

# 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>B.O.</b>	<b>Proposal ID</b>	<b>Proposal Work Type</b>	<b>County</b>	<b>Project Number</b>	<b>Addendum</b>
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 50°F 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 +/- 2°F in the temperature range of 32°F to 185°F. 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.

# IOWA DOT

Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

## PRIMARY ROAD SYSTEM

WOODBURY COUNTY

**LEGEND**

	INTERSTATE HIGHWAY
	PRIMARY HIGHWAY-DIVIDED
	PORTLAND CEMENT CONCRETE ROAD
	ASPHALT ROAD
	BITUMINOUS ROAD
	GRAVEL ROAD
	EARTHEN ROAD
	UNITED STATES HIGHWAY
	STATE HIGHWAY
	COUNTY HIGHWAY
	RAILROAD
	PIPELINE
	AIRPORT
	HYDROLOGY
	BRIDGE
	STATE BOUNDARY
	COUNTY BOUNDARY
	OWNERSHIP LINE
	SECTION NAME
	UNINCORPORATED PLACE
	ABANDONED ROAD
	ENWOOD

BRIDGE REPLACEMENT - PPCB  
 NHSX-020-(1130)--3H-97  
 10/20/2015

**ENGLISH STANDARD BRIDGE PLANS**

STANDARD	ISSUED	REVISED

TOTAL SHEETS	84
PROJECT NUMBER	NHSX-020-(1130)--3H-97
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	98-97-020-010-01

**INDEX OF SHEETS**

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET - DESIGN NO. 114
3 - 37	BRIDGE DESIGN NO. 114
38	ESTIMATE SHEET - DESIGN NO. 214
39 - 73	BRIDGE DESIGN NO. 214
SPS1 - SPS6	SOIL PROFILE SHEET - DESIGN NO. 114 AND DESIGN 214
C1	ESTIMATE SHEET FOR ROADWAY
MIT-1	ROCK RIFFLE AND QUANTITY SHEETS
MIT-2	
U1 - U2	BRIDGE APPROACH SHEETS

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

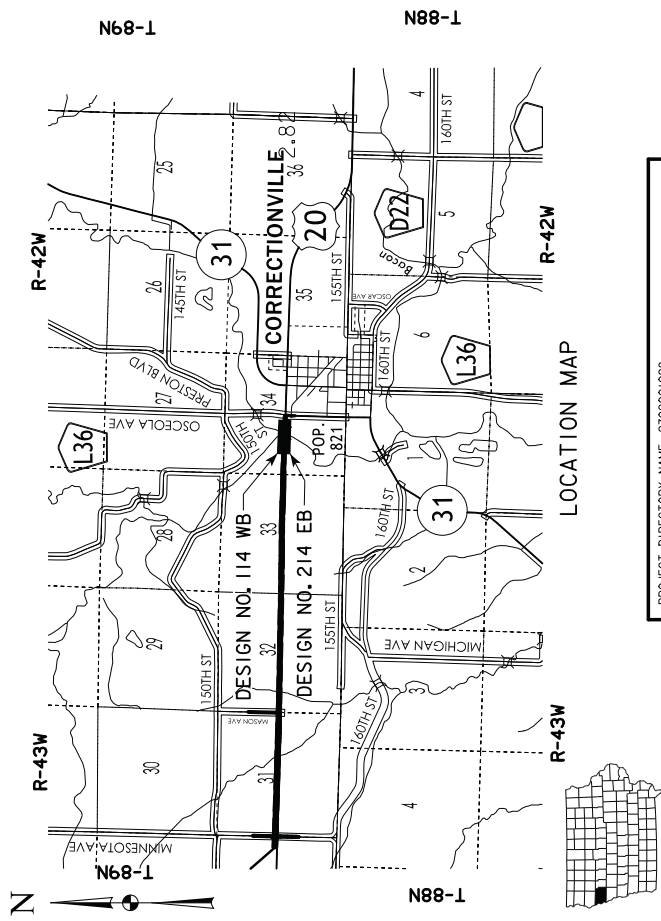
THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN NO. 114 AND 214

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

**REVISIONS**

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**DESIGN DATA RURAL**  
 REFER TO INDIVIDUAL SITUATION PLANS FOR TRAFFIC DATA INFORMATION

**STANDARD ROAD PLANS**

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**INDEX OF SEALS**

SHEET NO.	NAME	TYPE
1	KEVIN M. PLACZEK	STRUCTURAL
5 & 41	DAVID J. MULHOLLAND	HYDRAULICS
SPS1	ROBERT STANLEY	GEOTECHNICAL
C-1	PAUL W. FLATTERY	ROADWAY
MIT-1	CHIN-TA TSAI	ROADWAY

**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.

*Kevin M. Placzek*  
 Signature Kevin M. Placzek  
 Printed or Typed Name SEPTEMBER 25, 2015  
 Date

My license renewal date is December 31, 2015.  
 Pages or sheets covered by this seal: 1 - 73

**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, IOWA 50565. ISSUES 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 881 PPM. THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO ABOVE REGULATORY LEVELS. LEVELS ABOVE THESE LIMITS MAY BE THE RESULT OF OTHER TOXIC 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). CLASS BR CONCRETE SHALL BE USED FOR PERFORMANCE CONCRETE. CLASS C CONCRETES 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 SEALS SHALL BE INCLUDED IN THE PRICE BID FOR "HIGH PERFORMANCE STRUCTURAL CONCRETE".

ALL REINFORCING BARS AND BARS NOTED AS BOWELS 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, AND 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. NBSX-020-10333--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 BUTTMENT 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 NBSX-020-10333--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 AND THE PLAN. ROADWAY AND APPROACH BARRIERS 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. NBSX-020-10333--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 SHALL INCLUDE, BUT IS NOT LIMITED TO, CONSTRUCTION OF THE FOLLOWING PROJECTS:

- NBSX-020-10334--3H-97 TRAFFIC SIGNS
- NBSX-020-10347--3H-97 RCB CULVERT REPLACEMENT
- NBSX-020-10499--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, "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  $\frac{1}{2}$  OF EXPANSION JOINT AT THE WEST ABUTMENT TO THE  $\frac{1}{2}$  OF EXPANSION JOINT AT THE EAST ABUTMENT ALONG THE  $\frac{1}{2}$  US20 WESTBOUND APPROACH ROADWAY.

2. DECK WIDTH IS MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE  $\frac{1}{2}$  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+98.87  
**WOODBURY COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 3 OF 36 FILE NO. 30568 DESIGN NO. 1114

PROJECT NUMBER NBSX-020-10333--3H-97

WOODBURY COUNTY

PROJECT NUMBER NBSX-020-10333--3H-97

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WOODBURY COUNTY

**INCLUDES ADDENDA: A02**

PROJECT NUMBER NBSX-020-10333--3H-97

PROJECT NUMBER NBSX-020-10333--3H-97

PROJECT NUMBER NBSX-020-10333--3H-97

PROJECT NUMBER NBSX-020-10333--3H-97



Atif Benesch & Company  
 205 North Milligan Avenue, Suite 2400  
 Ames, IA 50565-4565  
 Job No. 19423.01

DESIGN TEAM MFL/RMG/AMP

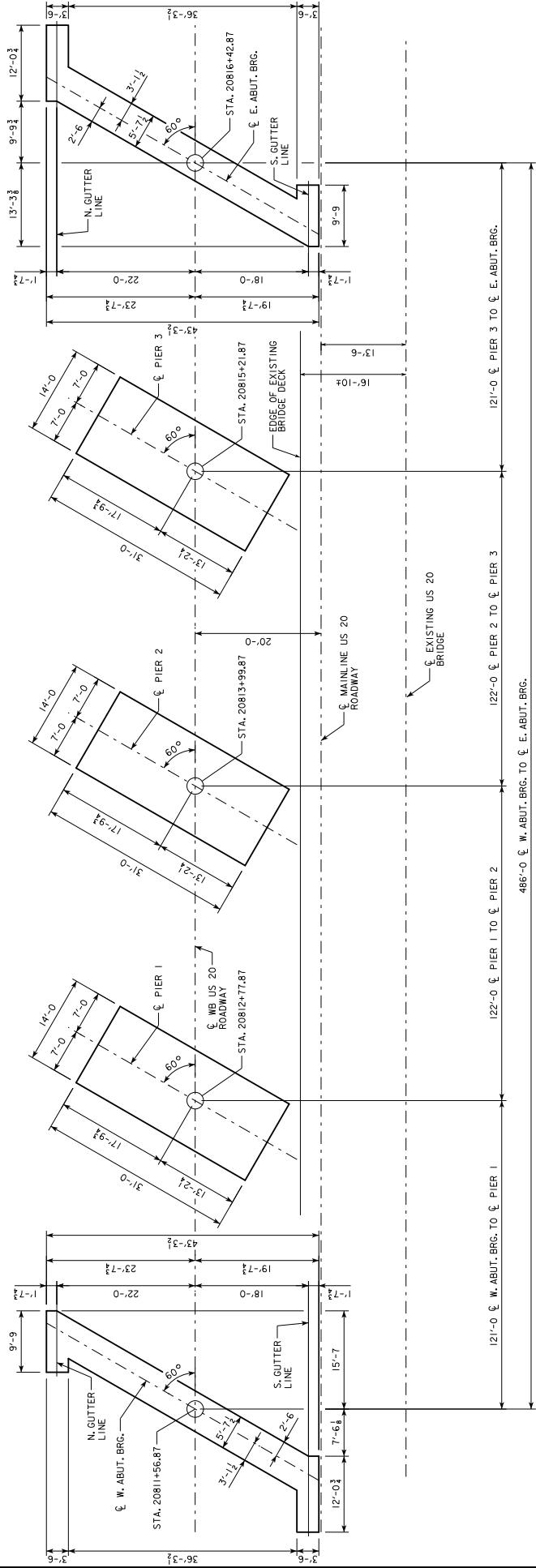
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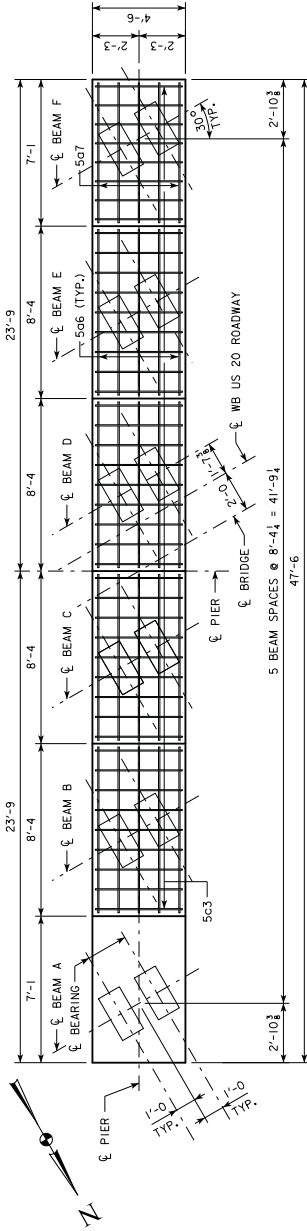
STAKING DIAGRAM

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  
**WOODBURY COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 6 OF 36 FILE NO. 30558 DESIGN NO. 114

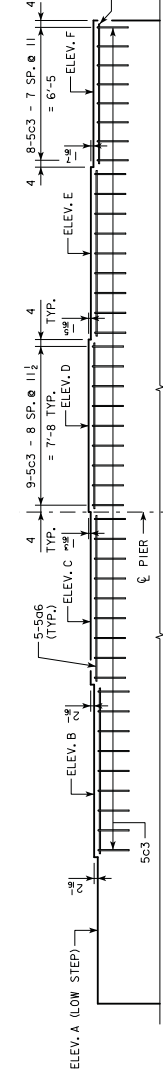
Alfred Benesch & Company  
 205 North Michigan Avenue, Suite 2400  
 Chicago, IL 60601-3900  
 312.565-4650  
 Job No. 19423.01



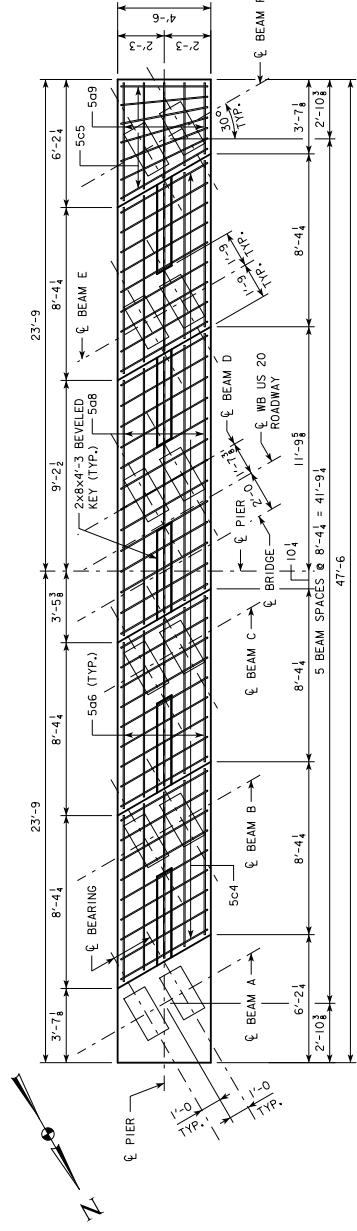
BENCH MARK NO. 567 STA. 1081+73.14 5.08' RT. EL. 1133.482  
 FOUND 100' PLUS TOP NW RAIL BRIDGE



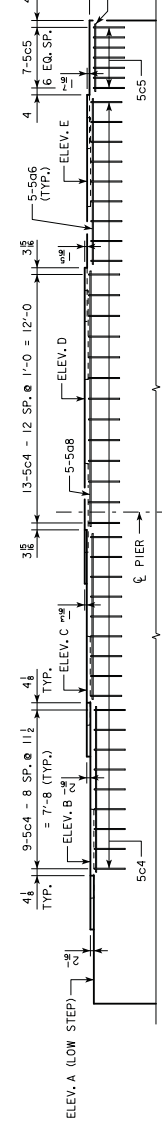
BEAM SEAT PLAN - PIERS 1 & 3 (EXPANSION)



BEAM SEAT ELEVATION - PIERS 1 & 3 (EXPANSION)



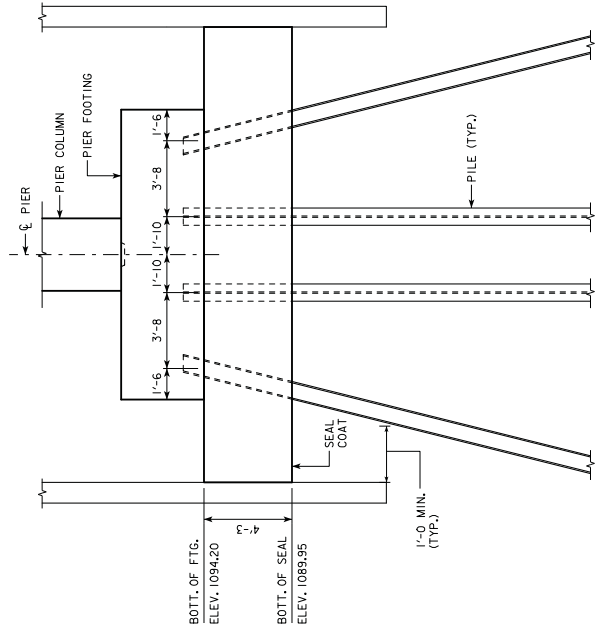
BEAM SEAT PLAN - PIER 2 (FIXED)



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

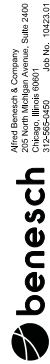
PIER DETAILS

STATION 20813+98.87  
 JULY 2015  
 WOODBURY COUNTY  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 8 OF 36 FILE NO. 30558 DESIGN NO. 114

WOODBURY COUNTY PROJECT NUMBER INHX-020-(130)-3H-97

INCLUDES ADDENDA: A02

SHEET NUMBER 9



Alfred Benesch & Company  
 205 North Michigan Avenue, Suite 2400  
 Chicago, IL 60601-3906  
 312.565-4650  
 Job No. 19423.01

DESIGN TEAM MFL/RMG/AMP  
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MODEL: 9701145008



**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 FILLERS, FURNISHING AND PLACING, SUBDRAIN (INCLUDING EXCAVATION), FLOORABLE BACKFILL, PIPERAILS 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 (5G) IS  $\frac{5}{8}$  IN. THE FOLLOWING BAR DESIGNATION IS 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 THE EVENT THE WEST BOUND BRIDGE DURING CONSTRUCTION 20' IS INDICATED IN THE TRAFFIC CONTROL PLAN, REFER TO THE TRAFFIC CONTROL PLAN IN PROJECT NO. NHSX-020-(1133)-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 144-466.

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 PROVIDED IN THE BRIDGE PLANS THROUGH THE PROJECT'S PROJECTS\Benesch\12784\97020130.Final\07302015.BRIDGE PLANS NHSX-020-(1133)-3H-97, CONTAIN 404 PERMIT INFORMATION AND THE POLLUTION PREVENTION PLAN.



Alfred Benesch & Company  
 205 North Michigan Avenue, Suite 2400  
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 312-555-4565  
 Job No. 19423.01

DESIGN TEAM MFL/RMG/AMP

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MODEL: 9702145003

**GENERAL NOTES (CONT.):**

GUARDRAIL AND APPROACH BARRIERS ARE TO BE PLACED BY PROJECT NHSX-020-(1133)-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: 3H-97 TRAFFIC SIGNS  
 NHSX-020-(1147)-3H-97 RCB CULVERT REPLACEMENT  
 NHSX-020-(1149)-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

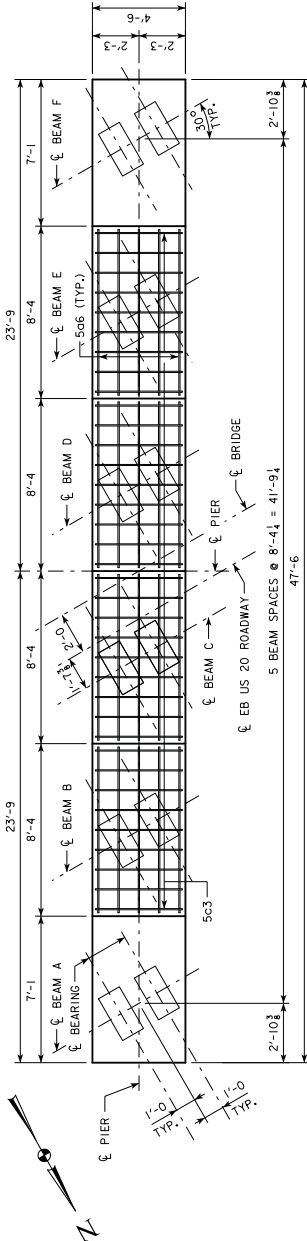
**BRIDGE DECK DIMENSIONS TABLE**

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

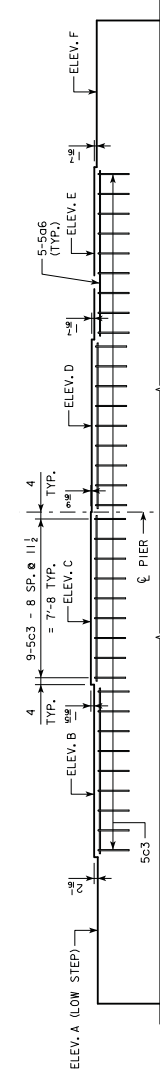
- DECK LENGTH IS MEASURED FROM  $\frac{1}{2}$  OF EXPANSION JOINT AT THE WEST ABUTMENT TO THE  $\frac{1}{2}$  OF EXPANSION JOINT AT THE EAST ABUTMENT ALONG THE  $\frac{1}{2}$  US20 EASTBOUND APPROACH ROADWAY.
- DECK WIDTH IS MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE  $\frac{1}{2}$  US20 EASTBOUND APPROACH ROADWAY.
- 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  
**WOODBURY COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 3 OF 36 FILE NO. 30568 DESIGN NO. 214

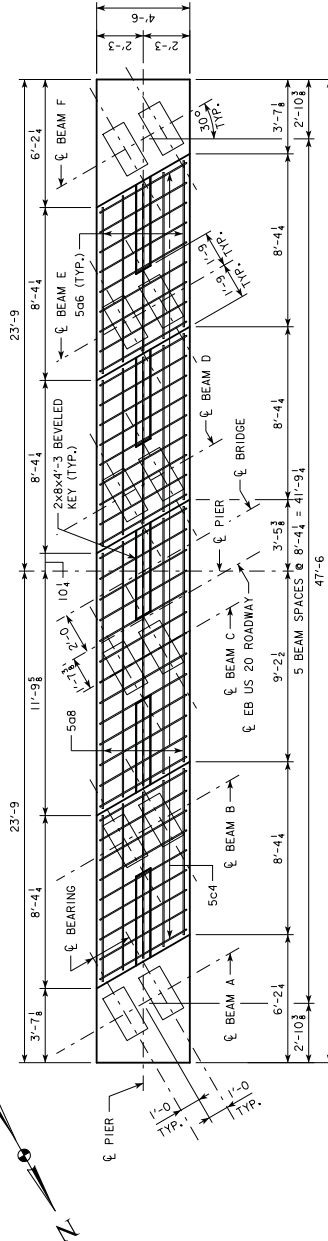
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 FOUND 100' PLUG TOP NW RAIL BRIDGE



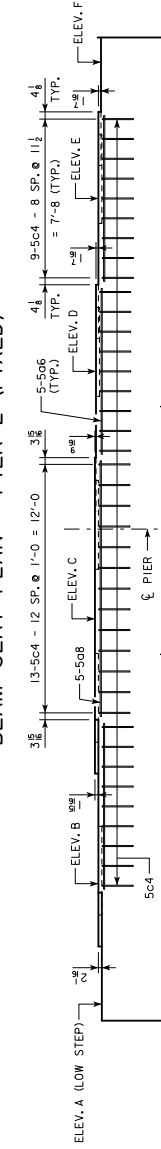
BEAM SEAT PLAN - PIERS 1 & 3 (EXPANSION)



BEAM SEAT ELEVATION - PIERS 1 & 3 (EXPANSION)



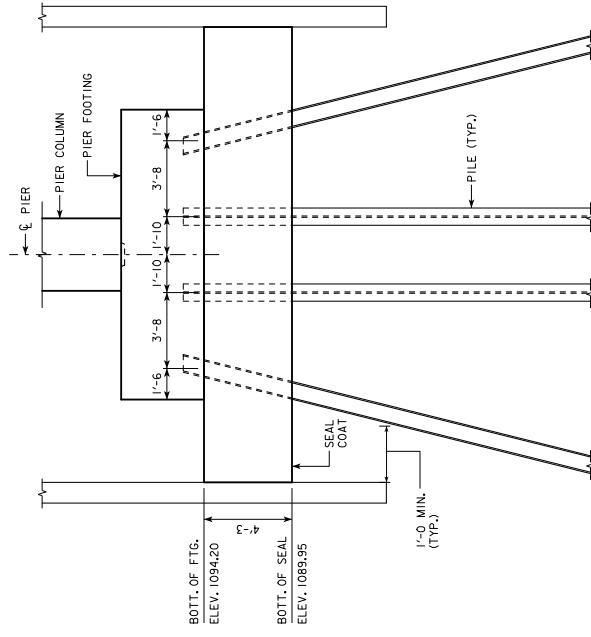
BEAM SEAT PLAN - PIER 2 (FIXED)



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:

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- SEE DESIGN SHEET 6 FOR STAKING DIAGRAM.

DESIGN FOR 30° SKEW L.A.  
**486'-0 X 40'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**  
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 STATION 30813+76.64  
**WOODBURY COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 8 OF 36 FILE NO. 30558  
 JULY 2015  
 SHEET NUMBER 45

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