A d d e n d u m

Iowa Department of Transportation
Office of Contracts

Date of Letting: October 20, 2015
Date of Addendum: September 29, 2015

B.O.	Proposal ID	Proposal Work Type	County	Project Number	Addendum
103	97-0201-133	PCC PAVEMENT - GRADE AND NEW	WOODBURY	NHSX-020-1(130)--3H-97 NHSX-020-1(133)--3H-97 NHSX-020-1(147)--3H-97 NHSX-020-1(149)--3H-97 NHSX-020-1(170)--3H-97	20OCT103.A02

Make the following changes to the PROPOSAL SPECIAL PROVISIONS LIST & TEXT:

Add the attached DS-15032

DEVELOPMENTAL SPECIFICATIONS FOR MASS CONCRETE CONTROL OF HEAT OF HYDRATION
Effective Date: October 20, 2015

Make the following change to the plans: NHSX-020-1(130)--3H-97

Replace SHEET NUMBER 1, SHEET NUMBER 4, SHEET NUMBER 7, SHEET NUMBER 9, SHEET NUMBER 10, SHEET NUMBER 40, SHEET NUMBER 45, SHEET NUMBER 46.

With the attached:

SHEET NUMBER 1, SHEET NUMBER 4, SHEET NUMBER 7, SHEET NUMBER 9, SHEET NUMBER 10, SHEET NUMBER 40, SHEET NUMBER 45, SHEET NUMBER 46

Summary of Changes:

Sheet No. 1
Change the reference of The Iowa Department of Transportation Standard Specifications For Highway and Bridge Construction from Series 2012 to Series 2015.

Sheet No. 4

1. Under the Specifications Notes - Replace the reference of The Iowa Department of Transportation Standard Specifications For Highway and Bridge Construction from Series 2012 to Series 2015.
2. Change the Developmental Specification Number for "Developmental Specifications for Mass Concrete - Control of Heat of Hydration" from DS-12070 to DS-15032.
3. Change the Developmental Specification Number for "Developmental Specifications for High Performance Concrete for Structures” from DS-12071 to DS-15033.

Sheet No. 7

1. Added the 13’-6” dimension between the centerline of the existing bridge to the centerline of Mainline US 20.
2. Added the 16’-10 +/-” dimension between the centerline of the existing bridge and the edge of the existing bridge deck.

Sheet No. 9

1. In the Cofferdam Section, removed the dimensions between the edge of the footing and the outside edge of the seal coat.
2. In the Cofferdam Section, removed the 22’-0” width of the seal coat.

Sheet No. 10

Change the Pier Note in reference to beveled keys from 3 x 10 x 1’-0 to 3 x 12 x 1’-0.

Sheet No. 40

1. Under the Specifications Notes - Replace the reference of The Iowa Department of Transportation Standard Specifications For Highway and Bridge Construction from Series 2012 to Series 2015.
2. Change the Developmental Specification Number for "Developmental Specifications for Mass Concrete - Control of Heat of Hydration" from DS-12070 to DS-15032.
3. Change the Developmental Specification Number for "Developmental Specifications for High Performance Concrete for Structures” from DS-12071 to DS-15033.

Sheet No. 45

1. In the Cofferdam Section, removed the dimensions between the edge of the footing and the outside edge of the seal coat.
2. In the Cofferdam Section, removed the 22’-0” width of the seal coat.

Sheet No. 46

Change the Pier Note in reference to beveled keys from 3 x 10 x 1’-0 to 3 x 12 x 1’-0.

DEVELOPMENTAL SPECIFICATIONS
FOR
MASS CONCRETE – CONTROL OF HEAT OF HYDRATION

Effective Date
October 20, 2015

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

15032.01 DESCRIPTION.
Produce a structure free of shrinkage cracks that would be a result of heat of hydration during the curing of large concrete cross-sections. Accomplish this through appropriate concrete mix design and management of concrete temperature and temperature differential. Structural mass concrete is defined as any concrete footing with a least dimension greater than 5 feet or other concrete placements with a least dimension greater than 4 feet. Additional constraints are required on placements with a least dimension greater than 6.5 feet. This specification does not apply to concrete drilled shafts.

Apply Section 2403 and Division 41 of the Standard Specifications with the following modifications.

15032.02 MATERIALS.

A. Cement shall be Type I, II, IP, or IS.

B. Use any combination of Ground Granulated Blast Furnace Slag or Class F fly ash. Class C fly ash may also be used with a maximum substitution of 20%. The maximum total substitution of Portland cement shall not exceed 50%, including the amount in the blended cement.

C. Cementitious content shall be a minimum of 560 pounds per cubic yard.

D. Maximum water to cementitious ratio shall be 0.45.

E. Air entrainment shall be used. To improve workability and aid in air entrainment, water reducing or retarding admixtures may be used. A mid range water reducing admixture may be used and the slump shall be increased to six inches maximum.

15032.03 CONSTRUCTION.

A. Thermal Control Plan.
Develop and submit a written Thermal Control Plan (TCP) to the Engineer describing the procedures that will be used during the period of heat dissipation following concrete placement, so the temperature differential between the interior of the section and the outside surface of the section does not exceed the restrictions in Article DS-15032.03, B. Submit the TCP at least 30 calendar days before the first intended structural mass concrete placement.

Compliance with this specification may result in long cooling times. Consider options to control heat of hydration that are compatible with their desired construction schedule and erection procedures.

Do not place concrete covered by this specification until the TCP has received written approval by the Engineer and equipment and materials necessary to facilitate the plan are on site and ready for use. Provide and install temperature sensing devices according to Article DS-15032.03, B, 3.

The location of construction joints shall be as shown in the plans.

For mass concrete placements with a least dimension of less than or equal to 6.5 feet the TCP procedures may include, but are not limited to, the following:

- Cooling component materials prior to addition to the mix to reduce the temperature of the concrete while in its plastic state.
- Adding crushed or shaved ice to the mix water.
- Sprinkle coarse aggregate with water or wet the stockpile.
- Warming concrete during cold weather placements (ie: using hot water when batching, ground heater loops or boiler loops after placement, etc).
- Controlling rate of concrete placement (low lifts).
- Insulating the forms and the surface of the concrete to prevent temperature differential.
- Placing concrete at times of day when the ambient temperature is lowest (in summer) or highest (in winter).
- Other acceptable methods that may be developed by the Contractor and approved in writing by the Engineer.

For mass concrete placements with a least dimension of greater than 6.5 feet, the TCP shall be developed by a Professional Engineer, licensed in the State of Iowa and competent in the modeling, design, and temperature control of concrete in mass elements (TC Engineer). The TC Engineer shall submit a list containing at least three mass concrete projects, of similar dimension and thermal control requirements to those shown on the plans, completed in the last 3 years. In the list of projects include names and phone numbers of owner's representatives who can verify the TC Engineer's participation on those projects. The TC Engineer shall follow the procedure outlined in Section 207.4R-05 of the ACI Manual of Cooling and Insulating Systems for Mass Concrete to formulate, implement, administer, and monitor a temperature control plan, making adjustments as necessary to ensure compliance with the contract documents.

The TCP shall include, but not be limited to the following:

1. Based on the concrete mix design, determine by lab testing the adiabatic heat generation for the concrete mix to be used.

2. Proposed methods to achieve required concrete temperature and control concrete temperature differential through concrete mix design and construction practices for temperature control to prevent thermal cracking during both warm and cold weather.

3. Design of a cooling system consisting of non-corrosive piping to be embedded in the structural mass concrete for all mass concrete placements that are below water level within the limits of the river.

4. Provide information on the temperature sensing and recording equipment to be used and details of installation locations of the temperature probes for each planned mass concrete placement.

5. Mass concrete placement plan to ensure prevention of concrete cold joints.

6. Monitoring Plan to control temperature gradient for both warm and cold weather placements.

B. Thermal Control.

1. Concrete Temperature Limits.
The concrete temperature at time of placement shall not exceed 70°F and shall not be less than 40°F. The maximum concrete temperature during the period of heat dissipation shall not exceed 160°F.

Maximum concrete temperature at time of placement may be based on the TCP developed by the TC Engineer, in accordance with Article DS-15032.03, A.

2. Temperature Differential Restrictions
The temperature differential between the interior of the section and the outside surface of the section shall not exceed the limits in the following table for placements with least dimensions of 6.5 feet or less):

Hours after placement	Maximum temperature differential °F
0-24	20
24-48	30
48-72	40
>72	50

Thermal control of each placement shall be maintained until the temperature of the interior is within 50ºF of the average outside air temperature. The average outside air temperature shall be determined by averaging the daily high and low temperatures over the preceding seven calendar days.

3. Temperature Sensing and Recording
For each placement of structural mass concrete, two temperature sensors shall be installed at each of the following locations (for a total of eight temperature sensors):

- Center of the placement,
- Midpoint of the side which is the shortest distance from the center (2 inch to 4 inch cover),
- Midpoint of the top surface (2 inch to 4 inch cover), and
- Air temperature.

The purpose for two sensors at each location is to provide a primary and secondary backup.

Temperatures shall be electronically recorded automatically by an approved recorder furnished by the Contractor and shall be capable of continuously recording a minimum of one reading per hour for the duration of the mass concrete temperature monitoring period. Sensors and recorder shall be accurate to within +/- 2ºF in the temperature range of 32ºF to 185ºF. Provide a backup temperature sensing system, which shall include both backup temperature sensors and backup temperature readout device. Back-up system is intended to be used to complete the monitoring of a placement should the primary system fail. Primary system shall be repaired or replaced before the commencement of the next placement.

C. Production Concrete.

1. The TC Engineer or their representative shall inspect and approve the installation of monitoring devices and verify the process for recording temperature data is effective for the first placement of each size and type mass component. Qualifications of all technicians employed to inspect or monitor mass concrete placements shall be submitted to the Engineer for approval. For placements other than the first, an employee, approved by the TC Engineer

as qualified to inspect monitor device installation, shall be designated to: 1) review temperature data, 2) be in contact at all times with the TC Engineer if adjustments must be made as a result of the temperature differential being exceeded, and 3) immediately implement adjustments to temperature control measures as directed by the TC Engineer. Recorded temperature data shall be reviewed at intervals of no greater than 4 hours. Recording of temperature data shall begin when the mass concrete placement is complete and shall continue until the maximum temperature differential (not maximum temperature) is reached and a decreasing temperature differential is confirmed as defined in the TCP. If conditions change, such as a drop in the ambient temperature or a change in insulation which would result in an increase in the temperature differential, the recording of temperature data shall be resumed. A copy of all recorded temperature data shall be furnished to the Engineer as they are determined, and a final report shall be furnished within 3 days of completion of monitoring of each element.

Only use approved mixes for production concrete.

2. If the temperature differential within any structural mass concrete placement exceeds the limits in Article DS-15032.03, B , immediate corrective action as directed by the Contractor or the TC Engineer shall be taken, future placement of structural mass concrete will be suspended, and a revised TCP shall be submitted to the Engineer for approval. Do not resume placement of mass concrete without written approval from the Engineer.

When mass concrete temperature differentials are exceeded, all analyses and test results deemed necessary by the Engineer shall be provided for determining the structural integrity and durability of the mass concrete element, to the satisfaction of the Engineer. The analyses and/or test results shall be provided at no additional cost to the Contracting Authority and without additional time to be granted.

Based on the analyses and test results, a determination of corrective action will be made by the Engineer which may include, but not be limited to, price adjustment, epoxy injection of thermal cracks, a combination of both, or removal of the non-complying concrete.

15032.04 METHOD OF MEASUREMENT.
None.

15032.05 BASIS OF PAYMENT.
Costs for complying with this specification shall be considered incidental to the contract unit price for structural concrete. Article 2403.05, A, 4 shall not apply to mass concrete. Protection of mass concrete shall be included in the contract unit price for Structural Concrete.

LETTING DATE 10/20/2015

BRIDGE REPLACEMENT - PPCB
NHSX-020-1(130)--3H-97

WOODBURY COUNTY

WOODBURY COUNTY - DESIGN NO. 114 AND 214
Page 7 of 14

LEGEND

- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD
- INTERSTATE HIGHWAY (80)
- UNITED STATES HIGHWAY (65)
- STATE HIGHWAY (175)
- COUNTY HIGHWAY (S27)
- RAILROAD
- PIPELINE
- AIRPORT
- HYDROLOGY
- BRIDGE
- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES (ABBEY ROAD)
- UNINCORPORATED PLACE (ELWOOD)

IOWA DOT
Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

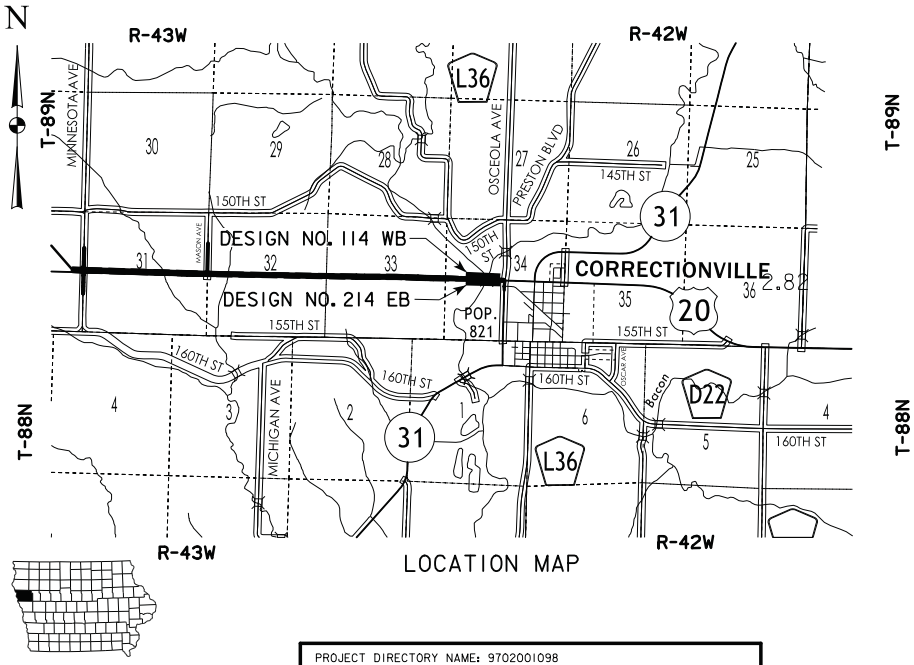
PRIMARY ROAD SYSTEM

WOODBURY COUNTY

BRIDGE REPLACEMENT-PPCB
U.S. 20 WB AND EB OVER LITTLE SIOUX RIVER
0.4 MILES WEST OF IA 31

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN NO. 114 AND 214



PROJECT DIRECTORY NAME: 9702001098

ENGLISH STANDARD BRIDGE PLANS

STANDARD	ISSUED	REVISED

REVISIONS

TOTAL SHEETS	84
PROJECT NUMBER	NHSX-020-1(130)--3H-97
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	98-97-020-010-01

INDEX OF SHEETS

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811

STANDARD ROAD PLANS

DESIGN DATA RURAL

REFER TO INDIVIDUAL SITUATION PLANS FOR TRAFFIC DATA INFORMATION

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	KEVIN M. PLACZEK	STRUCTURAL
5 & 41	DAVID J. MULHOLLAND	HYDRAULICS
SPS.1	ROBERT STANLEY	GEOTECHNICAL
C.1	PAUL W. FLATTERY	ROADWAY
MIT.1	CHIN-TA TSAI	ROADWAY

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER
KEVIN M. PLACZEK
19175
IOWA

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.

Kevin M. Placzek — SEPTEMBER 25, 2015
Signature — Date

Kevin M. Placzek
Printed or Typed Name

My license renewal date is December 31, 2015

Pages or sheets covered by this seal: 1 - 73

DESIGN TEAM: ALFRED BENESCH & CO.	ENGLISH	IOWA DOT * OFFICE OF BRIDGES AND STRUCTURES	FILE NO. 30568	WOODBURY COUNTY	PROJECT NUMBER NHSX-020-1(130)--3H-97	SHEET NUMBER 1

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INCLUDES ADDENDA: A02

GENERAL NOTES:

THIS DESIGN IS CARRY WEST BOUND TRAFFIC FOR THE REPLACEMENT OF THE EXISTING 424'x28' CONTINUOUS I-BEAM BRIDGE, DESIGN NO. 1556, WHICH CARRIES BOTH EAST BOUND AND WEST BOUND TRAFFIC.

REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING STRUCTURES" SHALL INCLUDE 424'x28' CONTINUOUS I-BEAM BRIDGE.

COPIES OF ORIGINAL DESIGN PLANS WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS - HIGHWAY DIVISION - IOWA D.O.T. - AMES. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN NO. 1556).

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

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

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

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

A SCRAPE SAMPLE WAS TAKEN FROM AN AREA OF THIS BRIDGE TO GET AN INDICATION OF THE EXISTENCE OF AND LEVEL OF TOTAL CHROMIUM AND TOTAL LEAD. ANALYSIS OF TOTAL LEAD ON THIS SAMPLE WAS 1500 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 581 PPM. THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE DEPARTMENT'S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

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.

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

THE COST OF PREFORMED EXPANSION JOINT FILLER, FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, AND COST OF FURNISHING AND PLACING CONCRETE SEALER IS TO BE INCLUDED IN THE PRICE BID FOR "HIGH PERFORMANCE STRUCTURAL CONCRETE".

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5@1 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.

THE CONTRACTOR SHALL CONTACT THE USGS AT LEAST 2 WEEKS BEFORE THE PRECONSTRUCTION MEETING. THIS WILL ALLOW A REPRESENTATIVE FROM THE USGS TO ATTEND THIS MEETING AND SCHEDULE THE RELOCATION OF THE GAGING STATION ON THE EXISTING BRIDGE. USGS PHONE: 712-323-8024.

THE ROAD WILL BE OPEN TO TRAFFIC ON THE EXISTING BRIDGE DURING CONSTRUCTION IN 2015, THE ROAD WILL BE CLOSED TO TRAFFIC IN 2016, AND THE ROAD WILL BE OPEN TO TRAFFIC ON THE NEW WEST BOUND BRIDGE DURING CONSTRUCTION IN 2017 AS INDICATED IN THE TRAFFIC CONTROL PLAN. REFER TO THE TRAFFIC CONTROL PLAN IN PROJECT NO. NHSX-020-1(133)--3H-97.

CAST IN ONE PIECE STEEL PILE POINTS ARE REQUIRED FOR ABUTMENTS AND PIERS IN ACCORDANCE WITH ARTICLE 4167.02 OF THE CURRENT STANDARD SPECIFICATIONS AND MATERIALS I.M. 468.

THE CONTRACTOR SHALL NOTE THE STANDARD ABUTMENT DETAILS HAVE BEEN MODIFIED TO OFFSET THE ABUTMENT FOOTING FROM THE WINGWALL AND THE ABUTMENT FOOTING FROM THE BACKWALL TO AID IN TYING THE REINFORCING STEEL BETWEEN THE FOOTING TO WINGWALL AND THE FOOTING TO BACKWALL.

GENERAL NOTES (CONT.):

GUARDRAIL AND APPROACH BARRIERS ARE TO BE PLACED BY PROJECT NHSX-020-1(133)--3H-97.

THE APPROACH FILLS AS SHOWN ARE NOT A PART OF THIS CONTRACT, BUT ARE TO BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

CONCRETE SEALER IS TO BE APPLIED TO THE EXPOSED BRIDGE SEAT SURFACE AT THE ABUTMENTS.

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 5 . PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING.

THESE BRIDGE PLANS DO NOT CONTAIN ROAD SHEETS FOR THE PROJECT SHOWN. ROAD PLANS FOR THE PROJECT HAVE BEEN TIED TO THE BRIDGE PLANS THROUGH THE CONTRACT LETTING PROCESS. THE TIED ROAD PLANS, PROJECT NO. NHSX-020-1(133)--3H-97, CONTAIN 404 PERMIT INFORMATION AND THE POLLUTION PREVENTION PLAN.

DURING CONSTRUCTION OF THIS PROJECT THE BRIDGE CONTRACTOR WILL BE REQUIRED TO COORDINATE OPERATIONS WITH THOSE OF OTHER CONTRACTORS WORKING WITHIN THE SAME AREA. OTHER WORK IN PROGRESS DURING THE SAME PERIOD OF TIME WILL INCLUDE, BUT IS NOT LIMITED TO, CONSTRUCTION OF THE FOLLOWING PROJECTS:

- NHSX-020-1(134)--3H-97 TRAFFIC SIGNS
- NHSX-020-1(147)--3H-97 RCB CULVERT REPLACEMENT
- NHSX-020-1(149)--3H-97 STRUCTURES-MISCELLANEOUS

SPECIFICATIONS:

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

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

THE DEVELOPMENTAL SPECIFICATION, DS-15032, "DEVELOPMENTAL SPECIFICATIONS FOR MASS CONCRETE - CONTROL OF HEAT OF HYDRATION" SHALL APPLY TO WORK ON THIS PROJECT.

THE DEVELOPMENTAL SPECIFICATIONS, DS-15033, FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES SHALL APPLY TO WORK ON THIS PROJECT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, LRFD 6th Ed, SERIES OF 2012, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.

REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60.

CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 4,000 PSI, EXCEPT PRESTRESSED BEAM CONCRETE AS NOTED.

BRIDGE DECK CONCRETE f'c = 4,000 PSI.

PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEETS 26- 27 .

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

SHOP DRAWING SUBMITTALS

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 SHOULD BE IN ACCORDANCE WITH ARTICLE 1105.03, OF THE STANDARD SPECIFICATIONS, FOR HIGHWAY AND BRIDGE CONSTRUCTION OF THE IOWA DEPARTMENT OF TRANSPORTATION.

1	STRUCTURAL STEEL
2	BEARINGS
3	STEEL EXTRUSION JOINT WITH NEOPRENE

BRIDGE DECK DIMENSIONS TABLE

	ITEM	UNITS	QUANTITY
1	DECK LENGTH	L.F.	489.8
2	DECK WIDTH	L.F.	43.2
3	DECK AREA	S.F.	21,144.6

1. DECK LENGTH IS MEASURED FROM ℄ OF EXPANSION JOINT AT THE WEST ABUTMENT TO THE ℄ OF EXPANSION JOINT AT THE EAST ABUTMENT ALONG THE ℄ US20 WESTBOUND APPROACH ROADWAY.
2. DECK WIDTH IS MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE ℄ US20 WESTBOUND APPROACH ROADWAY.
3. DECK AREA IS TO BE BASED ON THE TABULATED DECK AREAS.

DESIGN FOR 30° SKEW L.A.

486'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

121'-0 END SPANS 122'-0 INTERIOR SPANS

GENERAL NOTES

STATION 20813+99.87 JULY 2015

WOODBURY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 36 FILE NO. 30568 DESIGN NO. 114

benesch
Alfred Benesch & Company
205 North Michigan Avenue, Suite 2400
Chicago, Illinois 60601
312-565-0450 Job No. 10423.01

DESIGN TEAM MFH/RMG/KMP | WOODBURY COUNTY | PROJECT NUMBER NHSX-020-1(130)--3H-97 | SHEET NUMBER 4

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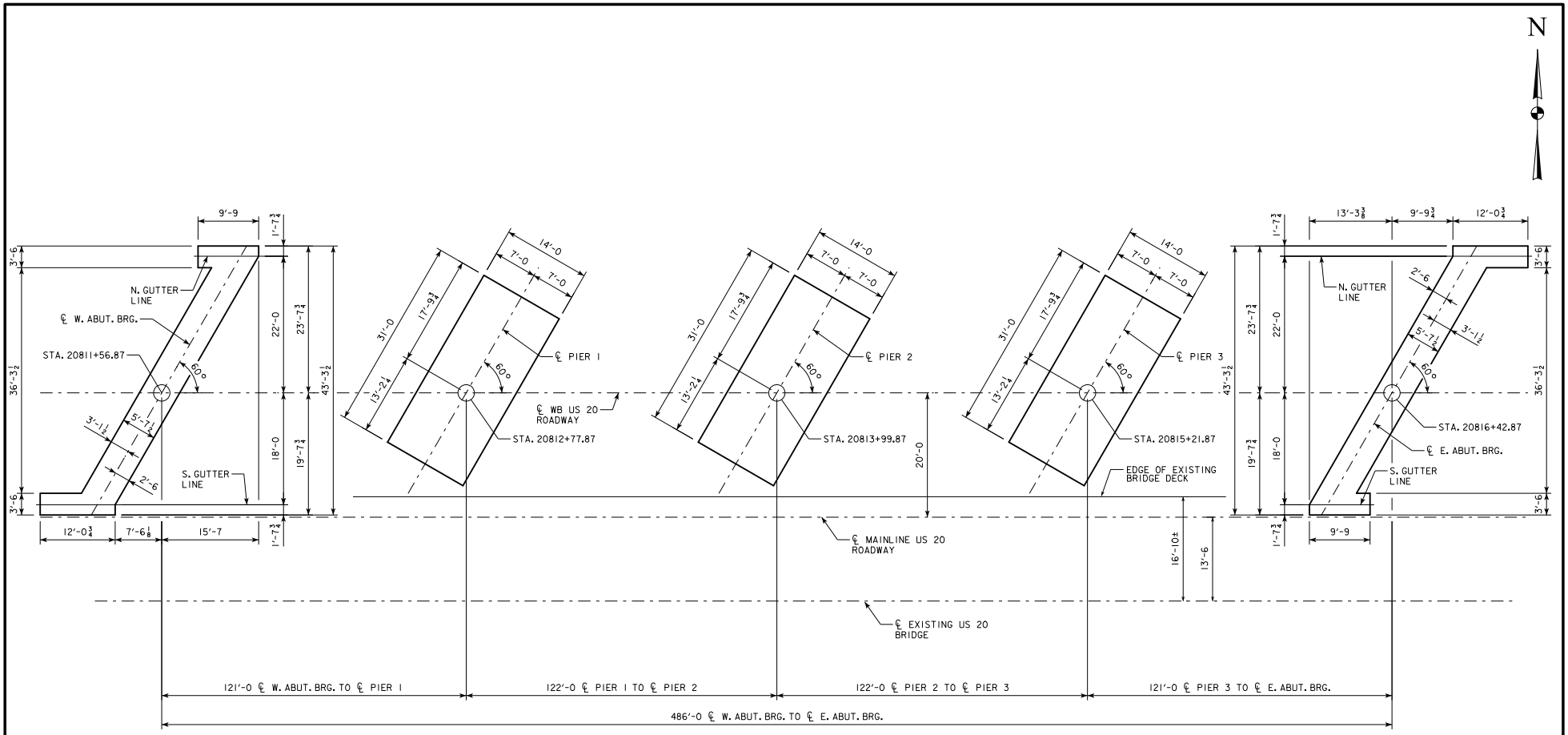
MODEL:97011 4S003

INCLUDES ADDENDA: A02



STAKING DIAGRAM

DESIGN FOR 30° SKEW L.A.

486'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

121'-0 END SPANS — 122'-0 INTERIOR SPANS

STAKING DIAGRAM

STATION 20813+99.87 — JULY 2015

WOODBURY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 6 OF 36 FILE NO. 30568 DESIGN NO. 114

benesch
Alfred Benesch & Company
205 North Michigan Avenue, Suite 2400
Chicago, Illinois 60601
312-565-0450 Job No. 10423.01

DESIGN TEAM MFH/RMG/KMP	WOODBURY COUNTY	PROJECT NUMBER NHSX-020-1(130)--3H-97	SHEET NUMBER 7

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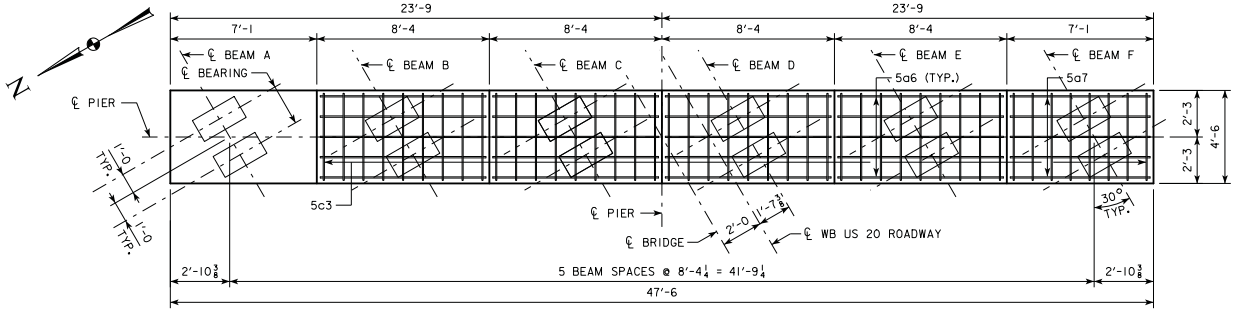
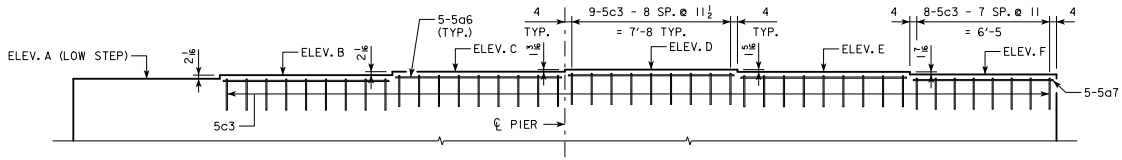
MODEL:970114S006

INCLUDES ADDENDA: A02

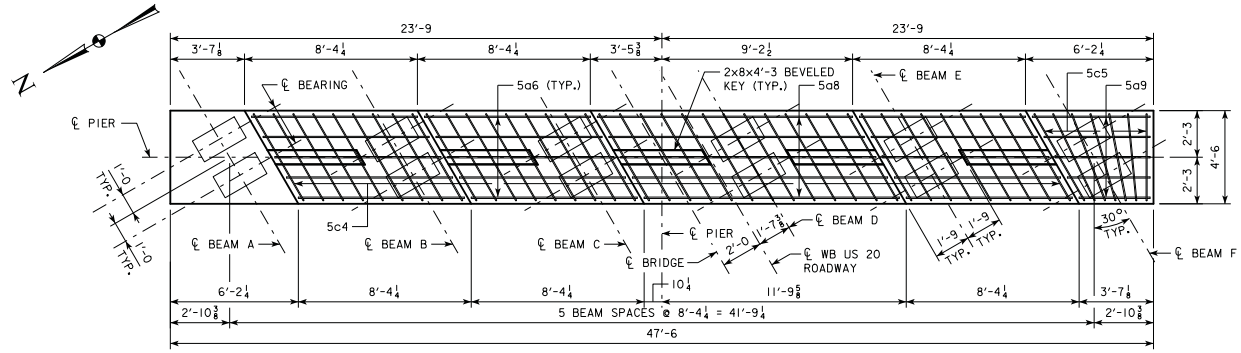
BENCH MARK NO. 567 STA. 10811+73.14 5.08' RT EL. 1133.482
FOUND IDOT PLUG TOP NW RAIL BRIDGE



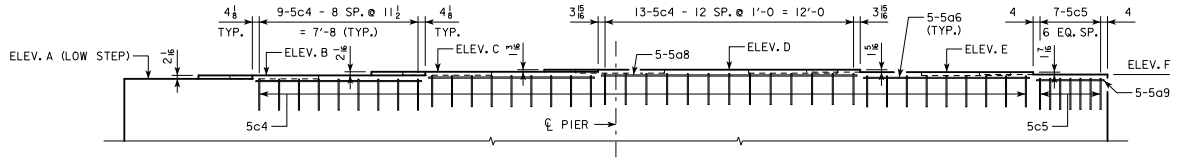
BEAM SEAT PLAN - PIERS 1 & 3 (EXPANSION)



BEAM SEAT ELEVATION - PIERS 1 & 3 (EXPANSION)



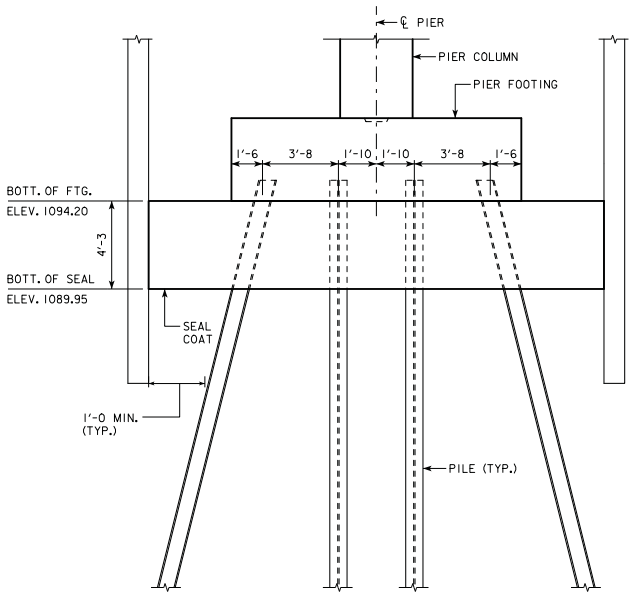
BEAM SEAT PLAN - PIER 2 (FIXED)



BEAM SEAT ELEVATION - PIER 2 (FIXED)

BEAM SEAT ELEVATIONS

LOCATION	ELEV. A	ELEV. B	ELEV. C	ELEV. D	ELEV. E	ELEV. F
PIER 1	1126.64	1126.81	1126.98	1127.08	1126.97	1126.85
PIER 2	1126.25	1126.42	1126.59	1126.69	1126.58	1126.46
PIER 3	1125.17	1125.34	1125.51	1125.61	1125.50	1125.38



COFFERDAM SECTION

PIER NOTES:

CAP REINFORCEMENT NOT SHOWN FOR CLARITY. SEE DESIGN SHEET 7 FOR DETAILS.

SEE DESIGN SHEET 9 FOR FOOTING DETAILS AND ADDITIONAL PIER NOTES.

SEE DESIGN SHEET 6 FOR STAKING DIAGRAM.

DESIGN FOR 30° SKEW L.A.

486'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

121'-0 END SPANS 122'-0 INTERIOR SPANS

PIER DETAILS

STATION 20813+99.87 JULY 2015

WOODBURY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 8 OF 36 FILE NO. 30568 DESIGN NO. 114

benesch
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312-565-0450 Job No. 10423.01

DESIGN TEAM MFH/RMG/KMP | WOODBURY COUNTY | PROJECT NUMBER NHSX-020-1(130)--3H-97 | SHEET NUMBER 9

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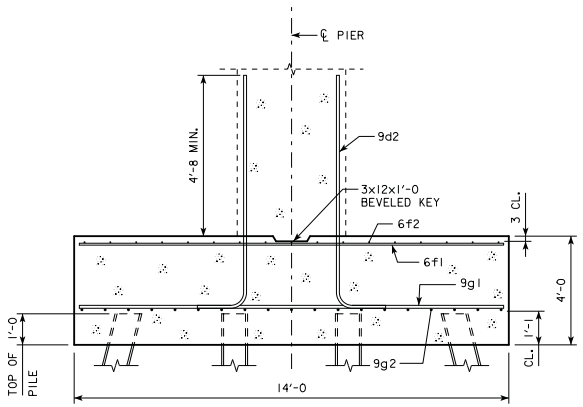
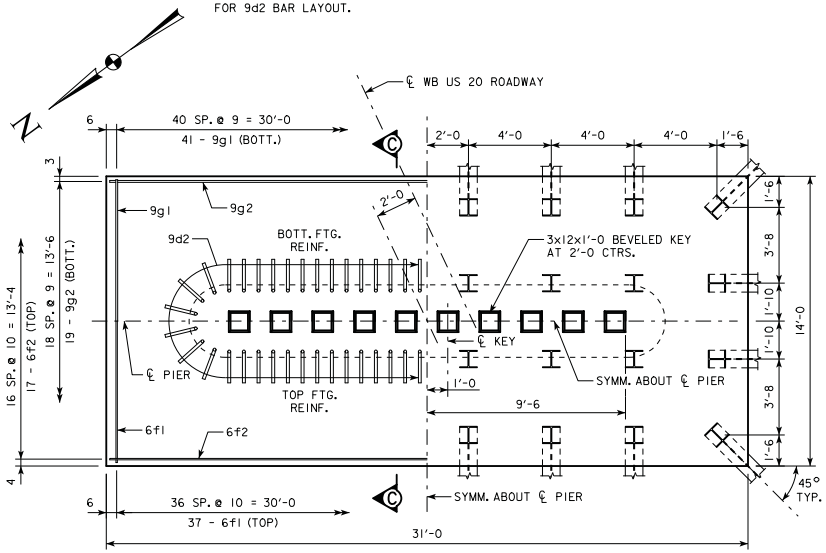


SECTION C-C

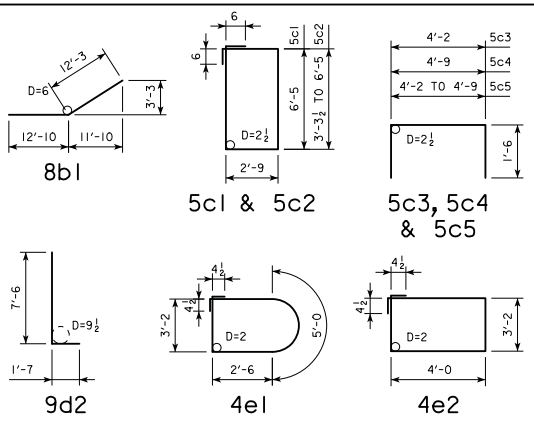
NOTE:
SEE SECTION A-A ON DESIGN SHEET 7
FOR 9d2 BAR LAYOUT.



FOOTING PLAN AND PILE LAYOUT

32-HP14x73 STEEL PILES (55' LONG) REQUIRED AT PIER 1
32-HP14x73 STEEL PILES (50' LONG) REQUIRED AT PIER 2
32-HP14x73 STEEL PILES (50' LONG) REQUIRED AT PIER 3

BENT BAR DETAILS



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

CAP

REINFORCING STEEL	BAR	LOCATION	SHAPE	PIER 1 NO.	PIER 1 LENGTH	PIER 1 WEIGHT	PIER 2 NO.	PIER 2 LENGTH	PIER 2 WEIGHT	PIER 3 NO.	PIER 3 LENGTH	PIER 3 WEIGHT
	10a1	TOP LONGITUDINAL		18	47'-2	3,654	18	47'-2	3,654	18	47'-2	3,654
	6a2	SIDES LONGITUDINAL		6	47'-2	426	6	47'-2	426	6	47'-2	426
	6a3	SIDES LONGITUDINAL		2	45'-0	136	2	45'-0	136	2	45'-0	136
	6a4	SIDES LONGITUDINAL		2	38'-3	115	2	38'-3	115	2	38'-3	115
	6a5	SIDES LONGITUDINAL		2	31'-6	95	2	31'-6	95	2	31'-6	95
	5a6	BEAM SEAT LONGITUDINAL		20	8'-0	167	15	8'-0	126	20	8'-0	167
	5a7	BEAM SEAT LONGITUDINAL		5	6'-9	36	-	-	-	5	6'-9	36
	5a8	BEAM SEAT LONGITUDINAL		-	-	-	5	12'-3	64	-	-	-
	5a9	BEAM SEAT LONGITUDINAL		-	-	-	5	VARIES	24	-	-	-
	8b1	BOTTOM LONGITUDINAL		12	25'-1	804	12	25'-1	804	12	25'-1	804
	5c1	MIDDLE TRANSVERSE		54	19'-4	1,089	54	19'-4	1,089	54	19'-4	1,089
	5c2	CANTILEVER TRANSVERSE		68	VARIES	1,150	68	VARIES	1,150	68	VARIES	1,150
	5c3	BEAM SEAT TRANSVERSE		44	7'-2	329	-	-	-	44	7'-2	329
	5c4	BEAM SEAT TRANSVERSE		-	-	-	40	7'-9	324	-	-	-
	5c5	BEAM SEAT TRANSVERSE		-	-	-	7	VARIES	55	-	-	-
		TOTAL (LB.)		8,001			8,062			8,001		
		STRUCTURAL CONCRETE (CY)		49.0			49.0			49.0		

COLUMN

REINF. STEEL	BAR	LOCATION	SHAPE	PIER 1 NO.	PIER 1 LENGTH	PIER 1 WEIGHT	PIER 2 NO.	PIER 2 LENGTH	PIER 2 WEIGHT	PIER 3 NO.	PIER 3 LENGTH	PIER 3 WEIGHT
	9d1	VERTICAL		68	24'-6	5,665	68	24'-1	5,569	68	23'-0	5,318
	4e1	END TRANSVERSE		44	13'-11	410	44	13'-11	410	42	13'-11	391
	4e2	MIDDLE TRANSVERSE		154	15'-1	1,552	154	15'-1	1,552	147	15'-1	1,482
		TOTAL (LB.)		7,627			7,531			7,191		
		STRUCTURAL CONCRETE (CY)		62.6			61.5			58.4		

FOOTING

REINFORCING STEEL	BAR	LOCATION	SHAPE	PIER 1 NO.	PIER 1 LENGTH	PIER 1 WEIGHT	PIER 2 NO.	PIER 2 LENGTH	PIER 2 WEIGHT	PIER 3 NO.	PIER 3 LENGTH	PIER 3 WEIGHT
	9d2	COLUMN DOWELS		68	9'-1	2,101	68	9'-1	2,101	68	9'-1	2,101
	6f1	TOP TRANSVERSE		37	13'-8	760	37	13'-8	760	37	13'-8	760
	6f2	TOP LONGITUDINAL		17	30'-8	784	17	30'-8	784	17	30'-8	784
	9g1	BOTTOM TRANSVERSE		41	13'-8	1,906	41	13'-8	1,906	41	13'-8	1,906
	9g2	BOTTOM LONGITUDINAL		19	30'-8	1,982	19	30'-8	1,982	19	30'-8	1,982
		TOTAL (LB.)		7,533			7,533			7,533		
		STRUCTURAL CONCRETE (CY)		64.3			64.3			64.3		

PIER NOTES:

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

THE CONTRACT LENGTH OF 55 FEET FOR THE PIER 1 PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 176 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55. THE CONTRACT LENGTH OF 50 FEET FOR THE PIER 2 AND PIER 3 PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 176 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL FOR THE PIER 1 PILES WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55. THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL FOR THE PIER 2 AND PIER 3 PILES WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING. DESIGN SCOUR (100-YEAR) WAS ASSUMED TO AFFECT THE UPPER 8 FEET OF EMBEDDED PILE LENGTH AND CAUSE 23 KIPS OF DRIVING RESISTANCE FOR THE PIER 1 PILES AND 28 KIPS OF DRIVING RESISTANCE FOR THE PIER 2 AND PIER 3 PILES.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR THE PIER 1 PILES IS 171 TONS AT END OF DRIVE OR RETAP. THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR THE PIER 2 AND PIER 3 PILES IS 149 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH A BEARING GRAPH. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 30 FEET.

STEEL PILE POINTS ARE REQUIRED FOR THE STEEL H-PILES AT THE PIERS.

ALL BATTERED PILES SHALL BE TRIMMED TO A HORIZONTAL LINE TO AID IN THE PLACEMENT OF REINFORCING.

THE LUMP SUM BID ITEM "EXCAVATE AND DEWATER" SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE EXCAVATION AND DEWATERING REQUIRED TO CONSTRUCT THE PIER FOOTINGS IN THE DRY, IN ACCORDANCE WITH SECTION 2405 OF THE STANDARD SPECIFICATIONS. THE LENGTH AND WIDTH OF THE SEAL COAT WAS BASED ON THE REQUIRED ONE FOOT CLEARANCE BETWEEN THE TIP OF THE SHEET PILES AND THE BATTERED PILING. THE CONCRETE SEAL COAT, IF USED, SHALL BE 4'-3 THICK, BASED ON A WATER ELEVATION OF 1122.00.

IF THE WATER ELEVATION IS HIGHER THAN 1122.00 AT THE TIME OF CONSTRUCTION, A LARGER SEAL COAT MAY BE REQUIRED TO MAINTAIN THE CLEARANCE BETWEEN THE SHEET PILES AND BATTERED PILING. THE BRIDGE ENGINEER SHALL BE NOTIFIED BEFORE USING A LARGER SEAL COAT.

ALL EXPOSED CORNERS 90° OR SHARPER ARE TO BE FILLETED WITH A ¾" DRESSED AND BEVELED STRIP.

SPECIFICATIONS FOR MASS CONCRETE CONTROL OF HEAT OF HYDRATION SHALL APPLY TO THE PIER CAP.

SEE DESIGN SHEETS 7 AND 8 FOR PIER DETAILS.

SEE DESIGN SHEET 6 FOR STAKING DIAGRAM.

PILE DIMENSIONS SHOWN ARE AT THE BOTTOM OF FOOTING. BATTER PILES 4V:1H IN THE DIRECTION SHOWN.

CONSTRUCTION JOINTS ARE TO BE FORMED WITH 3 x 12 x 1'-0 DRESSED AND BEVELED KEYS, SPACED AS SHOWN ON FOOTING PLAN.

DESIGN FOR 30° SKEW L.A.

486'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

121'-0 END SPANS — 122'-0 INTERIOR SPANS

PIER DETAILS

STATION 20813+99.87 — JULY 2015

WOODBURY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 9 OF 36 — FILE NO. 30568 — DESIGN NO. 114

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Alfred Benesch & Company
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312-565-0450 Job No. 10423.01

DESIGN TEAM MFH/RMG/KMP | WOODBURY COUNTY | PROJECT NUMBER NHSX-020-1(130)--3H-97 | SHEET NUMBER 10

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GENERAL NOTES:

THIS DESIGN IS CARRY EAST BOUND TRAFFIC FOR THE REPLACEMENT OF THE EXISTING 424'x28' CONTINUOUS I-BEAM BRIDGE, DESIGN NO. 1556, WHICH CARRIES BOTH EAST BOUND AND WEST BOUND TRAFFIC.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

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

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

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

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.

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

THE COST OF PREFORMED EXPANSION JOINT FILLER, FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, AND COST OF FURNISHING AND PLACING CONCRETE SEALER IS TO BE INCLUDED IN THE PRICE BID FOR "HIGH PERFORMANCE STRUCTURAL CONCRETE".

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5a1 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.

THE CONTRACTOR SHALL CONTACT THE USGS AT LEAST 2 WEEKS BEFORE THE PRECONSTRUCTION MEETING. THIS WILL ALLOW A REPRESENTATIVE FROM THE USGS TO ATTEND THIS MEETING AND SCHEDULE THE RELOCATION OF THE GAGING STATION ON THE EXISTING BRIDGE. USGS PHONE: 712-323-8024.

THE ROAD WILL BE OPEN TO TRAFFIC ON THE EXISTING BRIDGE DURING CONSTRUCTION IN 2015, THE ROAD WILL BE CLOSED TO TRAFFIC IN 2016, AND THE ROAD WILL BE OPEN TO TRAFFIC ON THE NEW WEST BOUND BRIDGE DURING CONSTRUCTION IN 2017 AS INDICATED IN THE TRAFFIC CONTROL PLAN. REFER TO THE TRAFFIC CONTROL PLAN IN PROJECT NO. NHSX-020-1(133)--3H-97.

CAST IN ONE PIECE STEEL PILE POINTS ARE REQUIRED FOR ABUTMENTS AND PIERS IN ACCORDANCE WITH ARTICLE 4167.02 OF THE CURRENT STANDARD SPECIFICATIONS AND MATERIALS I.M. 468.

THE CONTRACTOR SHALL NOTE THE STANDARD ABUTMENT DETAILS HAVE BEEN MODIFIED TO OFFSET THE ABUTMENT FOOTING FROM THE WINGWALL AND THE ABUTMENT FOOTING FROM THE BACKWALL TO AID IN TYING THE REINFORCING STEEL BETWEEN THE FOOTING TO WINGWALL AND THE FOOTING TO BACKWALL.

THE APPROACH FILLS AS SHOWN ARE NOT A PART OF THIS CONTRACT, BUT ARE TO BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

CONCRETE SEALER IS TO BE APPLIED TO THE EXPOSED BRIDGE SEAT SURFACE AT THE ABUTMENTS.

THESE BRIDGE PLANS DO NOT CONTAIN ROAD SHEETS FOR THE PROJECT SHOWN. ROAD PLANS FOR THE PROJECT HAVE BEEN TIED TO THE BRIDGE PLANS THROUGH THE CONTRACT LETTING PROCESS. THE TIED ROAD PLANS, PROJECT NO. NHSX-020-1(133)--3H-97, CONTAIN 404 PERMIT INFORMATION AND THE POLLUTION PREVENTION PLAN.

GENERAL NOTES (CONT.):

GUARDRAIL AND APPROACH BARRIERS ARE TO BE PLACED BY PROJECT NHSX-020-1(133)--3H-97.

DURING CONSTRUCTION OF THIS PROJECT THE BRIDGE CONTRACTOR WILL BE REQUIRED TO COORDINATE OPERATIONS WITH THOSE OF OTHER CONTRACTORS WORKING WITHIN THE SAME AREA. OTHER WORK IN PROGRESS DURING THE SAME PERIOD OF TIME WILL INCLUDE, BUT IS NOT LIMITED TO, CONSTRUCTION OF THE FOLLOWING PROJECTS:

- NHSX-020-1(134)--3H-97 TRAFFIC SIGNS
- NHSX-020-1(147)--3H-97 RCB CULVERT REPLACEMENT
- NHSX-020-1(149)--3H-97 STRUCTURES-MISCELLANEOUS

SPECIFICATIONS:

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

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

THE DEVELOPMENTAL SPECIFICATION, DS-15032, "DEVELOPMENTAL SPECIFICATIONS FOR MASS CONCRETE - CONTROL OF HEAT OF HYDRATION" SHALL APPLY TO WORK ON THIS PROJECT.

THE DEVELOPMENTAL SPECIFICATIONS, DS-15033, FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES SHALL APPLY TO WORK ON THIS PROJECT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, LRFD 6th Ed, SERIES OF 2012, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.

REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60.

CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 4,000 PSI, EXCEPT PRESTRESSED BEAM CONCRETE AS NOTED.

BRIDGE DECK CONCRETE f'c = 4,000 PSI.

PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEETS 26- 27.

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

SHOP DRAWING SUBMITTALS

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 SHOULD BE IN ACCORDANCE WITH ARTICLE 1105.03, OF THE STANDARD SPECIFICATIONS, FOR HIGHWAY AND BRIDGE CONSTRUCTION OF THE IOWA DEPARTMENT OF TRANSPORTATION.

1	STRUCTURAL STEEL
2	BEARINGS
3	STEEL EXTRUSION JOINT WITH NEOPRENE

BRIDGE DECK DIMENSIONS TABLE

	ITEM	UNITS	QUANTITY
1	DECK LENGTH	L.F.	489.8
2	DECK WIDTH	L.F.	43.2
3	DECK AREA	S.F.	21,145

1. DECK LENGTH IS MEASURED FROM ℄ OF EXPANSION JOINT AT THE WEST ABUTMENT TO THE ℄ OF EXPANSION JOINT AT THE EAST ABUTMENT ALONG THE ℄ US20 EASTBOUND APPROACH ROADWAY.
2. DECK WIDTH IS MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE ℄ US20 EASTBOUND APPROACH ROADWAY.
3. DECK AREA IS TO BE BASED ON THE TABULATED DECK AREAS.

DESIGN FOR 30° SKEW L.A.

486'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

121'-0 END SPANS 122'-0 INTERIOR SPANS

GENERAL NOTES

STATION 30813+76.64 JULY 2015

WOODBURY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 36 FILE NO. 30568 DESIGN NO. 214

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DESIGN TEAM MFH/RMG/KMP | WOODBURY COUNTY | PROJECT NUMBER NHSX-020-1(130)--3H-97 | SHEET NUMBER 40

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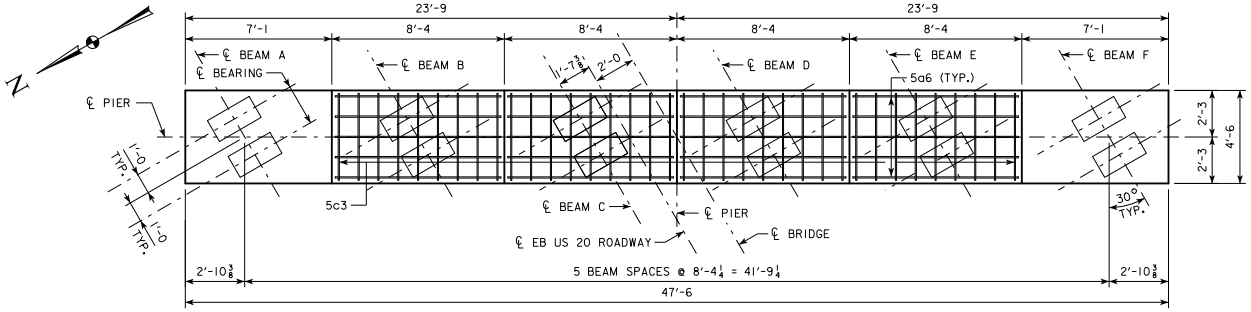
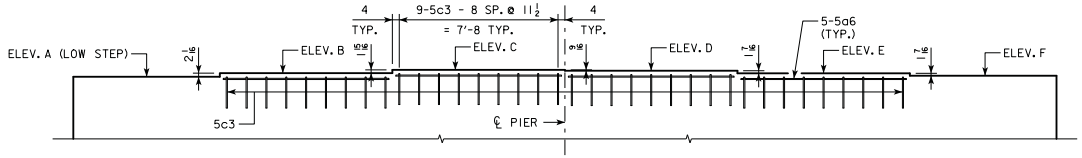
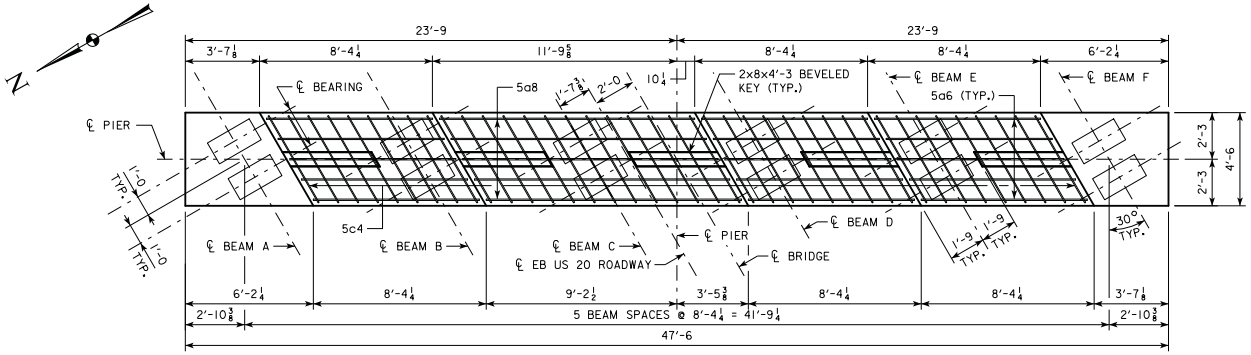
BENCH MARK NO. 567 STA. 10811+73.14 5.08' RT EL. 1133.482
FOUND IDOT PLUG TOP NW RAIL BRIDGE



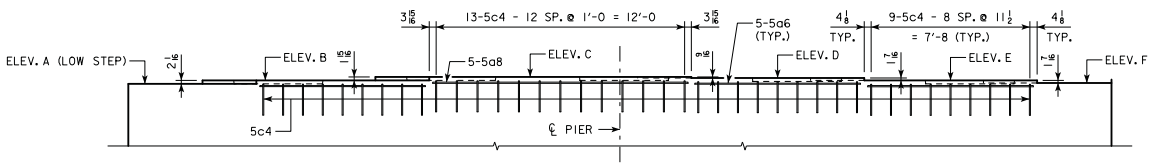
BEAM SEAT PLAN - PIERS 1 & 3 (EXPANSION)



BEAM SEAT ELEVATION - PIERS 1 & 3 (EXPANSION)



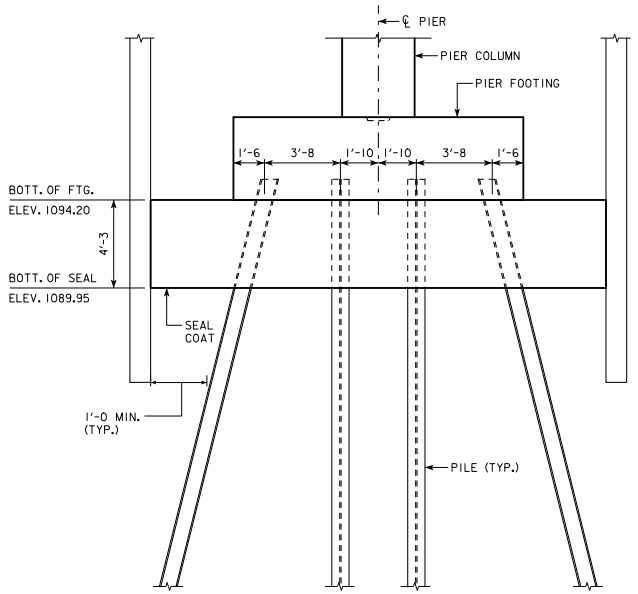
BEAM SEAT PLAN - PIER 2 (FIXED)



BEAM SEAT ELEVATION - PIER 2 (FIXED)

BEAM SEAT ELEVATIONS

LOCATION	ELEV. A	ELEV. B	ELEV. C	ELEV. D	ELEV. E	ELEV. F
PIER 1	1126.87	1127.04	1127.20	1127.16	1127.04	1126.91
PIER 2	1126.49	1126.66	1126.82	1126.77	1126.65	1126.53
PIER 3	1125.41	1125.58	1125.74	1125.69	1125.57	1125.45



COFFERDAM SECTION

PIER NOTES:

CAP REINFORCEMENT NOT SHOWN FOR CLARITY. SEE DESIGN SHEET 7 FOR DETAILS.

SEE DESIGN SHEET 9 FOR FOOTING DETAILS AND ADDITIONAL PIER NOTES.

SEE DESIGN SHEET 6 FOR STAKING DIAGRAM.

DESIGN FOR 30° SKEW L.A.

486'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

121'-0 END SPANS 122'-0 INTERIOR SPANS

PIER DETAILS

STATION 30813+76.64 JULY 2015

WOODBURY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 8 OF 36 FILE NO. 30568 DESIGN NO. 214

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DESIGN TEAM MFH/RMG/KMP | WOODBURY COUNTY | PROJECT NUMBER NHSX-020-1(130)--3H-97 | SHEET NUMBER 45

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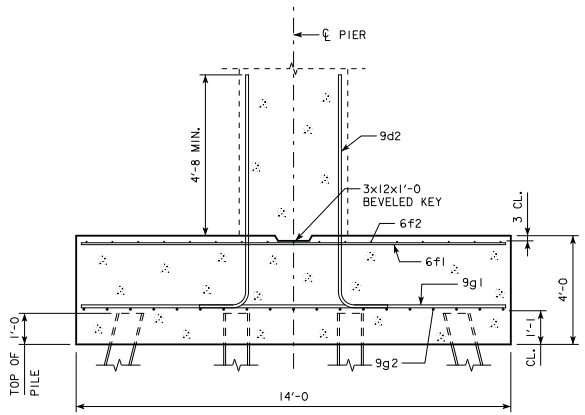
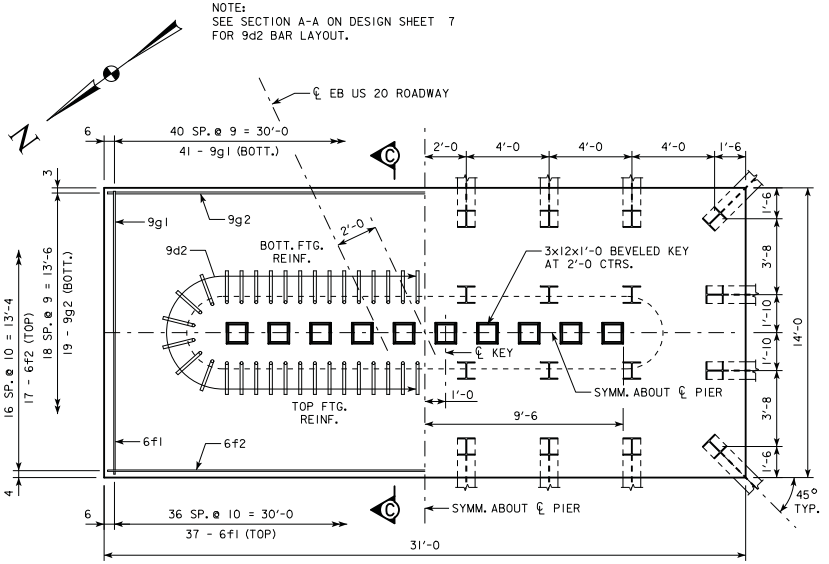


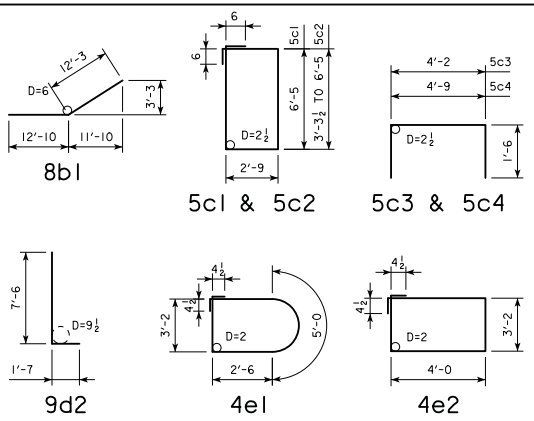
SECTION C-C



FOOTING PLAN AND PILE LAYOUT

32-HP14x73 STEEL PILES (55' LONG) REQUIRED AT PIER 1
32-HP14x73 STEEL PILES (50' LONG) REQUIRED AT PIER 2
32-HP14x73 STEEL PILES (50' LONG) REQUIRED AT PIER 3

BENT BAR DETAILS



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

CAP

REINFORCING STEEL	BAR	LOCATION	SHAPE	PIER 1 NO.	PIER 1 LENGTH	PIER 1 WEIGHT	PIER 2 NO.	PIER 2 LENGTH	PIER 2 WEIGHT	PIER 3 NO.	PIER 3 LENGTH	PIER 3 WEIGHT
	10a1	TOP LONGITUDINAL	———	18	47'-2	3,654	18	47'-2	3,654	18	47'-2	3,654
	6a2	SIDES LONGITUDINAL	———	6	47'-2	426	6	47'-2	426	6	47'-2	426
	6a3	SIDES LONGITUDINAL	———	2	45'-0	136	2	45'-0	136	2	45'-0	136
	6a4	SIDES LONGITUDINAL	———	2	38'-3	115	2	38'-3	115	2	38'-3	115
	6a5	SIDES LONGITUDINAL	———	2	31'-6	95	2	31'-6	95	2	31'-6	95
	5a6	BEAM SEAT LONGITUDINAL	———	20	8'-0	167	15	8'-0	126	20	8'-0	167
	5a8	BEAM SEAT LONGITUDINAL	———	-	-	-	5	12'-3	64	-	-	-
	8b1	BOTTOM LONGITUDINAL	⌒	12	25'-1	804	12	25'-1	804	12	25'-1	804
	5c1	MIDDLE TRANSVERSE	□	54	19'-4	1,089	54	19'-4	1,089	54	19'-4	1,089
	5c2	CANTILEVER TRANSVERSE	□	68	VARIES	1,150	68	VARIES	1,150	68	VARIES	1,150
	5c3	BEAM SEAT TRANSVERSE	⊓	36	7'-2	270	-	-	-	36	7'-2	270
	5c4	BEAM SEAT TRANSVERSE	⊓	-	-	-	40	7'-9	324	-	-	-
		TOTAL (LB.)			7,906			7,983			7,906	
		STRUCTURAL CONCRETE (CY)			48.3			48.3			48.3	

COLUMN

REINF. STEEL	BAR	LOCATION	SHAPE	PIER 1 NO.	PIER 1 LENGTH	PIER 1 WEIGHT	PIER 2 NO.	PIER 2 LENGTH	PIER 2 WEIGHT	PIER 3 NO.	PIER 3 LENGTH	PIER 3 WEIGHT
	9d1	VERTICAL	———	68	24'-9	5,723	68	24'-4	5,626	68	23'-3	5,376
	4e1	END TRANSVERSE	⊂⊃	44	13'-11	410	44	13'-11	410	42	13'-11	391
	4e2	MIDDLE TRANSVERSE	□	154	15'-1	1,552	154	15'-1	1,552	147	15'-1	1,482
		TOTAL (LB.)			7,685			7,588			7,249	
		STRUCTURAL CONCRETE (CY)			63.3			62.2			59.1	

FOOTING

REINFORCING STEEL	BAR	LOCATION	SHAPE	PIER 1 NO.	PIER 1 LENGTH	PIER 1 WEIGHT	PIER 2 NO.	PIER 2 LENGTH	PIER 2 WEIGHT	PIER 3 NO.	PIER 3 LENGTH	PIER 3 WEIGHT
	9d2	COLUMN DOWELS	⌐	68	9'-1	2,101	68	9'-1	2,101	68	9'-1	2,101
	6f1	TOP TRANSVERSE	———	37	13'-8	760	37	13'-8	760	37	13'-8	760
	6f2	TOP LONGITUDINAL	———	17	30'-8	784	17	30'-8	784	17	30'-8	784
	9g1	BOTTOM TRANSVERSE	———	41	13'-8	1,906	41	13'-8	1,906	41	13'-8	1,906
	9g2	BOTTOM LONGITUDINAL	———	19	30'-8	1,982	19	30'-8	1,982	19	30'-8	1,982
		TOTAL (LB.)			7,533			7,533			7,533	
		STRUCTURAL CONCRETE (CY)			64.3			64.3			64.3	

PIER NOTES:

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

THE CONTRACT LENGTH OF 55 FEET FOR THE PIER 1 PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 176 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55. THE CONTRACT LENGTH OF 50 FEET FOR THE PIER 2 AND PIER 3 PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 176 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL FOR THE PIER 1 PILES WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55. THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL FOR THE PIER 2 AND PIER 3 PILES WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING. DESIGN SCOUR (100-YEAR) WAS ASSUMED TO AFFECT THE UPPER 8 FEET OF EMBEDDED PILE LENGTH AND CAUSE 23 KIPS OF DRIVING RESISTANCE FOR THE PIER 1 PILES AND 28 KIPS OF DRIVING RESISTANCE FOR THE PIER 2 AND PIER 3 PILES.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR THE PIER 1 PILES IS 171 TONS AT END OF DRIVE OR RETAP. THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR THE PIER 2 AND PIER 3 PILES IS 149 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH A BEARING GRAPH. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 30 FEET.

STEEL PILE POINTS ARE REQUIRED FOR THE STEEL H-PILES AT THE PIERS.

ALL BATTERED PILES SHALL BE TRIMMED TO A HORIZONTAL LINE TO AID IN THE PLACEMENT OF REINFORCING.

THE LUMP SUM BID ITEM "EXCAVATE AND DEWATER" SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE EXCAVATION AND DEWATERING REQUIRED TO CONSTRUCT THE PIER FOOTINGS IN THE DRY, IN ACCORDANCE WITH SECTION 2405 OF THE STANDARD SPECIFICATIONS. THE LENGTH AND WIDTH OF THE SEAL COAT WAS BASED ON THE REQUIRED ONE FOOT CLEARANCE BETWEEN THE TIP OF THE SHEET PILES AND THE BATTERED PILING. THE CONCRETE SEAL COAT, IF USED, SHALL BE 4'-3 THICK, BASED ON A WATER ELEVATION OF 1122.00. IF THE WATER ELEVATION IS HIGHER THAN 1122.00 AT THE TIME OF CONSTRUCTION, A LARGER SEAL COAT MAY BE REQUIRED TO MAINTAIN THE CLEARANCE BETWEEN THE SHEET PILES AND BATTERED PILING. THE BRIDGE ENGINEER SHALL BE NOTIFIED BEFORE USING A LARGER SEAL COAT.

ALL EXPOSED CORNERS 90° OR SHARPER ARE TO BE FILLETED WITH A ¾" DRESSED AND BEVELED STRIP.

SPECIFICATIONS FOR MASS CONCRETE CONTROL OF HEAT OF HYDRATION SHALL APPLY TO THE PIER CAP.

SEE DESIGN SHEETS 7 AND 8 FOR PIER DETAILS.

SEE DESIGN SHEET 6 FOR STAKING DIAGRAM.

PILE DIMENSIONS SHOWN ARE AT THE BOTTOM OF FOOTING. BATTER PILES 4V:1H IN THE DIRECTION SHOWN.

CONSTRUCTION JOINTS ARE TO BE FORMED WITH 3 x 12 x 1'-0 DRESSED AND BEVELED KEYS, SPACED AS SHOWN ON FOOTING PLAN.

DESIGN FOR 30° SKEW L.A.

486'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

121'-0 END SPANS 122'-0 INTERIOR SPANS

PIER DETAILS

STATION 30813+76.64 JULY 2015

WOODBURY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 9 OF 36 FILE NO. 30568 DESIGN NO. 214

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