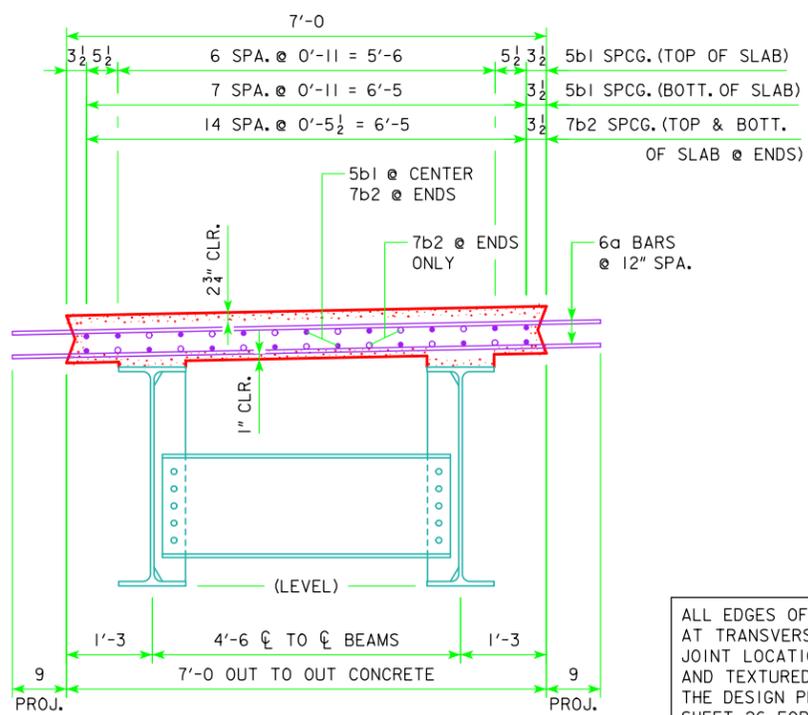
HIGH PERFORMANCE STRUCT. CONC.	
LOCATION	QTY.
MODULE DECK M90-A	16.6
TOTAL (CY)	16.6

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. 30846 DESIGN NO. 115



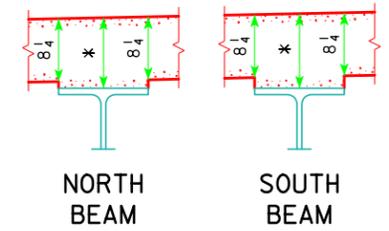
MODULE DECK PLAN (M90-B)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

* HAUNCH THICKNESS VARIES BETWEEN BEAMS. SEE HAUNCH DETAILS ON DESIGN SHEETS 32 & 33.

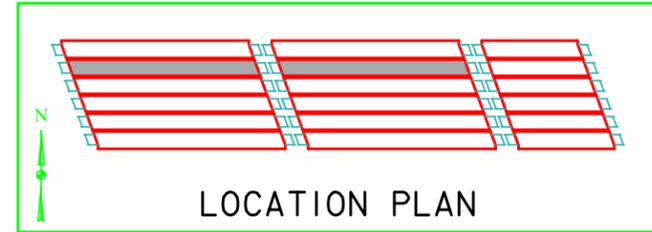


SECTION A-A

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEYPED 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.)

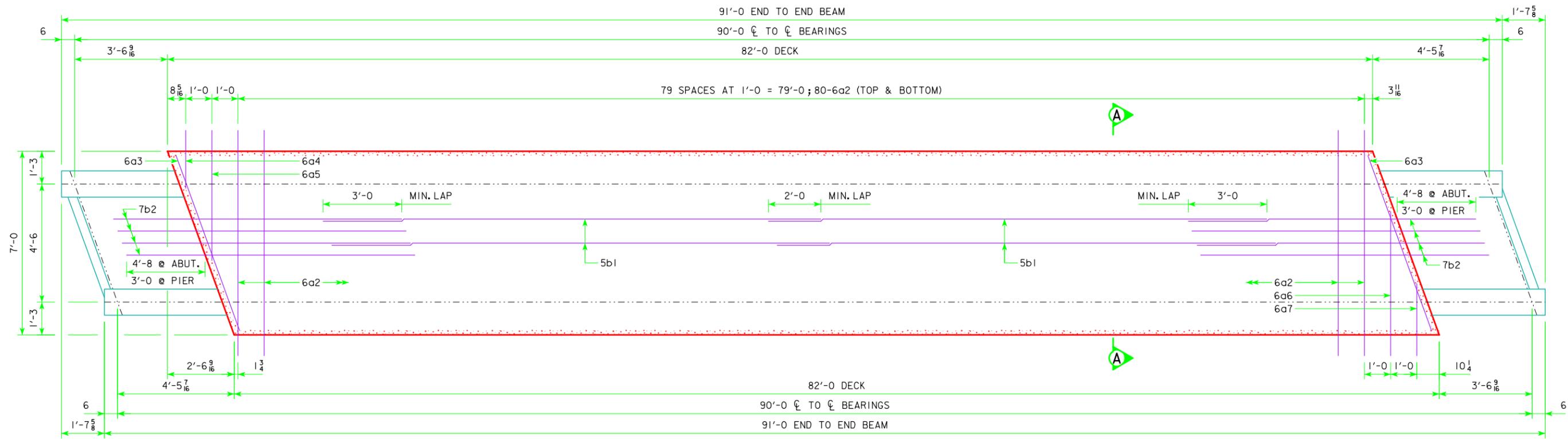


LOCATION PLAN

REINFORCING STEEL - ONE MODULE M90-B						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
6a2	TRANSVERSE		158	8'-6	2,029	
6a3	TRANSVERSE, SKEWED, DECK ENDS		4	7'-1	43	
6a4	TRANSVERSE, DECK END		2	3'-2	10	
6a5	TRANSVERSE, DECK END		2	5'-11	18	
6a6	TRANSVERSE, DECK END		2	7'-3	22	
6a7	TRANSVERSE, DECK END		2	4'-6	14	
6a8	TRANSVERSE, DECK END		2	1'-9	5	
5b1	LONGITUDINAL		34	37'-0	1,331	
7b2	LONGITUDINAL, DECK ENDS		60	12'-8	1,565	
TOTAL (LBS.)					5,037	

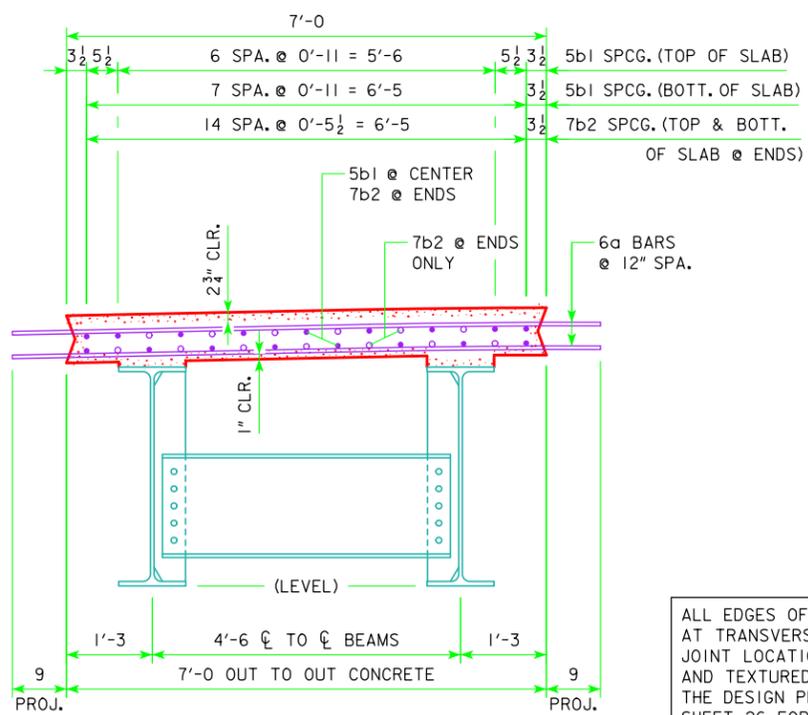
HIGH PERFORMANCE STRUCT. CONC.	
LOCATION	QTY.
MODULE DECK M90-B	15.1
TOTAL (CY)	15.1

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-B)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 41 OF 57 FILE NO. 30846 DESIGN NO. 115



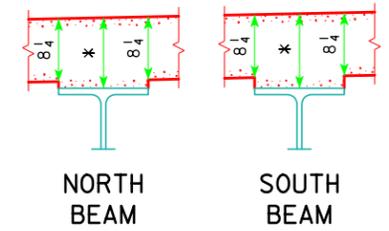
MODULE DECK PLAN (M90-C)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

* HAUNCH THICKNESS VARIES BETWEEN BEAMS. SEE HAUNCH DETAILS ON DESIGN SHEETS 32 & 33.

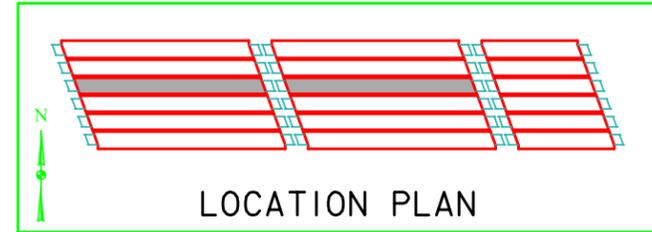


SECTION A-A

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEYED 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\"/>



LOCATION PLAN

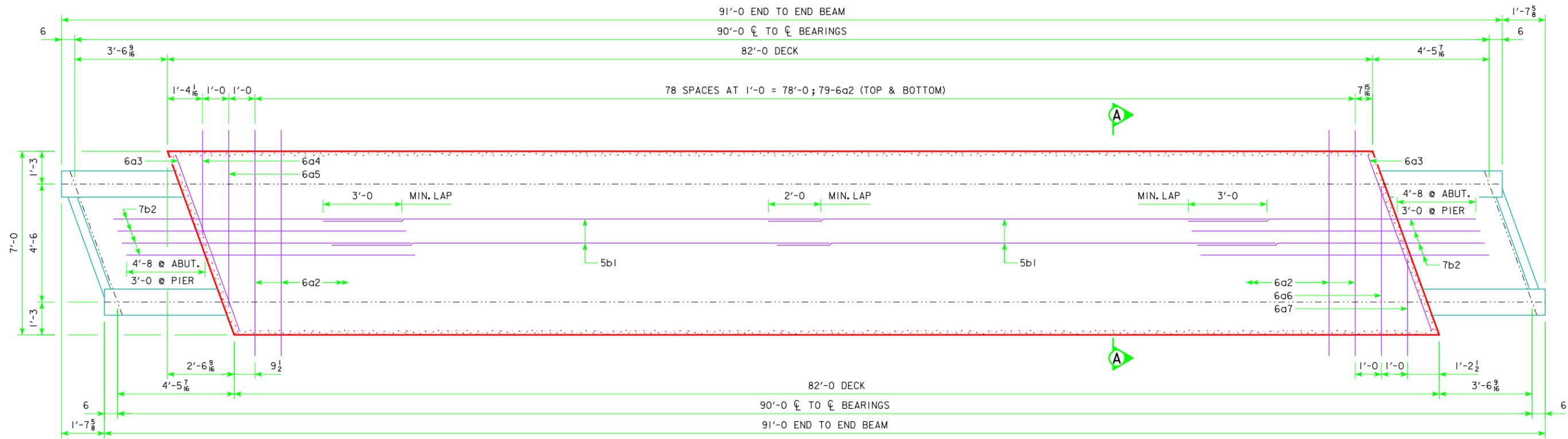
REINFORCING STEEL - ONE MODULE M90-C

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6a2	TRANSVERSE		160	8'-6"	2,055
6a3	TRANSVERSE, SKEWED, DECK ENDS		4	7'-1"	43
6a4	TRANSVERSE, DECK END		2	2'-2"	7
6a5	TRANSVERSE, DECK END		2	4'-11"	15
6a6	TRANSVERSE, DECK END		2	5'-6"	17
6a7	TRANSVERSE, DECK END		2	2'-9"	8
5b1	LONGITUDINAL		34	37'-0"	1,331
7b2	LONGITUDINAL, DECK ENDS		60	12'-8"	1,565
TOTAL (LBS.)					5,041

HIGH PERFORMANCE STRUCT. CONC.

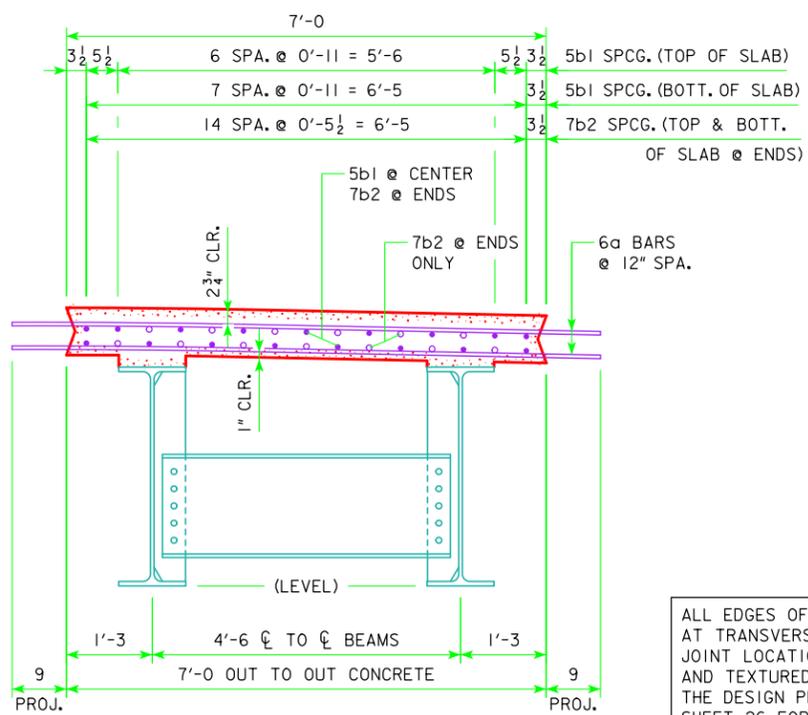
LOCATION	QTY.
MODULE DECK M90-C	15.1
TOTAL (CY)	15.1

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-C)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 42 OF 57 FILE NO. 30846 DESIGN NO. 115

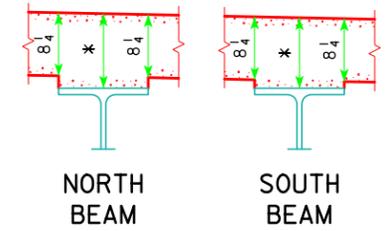


MODULE DECK PLAN (M90-D)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

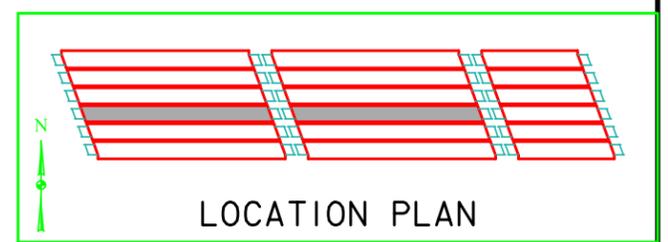
* HAUNCH THICKNESS VARIES BETWEEN BEAMS. SEE HAUNCH DETAILS ON DESIGN SHEETS 32 & 33.



SECTION A-A



TYP. SLAB AND HAUNCH DETAIL
(SLAB THICKNESS SHOWN INCLUDES 1/4\"/>



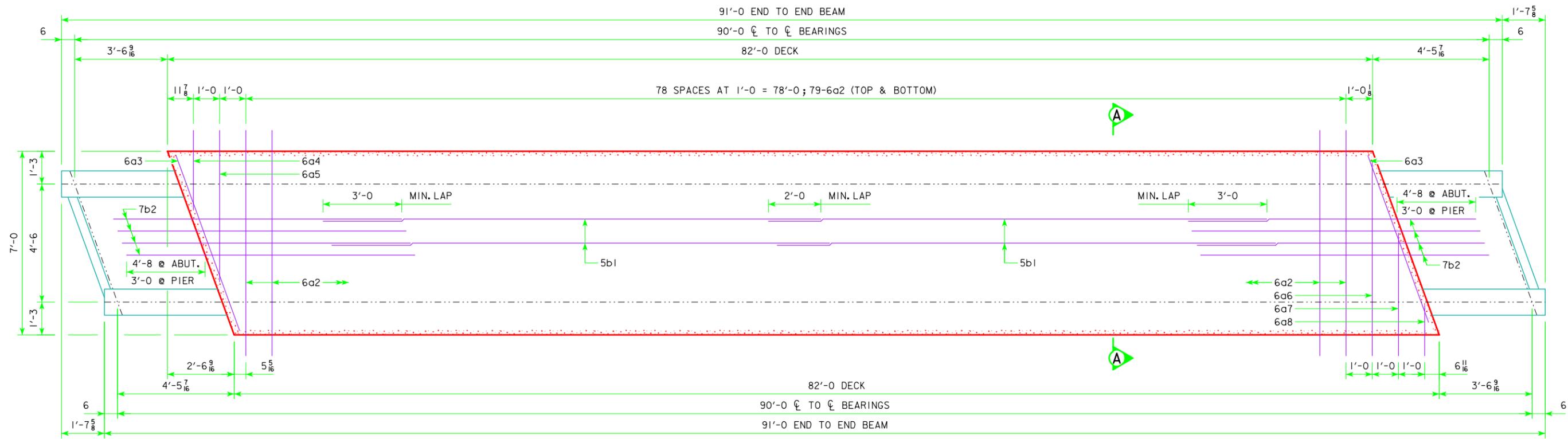
LOCATION PLAN

REINFORCING STEEL - ONE MODULE M90-D						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
6a2	TRANSVERSE		158	8'-6"	2,029	
6a3	TRANSVERSE, SKEWED, DECK ENDS		4	7'-1"	43	
6a4	TRANSVERSE, DECK END		2	4'-0"	12	
6a5	TRANSVERSE, DECK END		2	6'-9"	20	
6a6	TRANSVERSE, DECK END		2	6'-5"	19	
6a7	TRANSVERSE, DECK END		2	3'-9"	11	
5b1	LONGITUDINAL		34	37'-0"	1,331	
7b2	LONGITUDINAL, DECK ENDS		60	12'-8"	1,565	
TOTAL (LBS.)					5,030	

HIGH PERFORMANCE STRUCT. CONC.	
LOCATION	QTY.
MODULE DECK M90-D	15.1
TOTAL (CY)	15.1

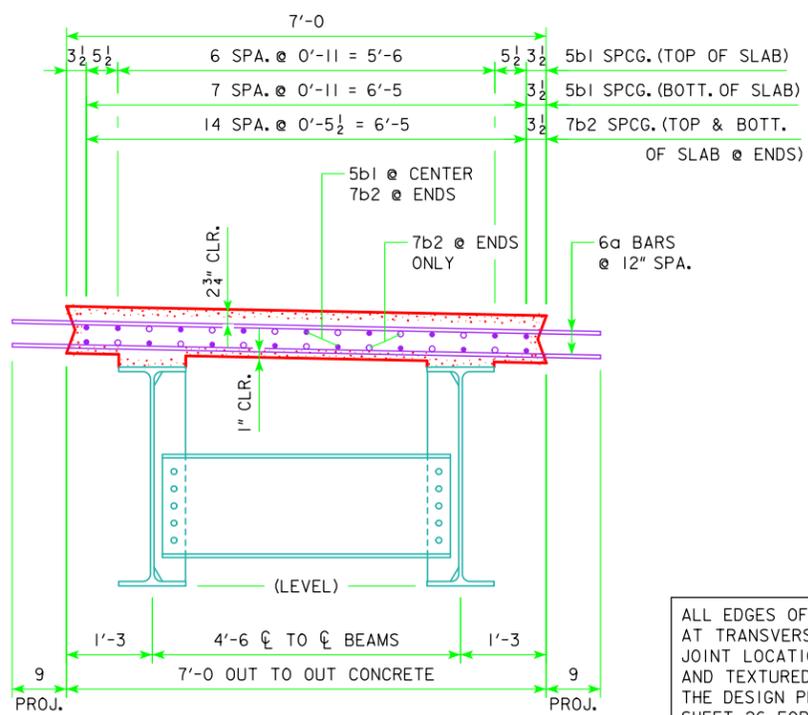
ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEYS AND TEXTURED IN ACCORDANCE WITH THE DESIGN PLANS. REFER TO DESIGN SHEET 26 FOR TYPICAL JOINT KEY PLAN AND DESIGN SHEET 28 FOR JOINT PREPARATION DETAIL.

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-D)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 43 OF 57 FILE NO. 30846 DESIGN NO. 115



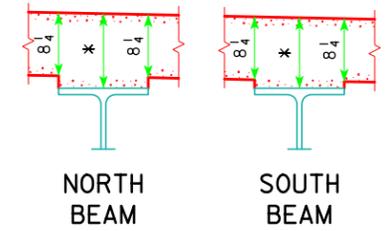
MODULE DECK PLAN (M90-E)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

* HAUNCH THICKNESS VARIES BETWEEN BEAMS. SEE HAUNCH DETAILS ON DESIGN SHEETS 32 & 33.

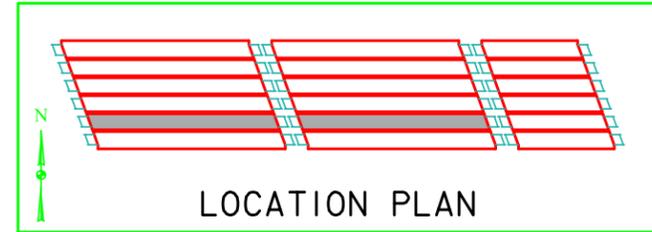


SECTION A-A

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEYS 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.)

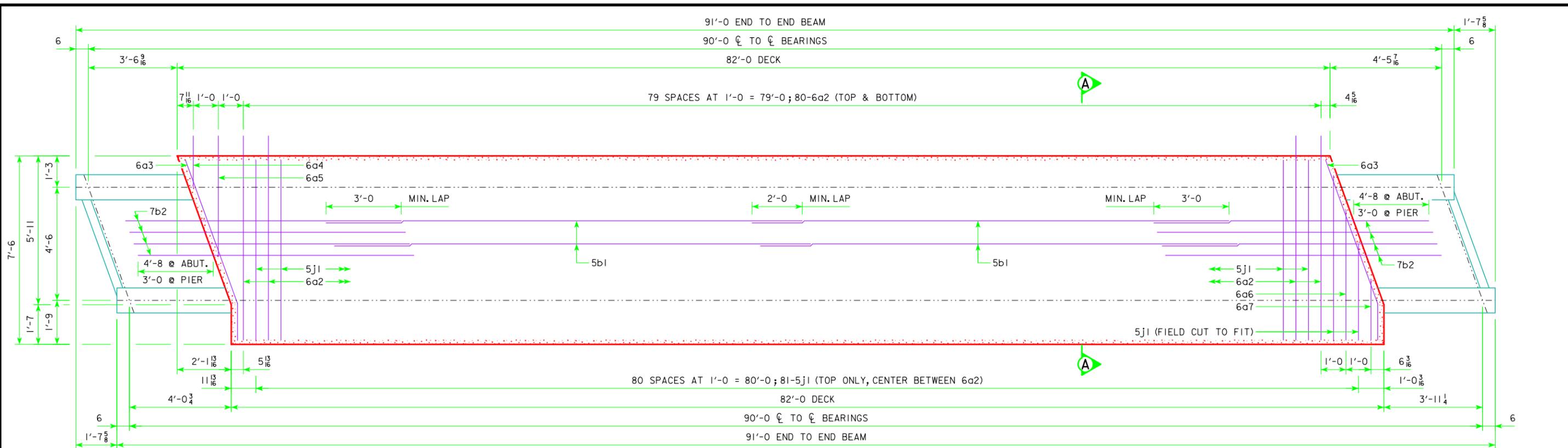


LOCATION PLAN

REINFORCING STEEL - ONE MODULE M90-E						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
6a2	TRANSVERSE		158	8'-6"	2,029	
6a3	TRANSVERSE, SKEWED, DECK ENDS		4	7'-1"	43	
6a4	TRANSVERSE, DECK END		2	3'-0"	9	
6a5	TRANSVERSE, DECK END		2	5'-9"	17	
6a6	TRANSVERSE, DECK END		2	7'-5"	22	
6a7	TRANSVERSE, DECK END		2	4'-8"	14	
6a8	TRANSVERSE, DECK END		2	1'-11"	6	
5b1	LONGITUDINAL		34	37'-0"	1,331	
7b2	LONGITUDINAL, DECK ENDS		60	12'-8"	1,565	
TOTAL (LBS.)					5,036	

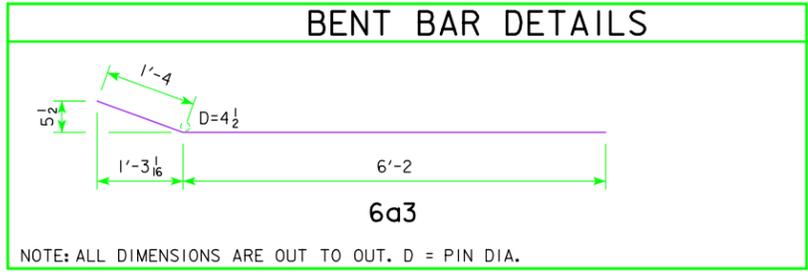
HIGH PERFORMANCE STRUCT. CONC.	
LOCATION	QTY.
MODULE DECK M90-E	15.1
TOTAL (CY)	15.1

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-E)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 44 OF 57 FILE NO. 30846 DESIGN NO. 115

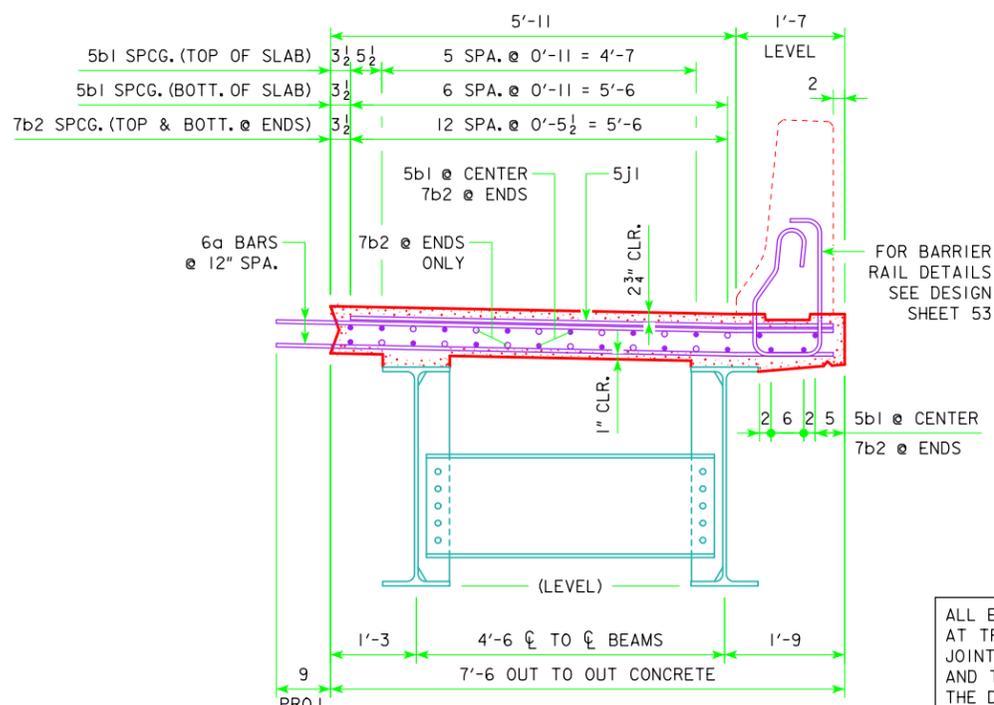


MODULE DECK PLAN (M90-F)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

REINFORCING STEEL, ONE MODULE M90-F						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
6a2	TRANSVERSE		160	8'-1	1,954	
6a3	TRANSVERSE, SKEWED, DECK ENDS		4	7'-6	45	
6a4	TRANSVERSE, DECK END		2	2'-1	6	
6a5	TRANSVERSE, DECK END		2	4'-10	15	
6a6	TRANSVERSE, DECK END		2	5'-2	16	
6a7	TRANSVERSE, DECK END		2	2'-5	7	
5b1	LONGITUDINAL		36	37'-0	1,409	
7b2	LONGITUDINAL, DECK ENDS		60	12'-8	1,565	
5j1	TOP OF DECK, TRANSV., AT RAIL		81	7'-2	614	
TOTAL (LBS.)					5,631	

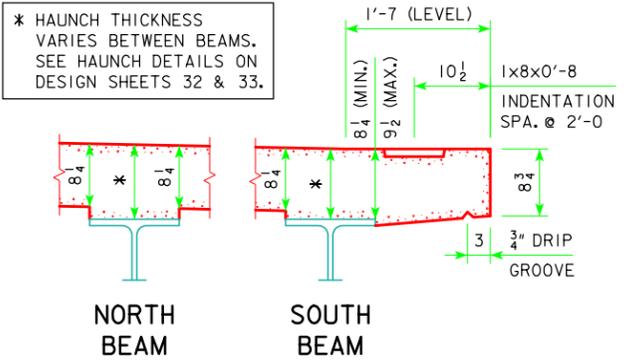


HIGH PERFORMANCE STRUCT. CONC.	
LOCATION	QTY.
MODULE DECK M90-F	16.6
TOTAL (CY)	16.6

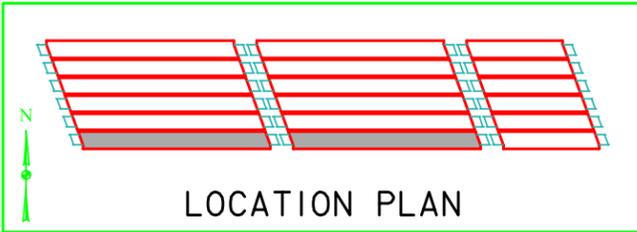


SECTION A-A

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEYS 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.

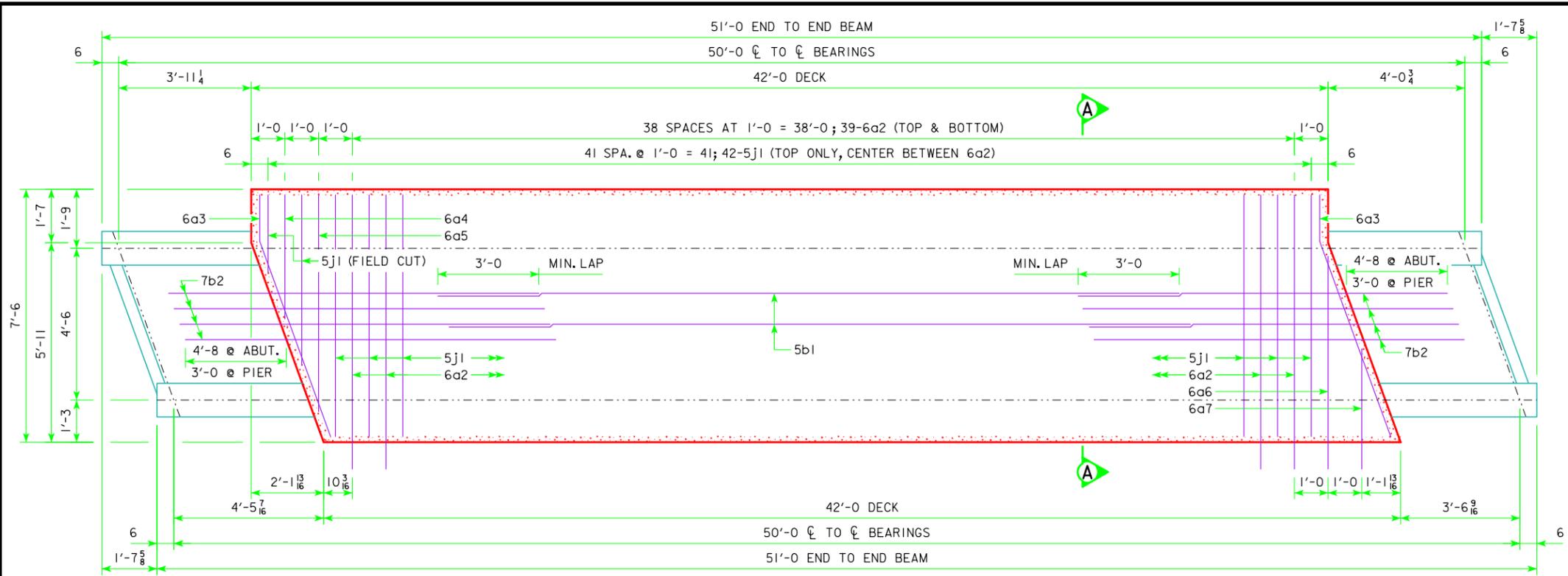


TYP. SLAB AND HAUNCH DETAIL
(SLAB THICKNESS SHOWN INCLUDES 1/4\"/>



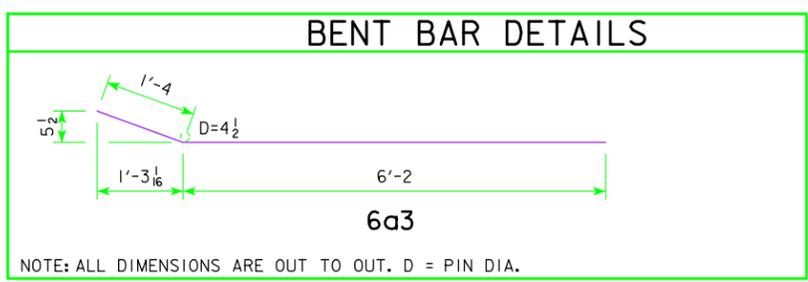
LOCATION PLAN

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
MODULE DETAILS (M90-F)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 45 OF 57 FILE NO. 30846 DESIGN NO. 115

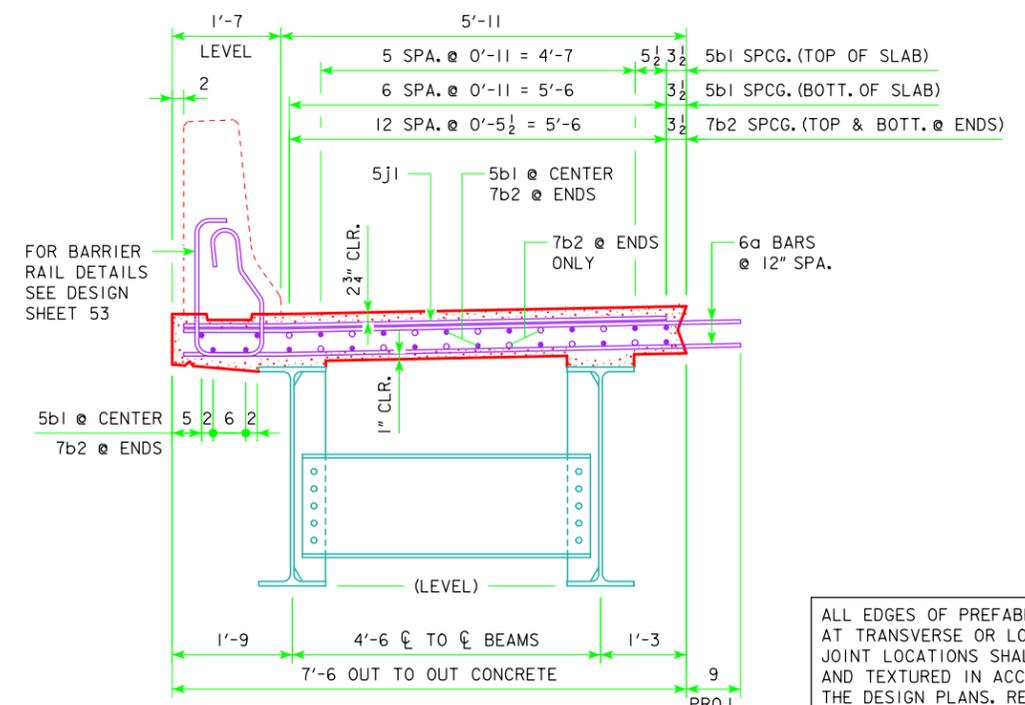


MODULE DECK PLAN (M50-A)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

REINFORCING STEEL - ONE MODULE M50-A						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
6a2	TRANSVERSE		78	8'-1"	953	
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		18	32'-0"	609	
7b2	LONGITUDINAL, DECK ENDS		60	12'-8"	1,565	
5j1	TOP OF DECK, TRANSV., AT RAIL		42	7'-2"	318	
TOTAL (LBS.)					3,550	

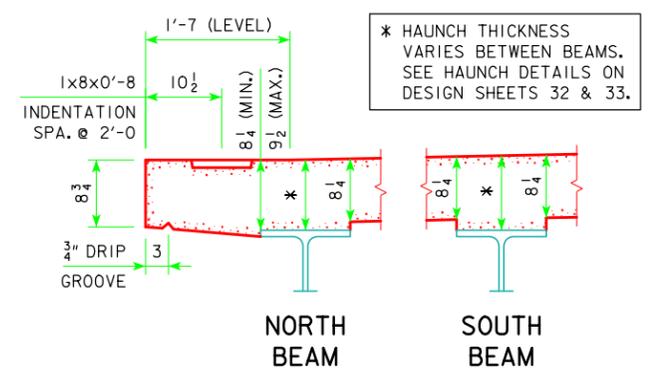


HIGH PERFORMANCE STRUCT. CONC.	
LOCATION	QTY.
MODULE DECK M50-A	8.4
TOTAL (CY)	8.4

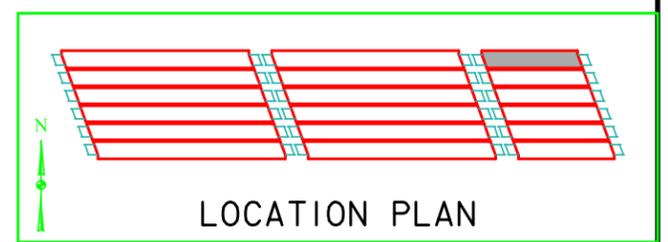


SECTION A-A

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEYS 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.

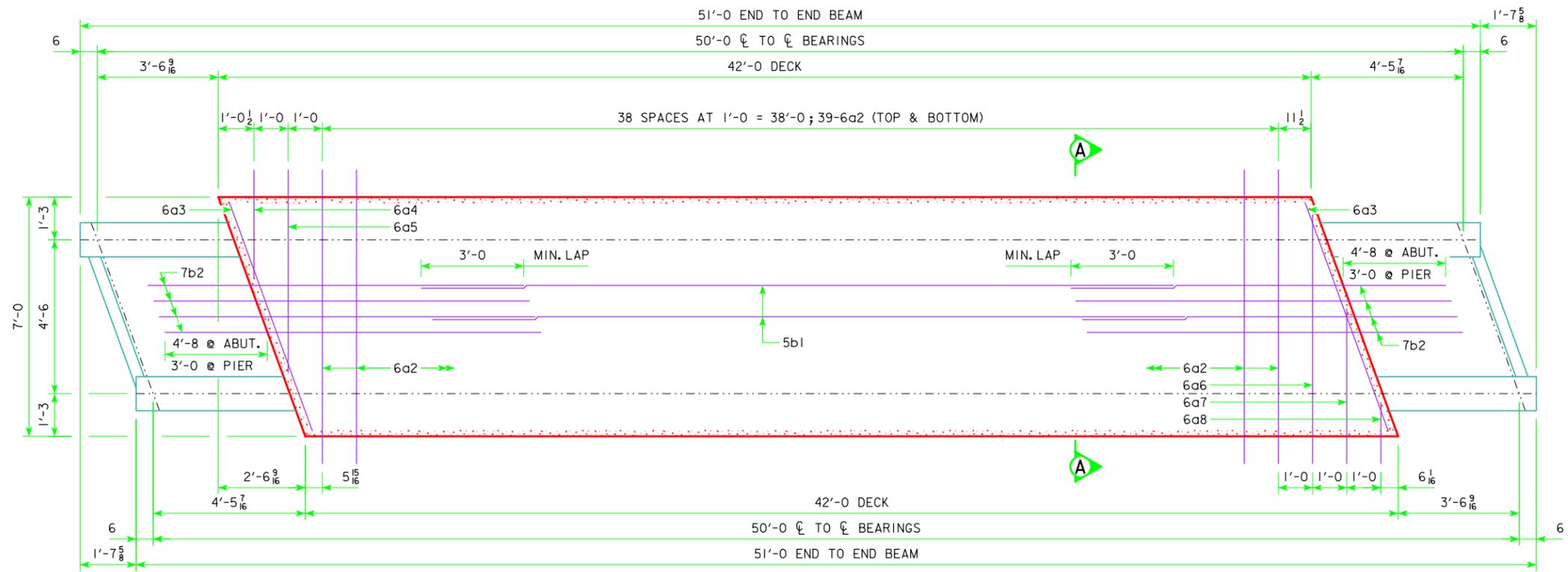


TYP. SLAB AND HAUNCH DETAIL
(SLAB THICKNESS SHOWN INCLUDES 1/4" SACRIFICIAL SURFACE FOR GRINDING.)



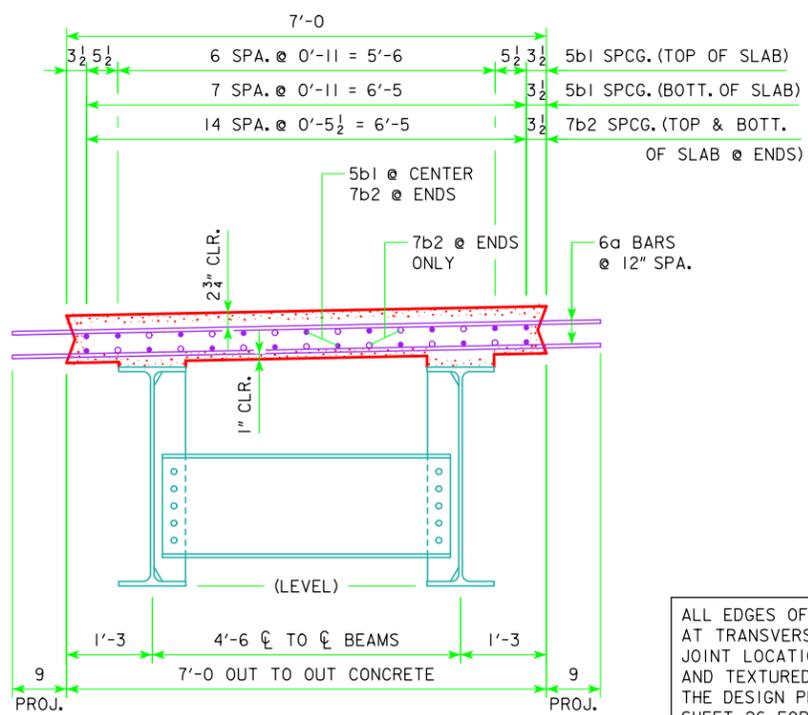
LOCATION PLAN

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
MODULE DETAILS (M50-A)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 46 OF 57 FILE NO. 30846 DESIGN NO. 115



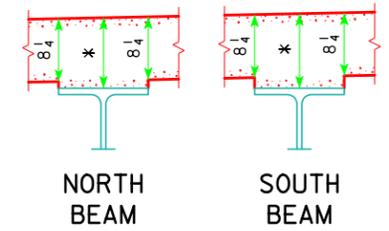
MODULE DECK PLAN (M50-B)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

* HAUNCH THICKNESS VARIES BETWEEN BEAMS. SEE HAUNCH DETAILS ON DESIGN SHEETS 32 & 33.

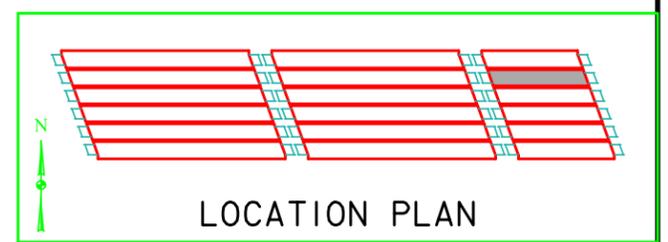


SECTION A-A

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEYS 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.)

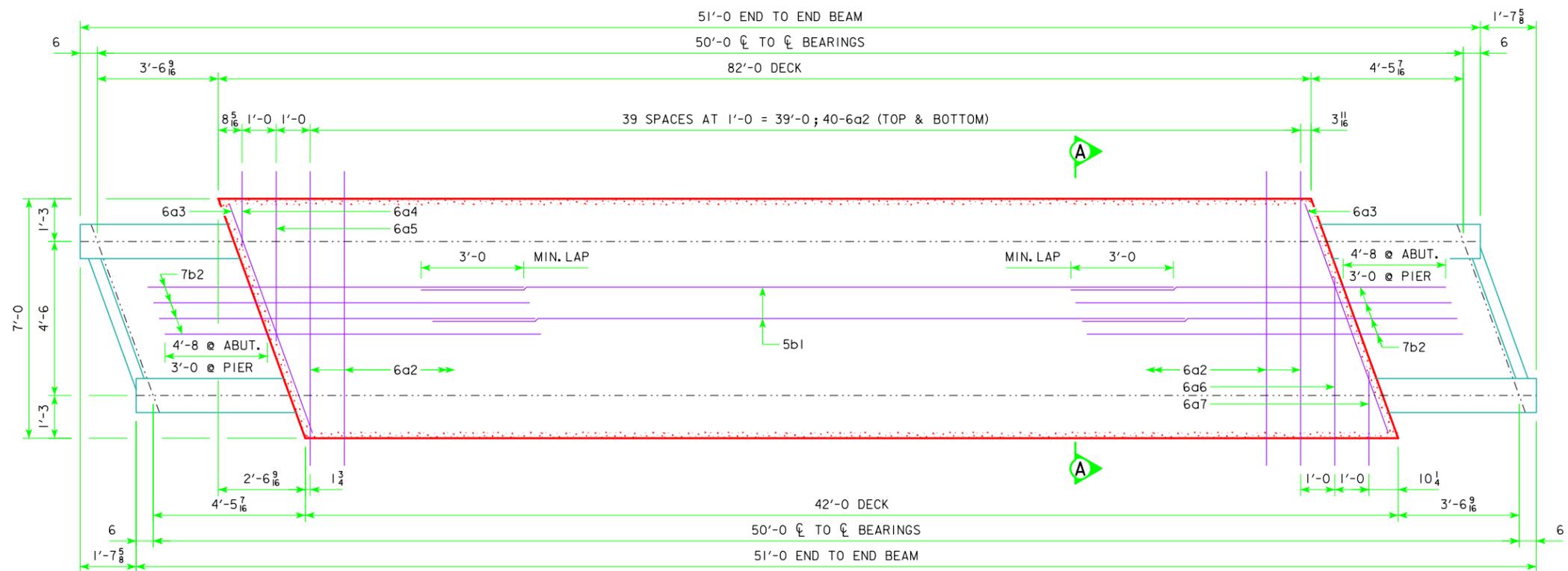


LOCATION PLAN

REINFORCING STEEL, ONE MODULE M50-B						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
6a2	TRANSVERSE		78	8'-6	1,002	
6a3	TRANSVERSE, SKEWED, DECK ENDS		4	7'-1	43	
6a4	TRANSVERSE, DECK END		2	3'-2	10	
6a5	TRANSVERSE, DECK END		2	5'-11	18	
6a6	TRANSVERSE, DECK END		2	7'-3	22	
6a7	TRANSVERSE, DECK END		2	4'-6	14	
6a8	TRANSVERSE, DECK END		2	1'-9	5	
5b1	LONGITUDINAL		17	32'-0	576	
7b2	LONGITUDINAL, DECK ENDS		60	12'-8	1,565	
TOTAL (LBS.)					3,255	

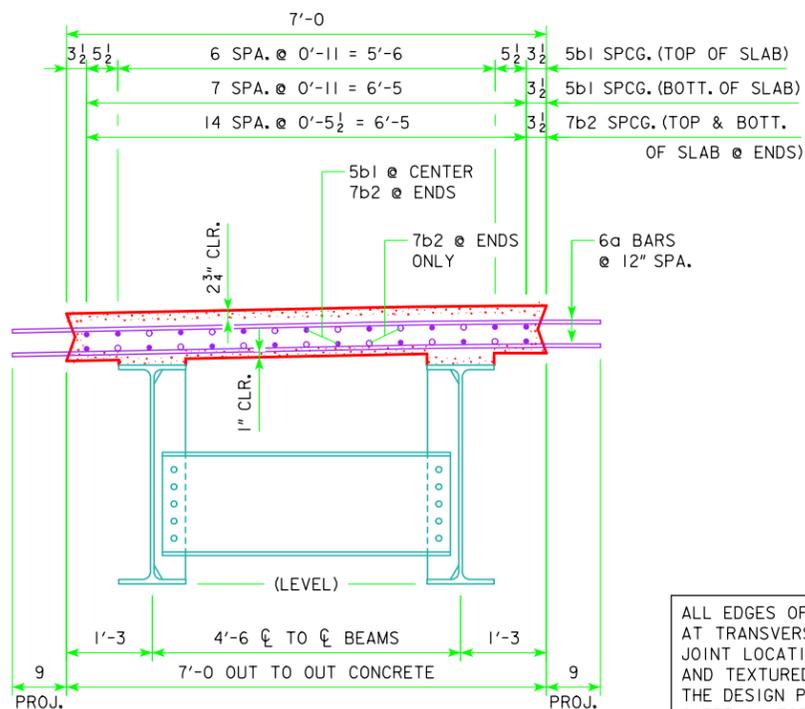
HIGH PERFORMANCE STRUCT. CONC.	
LOCATION	QTY.
MODULE DECK M50-B	7.7
TOTAL (CY)	7.7

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 (M50-B)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 47 OF 57 FILE NO. 30846 DESIGN NO. 115



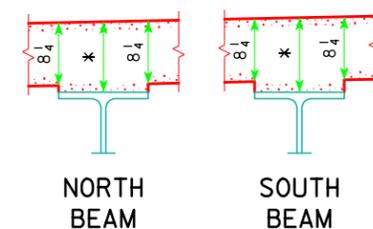
MODULE DECK PLAN (M50-C)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

* HAUNCH THICKNESS VARIES BETWEEN BEAMS. SEE HAUNCH DETAILS ON DESIGN SHEETS 32 & 33.

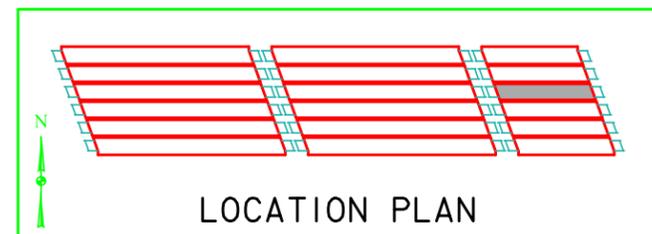


SECTION A-A

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEYPED 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.)



LOCATION PLAN

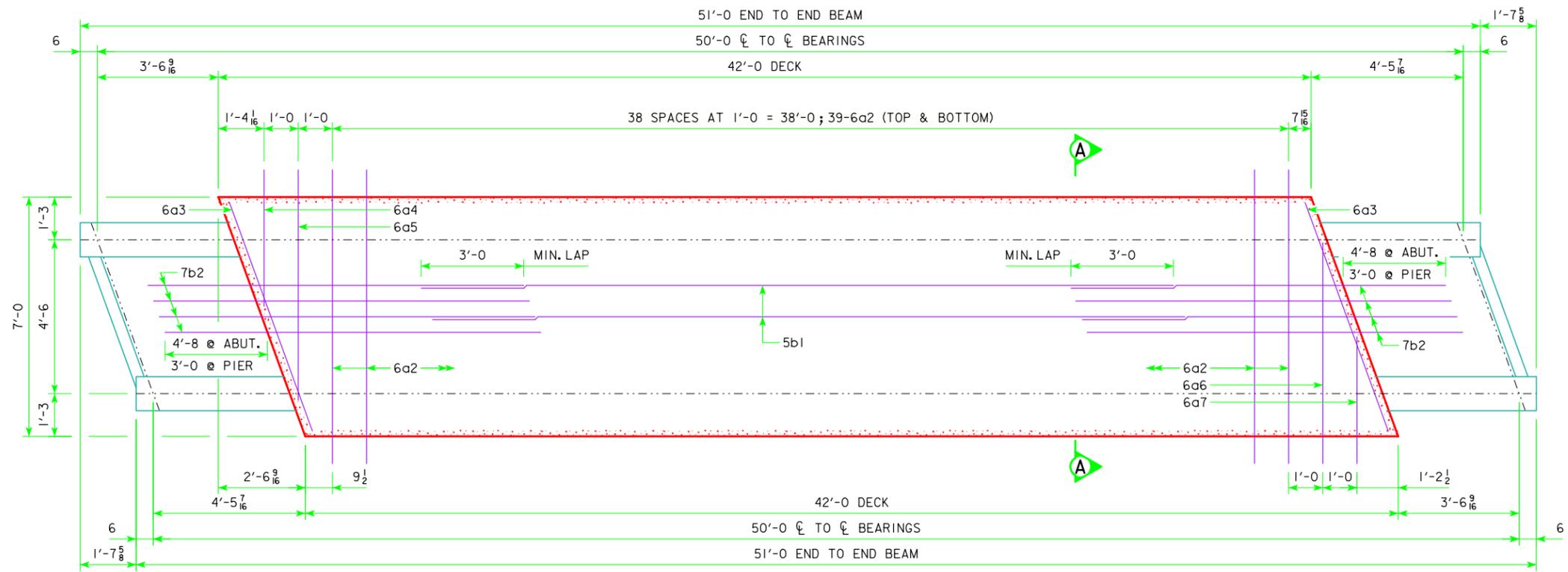
REINFORCING STEEL - ONE MODULE M50-C

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6a2	TRANSVERSE		80	8'-6"	1,027
6a3	TRANSVERSE, SKEWED, DECK ENDS		4	7'-1"	43
6a4	TRANSVERSE, DECK END		2	2'-2"	7
6a5	TRANSVERSE, DECK END		2	4'-11"	15
6a6	TRANSVERSE, DECK END		2	5'-6"	17
6a7	TRANSVERSE, DECK END		2	2'-9"	8
5b1	LONGITUDINAL		17	32'-0"	576
7b2	LONGITUDINAL, DECK ENDS		60	12'-8"	1,565
TOTAL (LBS.)					3,258

HIGH PERFORMANCE STRUCT. CONC.

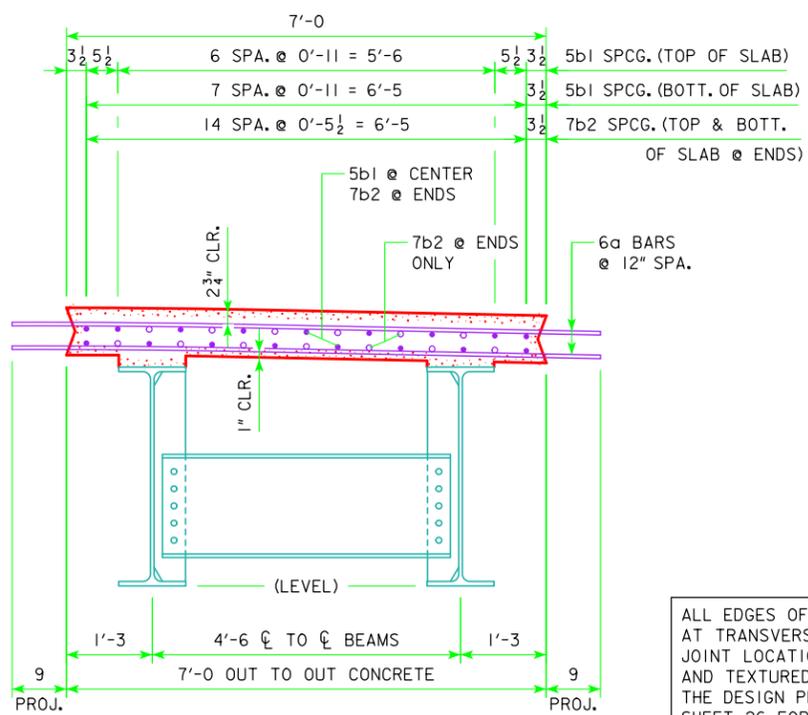
LOCATION	QTY.
MODULE DECK M50-C	7.7
TOTAL (CY)	7.7

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 (M50-C)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 48 OF 57 FILE NO. 30846 DESIGN NO. 115

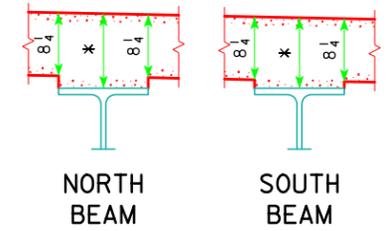


MODULE DECK PLAN (M50-D)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

* HAUNCH THICKNESS VARIES BETWEEN BEAMS. SEE HAUNCH DETAILS ON DESIGN SHEETS 32 & 33.



SECTION A-A



TYP. SLAB AND HAUNCH DETAIL
(SLAB THICKNESS SHOWN INCLUDES 1/4\"/>

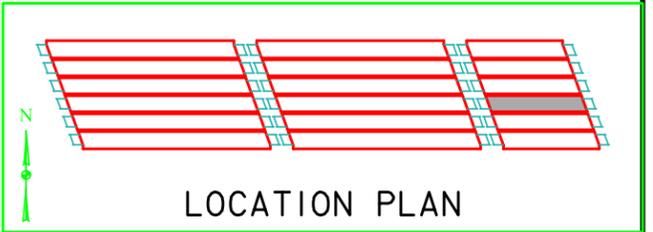
REINFORCING STEEL - ONE MODULE M50-D

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6a2	TRANSVERSE	—	78	8'-6"	1,002
6a3	TRANSVERSE, SKEWED, DECK ENDS	—	4	7'-1"	43
6a4	TRANSVERSE, DECK END	—	2	4'-0"	12
6a5	TRANSVERSE, DECK END	—	2	6'-9"	20
6a6	TRANSVERSE, DECK END	—	2	6'-5"	19
6a7	TRANSVERSE, DECK END	—	2	3'-9"	11
5b1	LONGITUDINAL	—	17	32'-0"	576
7b2	LONGITUDINAL, DECK ENDS	—	60	12'-8"	1,565
TOTAL (LBS.)					3,248

HIGH PERFORMANCE STRUCT. CONC.

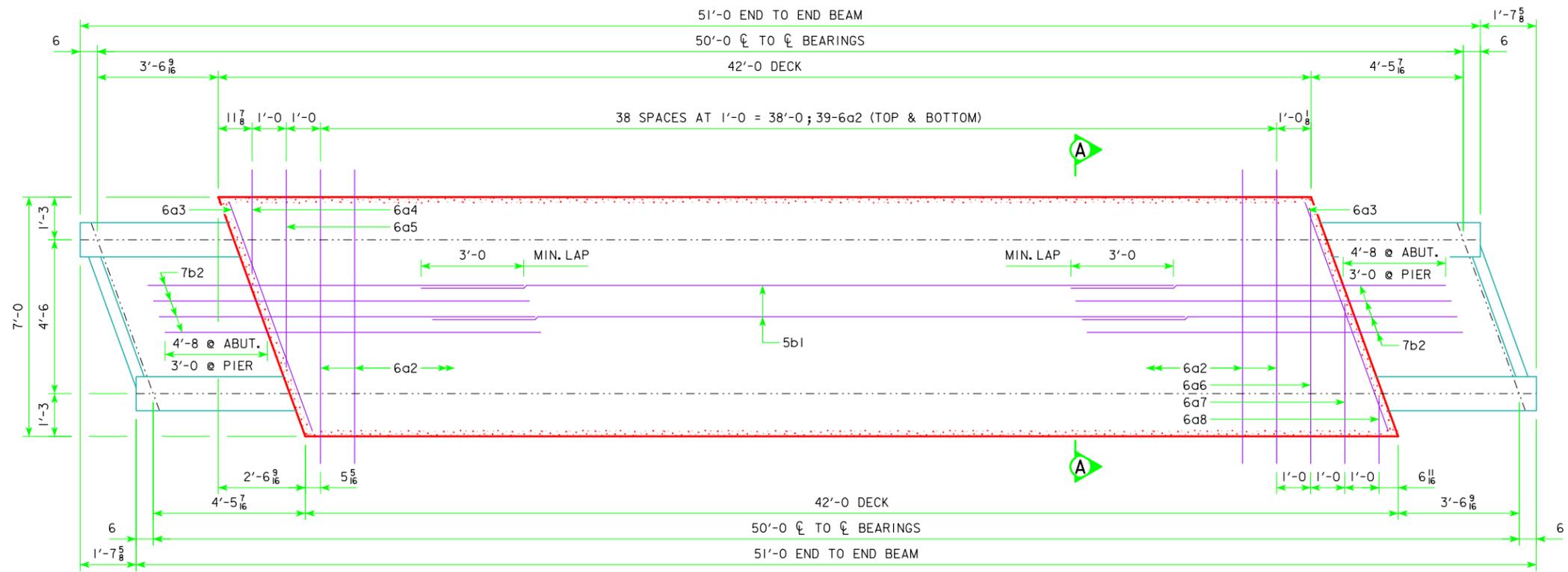
LOCATION	QTY.
MODULE DECK M50-D	7.7
TOTAL (CY)	7.7

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEYS 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.



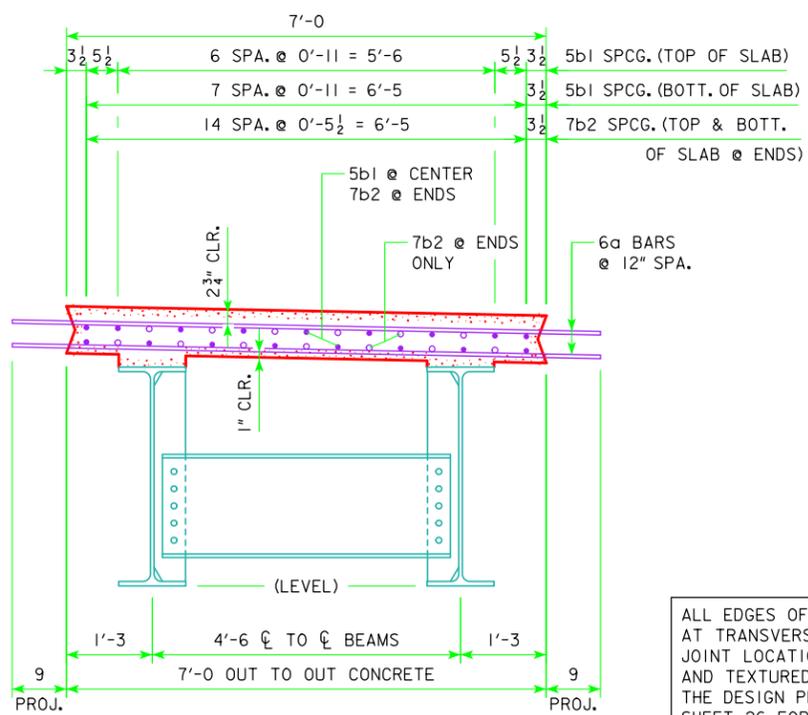
LOCATION PLAN

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
MODULE DETAILS (M50-D)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 49 OF 57 FILE NO. 30846 DESIGN NO. 115

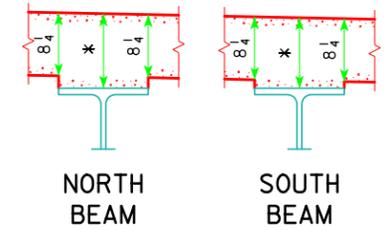


MODULE DECK PLAN (M50-E)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

* HAUNCH THICKNESS VARIES BETWEEN BEAMS. SEE HAUNCH DETAILS ON DESIGN SHEETS 32 & 33.



SECTION A-A

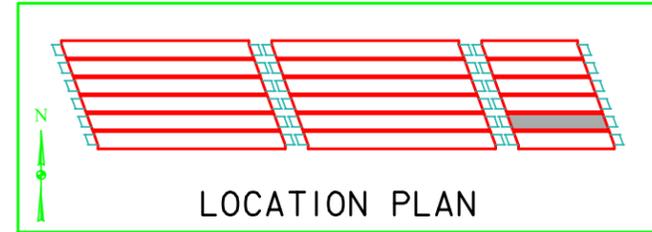


TYP. SLAB AND HAUNCH DETAIL
(SLAB THICKNESS SHOWN INCLUDES 1/4\"/>

REINFORCING STEEL - ONE MODULE M50-E						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
6a2	TRANSVERSE		78	8'-6	1,002	
6a3	TRANSVERSE, SKEWED, DECK ENDS		4	7'-1	43	
6a4	TRANSVERSE, DECK END		2	3'-0	9	
6a5	TRANSVERSE, DECK END		2	5'-9	17	
6a6	TRANSVERSE, DECK END		2	7'-5	22	
6a7	TRANSVERSE, DECK END		2	4'-8	14	
6a8	TRANSVERSE, DECK END		2	1'-11	6	
5b1	LONGITUDINAL		17	32'-0	576	
7b2	LONGITUDINAL, DECK ENDS		60	12'-8	1,565	
TOTAL (LBS.)					3,254	

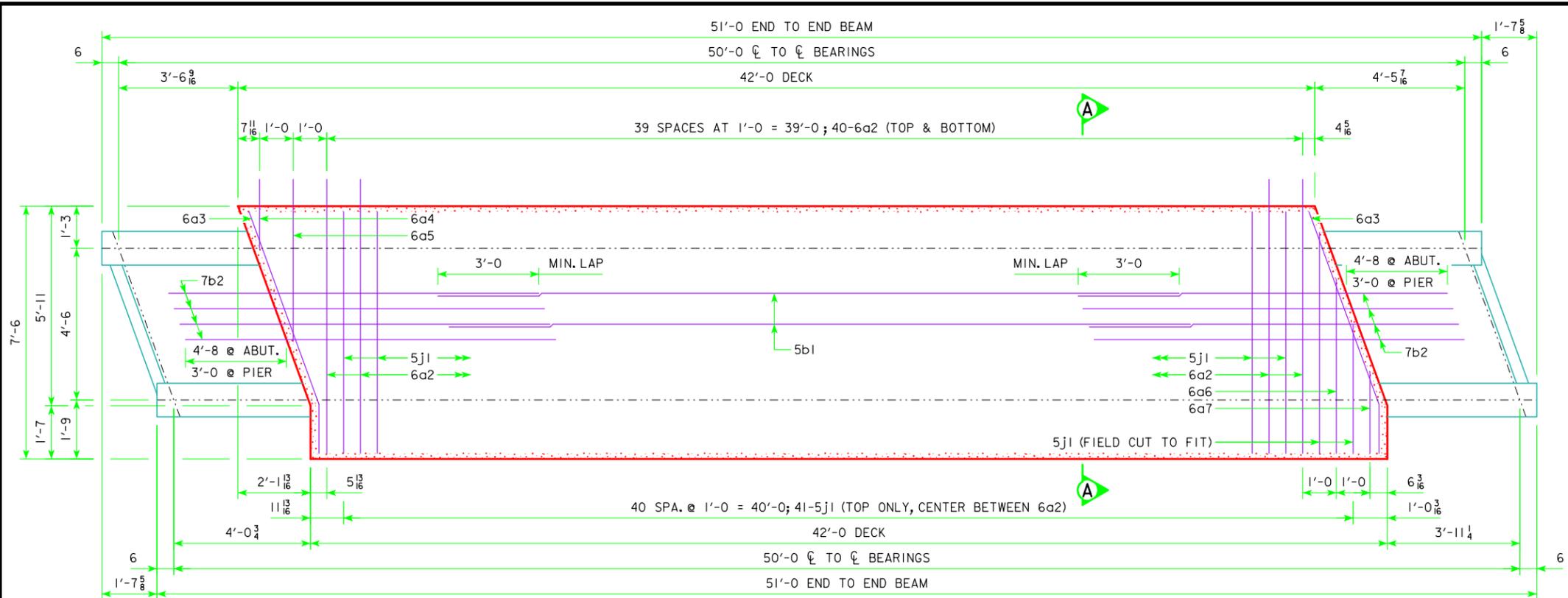
HIGH PERFORMANCE STRUCT. CONC.	
LOCATION	QTY.
MODULE DECK M50-E	7.7
TOTAL (CY)	7.7

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEYPED 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.



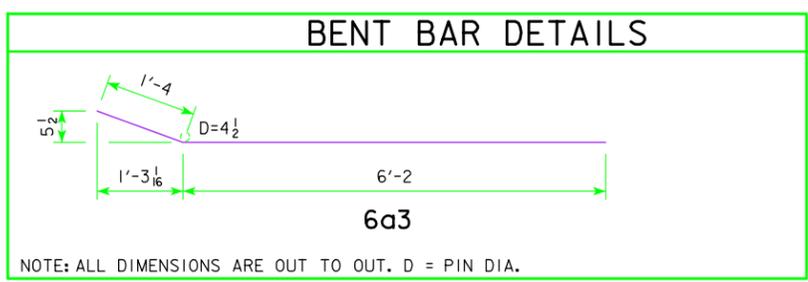
LOCATION PLAN

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
MODULE DETAILS (M50-E)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 50 OF 57 FILE NO. 30846 DESIGN NO. 115

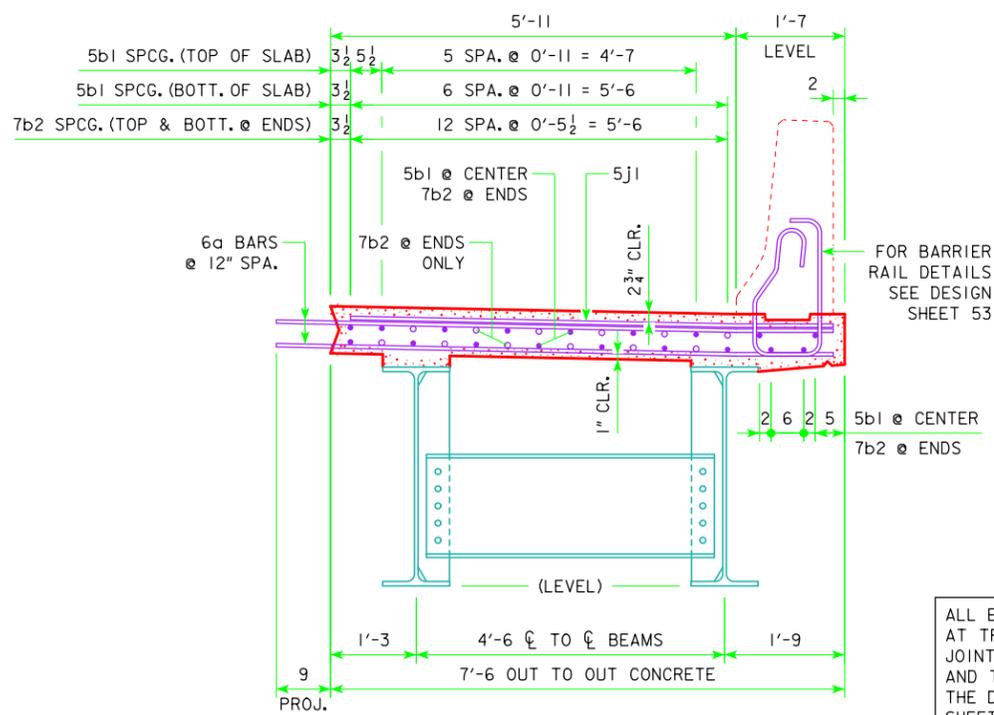


MODULE DECK PLAN (M50-F)
(LONGITUDINAL DIMENSIONS ARE SHOWN ALONG GRADE)

REINFORCING STEEL - ONE MODULE M50-F						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
6a2	TRANSVERSE		80	8'-1	977	
6a3	TRANSVERSE, SKEWED, DECK ENDS		4	7'-6	45	
6a4	TRANSVERSE, DECK END		2	2'-1	6	
6a5	TRANSVERSE, DECK END		2	4'-10	15	
6a6	TRANSVERSE, DECK END		2	5'-2	16	
6a7	TRANSVERSE, DECK END		2	2'-5	7	
5b1	LONGITUDINAL		18	32'-0	609	
7b2	LONGITUDINAL, DECK ENDS		60	12'-8	1,565	
5j1	TOP OF DECK, TRANSV., AT RAIL		41	7'-2	311	
TOTAL (LBS.)					3,551	

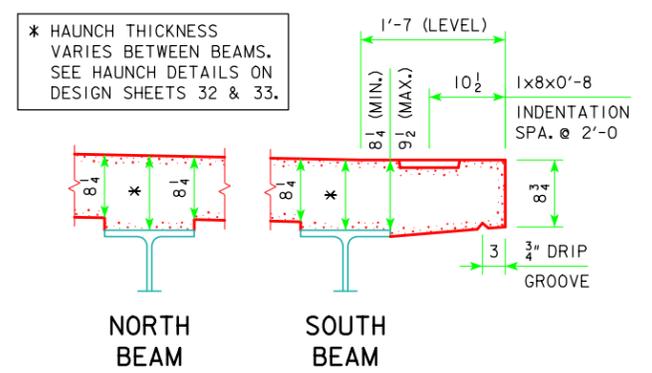


HIGH PERFORMANCE STRUCT. CONC.	
LOCATION	QTY.
MODULE DECK M50-F	8.4
TOTAL (CY)	8.4

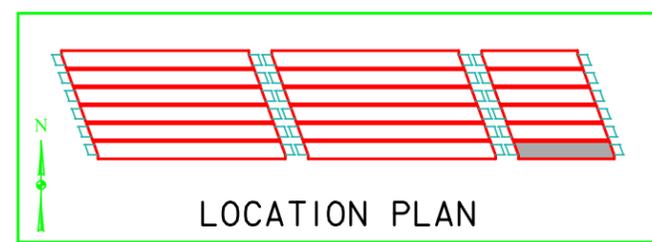


SECTION A-A

ALL EDGES OF PREFABRICATED DECK AT TRANSVERSE OR LONGITUDINAL JOINT LOCATIONS SHALL BE KEYS 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.



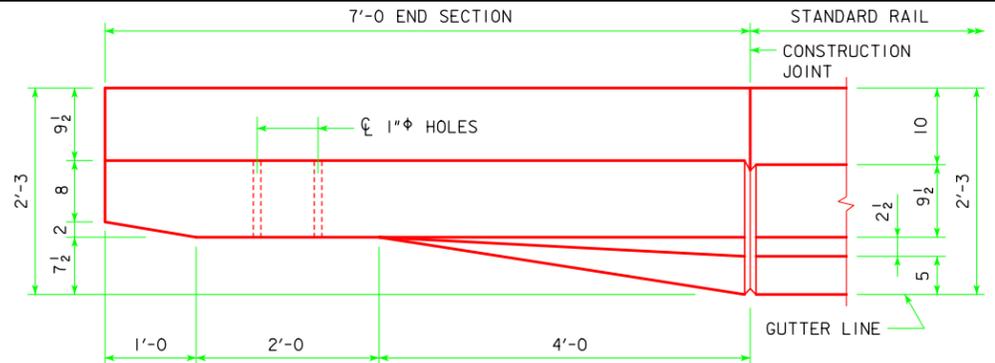
TYP. SLAB AND HAUNCH DETAIL
(SLAB THICKNESS SHOWN INCLUDES 1/4" SACRIFICIAL SURFACE FOR GRINDING.)



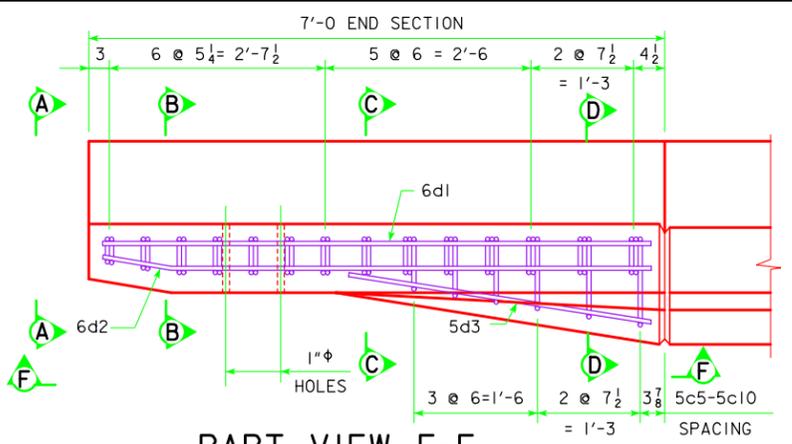
LOCATION PLAN

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
MODULE DETAILS (M50-F)
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 51 OF 57 FILE NO. 30846 DESIGN NO. 115

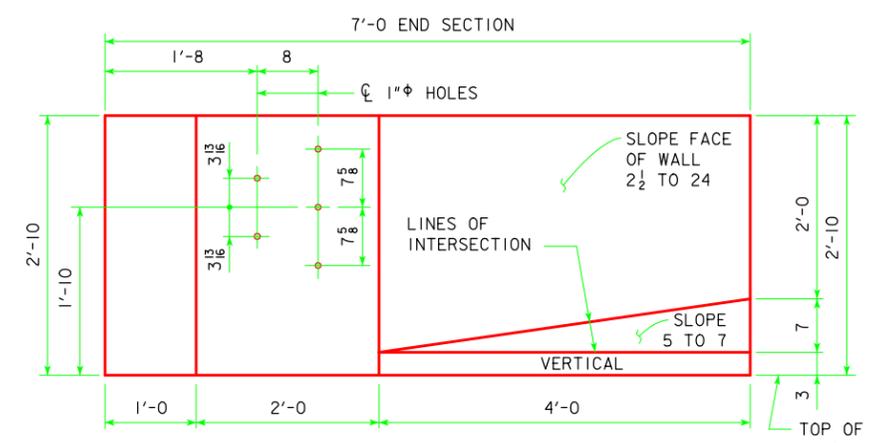
REVISION 02-08 - REINFORCING STEEL PATTERN & SIZE CHANGED AND WEIGHT ADJUSTED. CONCRETE THICKNESS WAS INCREASED 2" AND QUANTITY ADJUSTED. ENGLISH@CRRAILBRIDGES.DGN 1017 - THIS SHEET ISSUED 09-01



PART PLAN VIEW

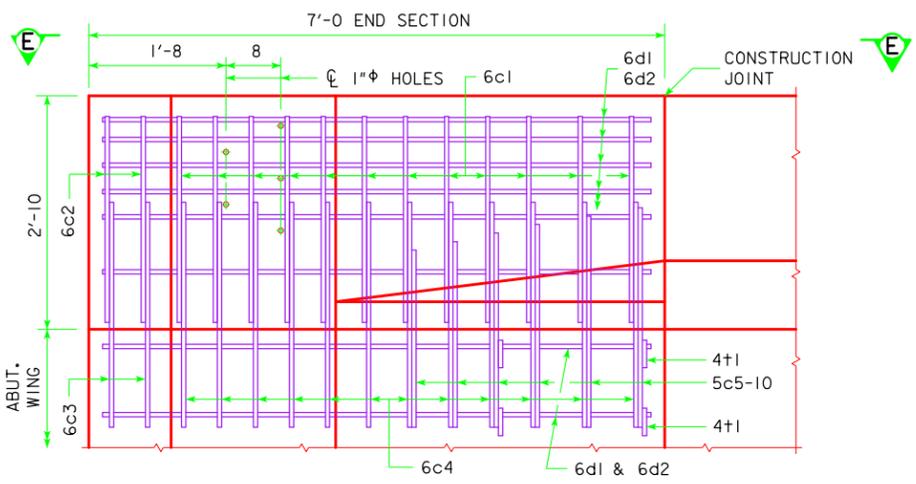


PART VIEW E-E

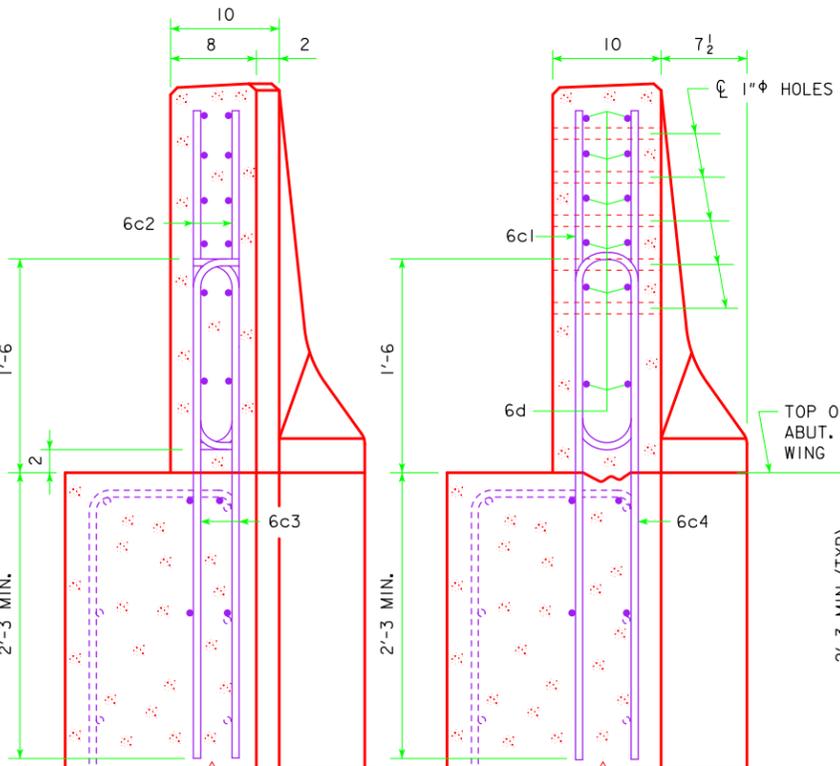


PART ELEVATION VIEW

PROVIDE 5 HOLES FORMED WITH 1" PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.

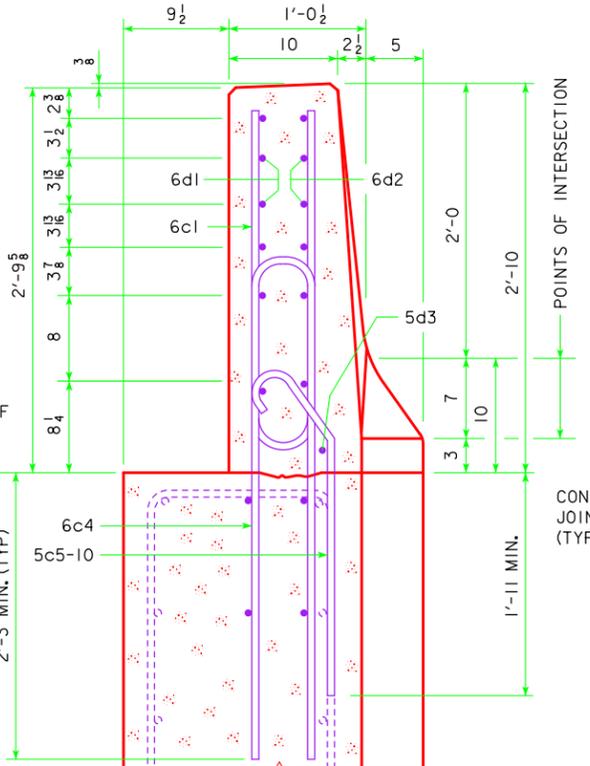


PART VIEW F-F

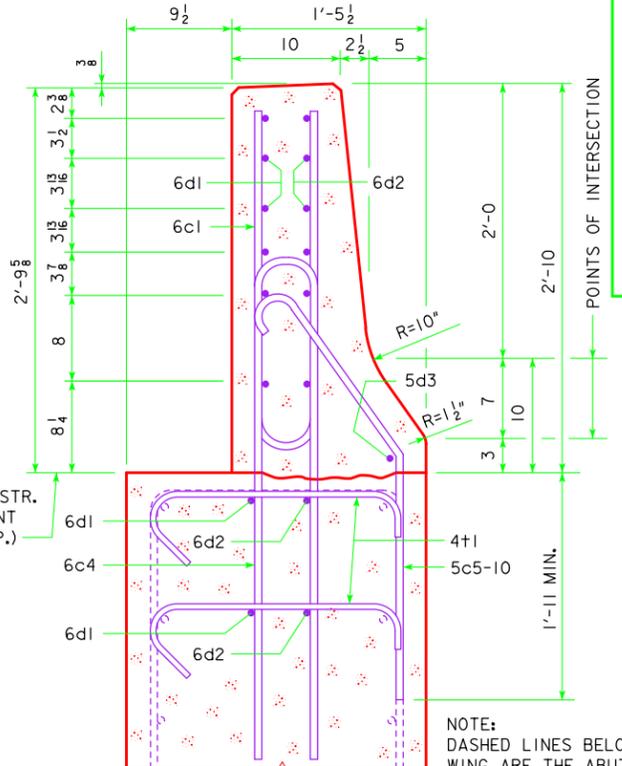


VIEW A-A

SECTION B-B



SECTION C-C



SECTION D-D

NOTE: DASHED LINES BELOW THE TOP OF WING ARE THE ABUTMENT WING REINFORCING STEEL. SEE WING ABUTMENT SHEET FOR PLACEMENT.

STAINLESS STEEL REINF. STEEL - ONE END SECT.						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
6c1	VERTICAL	U	12	5'-6	100	
6c2	VERTICAL	U	4	2'-10	17	
6c3	VERTICAL	U	4	4'-1	25	
6c4	VERTICAL	U	12	8'-0	145	
5c5-10	VERTICAL	U	6	VARIES	23	
6d1	HORIZONTAL	—	8	6'-8	81	
6d2	HORIZONTAL	—	8	6'-9	82	
5d3	HORIZONTAL	—	1	3'-9	4	
4+1	ABUTMENT WING TIE BARS	U	4	VARIES	7	
				(INCLUDE WITH BARRIER RAIL REINFORCING)	TOTAL WEIGHT (LBS.)	484

CONCRETE PLACEMENT SUMMARY	
SECTION	TOTAL
BARRIER RAIL ONE END SECTION	0.65 CU. YD.

BENT BAR DETAILS

6c1 & 6c4

6d2

6c2 & 6c3

5c5-5c10

BAR	"X"
5c5	0'-6 1/2
5c6	0'-8 1/2
5c7	0'-10 1/4
5c8	1'-0 1/4
5c9	1'-2
5c10	1'-4

NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

NOTE: 4+1 PLACEMENT - 2 BARS EACH. CONSTRUCTION JOINT BETWEEN TOP OF WING AND BARRIER RAIL IS ROUGHENED CONCRETE.

NOTE: THE 10" RADIUS AND 1 1/2" RADIUS ARE TYPICAL AND SHALL BE USED WHEN CONSTRUCTING THE CORNERS FOR VIEW A-A, SECTION B-B, SECTION C-C AND SECTION D-D.

NOTE: THE 6c4, 6c3, 5c5-10, 2 - 6d2 AND 4+1 BARS ARE TO BE PLACED WITH THE ABUTMENT WING. THE DETAILS FOR PLACEMENT ARE SHOWN ON THE WING ABUTMENT SHEET.

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

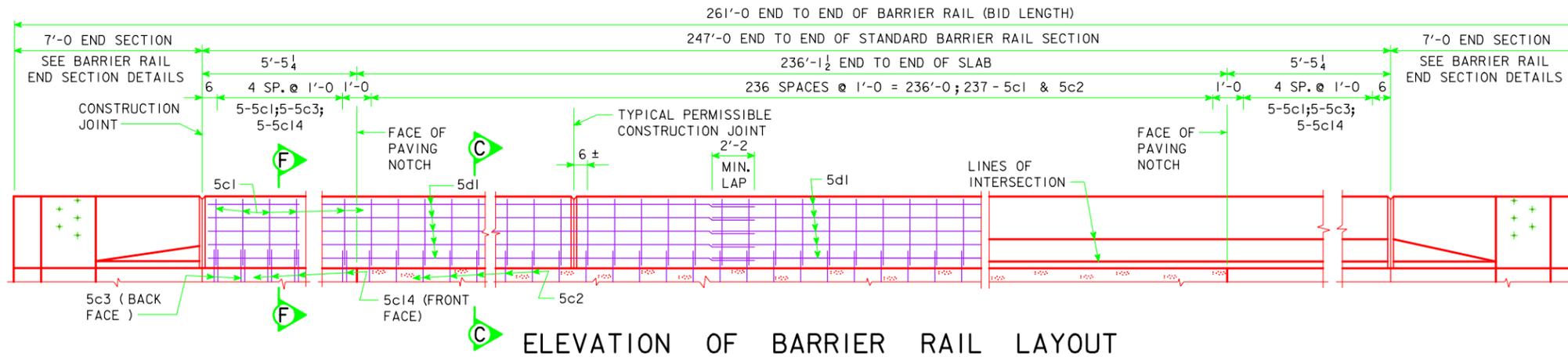
BARRIER END SECTION

STA. 528+80.00 IA 92 OCTOBER, 2014

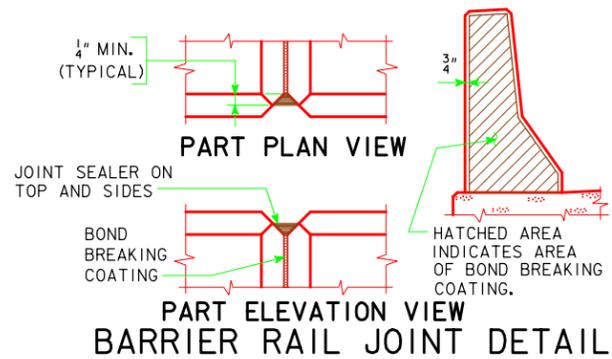
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 52 OF 57 FILE NO. 30846 DESIGN NO. 115



ELEVATION OF BARRIER RAIL LAYOUT

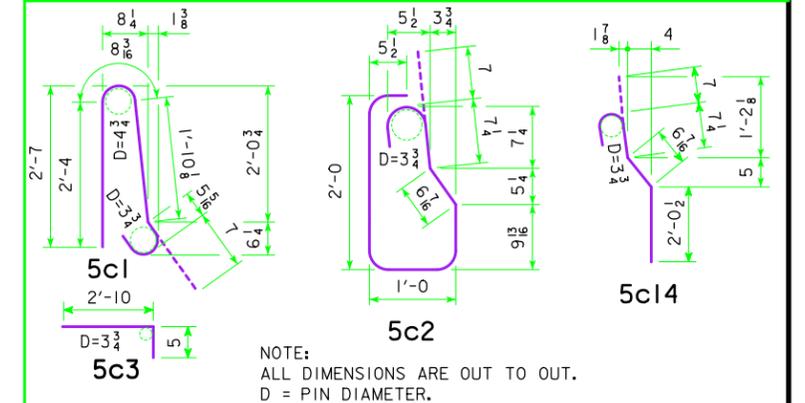


BARRIER RAIL JOINT DETAILS

STAINLESS STEEL REINF. STEEL-TWO BARRIER RAILS

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTION	5c1	VERTICAL		494	5'-11"	3,093
	5c2	VERTICAL		474	6'-0"	3,009
	5c3	VERTICAL		20	3'-3"	69
	5c14	VERTICAL		20	3'-10"	81
	5d1	LONGITUDINAL		126	37'-2"	4,955
BARRIER RAIL END SECTION				4 AT 484 LBS.		1,936
TOTAL (LBS.)						13,143

BENT BAR DETAILS

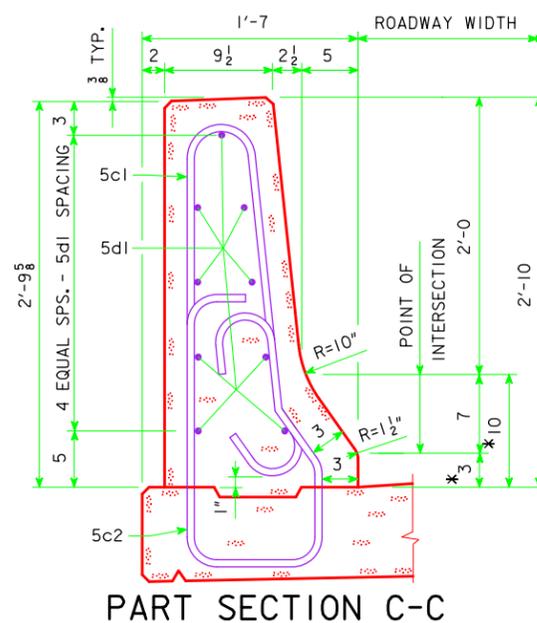


BARRIER RAIL NOTES:

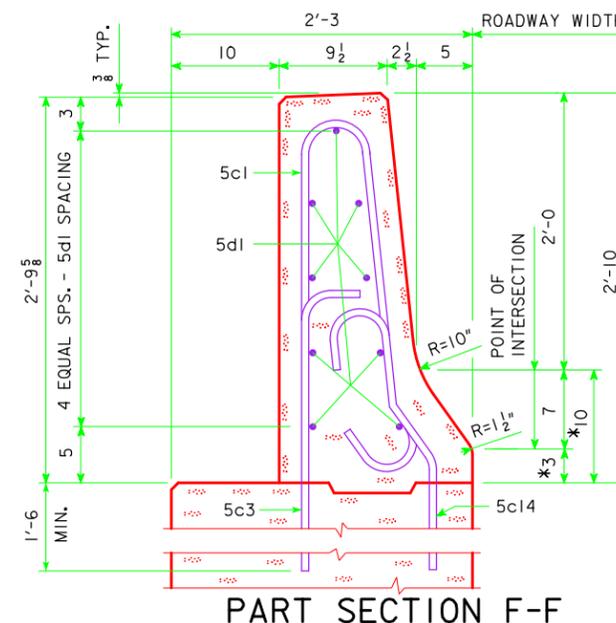
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
 THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 20 FEET, UNLESS OTHERWISE APPROVED. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.
 ALL BARRIER RAIL REINFORCING STEEL IS TO BE STAINLESS STEEL.
 THE CONCRETE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS. THE NUMBER OF LINEAL FEET OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES. PRICE BID FOR CONCRETE BARRIER RAILING SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS. IF CONDUIT IS REQUIRED IN THIS PLAN THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.
 ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.
 THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.
 TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL \bar{C} GRADE.
 CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 2.84 SQUARE FEET.

CONSTRUCTION PROCEDURE NOTE:

IT IS THE INTENT OF THESE PLANS FOR THE BARRIER RAIL TO BE CAST-IN-PLACE AFTER ALL THE DECK MODULES HAVE BEEN SET, AND AFTER ALL DECK CLOSURE POURS HAVE BEEN COMPLETED. MODULE WEIGHTS NOTED IN THESE PLANS DO NOT ACCOUNT FOR THE WEIGHT OF THE BARRIER RAIL OR BARRIER RAIL FORMS.
 ALTERNATE CONSTRUCTION PROCEDURES MAY BE SUBMITTED TO ACCOMMODATE PRE-PLACEMENT OF THE BARRIER RAIL FORMS AND/OR CONSTRUCTION OF THE BARRIER RAIL ON THE PRECAST PORTIONS OF THE DECK PRIOR TO SETTING OF THE DECK MODULES, SUBJECT TO THE ENGINEER'S APPROVAL. ALTERNATE CONSTRUCTION PROCEDURES PROPOSED BY THE CONTRACTOR SHALL BE ACCOMPANIED BY DESIGN CALCULATIONS BY A LICENSED PROFESSIONAL ENGINEER DEMONSTRATING THAT COMPONENTS, HANDLING EQUIPMENT AND SUPPORT/BRACING SYSTEMS HAVE ADEQUATE CAPACITY TO SUPPORT THE PROPOSED BARRIER AND/OR BARRIER FORM STRESSES.



PART SECTION C-C



PART SECTION F-F

CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
STANDARD SECTION	494 FT @ 0.1052 CU. YD. PER FT. 52.0
BARRIER RAIL END SECTION	4 @ 0.65 CU. YD. 2.6
TOTAL (CU. YD.)	54.6

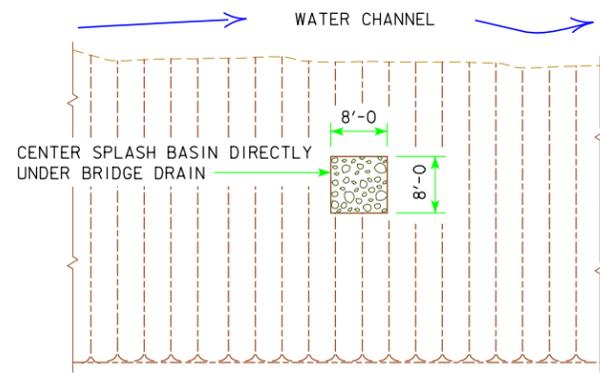
CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	L.F.	522

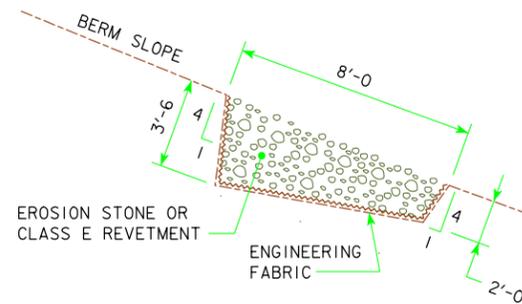
* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

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
BARRIER RAIL DETAILS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 53 OF 57 FILE NO. 30846 DESIGN NO. 115

CORRECTION 05-08 - BARRIER RAIL END SECTION QUANTITIES CORRECTED. ENGLISHDECKRAILBRIDGES.DGN 1020C - THIS SHEET ISSUED 02-00



**SPLASH BASIN UNDER BRIDGE DRAIN
PLAN VIEW**



**SPLASH BASIN UNDER BRIDGE DRAIN
TYPICAL SECTION FOR BERM SLOPES**

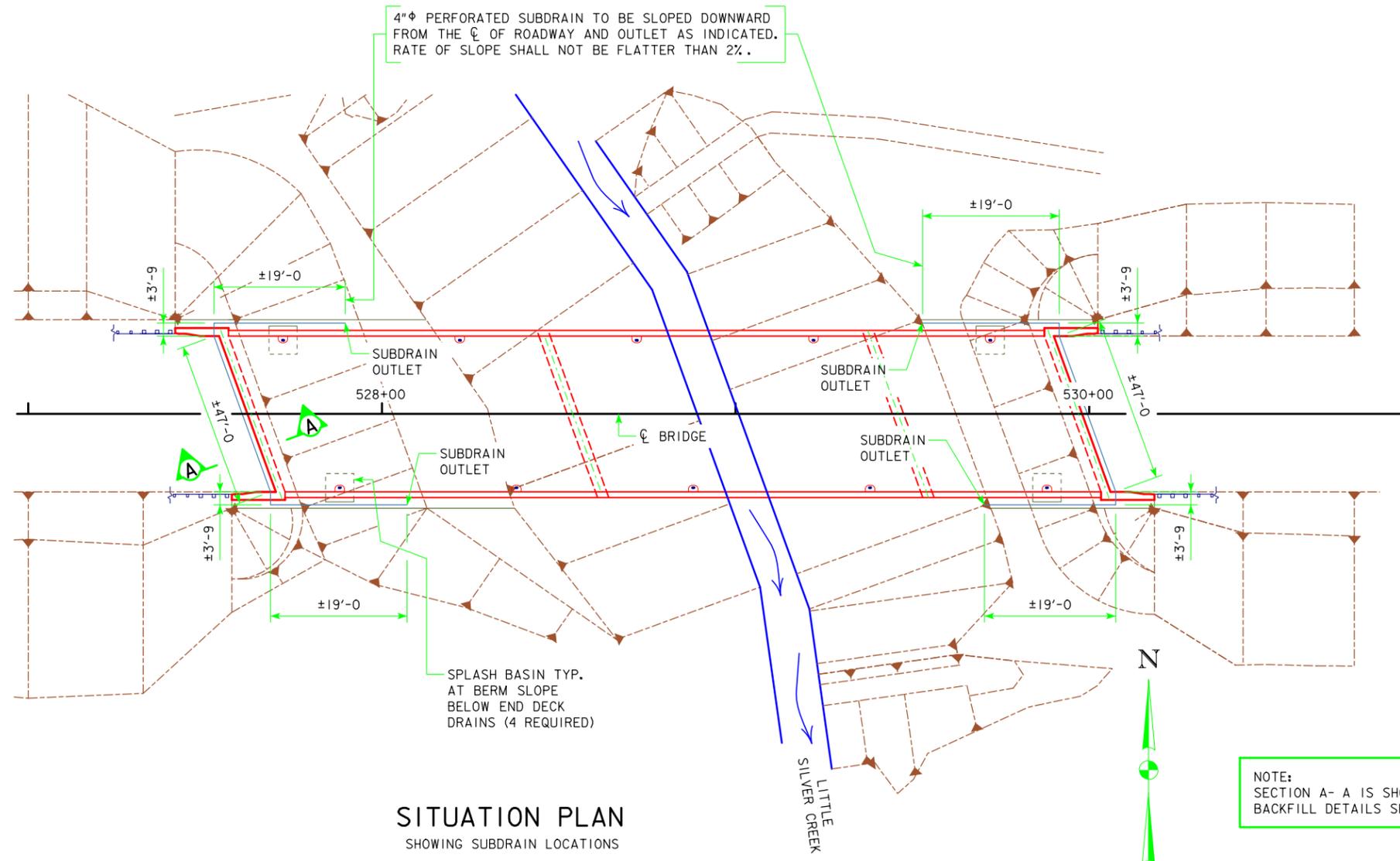
SPLASH BASINS SHALL BE REQUIRED BELOW DECK DRAINS THAT OUTLET OVER THE EROSION STONE BERM SLOPE (4 SPLASH BASINS REQUIRED). ALL COSTS FOR SPLASH BASINS SHALL BE INCIDENTAL TO THE BID ITEM FOR EROSION STONE.

SUBDRAIN NOTES :

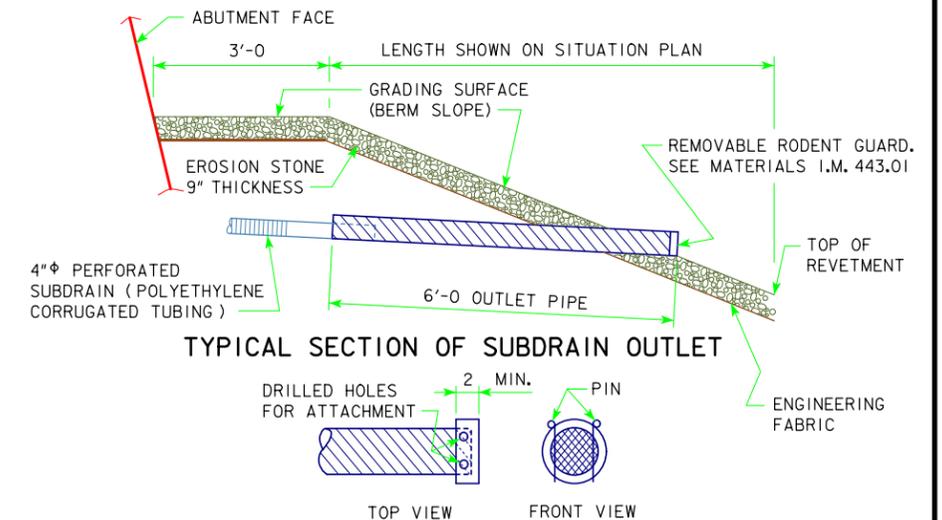
- THIS PLAN SHEET SHOWS DETAILS FOR PLACING SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.
- THE SUBDRAINS SHALL BE 4" IN DIAMETER AND SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS.
- THE SUBDRAIN OUTLET SHALL CONSIST OF A LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET. THE LENGTH OF THE OUTLET PIPE SHALL BE DETERMINED BY THE REVETMENT AND ITS PLACEMENT LOCATION. THE CONTRACTOR IS TO ENSURE THE OUTLET PIPE IS ADEQUATELY STRONG AND WILL NOT BE DAMAGED WHEN REVETMENT IS PLACED. A CHECK SHALL BE MADE AT THE SUBDRAIN OUTLET TO ENSURE THAT THE SUBDRAIN IS NOT DAMAGED AND IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS. A 6 INCH DIAMETER METAL OUTLET PIPE SHALL BE USED AND SHALL BE COUPLED TO THE 4 INCH DIAMETER SUBDRAIN IN ONE OF THE TWO FOLLOWING WAYS.
1. USE AN INSIDE FIT REDUCER COUPLER (COUPLER MUST BE INSERTED A MINIMUM OF 1'-0" INTO THE METAL OUTLET PIPE).
 2. INSERT 1'-0" OF THE 4" SUBDRAIN INTO THE 6" METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.
- THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "BRIDGE ABUTMENT FOOTING". NO EXTRA PAYMENT WILL BE MADE.
- THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

SUBDRAIN OUTLET ELEVATIONS	
LOCATION	ELEVATION
WEST ABUTMENT	±1099.22
EAST ABUTMENT	±1093.94

4"φ PERFORATED SUBDRAIN TO BE SLOPED DOWNWARD FROM THE C OF ROADWAY AND OUTLET AS INDICATED. RATE OF SLOPE SHALL NOT BE FLATTER THAN 2%.



**SITUATION PLAN
SHOWING SUBDRAIN LOCATIONS**



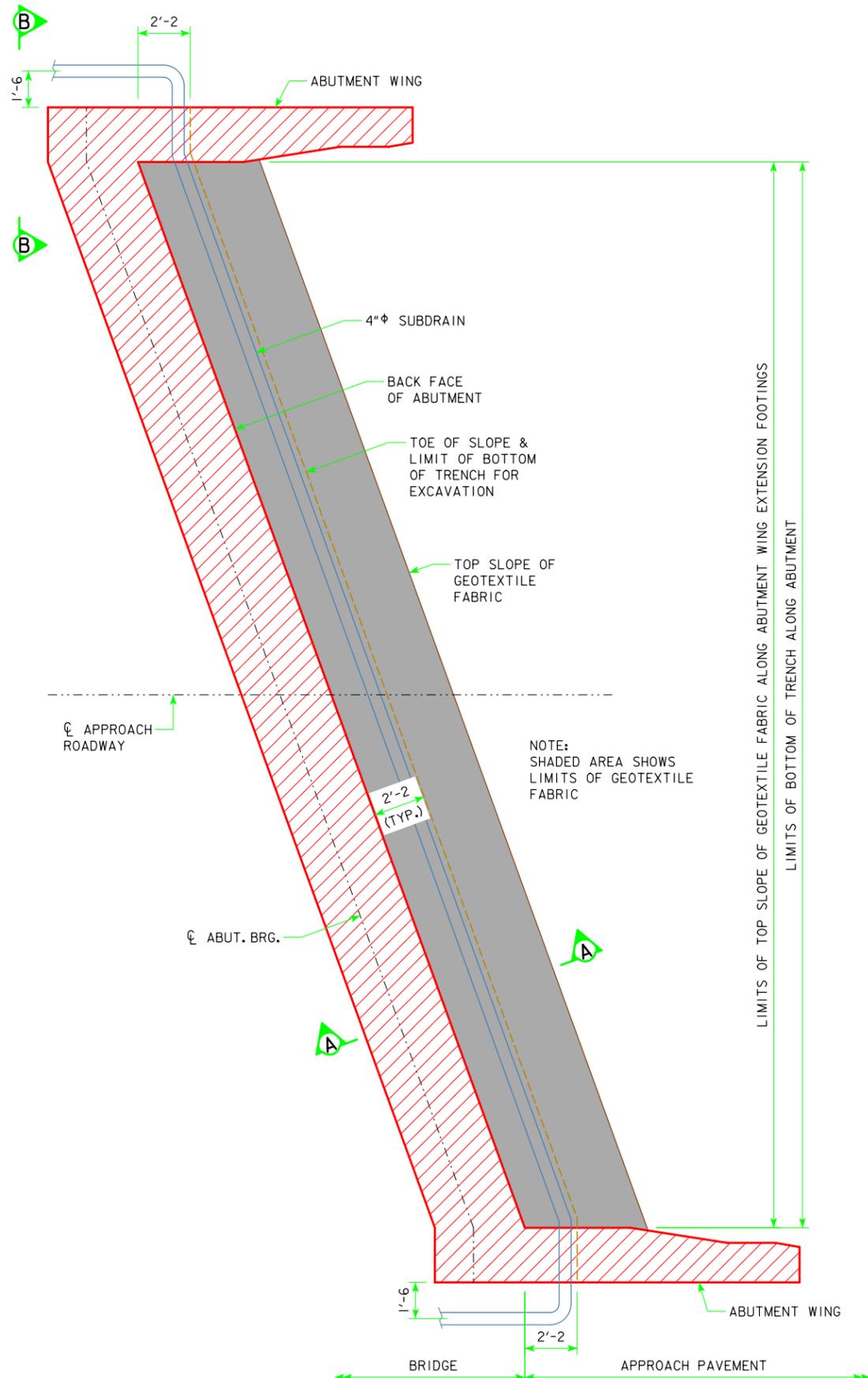
TYPICAL SECTION OF SUBDRAIN OUTLET
REMOVABLE RODENT GUARD DETAILS
EROSION STONE (EMBEDDED) OUTLET DETAILS

NOTE:
SECTION A- A IS SHOWN ON ABUTMENT BACKFILL DETAILS SHEET.

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
SUBDRAIN DETAILS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 54 OF 57 FILE NO. 30846 DESIGN NO. 115

REVISED 02-12 - THE 3'-0" TOP OF THE BERM SLOPE PROTECTION WAS CHANGED TO EROSION STONE FOR ALL SLOPE PROTECTION CONDITIONS. ENGLISH FORESLOPE PROTECTION BRIDGES.DGN 1007C - THIS SHEET ISSUED 06-02 FOR WATER CROSSINGS.

REVISED 04-12 - EXCAVATION LIMIT ON THE FRONT FACE OF THE ABUTMENT WAS CHANGED TO A 3'-0" LIMIT. THE APPROACH FILL WAS IDENTIFIED AS THE GRADING SURFACE. ENGLISHFORPROTECTIONBRIDGES.DGN - 1007E - THIS SHEET ISSUED 08-07.



ABUTMENT PLAN WITH WING EXTENSIONS

NOTE:
 SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM \bar{C} APPROACH ROADWAY WHEN OUTLETTING BOTH SIDES OF THE ABUTMENT.
 THE GEOTEXTILE FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01,B,6 OF THE STANDARD SPECIFICATIONS. IF THE ENGINEERING FABRIC IS LAPPED THE LAPS SHALL BE A MINIMUM OF ONE FOOT LENGTH, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.

ABUTMENT BACKFILL PROCESS:

THE BASE OF THE EXCAVATION SUBGRADE BEHIND THE ABUTMENT IS TO BE GRADED WITH A 4% SLOPE AWAY FROM THE ABUTMENT FOOTING AND A 2% CROSS SLOPE IN THE DIRECTION OF THE SUBDRAIN OUTLET. THIS EXCAVATION SHAPING IS TO BE DONE PRIOR TO BEGINNING INSTALLATION OF THE GEOTEXTILE AND BACKFILL MATERIAL.

AFTER THE SUBGRADE HAS BEEN SHAPED, THE GEOTEXTILE FABRIC SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS SHOWN. THE FABRIC IS INTENDED TO BE INSTALLED IN THE BASE OF THE EXCAVATION AND EXTENDED VERTICALLY UP THE ABUTMENT BACKWALL, ABUTMENT WING WALLS, AND EXCAVATION FACE TO A HEIGHT THAT WILL BE APPROXIMATELY 1 TO 2 FOOT HIGHER THAN THE HEIGHT OF THE POROUS BACKFILL PLACEMENT AS SHOWN IN THE "BACKFILL DETAILS" ON THIS SHEET. THE STRIPS OF THE FABRIC PLACED SHALL OVERLAP APPROXIMATELY 1 FOOT AND SHALL BE PINNED IN PLACE. THE FABRIC SHALL BE ATTACHED TO THE ABUTMENT BY USING LATH FOLDED IN THE FABRIC AND SECURED TO THE CONCRETE WITH SHALLOW CONCRETE NAILS. THE FABRIC PLACED AGAINST THE EXCAVATION FACE SHALL BE PINNED.

WHEN THE FABRIC IS IN PLACE, THE SUBDRAIN SHALL BE INSTALLED DIRECTLY ON THE FABRIC AT THE TOE OF THE REAR EXCAVATION SLOPE. A SLOT WILL NEED TO BE CUT IN THE FABRIC AT THE POINT WHERE THE SUBDRAIN EXITS THE FABRIC NEAR THE END OF THE ABUTMENT WING WALL. NOTE THAT THE SUBDRAIN SHALL BE MAINTAINED A MINIMUM OF 1" ABOVE THE BOTTOM OF THE FOOTING NEAR THE ENDS OF THE ABUTMENT, EXCEPT AS REQUIRED TO DROP THE SUBDRAIN FOR INSTALLATION BELOW THE ABUTMENT WING.

POROUS BACKFILL IS THEN PLACED AND LEVELED, NO COMPACTION IS REQUIRED.

THE REMAINING WORK INVOLVES BACKFILLING WITH FLOODABLE BACKFILL, SURFACE FLOODING, AND VIBRATORY COMPACTION. THE FLOODABLE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FLOODABLE BACKFILL SHALL BE PLACED IN INDIVIDUAL LIFTS, SURFACE FLOODED, AND COMPACTED WITH VIBRATORY COMPACTION TO ENSURE FULL CONSOLIDATION. LIMIT THE LOOSE LIFTS TO NO MORE THAN 2 FEET OF THICKNESS.

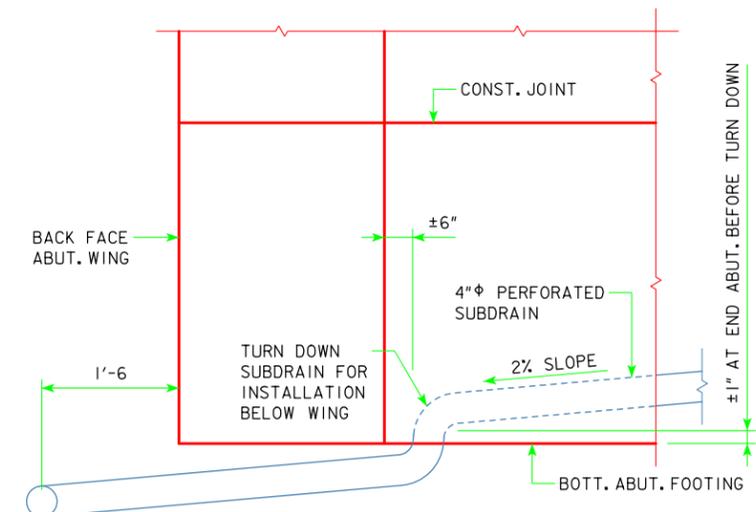
START SURFACE FLOODING FOR EACH FLOODABLE BACKFILL LIFT AT THE HIGH POINT OF THE SUBDRAIN AND PROGRESS TO THE LOW POINT WHERE THE SUBDRAIN EXITS THE FABRIC. TO ENSURE UNIFORM SURFACE FLOODING, WATER RUNNING FULL IN A 2-INCH DIAMETER HOSE SHOULD BE SPRAYED IN SUCCESSIVE 6-FOOT TO 8-FOOT INCREMENTS FOR 3 MINUTES WITHIN EACH INCREMENT.

FLOODABLE BACKFILL LIFT PLACEMENT, FLOODING, AND COMPACTION SHALL PROGRESS UNTIL THE REQUIRED FULL THICKNESS OF THE ABUTMENT BACKFILL HAS BEEN COMPLETED.

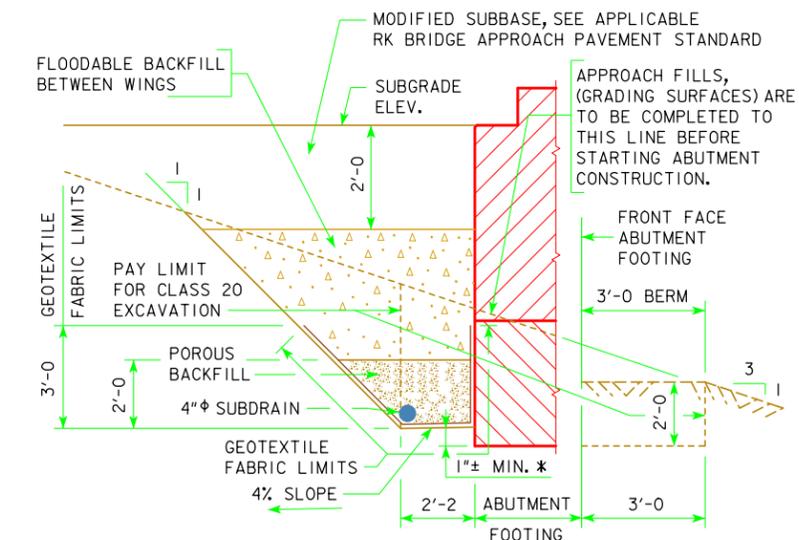
WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT PRICE BID FOR "BRIDGE ABUTMENT FOOTING".

NOTE:
 SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.



SECTION B-B
 (SUBDRAIN DETAIL AT ABUT. WING)



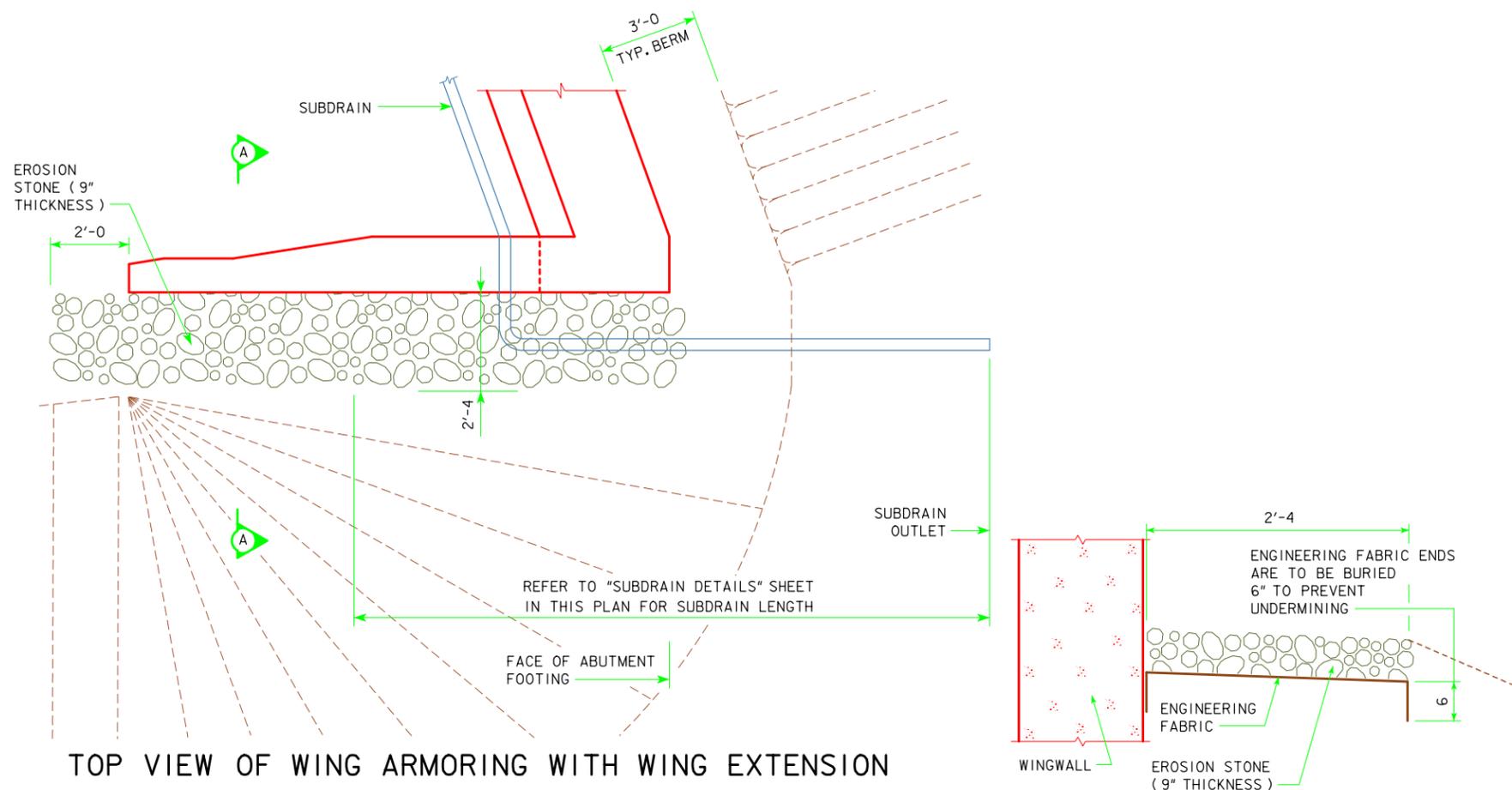
SECTION A-A
BACKFILL DETAILS

NOTE: GEOTEXTILE FABRIC WILL BE ATTACHED TO FACE OF ABUTMENT FOOTING AND WINGS.

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

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 BACKFILL DETAILS
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 55 OF 57 FILE NO. 30846 DESIGN NO. 115

REVISED 07-11 - THE LABELING OF THE BERM SLOPE IS IDENTIFIED AS 'GRADING SURFACE'. MACADAM STONE WAS CHANGED TO EROSION STONE. ENGLISHFORSLOPEPROTECTIONBRIDGES.DGN 1005A - THIS SHEET ISSUED 06-02.



TOP VIEW OF WING ARMORING WITH WING EXTENSION

SECTION A-A

A CHECK SHALL BE MADE AT THE SUBDRAIN OUTLET TO ENSURE THAT IT IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS.

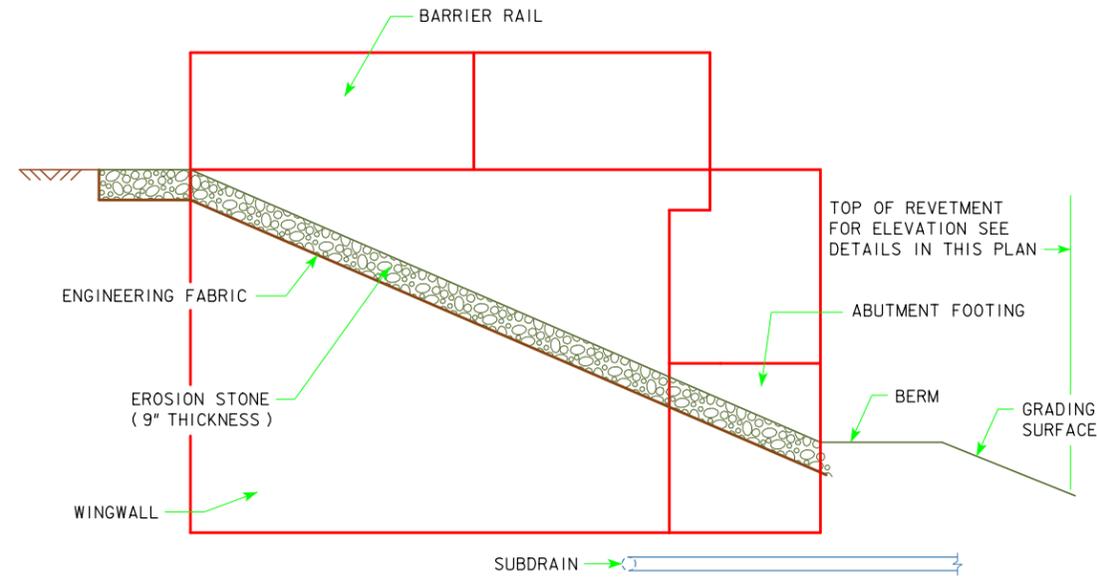
GENERAL NOTES:

EROSION STONE SHALL BE PLACED ALONG THE SIDES OF THE WINGS AND ABUTMENT FOOTING AS SHOWN IN SECTION A-A. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE EROSION STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

THE EROSION STONE SHALL BE IN ACCORDANCE WITH SECTION 4130, OF THE STANDARD SPECIFICATIONS. MATERIAL PASSING THE 3 INCH SCREEN BUT 100% RETAINED ON A 1 INCH SCREEN MAY BE USED AS CHOKE STONE.

THE EROSION STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM 9" DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

PAYMENT FOR THE BRIDGE WING ARMORING WILL BE BID PER SQUARE YARD. COST WILL INCLUDE ENGINEERING FABRIC, EROSION STONE, EXCAVATION, SHAPING, AND COMPACTION TO DIMENSIONS SHOWN IN THESE PLANS. BID ITEM SHALL BE "BRIDGE WING ARMORING - EROSION STONE".



PROFILE VIEW OF WING ARMORING WITH WING EXTENSION
(INTEGRAL ABUTMENT WITH WING EXTENSIONS)

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

BRIDGE WING ARMORING

STA. 528+80.00 IA 92 OCTOBER, 2014

POTTAWATTAMIE COUNTY

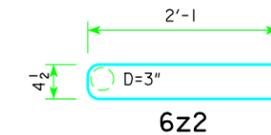
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 56 OF 57 FILE NO. 30846 DESIGN NO. 115

REINFORCING BAR LIST (NON-COATED)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5z1	JOINT MOCKUP, LONGITUDINAL		10	15'-8"	163
6z2	JOINT MOCKUP, TRANSVERSE, HAIRPIN		32	4'-7"	220
TOTAL (LBS.)					383

BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT-TO-OUT. "D" = PIN DIAMETER.

JOINT MOCKUP NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO CONSTRUCT AN ULTRA HIGH PERFORMANCE CONCRETE (UHPC) JOINT MOCKUP, AS DETAILED IN THESE PLANS, TO DEMONSTRATE JOINT SURFACE PREPARATION AND UHPC FORMING AND PLACEMENT OPERATIONS. THE UHPC JOINT MOCKUP SHALL BE AVAILABLE FOR REVIEW AND APPROVAL BY THE ENGINEER NO LESS THAN 28 CALENDAR DAYS PRIOR TO SCHEDULED DATE OF UHPC PLACEMENT FOR THE BRIDGE SUPERSTRUCTURE MODULES. FINAL PREPARED (ROUGHENED) JOINT SURFACES MUST BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO PLACEMENT OF UHPC WITHIN THE MOCKUP. REPRESENTATIVES OF THE ENGINEER AND MANUFACTURER SHALL BE PRESENT DURING PLACEMENT OF THE UHPC WITHIN THE MOCKUP.

PRECAST CONCRETE JOINT SURFACES SHALL BE TEXTURED TO A MINIMUM OF ICRI "CONCRETE SURFACE PROFILE 6" OR ROUGHER. METHODS TO ACHIEVE JOINT SURFACE TEXTURE SHALL MATCH THE METHODS INTENDED FOR USE ON THE SUPERSTRUCTURE MODULES. REFER TO NOTES ON DESIGN SHEET 28 FOR ADDITIONAL DETAILS.

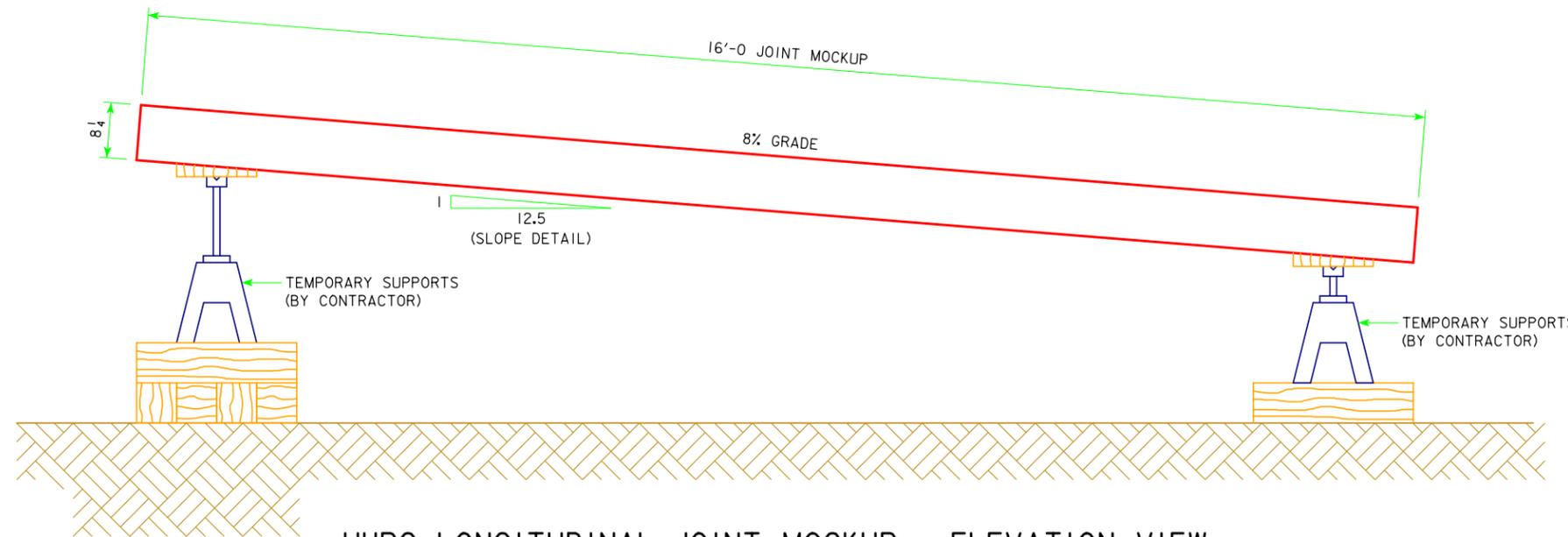
METHODS AND MATERIALS FOR FORMING AND PLACING THE MOCKUP UHPC JOINT SHALL MATCH THOSE INTENDED FOR USE ON THE SUPERSTRUCTURE MODULES.

THE UHPC JOINT MOCKUP SHALL BE SUPPORTED ABOVE GRADE AND CONSTRUCTED ON A MINIMUM 8% SLOPE DURING UHPC PLACEMENT IN EFFORT TO PARTIALLY SIMULATE THE CONDITIONS AND FORM PRESSURES THAT MIGHT OCCUR DURING PLACEMENT OF UHPC FOR THE SUPERSTRUCTURE MODULES. (NOTE THAT FORM PRESSURES DURING SUPERSTRUCTURE CONSTRUCTION WILL LIKELY EXCEED FORM PRESSURES DURING MOCKUP CONSTRUCTION.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AN APPROPRIATE MEANS TO SUPPORT THE MOCKUP DURING DEMONSTRATION UHPC PLACEMENT.

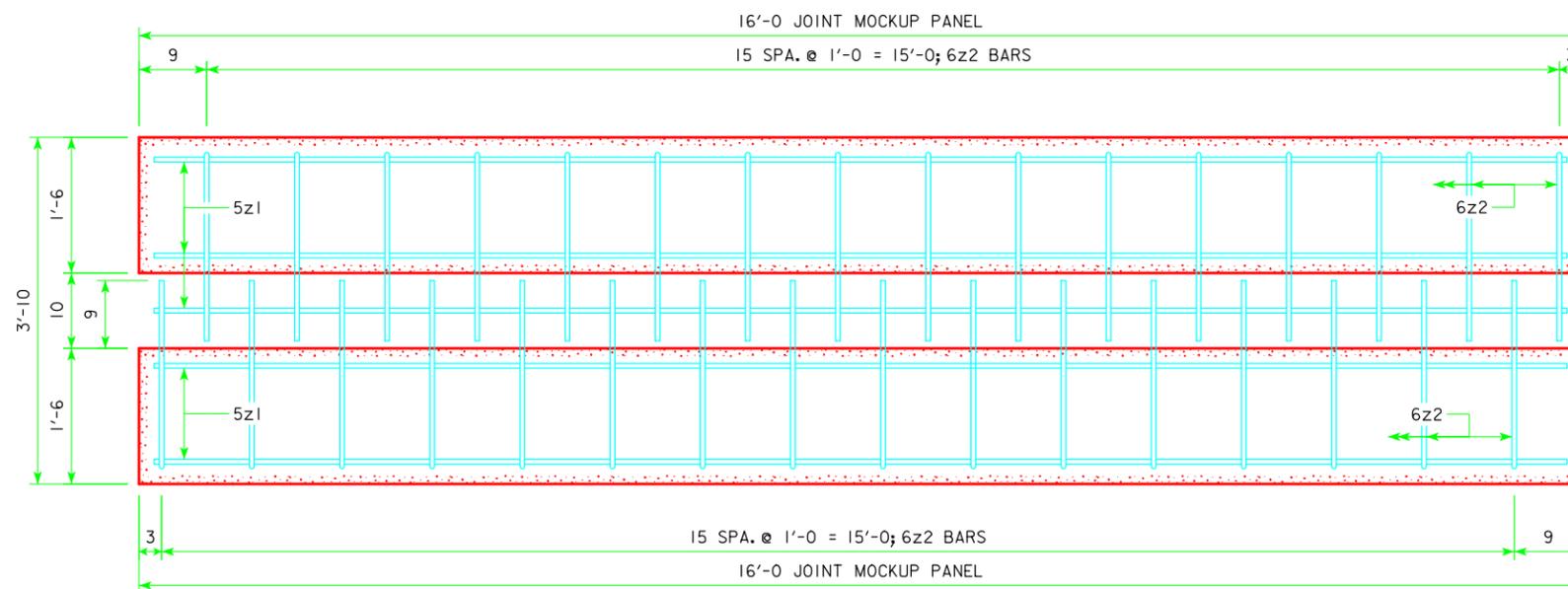
FOLLOWING SET OF THE UHPC AND DEVELOPMENT OF SUFFICIENT STRENGTH, THE COMPLETED JOINT MOCKUP SHALL BE CUT TRANSVERSELY BY THE CONTRACTOR AT TWO LOCATIONS, TO BE DETERMINED BY THE ENGINEER, TO ALLOW FOR VISUAL INSPECTION BY THE ENGINEER OF THE JOINT INTERFACE AND MATERIAL BOND.

ALL COSTS ASSOCIATED WITH CONSTRUCTION OF THE JOINT MOCKUP SHALL BE INCIDENTAL TO THE LUMP SUM PRICE BID FOR "DEMONSTRATION UHPC JOINT".

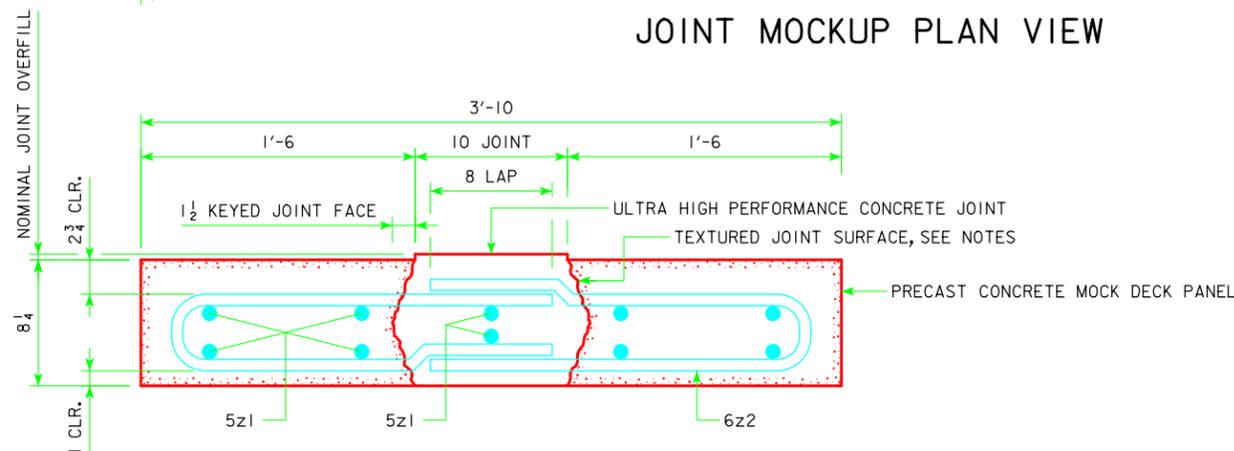
FOLLOWING DOT ACCEPTANCE, THE JOINT MOCKUP SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE PROJECT SITE PRIOR TO COMPLETION OF CONSTRUCTION ACTIVITIES.



UHPC LONGITUDINAL JOINT MOCKUP - ELEVATION VIEW
(TEMPORARY SUPPORTS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY)



JOINT MOCKUP PLAN VIEW



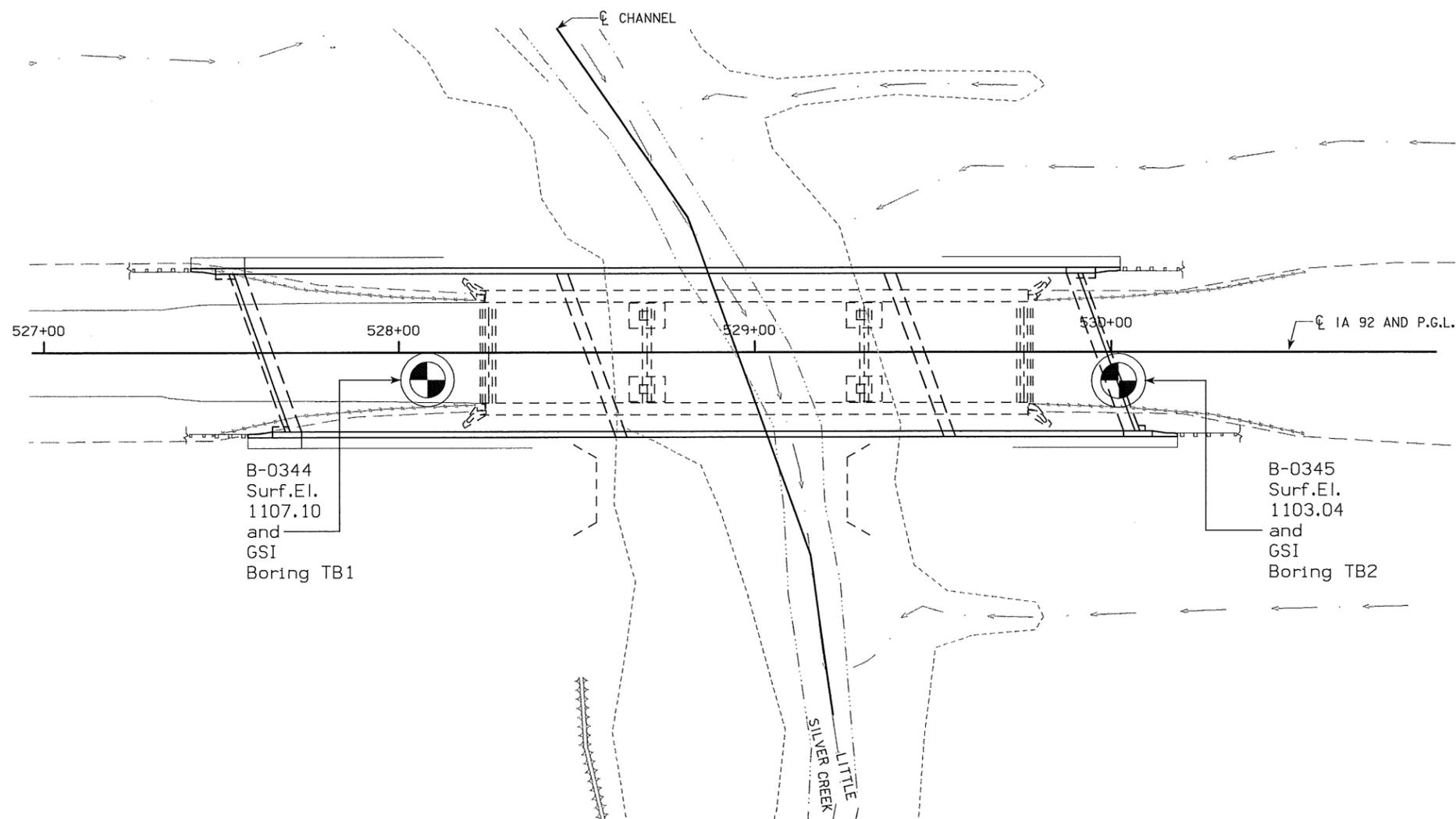
TYPICAL SECTION THROUGH JOINT MOCKUP

CONCRETE PLACEMENT SUMMARY

ITEM	TOTAL (CY)
HIGH PERFORMANCE STRUCTURAL CONCRETE (MOCK DECK PANELS)	1.2
ULTRA HIGH PERFORMANCE CONCRETE (JOINT)	0.4

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
DEMONSTRATION UHPC JOINT
 STA. 528+80.00 IA 92 OCTOBER, 2014
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 57 OF 57 FILE NO. 30846 DESIGN NO. 115

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.



LOCATION

IA 92 OVER LITTLE SILVER CREEK
T-74N R-42W
SECTION 2&11
KEG CREEK TOWNSHIP
POTTAWATTAMIE COUNTY
BRIDGE MAINT. NO. 7816.6S092
LATITUDE 41.232779°
LONGITUDE -95.634139°

Boring No.	Date Drilled	GroundWater Level (Ft.)
B-0344	05/23/2012	WASH BORE
B-0345	05/23/2012	28.0

Boring No.	Date Drilled	Ground Water Level (Ft.)	
		while drilling	after drilling
TB1	4/15 - 4/16/2014	WASH BORE	BACKFILLED
TB2	4/16 - 4/18/2014	WASH BORE	BACKFILLED

GEOTECHNICAL DESIGN



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: *Robert L. Stanley* Date: 6-2-14
Printed or Typed Name: Robert L. Stanley

My license renewal date is December 31, 2014.

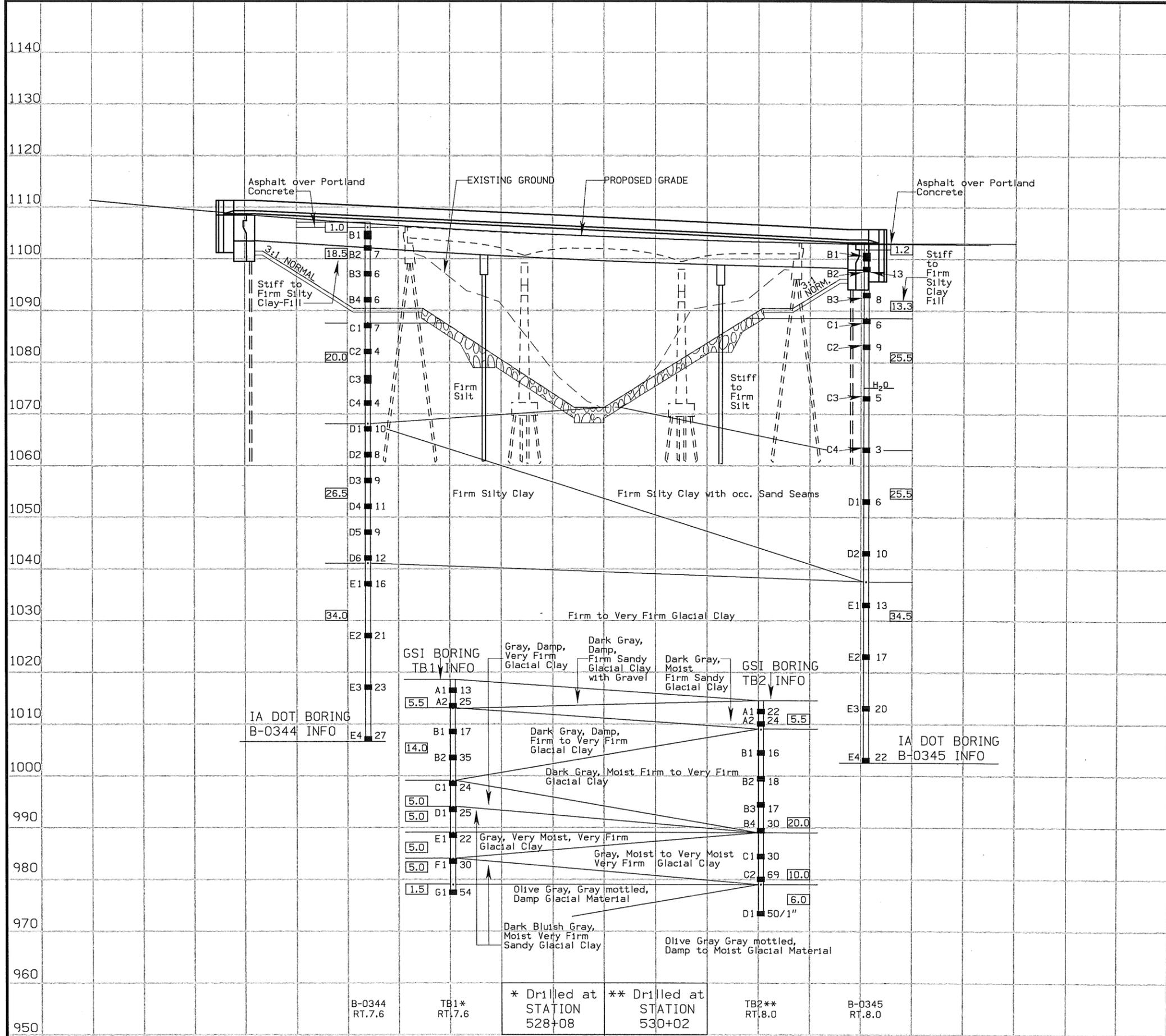
Pages or sheets covered by this seal: SPS.1 and SPS.2

DESIGN FOR 20° SKEW (R.A.)
234'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

91'-0 & 51'-0 END SPANS (BTC BEAM) 92'-0 INTERIOR SPAN

SOIL PROFILE SHEET
STATION 528+80.00 IA 92 APRIL 2013
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 2 FILE NO. 30846 DESIGN NO. 115



LOCATION

IA 92 OVER LITTLE SILVER CREEK
 T-74N R-42W
 SECTION 2&11
 KEG CREEK TOWNSHIP
 POTTAWATTAMIE COUNTY
 BRIDGE MAINT. NO. 7816.6S092
 LATITUDE 41.232779°
 LONGITUDE -95.634139°

Note: **13.3** Indicates Layer Thickness

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

SHELBY TUBE CORE DATA

CORE NO.	B-0344-B1	B-0344-C3	B-0345-B1
CLASSIFICATION [AASHTO]	A-6(23)	A-7-6(24)	A-7-6(20)
COEFF. CONSOL. SQ. FT / DAY	0.172	0.157	1.538
TRIAXIAL COMPRESSION	CU*	CU	CU*
COHESION - PSF	839	371	536
FRICTION COEFF.	0.263	0.20	0.233
MOISTURE CONTENT %	19.5	24.3	22.4
DRY DENSITY - PCF	115.3	93.6	112.0
CU-CONSOLIDATED UNDRAINED TRIAXIAL			
CU* - CU WITHOUT SATURATION OR PORE PRESSURE MEASUREMENTS			

WATER	BLOW COUNT LAYER - NO. BLOWS B2 5	LEGEND SOILS BOOK NO. --- SOIL REMEDIATION AREA LIMESTONE (L.S.) BROKEN & WEATHERED L.S. SANDSTONE SHALE SANDY SOIL
DRY	PLUGGED	
MOISTURE	SHELBY	DIAMOND CORE
DENS. CORE	BLOW COUNT	SAND
SAMPLE	DENS. CORE	GRAVELLY SAND
	SAMPLE	BOULDERS

DESIGN FOR 20° SKEW (R.A.)
234'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 91'-0 & 51'-0 END SPANS (BTC BEAM) 92'-0 INTERIOR SPAN
SOIL PROFILE SHEET
 STATION 528+80.00 IA 92 APRIL 2013
POTTAWATTAMIE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 2 OF 2 FILE NO. 30846 DESIGN NO. 115

GSI BORING TB1 INFO

A1 13
 A2 25
 B1 17
 B2 35
 C1 24
 D1 25
 E1 22
 F1 30
 G1 54

GSI BORING TB2 INFO

A1 22
 A2 24
 B1 16
 B2 18
 B3 17
 B4 30
 C1 30
 C2 69
 D1 50/1"

Gray, Damp, Very Firm Glacial Clay
 Dark Gray, Damp, Firm Sandy Glacial Clay with Gravel
 Dark Gray, Moist Firm to Very Firm Glacial Clay
 Dark Gray, Moist Firm to Very Firm Glacial Clay
 Gray, Very Moist, Very Firm Glacial Clay
 Gray, Moist to Very Moist Very Firm Glacial Clay
 Olive Gray, Gray mottled, Damp Glacial Material
 Dark Bluish Gray, Moist Very Firm Sandy Glacial Clay
 Olive Gray Gray mottled, Damp to Moist Glacial Material

B-0344 RT.7.6 TB1* RT.7.6 * Drilled at STATION 528+08 ** Drilled at STATION 530+02 TB2** RT.8.0 B-0345 RT.8.0

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
B Sheets	Typical Cross Sections and Details
B.1 - 2	Typical Cross Sections and Details
C Sheets	Quantities and General Information
C.1	Project Description
C.1	Estimated Project Quantities
C.2 - 3	Estimate Reference Information
C.4	Pollution Prevention Plan
C.5	Standard Road Plans
C.5	Index of Tabulations & General Notes
C.6 - 10	Tabulations
CS Sheets	Soils Information
CS.1	Soils Tabulations
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	IA 92 Mainline
* D.3	Letdowns - Northeast & Northwest
* D.4	Letdown - Southeast
E Sheets	Side Road Plan and Profile Sheets
* E.1	Channel
G Sheets	Survey Sheets
G.1 - 2	Reference Ties and Bench Marks
G.3	Horizontal Control Tab. & Super for all Alignments
H Sheets	Right-of-Way Sheets
* H.1	IA 92
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
J.1	Coordinated Operations
J.1	511 Travel Restrictions
* J.2	Detour Map
T Sheets	Earthwork Quantity Sheets
T.1	Earthwork Quantity Sheet
W Sheets	Mainline Cross Sections
W.1	Cross Section Legend & Symbol Information Sheet
W.2 - 14	Mainline Cross Sections
X Sheets	Channel Cross Sections
X.1 - 4	Side Road Cross Sections
	* Color Plan Sheets

ROADWAY DESIGN



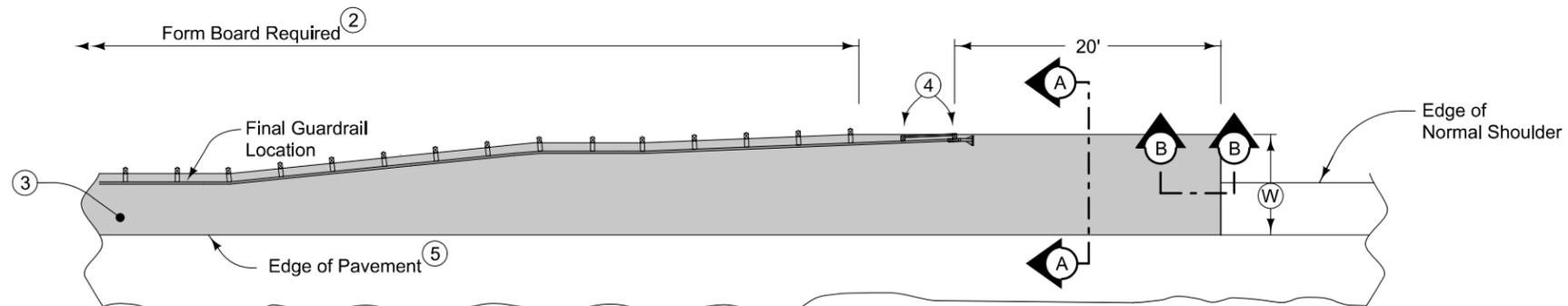
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.


10-02-2014
 Signature Date

Jason M. Holst
 Printed or Typed Name

My license renewal date is December 31, 2015

Pages or sheets covered by this seal: A1, B1-B2, C1-C10, D1-D4, E1, G1-G3, H1, J1-J2, T1, W1-W14, X1-X4

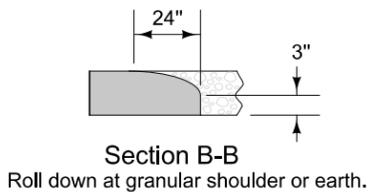
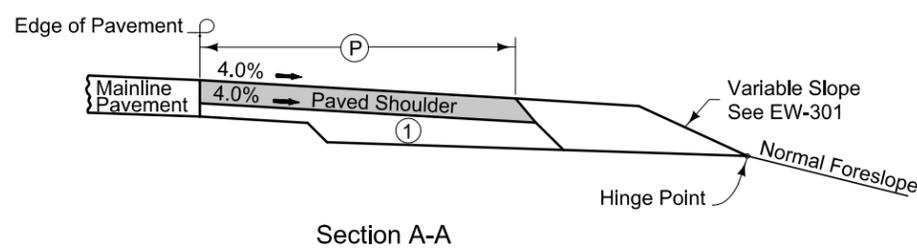
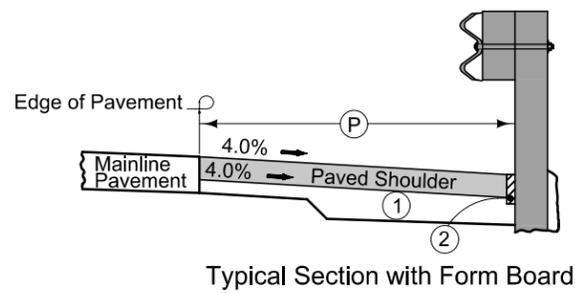


6" HMA Paved Shoulder at guardrail. 7" PCC may be substituted with the following jointing layout:

Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at W/2 from edge of mainline pavement when W is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

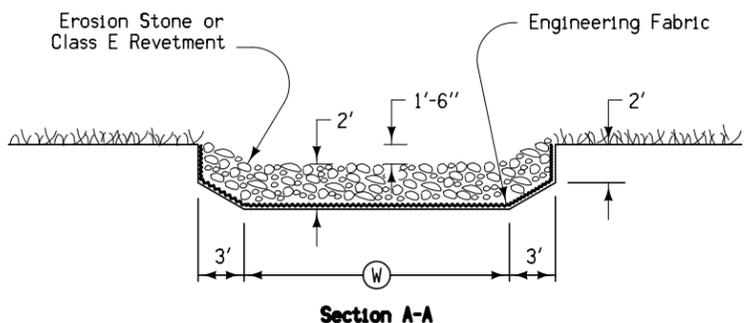
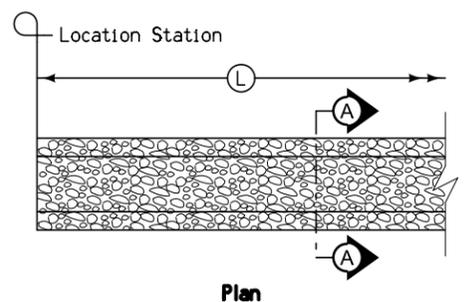
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal & reinstallation of guardrail will be allowed with no additional payment.

Refer to Shoulder tabulation (112-9) for quantities.



- ① 6" subgrade treatment. (Special Backfill)
- ② When guardrail posts are installed prior to construction of paved shoulder, nail 1" x 6" untreated form boards along the face of guardrail posts for the length shown. This board is to prevent shoulder material from contacting the sides of the posts and altering the function of the guardrail. Form board not required for final 2 posts.
- ③ Continue paved shoulder to existing paved shoulder or 20' beyond the end of guardrail.
- ④ Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement.
- ⑤ 'KT-1' joint for PCC shoulder. 'B' joint for HMA shoulder.

PAVED SHOULDER AT GUARDRAIL



Refer to Tabulation 100-23 for additional information.

ROCK DITCH

100-1D
10-18-05

PROJECT DESCRIPTION

Project includes removal and replacement of the Iowa 92 bridge over Little Silver Creek including constructing new bridge approaches and replacement of the of the existing guardrail with new guardrail.

Traffic on IA 92 will be maintained at all times via an off-site detour.

100-0A
10-28-97

**ESTIMATED ROADWAY QUANTITIES
(1 DIVISION PROJECT)**

Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2101-0850001	CLEARING AND GRUBBING	ACRE	0.9	
2	2102-0425070	SPECIAL BACKFILL	TON	260.2	
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	9,666.0	
4	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS	CY	10.0	
5	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	1,918.0	
6	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	44.0	
7	2122-5190501	PAVED SHOULDER, PORTLAND CEMENT CONCRETE (PAVED SHOULDER PANEL FOR BRIDGE END DRAIN)	SY	21.2	
8	2122-5500060	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 6 IN.	SY	634.2	
9	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	4.50	
10	2301-0690200	BRIDGE APPROACH, RK-20	SY	552.6	
11	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE	SY	1,533.2	
12	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.	LF	20.0	
13	2502-8220196	SUBDRAIN OUTLET, RF-19E	EACH	2	
14	2503-0500400	BRIDGE END DRAIN, RF-40	EACH	2	
15	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	300.0	
16	2505-4008300	STEEL BEAM GUARDRAIL	LF	125.0	
17	2505-4008400	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION	EACH	4	
18	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EACH	4	
19	2505-4021700	STEEL BEAM GUARDRAIL END TERMINAL	EACH	4	
20	2507-3250005	ENGINEERING FABRIC	SY	184.5	
21	2507-8029000	EROSION STONE	TON	119.5	
22	2510-6745850	REMOVAL OF PAVEMENT	SY	686.8	
23	2518-6910000	SAFETY CLOSURE	EACH	4	
24	2520-3350015	FIELD OFFICE	EACH	1	
25	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	
26	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	14.46	
27	2528-8445110	TRAFFIC CONTROL	LS	1.00	
28	2528-8445113	FLAGGERS	EACH	See Proposal	
29	2601-2634100	MULCHING	ACRE	2.7	
30	2601-2636015	NATIVE GRASS SEEDING	ACRE	2.6	
31	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING	ACRE	2.7	
32	2601-2643110	WATERING FOR SOD, SPECIAL DITCH CONTROL, OR SLOPE PROTECTION	MGAL	13.20	
33	2601-2643300	MOBILIZATION FOR WATERING	EACH	3	
34	2601-2643412	TURF REINFORCEMENT MAT, TYPE 2	SQ	65.6	
35	2602-0000020	SILT FENCE	LF	1,295.0	
36	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	165.0	
37	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	1,146.0	
38	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	115.0	
39	2602-0000212	FLOATING SILT CURTAIN (HANGING)	LF	560.0	
40	2602-0000240	MAINTENANCE OF FLOATING SILT CURTAIN	LF	280.0	
41	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.	LF	400.0	
42	2602-0000320	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA.	LF	400.0	
43	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	LF	800.0	
44	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EACH	1	
45	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL	EACH	1	

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	2101-0850001	CLEARING AND GRUBBING Quantity estimated from 'Square Yard' area shown within excavation limits on 'D' Sheets.
2	2102-0425070	SPECIAL BACKFILL Refer to typicals on 'B' Sheets and Tab. 112-9.
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW Refer to 'T' Sheets. Includes 6316 cu. yds. of Class 10 to be wasted.
4	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS Refer to Tab. 103-7 on 'CS' Sheets.
5	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD Refer to Tab. 104-3.
6	2121-7425020	GRANULAR SHOULDERS, TYPE B Refer to Typ. 7135M in the 'B' Sheets.
7	2122-5190501	PAVED SHOULDER, PORTLAND CEMENT CONCRETE (PAVED SHOULDER PANEL FOR BRIDGE END DRAIN) Refer to Tab. 104-8A.
8	2122-5500060	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 6 IN. Refer to Typical 7156 and Tab 112-9 for location and details.
9	2123-7450000	SHOULDER CONSTRUCTION, EARTH Requires 92 cu. yds. of topsoil for Earth Shoulder Fill.
10	2301-0690200	BRIDGE APPROACH, RK-20 Refer to Tab. 112-6. Pavement width shall be 28' in the single reinforced and non-reinforced areas.
11	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE Refer to Tab. 100-28.
12	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.
13	2502-8220196	SUBDRAIN OUTLET, RF-19E Refer to Tab. 104-9 on 'CS' Sheet.
14	2503-0500400	BRIDGE END DRAIN, RF-40 Refer to Tab. 104-8A.
15	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL Refer to Tab. 110-7A.
16	2505-4008300	STEEL BEAM GUARDRAIL
17	2505-4008400	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION
18	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED
19	2505-4021700	STEEL BEAM GUARDRAIL END TERMINAL Refer to Tab. 108-8A in the 'C' Sheets for quantities.
20	2507-3250005	ENGINEERING FABRIC Refer to Typical 4402 and Tab. 100-23.
21	2507-8029000	EROSION STONE To be placed in bottom of NW ditch outside the placement of the rip-rap. Refer to Typical 4402 and Tab. 100-23
22	2510-6745850	REMOVAL OF PAVEMENT Refer to Tab. 110-1. Pavement removal is for existing HMA/PCC composite pavement and bridge approaches.
23	2518-6910000	SAFETY CLOSURE Refer to Tab. 108-13A.
24	2520-3350015	FIELD OFFICE
25	2526-8285000	CONSTRUCTION SURVEY
26	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED Refer to Tab. 108-22.
27	2528-8445110	TRAFFIC CONTROL Refer to Sheet J.1.
28	2528-8445113	FLAGGERS - -

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
29	2601-2634100	MULCHING Mulching per Article 2601.03, E, 2. Anchor mulch into the soil using mulch anchoring equipment with a minimum of two passes. Included for areas requiring reshaping and seedbed preparation. Mulch shall be Certified Noxious Weed Seed Free Mulch as certified by the Iowa Crop Improvement Association or adjacent states Crop Improvement Associations. Mulch Rate: 1 1/2 tons of dry cereal straw or native grass straw per acre.
30	2601-2636015	NATIVE GRASS SEEDING All areas outside eight feet adjacent to shoulder shall be seeded with "Native Grass Seeding". All seed for "Native Grass Seeding" will be supplied and mixed by the contractor according to Article 2601.03, B, 4, c and installed according to Article 2601.03, C, 5. All forb seed will be applied through the native grass drill wildflower or small seed box. Forb seed will not be allowed to be mixed and applied with the native grass seed. Cover crop will be required to be applied through the cool season or cover crop seed box. The cover crop seed will not be allowed to be mixed and applied with the native grass seed. Drill shall be calibrated prior to operation at the project site to the specified seeding rate for the project and witnessed by the contracting authority. The Engineer will review the limits prior to seeding with the Contractor.
31	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING Included for disturbed areas as directed by the Engineer. All disturbed areas shall be seeded and fertilized per Article 2601.03, C, 1.
32	2601-2643110	WATERING FOR SOD, SPECIAL DITCH CONTROL, OR SLOPE PROTECTION Estimate based on four waterings at a rate of 50 gallons per square. The contractor shall water the required areas no later than the day following placement of the 'Special Ditch Control'. If the Contractor fails to water by the second day following placement, a price adjustment will be assessed at a rate of \$200.00 per calendar day until the watering has been completed. Additional waterings will be required at intervals of 5 to 8 calendar days. Perform all waterings unless notified by the Engineer in writing at least 1 calendar day prior to the day the watering is to occur. If the Contractor fails to complete the watering before the 8th calendar day has elapsed a price adjustment will be assessed at a rate of \$200.00 per calendar day, beginning on the 9th day, until the watering is completed.
33	2601-2643300	MOBILIZATION FOR WATERING
34	2601-2643412	TURF REINFORCEMENT MAT, TYPE 2 Refer to Tab. 100-22 for locations. Refer to Standard Road Plan EC-101. Install according to article 2601.03, H, 3 The seed and and rate for the TRM application shall be as described in Table 2601.03-7 Ditches-Outside Shoulder Adjacent to Native Grass Seedings
35	2602-0000020	SILT FENCE Refer to Tab. 100-17. The tabulation includes estimated locations for placement of "Silt Fence" to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.
36	2602-0000030	SILT FENCE FOR DITCH CHECKS Refer to Tab 100-18. The tabulation includes estimated locations for placement of "Silt Fence for Ditch Checks" to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 50% additional quantity for field adjustments and replacements.
37	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS This item is included for silt fence and silt fence for ditch check removal required during constuction to allow for replacement (replacement to be paid separately), or for areas that have achieved 70% permanent growth.
38	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK This item is included for clean-out and repair of the silt fence and silt fence for ditch checks during construction.
39	2602-0000212	FLOATING SILT CURTAIN (HANGING) Refer to Tab. 100-10.
40	2602-0000240	MAINTENANCE OF FLOATING SILT CURTAIN

POLLUTION PREVENTION PLAN

This Base Pollution Prevention Plan (PPP) includes information on Roles and Responsibilities, Project Site Description, Controls, Maintenance Procedures, Inspection Requirements, Non-Storm Water Controls, Potential Sources of Off Right-of-Way Pollution, and Definitions. This plan references other documents rather than repeating the information contained in the documents. A copy of this Base Pollution Prevention Plan, amended as needed per plan revisions or by contract modification, will be readily available for review.

All contractors shall conduct their operations in a manner that controls pollutants, minimizes erosion, and prevents sediments from entering waters of the state and leaving the highway right-of-way. The prime contractor shall be responsible for compliance and implementation of the PPP for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.

I. ROLES AND RESPONSIBILITIES**A. Designer:**

1. Prepares Base PPP included in the project plan.
2. Prepares Notice of Intent (NOI) submitted to Iowa DNR.
3. Signature authority on the Base PPP and NOI.

B. Contractor/Subcontractor:

1. Affected contractors/subcontractors are co-permittees with the IDOT and will sign a certification statement adhering to the requirements of the NPDES permit and this PPP plan. All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.
2. Submit a detailed schedule according to Article 2602 of the Specifications and any additional plan notes.
3. Install and maintain appropriate controls.
4. Supervise and implement good housekeeping practices.
5. Conduct joint required inspections of the site with inspection staff.
6. Signature authority on Co-Permittee Certification Statements and storm water inspection reports.

C. RCE/Inspector:

1. Update PPP whenever there is a change in design, construction, operation or maintenance, which has a significant effect on the discharge of pollutants from the project.
2. Maintain an up-to-date list that identifies contractors and subcontractors as co-permittees.
3. Make these plans available to the DNR upon their request.
4. Conduct joint required inspections of the site with the contractor/subcontractor.
5. Complete an inspection report after each inspection.
6. Signature authority on storm water inspection reports and Notice of Discontinuation (NOD).

II. PROJECT SITE DESCRIPTION

- A. This Pollution Prevention Plan (PPP) is for the construction of a 234' X 44' Pretensioned Prestressed Concrete Beam Bridge on Ia. 92 over Little Silver Creek 0.3 miles west of County Road L-55 in Pottawattamie County.
- B. This PPP covers approximately 3.6 acres with an estimated 2.7 acres being disturbed. The portion of the PPP covered by this contract has 2.7 acres disturbed.
- C. The PPP is located in an area of two soil associations (Marshall-Shelby and Monona-Ida-Napier). The estimated average SCS runoff curve number for this PPP after completion will be 62.
- D. Storm Water Site Map - Multiple sources of information comprise the base storm water site map including:
 1. Drainage patterns - Plan and Profile sheets and Situation plans.
 2. Proposed Slopes - Cross Sections.
 3. Areas of Soil Disturbance - construction limits shown on Plan and Profile sheets.
 4. Location of Structural Controls - Tabulations on C sheets.
 5. Locations of Non-structural Controls - Tabulations on C sheets.
 6. Locations of Stabilization Practices - generally within construction limits shown on Plan and Profile sheets.
 7. Surface Waters (including wetlands) - Plan and Profile sheets.
 8. Locations where storm water is discharged - Plan and Profile sheets.
- E. The base site map is amended by contract modifications and progress payments of completed erosion control work.
- F. Runoff from this work will flow into Little Silver Creek.

III. CONTROLS

- A. The contractor's work plan and sequence of operations specified in Article 2602.03 for accomplishment of storm water controls should clearly describe the intended sequence of major activities and for each activity define the control measure and the timing during the construction process that the measure will be implemented.
- B. Preserve vegetation in areas not needed for construction.
- C. Section 2601 and 2602 of the Standard Specifications define requirements to implement erosion and sediment control measures. Actual quantities used may vary from the Base PPP and amendment of the plan will be documented via fieldbook entries or by contract modification. Additional erosion and sediment control items may be required as determined by the inspector and/or contractor during storm water monitoring inspections. If the work involved is not applicable to any contract items, the work will be paid for according to Article 1109.03 paragraph B.
 1. EROSION AND SEDIMENT CONTROLS
 - a. Stabilization Practices
 - 1) Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized.
 - 2) Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased.
 - 3) Temporary stabilizing seeding shall be completed as the disturbed areas are constructed. If construction activity is not planned to occur in a disturbed area for at least 21 days, the area shall be stabilized by temporary seeding or mulching within 14 days. Other stabilizing methods shall be used outside the seeding time period.
 - 4) Stabilization measures to be used for this project are located in the Estimated Project Quantities (100-1A) and Estimate Reference Information (100-4A) located on the C sheets of the plan. Additional items may be found in the Inspector's Daily Reports (IDR) or Contract Modifications.
 - b. Structural Practices
 - 1) Structural practices will be implemented to divert flows from exposed soils and detain or otherwise limit runoff and the discharge of pollutants from exposed areas of the site.
 - 2) Structural items to be used for this project are located in the Estimated Project Quantities (100-1A) and Estimate Reference Information (100-4A) located on the C sheets of the plan, as well as all other item specific Tabulations. Typical drawings detailing construction of the devices to be used on this project can be found on the B sheets of the plan or are referenced in the Standard Road Plans Tabulation.
 - c. Storm Water Management
 - 1) Measures shall be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404

POLLUTION PREVENTION PLAN

of the Clean Water Act.

2. OTHER CONTROLS

- a. Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.
 - 1) Vehicle Entrances and Exits - Construct and maintain entrances and exits to prevent tracking of sediments onto roadways.
 - 2) Material Delivery, Storage and Use - Implement practices to prevent discharge of construction materials during delivery, storage, and use.
 - 3) Stockpile Management - Install controls to reduce or eliminate pollution of storm water from stockpiles of soil and paving.
 - 4) Waste Disposal - Do not discharge any materials, including building materials, into waters of the state, except as authorized by a Section 404 permit.
 - 5) Spill Prevention and Control - Implement procedures to contain and clean-up spills and prevent material discharges to the storm drain system and waters of the state.
 - 6) Concrete Residuals and Washout Wastes - Designate temporary concrete washout facilities for rinsing out concrete trucks. Provide directions to truck drivers where designated washout facilities are located.
 - 7) Vehicle and Equipment Cleaning - Employ washing practices that prevent contamination of surface and ground water from wash water.
 - 8) Vehicle and Equipment Fueling and Maintenance - Perform on site fueling and maintenance in accordance with all environment laws such as proper storage of onsite fuels and proper disposal of used engine oil or other fluids on site.
 - 9) Litter Management - Ensure employees properly dispose of litter.

3. APPROVED STATE OR LOCAL PLANS

During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations are encountered, they will be handled according to all federal, state, and local regulations in effect at the time.

IV. MAINTENANCE PROCEDURES

The contractor is required to maintain all temporary erosion and sediment control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. This shall begin when the features have lost 50% of their capacity.

V. INSPECTION REQUIREMENTS

- A. Inspections shall be made jointly by the contractor and the contracting authority at least once every seven calendar days. Storm water monitoring inspections will include:
 1. Date of the inspection.
 2. Summary of the scope of the inspection.
 3. Name and qualifications of the personnel making the inspection.
 4. Rainfall amount.
 5. Review erosion and sediment control measures within disturbed areas for the effectiveness in preventing impacts to receiving waters.
 6. Major observations related to the implementation of the PPP.
 7. Identify corrective actions required to maintain or modify erosion and sediment control measures.
- B. Include storm water monitoring inspection reports in the Amended PPP. Incorporate any additional erosion and sediment control measures determined as a result of the inspection. Immediately begin corrective actions on all deficiencies found and complete all actions within 3 calendar days of the inspection.

VI. NON-STORM WATER DISCHARGES

This includes subsurface drains (i.e. longitudinal and standard subdrains) and slope drains. The velocity of the discharge from these features may be controlled by the use of patio blocks, Class A stone, erosion stone or other appropriate materials.

VII. POTENTIAL SOURCES OF OFF RIGHT-OF-WAY (ROW) POLLUTION

Silts, sediment, and other forms of pollution may be transported onto highway right-of-way (ROW) as a result of a storm event. Potential sources of pollution located outside highway ROW are beyond the control of this PPP. Pollution within highway ROW will be conveyed and controlled per this PPP.

VIII. DEFINITIONS

- A. Base PPP - Initial Pollution Prevention Plan.
- B. Amended PPP - May include Plan Revisions or Contract Modifications for new items and fieldbook entries made by the inspector.
- C. IDR - Inspector's Daily Report - this contains the inspector's daily diary and item postings.
- D. Controls - Methods, practices, or measures to minimize or prevent erosion, control sedimentation, control storm water, or minimize contaminants from other types of waste or materials.
- E. Signature Authority - Representative from Designer, Contractor/Subcontractor, or RCE/Inspector authorized to sign various storm water documents.

105-4
10-18-11

STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
BA-200	10-18-11	Steel Beam Guardrail Components
BA-201	10-19-10	Steel Beam Guardrail Barrier Transition Section
BA-202	10-21-14	Steel Beam Guardrail Bolted End Anchor
BA-205	10-18-11	Steel Beam Guardrail End Terminal
BA-250	10-21-14	Steel Beam Guardrail Installation at Concrete Barrier or Bridge End Post
EC-101	04-20-10	Wood Excelsior Mat for Ditch Protection
EC-201	04-20-10	Silt Fence
EC-202	10-21-14	Floating Silt Curtain
EC-204	10-16-12	Perimeter and Slope Sediment Control Devices
EW-202	10-21-14	Bridge Berm Grading without Recoverable Slope (Non-Barnroof Section)
EW-301	04-19-11	Guardrail Grading
PM-110	04-16-13	Line Types
PV-101	10-21-14	Joints
RF-19C	10-16-12	Subdrains (Longitudinal)
RF-19E	10-21-14	Outlets for Longitudinal, Transverse and Backslope Subdrains
RF-40	10-15-13	Rock Flume for Bridge End Drain
RK-19A	10-21-14	Bridge Approach Section (General Details)
RK-20	10-21-14	Double Reinforced 12" Approach
RK-21	10-16-12	Bridge Approach (abutting PCC or Composite Pavement)
SI-173	04-20-10	Object Markers
SI-211	10-19-10	Object Marker and Delineator Placement with Guardrail
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-202	10-15-13	Shoulder Closure (One Lane)
TC-212	04-16-13	Spot Location Lane Closure with Flaggers
TC-213	04-17-12	Lane Closure with Flaggers
TC-252	04-17-12	Routes Closed to Traffic

111-25
10-18-11

INDEX OF TABULATIONS

Tabulation	Tabulation Title	Sheet No.
C Sheets		
100-0A	ESTIMATED ROADWAY QUANTITIES (1 DIVISION PROJECT)	C.1
100-1D	PROJECT DESCRIPTION	C.1
100-4A	ESTIMATE REFERENCE INFORMATION	C.2 - C.3
100-10	FLOATING SILT CURTAINS	C.6
100-17	TABULATION OF SILT FENCES	C.6
100-18	TABULATION OF SILT FENCES FOR DITCH CHECKS	C.6
100-22	SPECIAL DITCH CONTROL AND SLOPE PROTECTION	C.8
100-23	ROCK DITCH CHECKS/DITCHES/FLUMES/SPLASH BASINS/SLOPE PROTECTION	C.9
100-28	LONGITUDINAL GROOVING	C.7
102-5	EXISTING PAVEMENT	C.6
103-4	TABULATION OF SPREADING TOPSOIL	C.10
104-8A	SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN	C.9
105-4	STANDARD ROAD PLANS	C.5
107-23	GRADING FOR GUARDRAIL INSTALLATIONS	C.7
108-8A	STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION	C.7
108-13A	SAFETY CLOSURES	C.6
108-22	PAVEMENT MARKING LINE TYPES	C.9
110-1	REMOVAL OF PAVEMENT	C.6
110-7A	REMOVAL OF STEEL BEAM GUARDRAIL	C.6
110-12A	POLLUTION PREVENTION PLAN	C.4 - C.4
111-25	INDEX OF TABULATIONS	C.5
112-6	BRIDGE APPROACH SECTION	C.7
112-9	SHOULDERS	C.8
232-3A	EROSION CONTROL (RURAL SEEDING)	C.5
232-10	EMERALD ASH BORER	C.5
262-6	UTILITIES (NOT A POINT 25 PROJECT)	C.5
281-1	SECTION 404 PERMIT AND CONDITIONS	C.5

232-3A
04-15-14

**EROSION CONTROL
(RURAL SEEDING)**

Following the completion of work in a disturbed area, place seed, fertilizer, and mulch on the disturbed area lying 8 feet adjacent to shoulder and median as follows:

Use seed mix and fertilizer meeting the requirements of Section 2601.03,C,3 of the Standard Specifications.

Use mulch meeting the requirements of Sections 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed and furnishing and applying seed, fertilizer, and mulch is incidental to mobilization and will not be paid for separately.

232-10
10-21-14

EMERALD ASH BORER

Dispose of all wood material generated as a result of clearing and/or grubbing according to the Iowa Department of Agriculture and Land Stewardship's Emerald Ash Borer (EAB) Quarantine Order. For more information refer to http://www.iowatreepests.com/eab_regulations.html.

281-1
10-15-13

SECTION 404 PERMIT AND CONDITIONS

Construct this project according to the requirements of U.S. Army Corps of Engineers NWP 14-Linear Transportation Projects and NWP 33 Temporary Construction, Access and Dewatering, Permit No.2014-721.

A copy of this permit is available from the Iowa DOT website (<http://envpermits.iowadot.gov/CMEPortalENV/Home.aspx>). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.

262-6
10-18-05

**UTILITIES
(NOT A POINT 25 PROJECT)**

This is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.

EXISTING PAVEMENT

No.	Location					Year	Type	Project Number	Surface		Base		Subbase		Removal		Coarse Aggregate			Reinforcement	Remarks
	County	Route	Dir. of Travel	Begin Milepost	End Milepost				Type	Depth IN	Type	Depth IN	Type	Depth IN	Type	Depth IN	Source	Type	Durability Class		
	Pott.	I-92	Both	15.53	17.21	2005 1956		MP-92-4(702)8--76-78 F-773(3)	AAC PCC	2 10							Crescent Weeping Water	C.LST. C.LST.	I		

110-1
04-16-13

REMOVAL OF PAVEMENT
Refer to Tabulation 102-5

* Not a Bid Item

Begin Station	End Station	Side	Pavement Type	Area		Saw Cut*	Remarks
				SY	LF		
526+88.00	527+38.00	Both	Composite	133.3	24.0	--	Removal includes existing HMA\PCC composite pavement and west bridge approach.
527+38.00	528+23.00	Both	Composite	264.4	--		
529+76.31	530+55.00	Both	Composite	244.8	--	--	Removal includes existing HMA\PCC composite pavement and east bridge approach.
530+55.00	530+71.60	Both	Composite	44.3	24.0		
Total				686.8	48.0		

108-13A
08-01-08

SAFETY CLOSURES
Refer to Section 2518 of the Standard Specifications

Station	Closure Type		Remarks
	Road Qty.	Hazard Qty.	
522+00.00	1		
526+50.00		1	
531+00.00		1	
533+00.00	1		
Total	2	2	

110-7A
04-17-12

REMOVAL OF STEEL BEAM GUARDRAIL

① Lane(s) to which the installation is adjacent.
② Includes length of End Terminals and End Anchors.

No.	Direction of Traffic	Location			Removal of Guardrail LF
		Station to Station	Side		
1	WB	527+47.00	528+22.00	Lt	75.0
2	EB	527+47.00	528+22.00	Rt	75.0
3	WB	529+79.00	530+54.00	Lt	75.0
4	EB	529+79.00	530+54.00	Rt	75.0
Total					300.0

100-17
04-20-10

TABULATION OF SILT FENCES
Refer to EC-201

Begin Station	End Station	Side	Length		Remarks
			LF		
525+60.00	527+53.00	Lt	213.0		Includes 20' tail
529+87.00	531+00.00	Lt	133.0		"
531+00.00	532+55.00	Lt	175.0		"
525+00.00	527+00.00	Rt	220.0		Includes 20' tail
527+00.00	527+75.00	Rt	95.0		"
530+15.00	531+95.00	Rt	200.0		"
Subtotal			1036.0		
+25% for Replacements			259.0		
Total			1295.0		

100-18
04-20-10

TABULATION OF SILT FENCES FOR DITCH CHECKS
Refer to EC-201

Location Station	Side	Length		Remarks
		LF		
525+75.00	Lt	11.0		
526+00.00	Lt	13.0		
526+25.00	Lt	12.0		
526+50.00	Lt	11.0		
526+75.00	Lt	12.0		
527+00.00	Lt	13.0		
531+25.00	Lt	14.0		
532+00.00	Lt	11.0		
531+25.00	Rt	13.0		
Subtotal		110.0		
50% for Replacement		55.0		
Total		165.0		

100-10
10-21-14

FLOATING SILT CURTAINS
Refer to EC-202

Station	Hanging	Containment	Clean-out (Containment)	Maintenance of Floating Silt Curtain	Remarks
528+80.00	560.0			280.0	Both Sides of Channel R.O.W. to R.O.W.

GRADING FOR GUARDRAIL INSTALLATIONS

① Lane(s) to which the installation is adjacent.

Refer to EW-301

No.	Direction of Traffic	Location		Foreslope at Guardrail	Dimensions (Feet)									Earthwork		Remarks
		Station	Side		X1	Y1	X2	Y2	X3	Y3	X4	Y4	Z	Excavation Class 10	Embankment In Place	
	WB	527+41.52	Lt	6	27.5	5.4	-	-	-	-	78.0	7.3	47.0	(1)		
	EB	527+57.54	Rt	6	27.5	5.4	52.5	7.9	90.0	7.9	140.0	9.9	57.0	(1)		
	WB	530+02.45	Lt	6	27.5	5.4	52.5	7.9	90.0	7.9	140.0	9.9	57.0	(1)		
	EB	538+18.47	Rt	6	27.5	5.4	-	-	-	-	78.0	7.3	47.0	(1)		

(1) Quantity is included in 'T' Sheet.

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION

Refer to BA-200, BA-201, BA-202, BA-205, BA-206, BA-210, BA-211, BA-250, SI-172, SI-173 and SI-211.

① Lane(s) to which the obstacle is adjacent.

No.	Direction of Traffic	Location		Layout Lengths				Long-Span System	Delineators and Object Markers				Bid Items						Remarks			
		Station	Side	BA-250					SI-211	SI-172	Object Marker			Bolted End Anchor	Barrier Transition Section	Steel Beam Guardrail	End Terminal			Post Adapter		
				Offset	VT1	VF	VT2				ET (37.5' or 50.0')	Type 1	Type 2				Type 3	Standard			Flared	BA-210
FT	LF	LF	LF	LF	STATION	TYPE	TYPE	EACH	EACH	EACH	EACH	TYPE	EACH	EACH	LF	EACH	EACH	EACH				
1		527+41.52	23.54 Lt	28.125	--	--	50.0		3	--	--	1	--	A	1	1	0.0	1				
2		527+57.54	23.54 Rt	28.125	25.00	37.50	50.0		3	--	--	--	1	A	1	1	62.5	1				
3		530+02.45	23.54 Lt	28.125	25.00	37.50	50.0		3	--	--	1	--	A	1	1	62.5	1				
4		530+18.47	23.54 Rt	28.125	--	--	50.0		3	--	--	--	1	A	1	1	0.0	1				
Total												2	2		4	4	125.0	4				

BRIDGE APPROACH SECTION

Refer to the RK-Series.

* Not a bid item

Bridge Station	End	Location		Approach Pavement					Fixed or Movable Abutment	Subdrain						Remarks	
		Skew Ahead	Degrees	T Thickness	Pay Length	Non-Reinf. Pavement Area	Single-Reinf. Pavement Area	Double-Reinf. Pavement Area		Perforated Subdrain 4"	Subdrain Outlet		Porous Backfill	Class 'A' Backfill	Modified Subbase		Polymer Grid
											LEFT	RIGHT					
528+80.00	W		20	12.0	74.0	93.3	62.2	121.8	M	72.0	526+98.00	Rt	2.2	0.5	285.100	317.0	(1) (2)
528+80.00	E		20	12.0	73.6	93.3	62.2	119.8	M	72.0	530+61.60	Rt	2.2	0.5	282.900	314.8	(1) (2)
Totals						186.6	124.4	241.6		144.0			4.4	1.0	568.000	631.8	

(1) Non-Reinforced Pavement Width is 28'

(2) Single Reinforced Pavement Width is 28'

LONGITUDINAL GROOVING

Location	Total SY	Remarks
526+88.00	121.2	Single and Non-Reinforced sections
527+38.00	110.2	Double Reinforced Section
530+21.60	109.5	Double Reinforced Section
530+71.60	121.2	Single and Non-Reinforced sections
528+80.00	1071.1	Bridge Deck
Total	1533.2	

104-8A
10-21-14

SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN

Refer to Standard Road Plan RF-39 or RF-40

Location		Bid Items			PCC Paved Shoulder			Scour Protection (RF-39)		Rock Flume (RF-40)			Remarks
Bridge Station	Bridge Corner	Distance DI-1 or DI-2	PCC Paved Shoulder	Bridge End Drain	Panels Required	Polymer Grid	Modified Subbase	Outlet or Channel Scour Protection	Turf Reinforced Mat (TRM), Type 2	Macadam Stone Base	Engineering Fabric	Erosion Stone	
		FT	SY	TYPE	A B C or D	SY	TONS	SF	SQ	TONS	SY	TONS	
528+80.00	NE	15.8	--	RF-40	--					1.500	50.5	31.500	
528+80.00	SE	20.1	21.2	RF-40	B	21.2	18.800			1.500	50.5	31.500	
Totals			21.2			21.2	18.800			3.000	101.0	63.000	

100-23
10-19-10

* Design shown for mandatory locations is the minimum allowed.

ROCK DITCH CHECKS/DITCHES/FLUMES/SPLASH BASINS/SLOPE PROTECTION

Refer to Typical 4401, 4402, 4403, 4404, and 4405

Location		Type							Material			Remarks		
Road Identification	Station	Side	Mandatory* Location (yes or no)	Rock Ditch Check	Rock Ditch	Rock Flume	Rock Splash Basin	Rock Slope Protection	(L)	(W)	Erosion Stone		Class E Revetment	Eng. Fabric
		Lt./Rt.							FT	FT	TON		TON	SY
Ia. 92	525+75.00	Lt.	Yes		X				166.0	10.0	119.5		184.5	
Total											119.5		184.5	

108-22
04-16-13

PAVEMENT MARKING LINE TYPES

See PM-110

*BCY4 - Place on the same side of the roadway to match existing markings near the project.

***MNY4 - Factor of 1.00 as value includes number of 4-inch passes to cover median nose area.

**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

BCY4: Broken Centerline (Yellow) @ 0.25

DCY4: Double Centerline (Yellow) @ 2.00

NPY4: No Passing Zone Line (Yellow) @ 1.25

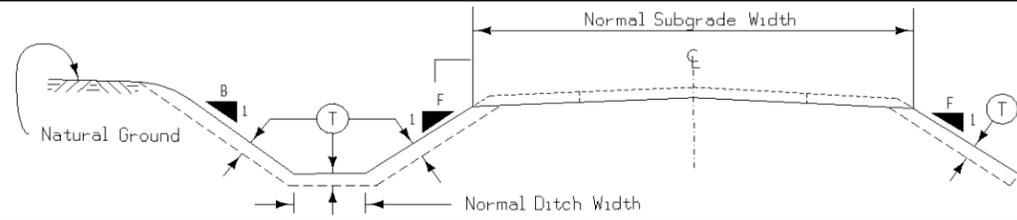
BLW4: Broken Lane Line (White) @ 0.25

ELW4: Edge Line Right (White) @ 1.00

ELY4: Edge Line Left (Yellow) @ 1.00

Location				Length by Line Type (Unfactored)																Remarks	
Road ID	Station to Station		Dir. of Travel	Marking Type	Side			BCY4*	DCY4	NPY4**	BLW4	ELW4	ELY4								
	L	C			R	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA		STA
Ia. 92	526+88.00	527+72.00	WB	Waterborne/Solvent Paint		X			0.84												
"	527+72.00	530+36.00	BOTH	Waterborne/Solvent Paint		X		2.64													
"	530+36.00	530+71.60	EB	Waterborne/Solvent Paint		X			0.36												
"	526+88.00	530+71.60	WB	Waterborne/Solvent Paint	X						3.84										
"	526+88.00	530+71.60	EB	Waterborne/Solvent Paint			X				3.84										
Factored Total: Waterborne/Solvent Paint							-	5.28	1.50	-	7.68	-	-	-	-	-	-	-	-	-	
Bid Quantity: Painted Pavement Markings, Waterborne or Solvent-Based											14.46										

TABULATION OF SPREADING TOPSOIL



Perform this work according to Section 2105. Prior to placing topsoil on any cohesive soil, scarify the area to be covered to a minimum depth of 3 inches.

Appropriate adjustments have been made in the template quantities to reflect the placement of topsoil on foreslope, backslope and ditch bottom as detailed hereon.

Placement Description						Remarks	Topsoil Excavation Available From		Remarks
Area	Quantity	Location		Side	Slope		(T)	Amount Reserved	
No.	CY	Station to Station		L. or R.	B. or F.	IN	CY		
1	338.0	525+50.00	527+41.51	L	both	8.0	1370 *	525+00.00 532+60.00	* after 40% shrink * Refer to T.1
2	348.0	530+03.44	532+60.00	L	both	8.0			
3	275.0	525+00.00	527+57.53	R	both	8.0			
4	231.0	530+18.47	531+95.00	R	both	8.0			
					Total	=			
									1192
									1370 - 1192 = 178 CY
									To be wasted on areas of the letdowns and berms; outside of the channel and other areas where erosion measures are in place.

104-9
10-15-13

LONGITUDINAL SUBDRAIN SHOULDER AND BACKSLOPE

Refer to Soils Sheets

① Refer to EW-203, EW-204, or EW-211.
*Not a bid item

Line No.	Road or Lane Ident.	Location Station to Station		Side	Longitudinal Subdrain (RF-19C)						Subdrain Outlet			Porous* Backfill CY	Class "A"* Crushed Stone CY	Remarks		
					Shoulder		Backslope		Bridge Berm ①		RF-19C, RF-19E, or RF-19F							
					Depth D	Size IN	Length FT	Size IN	Length FT	Size IN	Type	Length FT	Station				Size IN	Standard Road Plan and Type
1	IA 92	526+88.00	526+88.00	LT	48.0	4.0	10.0						526+88.00	6.0	RF-19E	1.1	0.2	
2	IA 92	530+71.60	530+71.60	LT	48.0	4.0	10.0						530+71.60	6.0	RF-19E	1.1	0.2	
Totals						20.0		0.0						2	2.2	0.4		

NOTE: RECORDS INDICATE THAT LONGITUDINAL SUBDRAINS AND OUTLETS EXIST WITHIN THE BRIDGE APPROACH CONSTRUCTION AREA. EXTEND LONGITUDINAL SUBDRAIN OUTLETS AS INDICATED ABOVE.
ALL UNAFFECTED EXISTING DRAINS AND ALL EXISTING OUTLETS SHALL REMAIN FUNCTIONAL AT ALL TIMES. ANY DAMAGED DRAINS OR OUTLETS ALONG ENTIRE PROJECT SHALL BE REPLACED.

103-7
08-01-08

SHRINKAGE DATA

Material	%	Remarks
TOPSOIL	40%	
REMAINDER PROJECT CUT	30%	10 Cu. Yds. Boulders

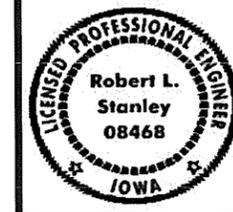
SASF-1
02-18-14

SPECIAL ATTENTION-SLIVER FILL

Special attention should be given to Article 2107.03.C, Standard Specification Series of 2012, on this project.

Design No. 115
File No. 30846

GEOTECHNICAL DESIGN



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: *Robert Stanley* Date: 6-2-14

Printed or Typed Name: Robert L. Stanley
My license renewal date is December 31, 2014

Pages or sheets covered by this seal: CS.1

SURVEY SYMBOLS

- x — FW Wire Fence
- ● — PPA Power Pole Co. 1
- TP TPD Telephone Pedestal
- ● — TR Telephone Riser Pole
- LUM Luminaire
- ● — PR Electric Riser Pole
- SIGN SI Sign
- +—+—+— GDL Guard Rail Steel
- SNP Unpaved Shoulder
- D Centerline Draw or Stream (Down)
- < DU Centerline Draw or Stream (Up)
- ENU Edge Unpaved Entrance & Parking
- ENT Centerline BL of Entrance
- EG Edge of Gravel Road
- SP Stream Profile
- BNK Stream Bank
- DIK Centerline of Dike or Dam
- EW Edge of Water
- RIP Rip-Rap
- F0 — FOA Underground Fiber Optic Co. 1
- F02 — FOB Underground Fiber Optic Co. 2
- F03 — FOC Underground Fiber Optic Co. 3

UTILITY LEGEND

	Contact	Phone
— ● — MidAmerican Energy	Gary Richardson	712-366-5651
— F0 — AT&T	Lenny Vohs	816-275-4014
— F02 — MCI	Dean Boyers	972-729-6322
— F03 — Frontier Communications	Bob Hudson	712-263-5222

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING		
Design Color No.		
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

CONVENTIONAL SIGNS

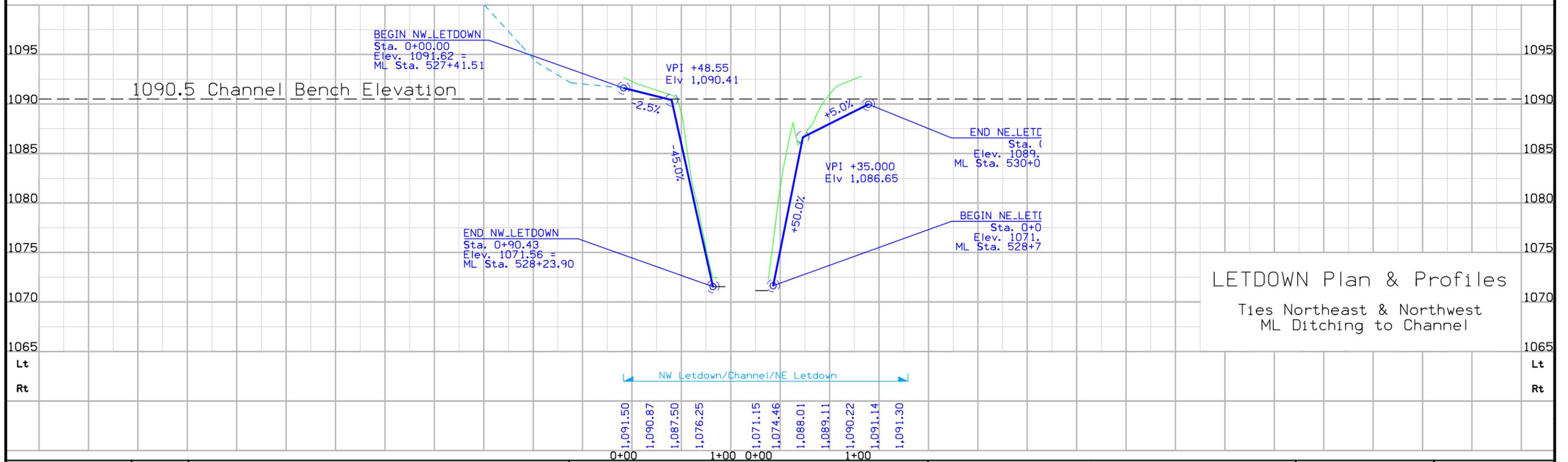
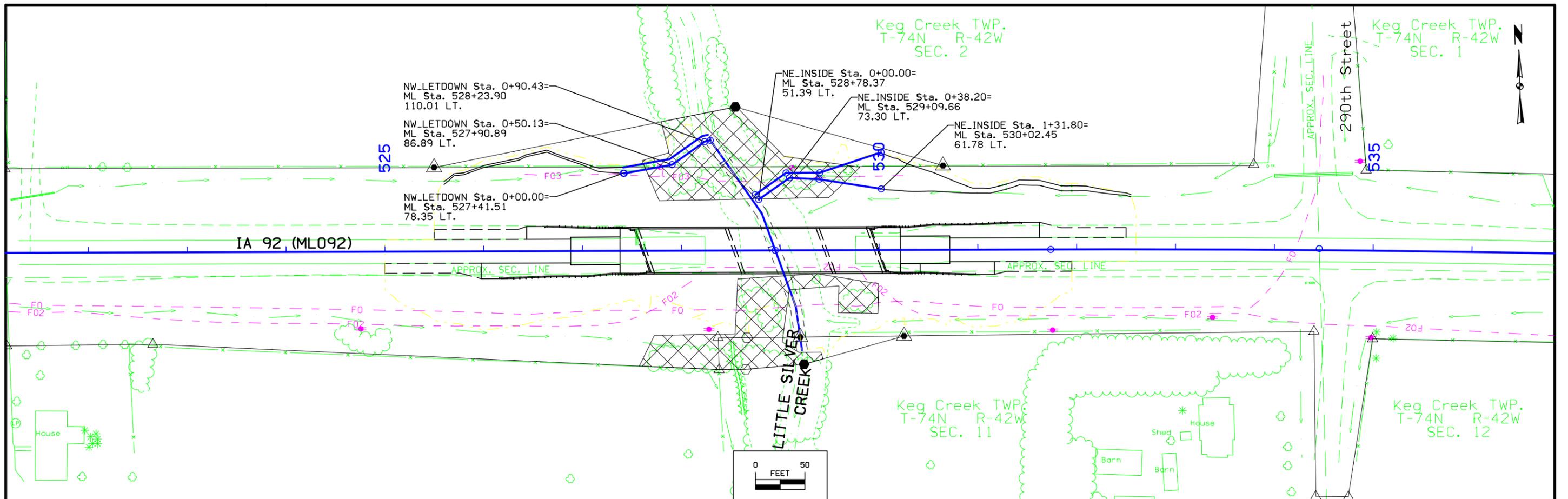
- +—+—+— Reference Point
- Station
- ▲ Section Corner
- — — — — Ground Line Intercept
- //// Saw Cut
- +—+—+— Guardrail
- ▨ Clearing & Grubbing Area
- ▩ Pavement Removal

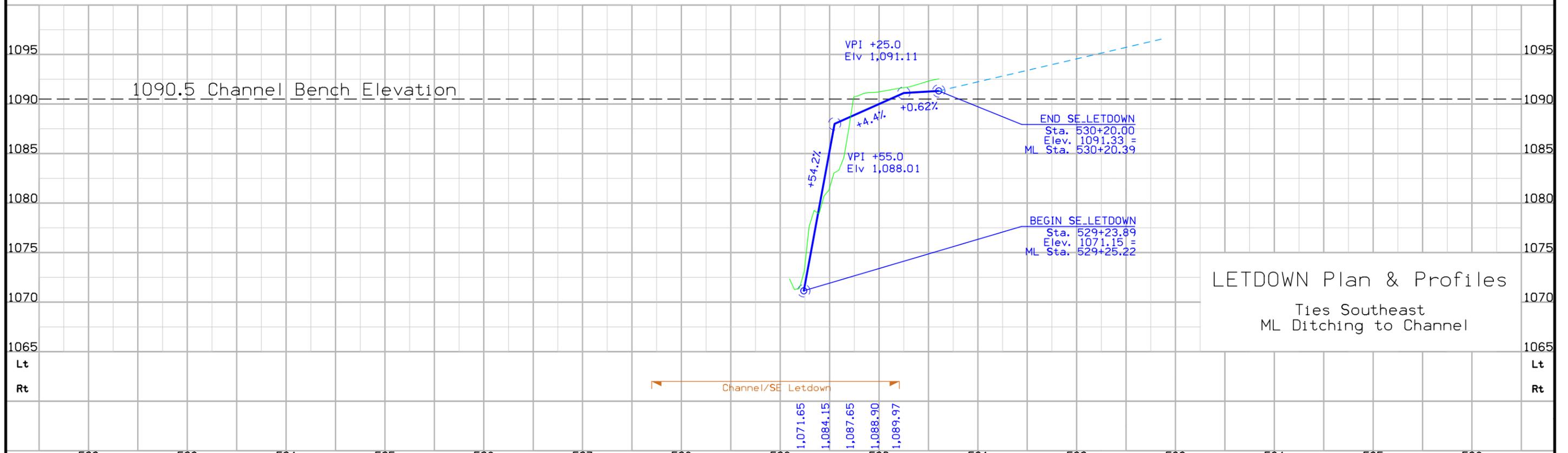
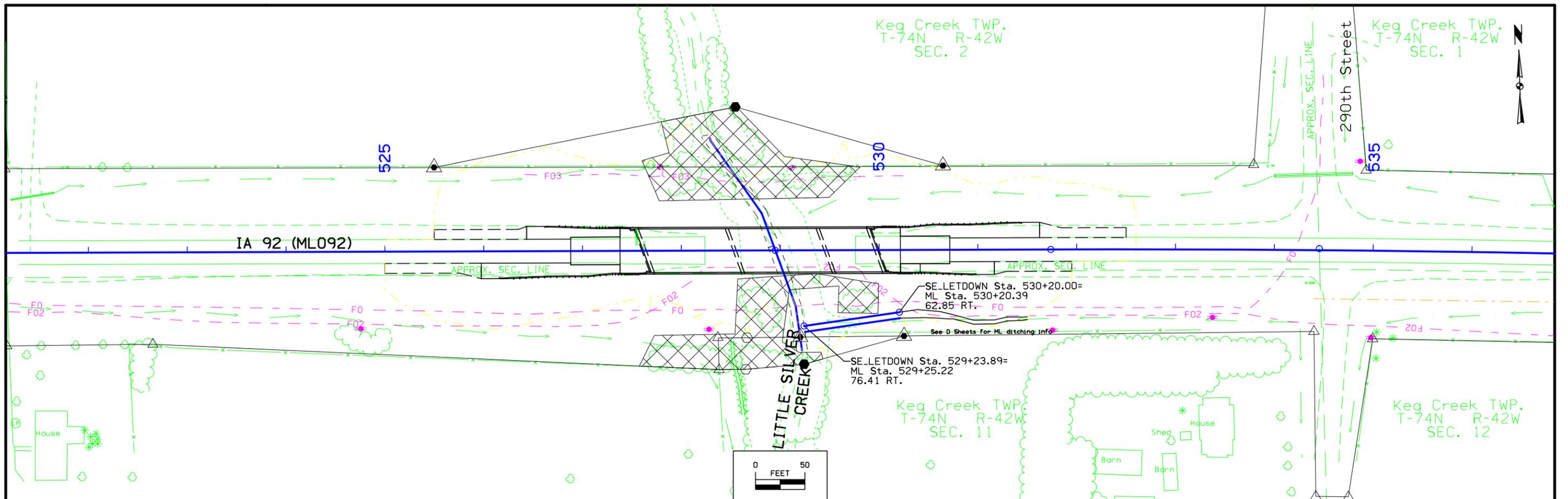
RIGHT-OF-WAY LEGEND

- ▲ Proposed Right-of-Way
- ▲ Existing and Proposed Right-of-Way
- ▲ Easement and Existing Right-of-Way
- ▩ Borrow
- Easement (Temporary)
- Easement
- X Excess
- A/C Access Control

**PLAN AND PROFILE
LEGEND AND SYMBOL
INFORMATION SHEET**

(COVERS SHEET SERIES D, E, F, & K)

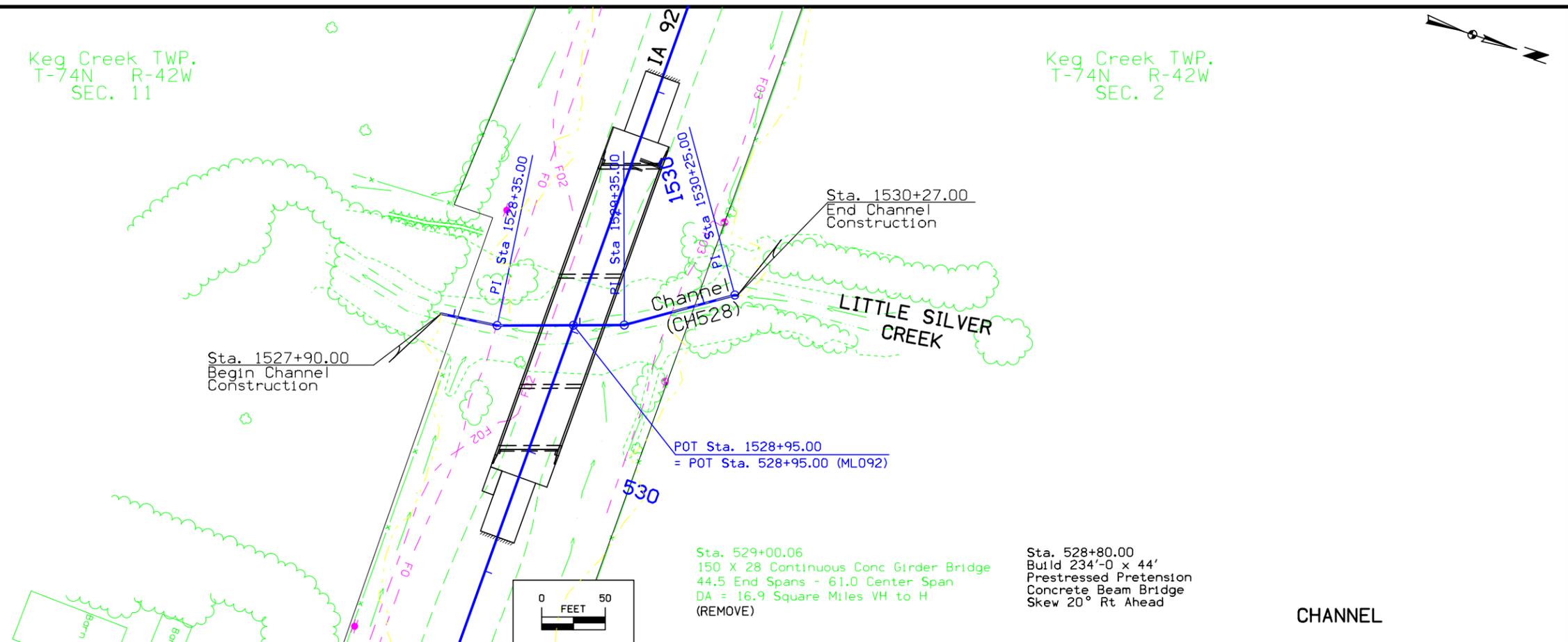




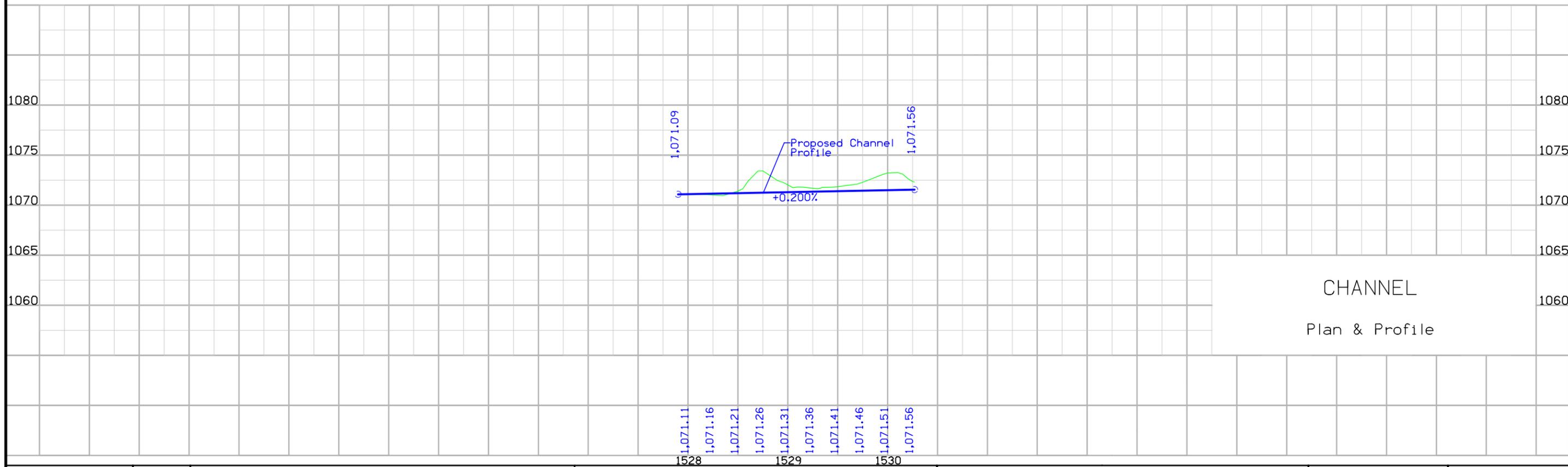
LETDOWN Plan & Profiles
Ties Southeast
ML Ditching to Channel

Keg Creek TWP.
T-74N R-42W
SEC. 11

Keg Creek TWP.
T-74N R-42W
SEC. 2



CHANNEL



CHANNEL

Plan & Profile

Survey Information

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge reconstruction and reconstruction of IA highway 92. Project datum and control information is provided by Design Survey Office. This project is a partial field survey for the digital terrain model with photo coverage.

Vertical Control

Vertical datum for this survey is relative to NAVD88.

All benchmark elevations were established with multiple observations using a GPS rover and base. Coordinates are the mean result of these observations. Any readings outside normal tolerances are removed and the benchmark is observed again. A minimum of three observations is required to establish coordinates.

Vertical equations are as follows:

BM # 501 this survey Elevation = 1103.65 NAVD 1988
= El. 1105.64 As Built Plans F.N. Project # 773

Horizontal Control

Control point 301 was used to transfer NAD83(1996) Iowa state plane south zone (US ft.) coordinates to project control. Five redundant RTK observations were used to verify these values. The project coordinates are scaled around control point 301 at 456364.500 N, 1053390.810 E, 1106.896 EL. A ground scale factor (1/combined factor) of 1.000100 was used to project the state plane coordinates to surface coordinates so that a scale of 1 can be applied for total station use and design when using project coordinates.

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans F.N. Project # 773. Survey stationing was equated to the plan at PI Sta. 517+26.40 and run back and ahead without equation throughout the survey.

Equations are as follows:

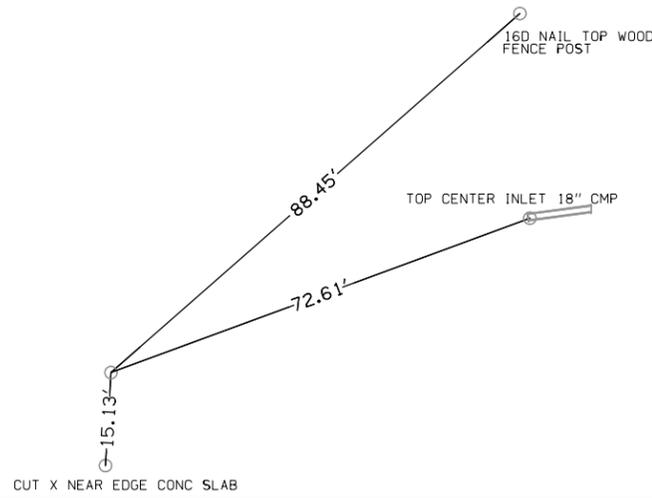
PI Sta. 517+26.40 This Survey
= PI Sta. 517+26.40 As Built Plans F.N. Project # 773

PI STA 534+45.54 this survey
= PI STA 534+48.8 As Built Plans F.N. Project # 773

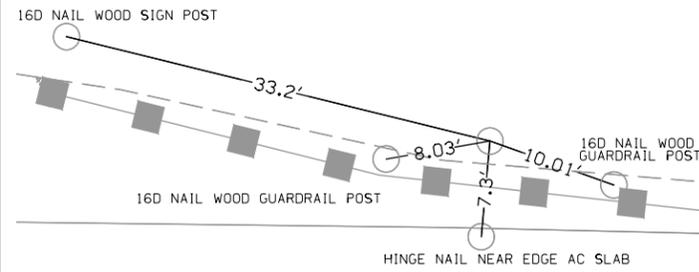
VERTICAL CONTROL

Point	North	East	Elevation	Station	Offset	Feature	Description
500	456446.6820	1052743.5110	1136.5260	521+31.73	-85.7217	BM	500 RR SPK WOOD BRACE POST
501	456358.9850	1053592.0050	1103.6480	529+82.22	-20.2127	BM	501 FND X NE CORNER BRIDGE
502	456337.7050	1054301.0130	1123.5920	536+91.06	-23.2991	BM	502 IHC BUTTON HDWL CATTLE PASS

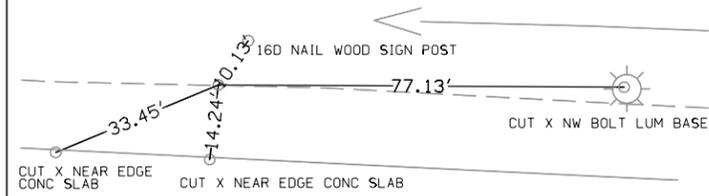
CP Sta. 520+54.72, 26.57 Lt.
 CP No. 300, Set Iron Pin
 N= 456389.563, E=1052664.984, Z=1142.985



CP Sta. 527+80.95, 20.47 Lt.
 CP No. 301, Set Iron Pin
 N= 456364.500, E=1053390.810, Z=1106.896



CP Sta. 540+69.62, 25.72 Lt.
 CP No. 302, Set Iron Pin
 N= 456321.284, E=1054679.249, Z=1132.932



ALIGNMENT COORDINATES

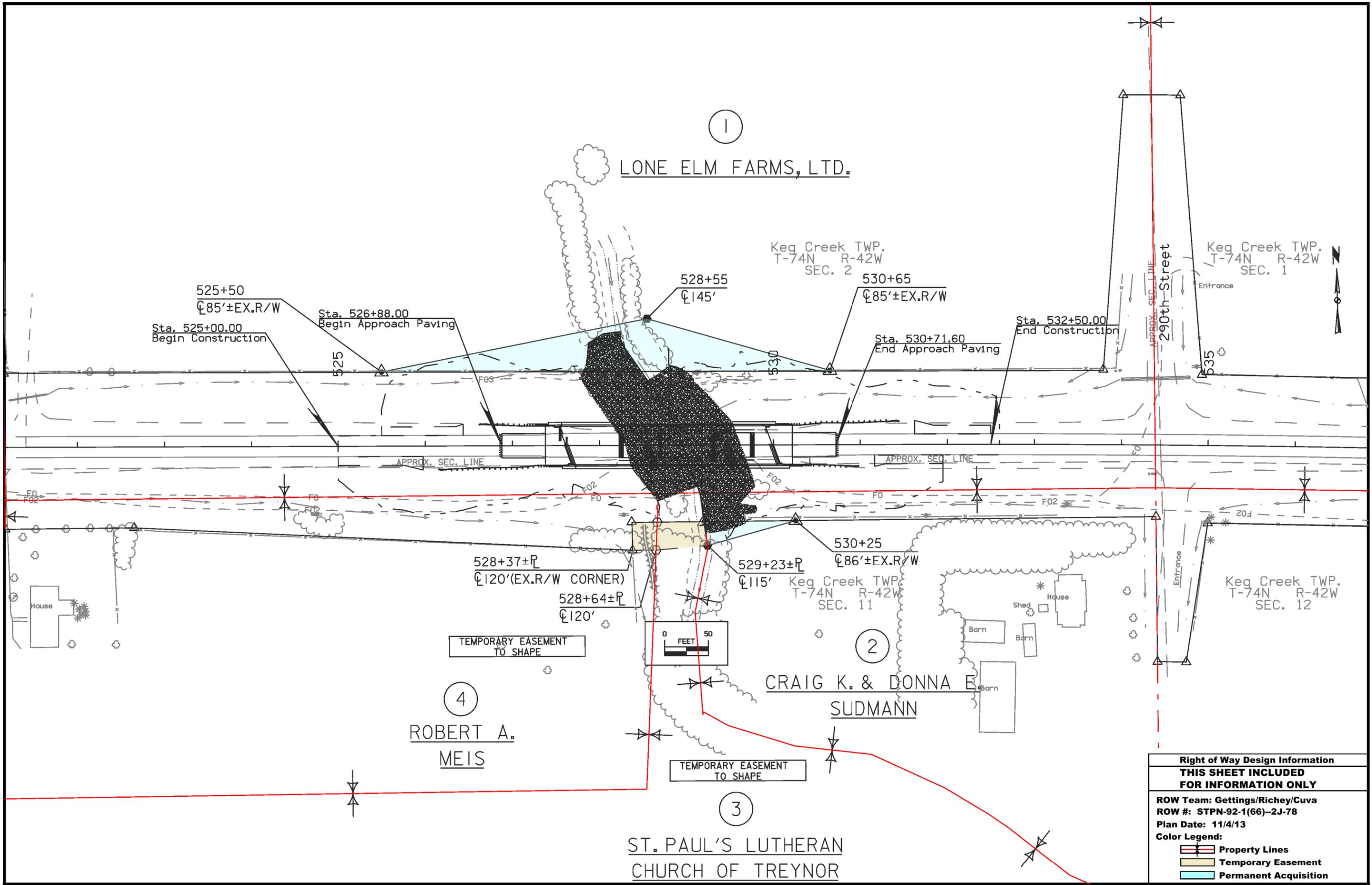
101-16
10-20-09

Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
ML092																			
20005		510+18.40	456,370.18	1,051,628.06															
20020								514+84.94	456,371.10	1,052,094.58	517+26.40	456,371.58	1,052,336.05	519+67.83	456,365.27	1,052,577.43			
20050								531+73.75	456,333.78	1,053,782.94	534+45.54	456,326.68	1,054,054.63	537+17.30	456,313.14	1,054,326.08			
20070		544+98.09	456,274.25	1,055,105.90															
20080		560+72.00	456,195.85	1,056,677.86															
CH528																			
30105		1527+90.00	456,239.45	1,053,528.42															
30110		1528+35.00	456,284.16	1,053,523.32															
30120		1529+35.00	456,378.99	1,053,491.59															
30125		1530+25.00	456,454.04	1,053,441.91															
30130		1530+27.00	456,456.01	1,053,441.61															
NW_LETDOWN																			
40200		0+00.00	456,423.39	1,053,352.89															
40201		0+00.92	456,423.31	1,053,353.80															
40202		0+50.13	456,430.64	1,053,402.47															
40203		0+90.43	456,452.89	1,053,436.08															
40204		0+96.38	456,454.04	1,053,441.91															
NE_INSIDE																			
40101		0+00.00	456,392.87	1,053,489.00															
40102		0+38.20	456,413.95	1,053,520.85															
40103		0+68.26	456,411.49	1,053,550.81															
40104		1+31.80	456,400.01	1,053,613.31															
NE_OUTSIDE																			
40105		0+00.00	456,397.87	1,053,485.69															
40106		0+38.20	456,418.95	1,053,517.54															
40107		0+72.32	456,418.18	1,053,551.65															
40108		1+37.66	456,436.83	1,053,614.27															
SE_LETDOWN																			
40000		529+09.38	456,262.42	1,053,518.08															
40001		530+60.40	456,279.53	1,053,668.13															

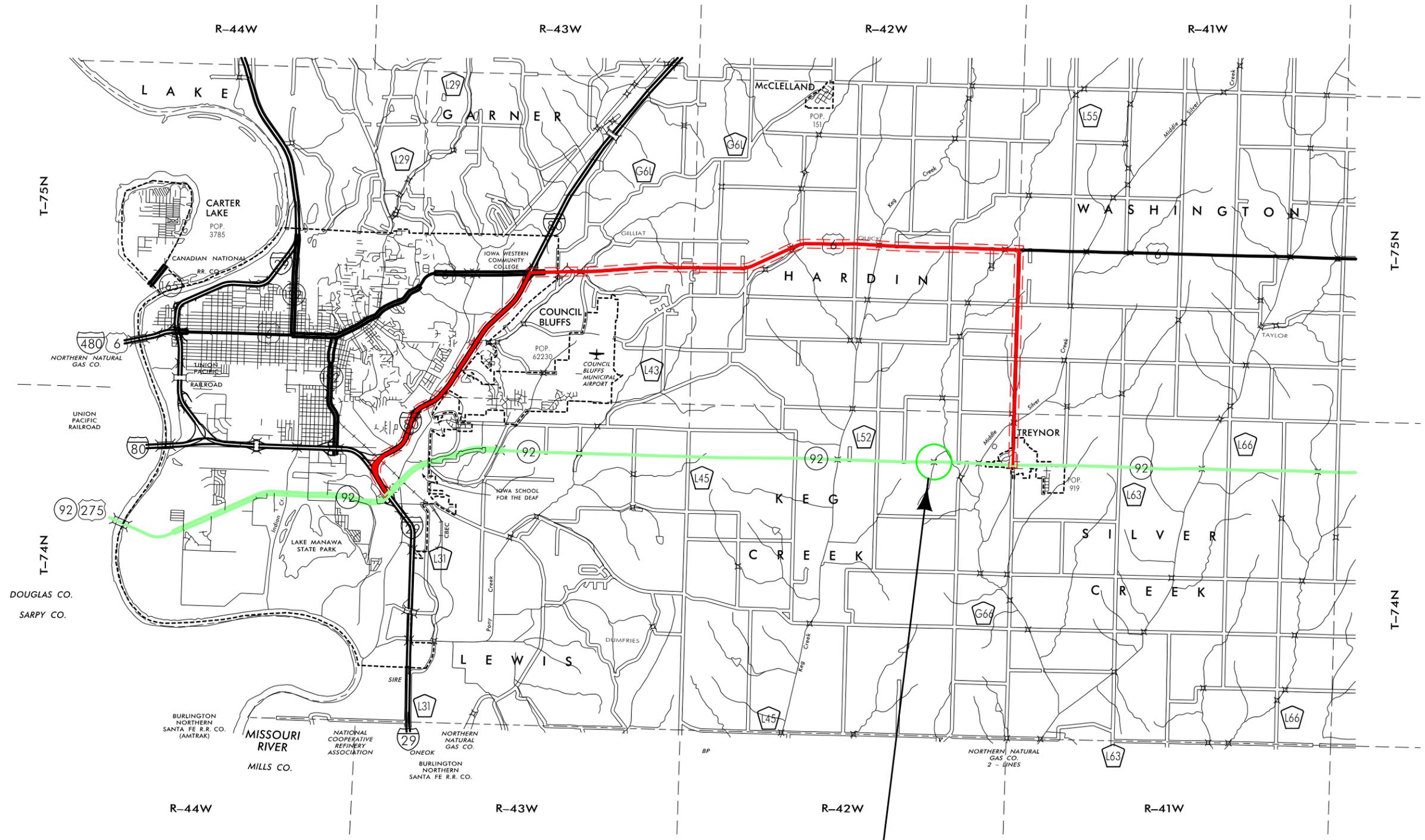
SPIRAL OR CIRCULAR CURVE DATA

101-17
04-19-11

Name	Location	Δ _{scs}	Horizontal Alignment Data												Remarks			
			Spiral Data						Curve Data									
			θs	Ls	Ts	Es	Xc	Yc	L.T.	S.T.	Δ _c	T	L	R		E		
20020														1° 36' 34.36" RT	241.47'	482.90'	17,190.00'	1.70'
20050														1° 21' 31.54" RT	271.78'	543.54'	22,920.00'	1.61'

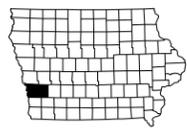


Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: Gettings/Richey/Cuva	
ROW #: STPN-92-1(66)--2J-78	
Plan Date: 11/4/13	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



PROJECT LOCATION

LEGEND	
	Traffic Detour



TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Refer to Standard Road Plans EW-101 and EW-102.

STATION	TOTAL CUT	TOPSOIL TYPE B SAVED -C	CLASS 10 SUITABLE CUT	TOTAL FILL	APPROX. FILL VOLUME BELOW 3 FT	APPROX. FILL VOLUME BELOW 5 FT	STATION	TOTAL CUT	TOPSOIL TYPE B SAVED -C	CLASS 10 SUITABLE CUT	TOTAL FILL	APPROX. FILL VOLUME BELOW 3 FT	APPROX. FILL VOLUME BELOW 5 FT
525+00.00	47	37	10	3	0	0							
525+25.00	65	51	14	23	12	0							
525+50.00	92	65	27	56	45	30							
525+75.00	102	66	36	92	82	69							
525+97.50	13	8	5	13	11	10							
526+00.00	142	95	47	132	121	106							
526+25.00	117	89	28	106	98	87							
526+43.50	52	34	18	40	37	33							
526+50.00	165	133	32	135	124	109							
526+75.00	92	70	22	52	46	38							
526+88.00	95	65	30	32	27	19							
527+00.00	199	133	66	31	20	5							
527+25.00	134	87	47	6	0	0							
527+41.52	100	42	58	1	0	0							
527+50.00	128	38	90	1	0	0							
527+57.54	11	3	8		0	0							
527+58.14	477	99	378		0	0							
527+75.00	79		79		0	0							
527+77.49	980		980		0	0							
528+00.00	1,455		1,455		0	0							
528+25.00	1,333		1,333		0	0							
528+50.00	833		833		0	0							
528+75.00	514		514	1	0	0							
529+00.00	521		521	1	0	0							
529+25.00	716		716	9	0	0							
529+50.00	858		858	14	3	0							
529+75.00	258		258	1	0	0							
529+82.50	452		452	2	0	0							
530+00.00	38	8	30		0	0							
530+01.85	12	3	9		0	0							
530+02.45	232	65	167	18	11	1							
530+18.47	65	26	39	8	5	1							
530+25.00	236	95	141	28	17	2							
530+50.00	181	81	100	31	22	9							
530+71.59	25	12	13	6	4	2							
530+75.00	165	93	72	58	47	32							
531+00.00	98	67	31	48	41	31							
531+16.51	47	34	13	23	19	14							
531+25.00	131	93	38	62	51	36							
531+50.00	63	45	18	28	22	15							
531+62.50	61	44	17	19	13	6							
531+75.00	76	49	27	17	8	0							
531+95.00	13	8	5	3	0	0							
532+00.00	56	40	16	14	3	0							
532+25.00	55	40	15	5	0	0							
532+50.00					0	0							
Totals	11,584	1,918	9,666	1,119	889	655							
Topsoil Available			1,918		Class 10 Excavation	9,666							
÷ 1.4					Class 10 ÷ 1.3	=	7,435						
Topsoil; 40% Shrink			1,370		Total Fill		1,119						
					Class 10 Waste		6,316						