

# A d d e n d u m

Iowa Department of Transportation  
Office of Contracts

Date of Letting: April 25, 2017  
Date of Addendum: April 20, 2017

<b>B.O.</b>	<b>Proposal ID</b>	<b>Proposal Work Type</b>	<b>County</b>	<b>Project Number</b>	<b>Addendum</b>
002	82-0741-198	BRIDGE – STEEL GIRDER	SCOTT	IM-NHS-074-1(198)5--03-82	25APR002A08

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

Replace SP-150216 for POST-TENSIONING OF WIND TONGUES AND LONGITUDINAL RESTRAINTS with attached SP-150216a.

Make the following changes to the PLAN:

Replace SHEET 2 with attached SHEET 2.

Note: Sheet 2:

Corrected test shaft tip elevation in estimate reference information from 511.00 to 527.00.



**SPECIAL PROVISIONS  
FOR  
POST-TENSIONING OF WIND TONGUES AND LONGITUDINAL RESTRAINTS**

**Scott County  
IM-NHS-074-1(198)5--03-82**

**Effective Date  
April 25, 2017**

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

**150216a.01 DESCRIPTION.**

- A.** This work includes furnishing, installing, and post-tensioning the all-thread-bars at the wind tongues. It also includes furnishing and installing corrosion inhibiting grease, top and bottom caps with attachments, nuts, and washers as indicated in the plans. This work does not include fabricating, installing, or temporarily supporting the steel pipes, embedded base plates, and studs on the wind tongues, which are included in Design No. 817.
- B.** This work also includes furnishing, installing, and post-tensioning the all-thread-bars at the longitudinal restraints. It also includes furnishing and installing corrosion inhibiting grease, top and bottom caps with attachments, nuts, and washers as indicated in the plans. This work does not include fabricating, installing, or temporarily supporting the steel pipes, embedded base plates, grillage plates, and studs on the longitudinal restraints, which are included in Design No. 817.

**150216a.02 QUALIFICATIONS AND INSPECTION.**

- A.** Perform all post-tensioning field operations under the direct supervision (crew foreman) of a qualified post-tensioning technician.
- B.** Provide a crew foreman with the following:
  - A minimum of 5 years bridge construction experience, including 2 years in post-tensioning-related operations,
  - A minimum of 1 year as a foreman in responsible charge of post-tensioning-related operations, and
  - Certification according to the "Post-Tensioning Training Course" of the Post-Tensioning Institute (PTI), or other equivalent and recognized alternative course.

**150216a.03 TERMINOLOGY.**

**Anchorage:** An assembly of various hardware components which secures the all-thread-bars at their ends after they have been stressed and transfers a compressive force into the concrete.

**Job Site:** The location where the post-tensioning is to be performed. Also called the “site”.

**Post-tensioning:** A method of prestressing where tensioning of the tendons occurs after the concrete has reached a specified strength.

**Set (also Anchor Set):** Anchor set is the total movement of a point on the post-tensioning bar during load transfer from the jack to the permanent anchorages.

**Tendon:** A complete assembly consisting of post-tensioning anchorages, all-thread-bar, and ducts with corrosion inhibiting grease.

**150216a.04 MATERIAL.**

**A. General.**

Furnish all components of a post-tensioning system from a single supplier.

**B. All-Thread-Bars.**

1. Provide all-thread-bar conforming to ASTM A 722, Gr. 150, Type II, including Supplementary Requirement S1. Provide full load nuts and hardened washers according to the manufacturer’s proprietary system design. Epoxy coat all all-thread-bars, nuts, and washers in accordance with ASTM A 775.
2. Fabricate the all-thread-bar with sufficient length beyond the custom bearing plates to allow for post-tensioning and anchorage device installation.

**C. Corrosion Inhibiting Grease.**

Provide corrosion inhibiting grease conforming to NLGI Grade 2 and the following requirements:

Test Description	Test Method	Acceptance Criteria
Dropping Point	ASTM D 566 or ASTM D 2265	300°F min.
Oil Separation @ 160°F	FTMS 791B Method 321.2	0.5% max. by mass
Water Content	ASTM D 95	0.1% max.
Flash Point (refers to oil components)	ASTM D 92	300°F min.
Corrosion Test (5% salt fog at 100°F, 5 mils, Q Panel Type S)	ASTM B 117	Rust Grade 7 or better after 1000 hrs of exposure according to ASTM D 610
Water Soluble Ions <sup>a</sup> a. Chlorides b. Sulfides c. Nitrates	ASTM D 512 APHA <sup>b</sup> 4500S <sup>2</sup> -E ASTM D 3867	10 ppm max. 10 ppm max. 10 ppm max.
Soak Test (5% salt fog at 100°F, 5 mils, Q Panel Type S. Immerse panels 50% in a 5% salt solution and expose to salt fog)	ASTM B 117 (modified)	No emulsification of the coating after 720 hrs of exposure

<p>Compatibility with sheathing</p> <p>a. Hardness and volume change of polymer after exposure to grease, 40 days at 150°F.</p> <p>b. Tensile strength change of polymer after exposure to grease, 40 days at 150°F.</p>	<p>ASTM D 4289 (ASTM D 792 for density)</p> <p>ASTM D 638</p>	<p>Permissible change in hardness 15%, volume 10%.</p> <p>Permissible change in tensile strength 30%.</p>
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- a **Procedure:** The inside (bottom and sides) of a 1 L Pyrex beaker (approximate outside diameter 105 mm, height 145 mm) is thoroughly coated with 100 +/- 10 g of corrosion inhibiting grease. The coated beaker is filled with approximately 900 cc of distilled water and heated in an oven at a controlled temperature of 38 deg. C +/- 1°C for 4 hours. The water extraction is tested by the noted test procedures for the appropriate water-soluble ions. Results are reported as ppm in the extracted water.
- b American Public Health Association (AHPA)

**D. Post-Tensioning Anchorage.**

- ~~1. Secure all all thread bars at the ends by means of permanent type anchorage devices. The design of the end anchorages is the sole responsibility of the post-tensioning system manufacturer.~~
- ~~2. Ensure that the anchorages develop at least 95% of the actual ultimate tensile strength of the all-thread bars, when tested in an unbonded state, without exceeding the anticipated jacking force. Provide written certification that anchorages meet or exceed these testing requirements.~~
- ~~3. Design anchorages so that the average concrete bearing stress is in compliance with the AASHTO LRFD Bridge Design Specifications. Test anchorages with the actual local zone reinforcement present in the field. Provide written certification that anchorages meet or exceed the testing requirements in the AASHTO LRFD Bridge Construction Specifications.~~
- ~~4. Perform testing of post-tensioning anchorage devices using samples of the type of all-thread bars to be used on the project. Assemble the test specimen in an unbonded state, and, in testing, the anticipated jacking force shall not be exceeded.~~

**E. Top and Bottom Caps.**

Provide top and bottom caps fabricated from ASTM A 588 steel and ASTM A 500 HSS with neoprene rubber washer and Type 316 stainless steel plug. ASTM A 572 or ASTM A 36 may be substituted at no additional cost. ASTM A53 Grade B shall be used for pipe.

**F. Testing Requirements.**

- 1. General.**
  - a. Testing shall conform to the applicable ASTM Specifications for the post-tensioning material used.
  - b. Furnish all material samples for testing at no additional cost.
- 2. All-Thread-Bars.**
  - a. Furnish samples for testing as described below for each manufacturer of all-thread-bar to be used on the project.
  - b. With each sample of all-thread-bar furnished for testing, submit a certification stating the manufacturer's "Guaranteed Ultimate Tensile Strength (GUTS)" of the sample furnished.
  - c. The Engineer will obtain the following sample of bar, at the plant or jobsite, from the all-thread-bar used for post-tensioning operations:
  - d. Three randomly selected samples, 5 feet long, per manufacturer, per size of bar, per heat

of steel, with a minimum of one sample per shipment.

- e. One of each of the samples furnished to represent a lot will be tested. The remaining sample(s), properly identified and tagged, will be stored by the Engineer for future testing in the event of loss or failure of the component represented to meet minimum strength requirements. For acceptance of the lot represented, test results must show that 100% of the guaranteed ultimate tensile strength has been met.

**3. Lots and Identification.**

A lot is that parcel of components as described herein. All all-thread-bars from each mill heat of steel shipped to the site shall be assigned an individual lot number and shall be tagged in such a manner that each such lot can be accurately identified at the job site. Submit records to the Engineer identifying assigned lot numbers with the heat of material represented. All unidentified all-thread-bars received at the site will be rejected. Also, loss of positive identification of these items at any time will be cause for rejection.

**4. Approval of Materials.**

The approval of any material by the Engineer shall not preclude subsequent rejection if the material is damaged in transit or later damaged or found to be defective for any reason.

**150216a.05 SUBMITTALS.**

**A. General.**

1. Submit detailed shop drawings, calculations, and manuals for all work related to post-tensioning. Provide shop drawings and calculations that are sealed by a Professional Engineer licensed in the state of Iowa. Do not commence work until the submittals have been approved by the Engineer.
2. All shop drawings are to accurately detail the actual methods, materials, equipment, etc., that will be used in the field on the project. Deviation is not permitted unless approved by the Engineer.

**B. Submittals.**

At a minimum, submit the following information:

1. A post-tensioning system that meets the requirements of the contract documents and is compatible with the local zone reinforcement already in place.
2. A detailed proposed sequence of construction, including any variations from the procedures provided herein.
3. Specific details regarding the assembly of the post-tensioning assemblies.
4. Properties, dimensions, and designations (where applicable) of each of the components of the post-tensioning assemblies, including the top and bottom caps.
5. Appropriate details of changes from the dimensions shown on the plans, with clear and concise cross reference to the appropriate plans to which the variations apply.
6. Details of the sequence of the stressing of the all-thread-bars;
7. Details of the post-tensioning jacking forces and elongation of each tendon, including stressing end seating losses at each stage of erection for all post-tensioning.
8. Elongation calculations and tolerances.

9. Equipment to be used in the post-tensioning operation.
10. Calculations for anticipated anchor set, elastic shortening, and long-term effects.
11. Calculations to substantiate the post-tensioning system and procedures to be used. These calculations shall show a typical tendon force after applying the anticipated losses for the stressing system to be used, including anchor set, elastic shortening, and long-term effects.
12. Details of corrosion inhibiting grease, greasing equipment and methods for injecting grease.
13. Any manufacturer's literature, where applicable.
14. Safety procedures.
15. Record of stressing operations. Submit within 7 days following completion and acceptance of the post-tensioning operations at each wind tongue or longitudinal restraint.
16. Qualifications and certifications for the crew foreman as described herein.

**C. Submittal Procedures.**

Unless noted otherwise, submit the above in advance of the start of construction to allow a 30 calendar day review period. All submittals not approved and requiring resubmittal shall be subject to the above review time period, with the review time beginning anew for each such submittal. Coordinate all submittals between various subordinates (contractors, suppliers, and engineers) to allow for a reasonable distribution of the review effort required by the Engineer at any given time.

**150216a.06 CONSTRUCTION.**

**A. Protection of All-Thread-Bars and Hardware.**

1. Protect all-thread-bars and hardware against physical damage or rust at all times (from time of manufacturer to greasing). All-thread-bars or hardware that have sustained physical damage at any time shall be rejected.
2. Package all-thread-bars in containers or shipping forms for protection of the steel against physical damage and corrosion during shipping and storage. Place a corrosion inhibitor, which prevents rust or other results of corrosion, in the package or form, or incorporate a corrosion inhibitor carrier type packaging material. Do not apply a corrosion inhibitor directly to the steel. The corrosion inhibitor shall have no deleterious effect on the steel or concrete. Provide a corrosion inhibitor carrier type packaging material conforming to the provisions of Federal Specification MIL-P-3420. Immediately replace or restore packaging or forms damaged from any cause to original condition.
3. Clearly mark the shipping package or form with a statement that the package contains high-strength all-thread-bars and the type of care that is to be used in handling. Also mark the type and amount of corrosion inhibitor used, the date when it was placed, safety orders and instructions for use on the package or form.
4. All-thread-bars shall be stored and handled in a manner which will protect them from physical damage or contamination at all times from manufacture until greased in place. All-thread-bars shall not be dragged on abrasive surfaces during fabrication and installation. Damaged, abraded, or contaminated all-thread-bars shall be rejected.
5. Store the all-thread-bars in a manner which will at all times prevent the packaging material from

becoming saturated with water and allow a free flow of air around the packages. If the useful life of the corrosion inhibitor in the package expires, it shall immediately be rejuvenated or replaced.

6. At the time the all-thread-bars are installed in the work, they shall be free from rust, loose mill scale, dirt, paint, oil, grease or other deleterious material. All-thread-bars which have experienced rusting shall be subject to rejection.

**B. Post-Tensioning Operations.**

**1. General.**

Apply post-tensioning forces after a minimum of 120 days following placement of the crossbeams and pedestals. Conduct all stressing operations in the presence of the Engineer.

**2. Stressing Procedure.**

**a. General.**

- 1) Tension all all-thread-bars with hydraulic jacks so that the jacking force is not less than that required by the contract documents and the approved shop drawings.
- 2) Tension tendons by jacking from the bottom of the crossbeam.

**b. Wind Tongues.**

- 1) During all-thread-bar installation, place the top cap and rubber washer and thread the jam nut onto the bar so that it is at the approximate final location as shown in the plans. Do not secure the top cap with the jam nut until post-tensioning operations are completed.
- 2) First, tension and lock-off all-thread-bars to one-half the values in the jacking force table below. Then, tension and lock-off the all-thread-bars to the values provided in the jacking force table below. For each tensioning phase, tension all-thread-bars 1 through 4 prior to or simultaneously with all-thread-bars 5 through 10.

All-Thread-Bar No.	Jacking Force per All-Thread-Bar (k)
1 through 4	200
5 through 10	260

**c. Longitudinal Restraints.**

First, tension and lock-off the eight all-thread-bars closest to the centerline of the pin to 275 k per bar. Then, tension and lock-off each of the remaining all-thread-bars to 275 k per bar.

**3. Stressing Equipment.**

Only use equipment furnished by the manufacturer of the post-tensioning system.

**a. Stressing Jacks and Gauges.**

Equip each jack with a pressure gauge for determining the jacking pressure. Provide a pressure gauge with an accurately reading dial at least 6 inch in diameter with display increments of 100 psi.

**b. Calibration of Jacks and Gauges.**

- 1) Within 30 days prior to use, calibrate each jack and its gauge as a unit with the cylinder extension in the approximate position it will be in at the final jacking force. Perform calibration when the jack is connected to the equipment (pumps and gauges) in the identical configuration as will be used on the job site, e.g. with the same length hydraulic lines. Initial calibration of the jacks and gauges shall be performed by an independent laboratory using a proven load cell. For each jack and gauge unit used on the project, furnish certified calibration charts from the independent laboratory prior to stressing the first all-thread-bar. The jack and its gauge shall be used together in the field.
- 2) Perform certified calibration at the start of the work or as requested by the Engineer.

Calibrations subsequent to the initial calibration with a load cell may be accomplished by the use of a master gauge. Supply the master gauge to the Engineer in a protective waterproof container capable of protecting the calibration of the master gauge during shipment to a laboratory. Provide a quick-attach coupler next to the permanent gauge in the hydraulic lines to enable quick and easy installation of the master gauge to verify the permanent gauge readings. The master gauge will be calibrated by, and remain in the possession of, the Engineer for the duration of the project.

- 3) Any jack repair, such as replacing seals or changing the length of the hydraulic lines, is cause for recalibration using a load cell.
- 4) No extra compensation will be allowed for the initial or subsequent calibrations or for the use and required calibrations of the master gauge.

**c. Elongations and Agreement with Forces.**

- 1) Ensure that the forces being applied to the tendon and the elongation of the post-tensioning tendon can be measured at all times.
- 2) Tension all tendons to a preliminary force as necessary to eliminate any take-up in the tensioning system before elongation readings are started. This preliminary force shall be between 5% and 25% of the final jacking force. Measure the initial force by a dynamometer, or by another approved method, so that its amount can be used as a check against elongation as computed and as measured. Each all-thread-bar shall be marked prior to final stressing to permit measurement of elongation.
- 3) Measure elongations to the nearest 1/32 inch.
- 4) For the required force, the observed elongation shall agree within 7% of the theoretical elongation or the entire operation shall be checked and the source of error determined and remedied to the satisfaction of the Engineer before proceeding further. Do not overstress the tendon to achieve the theoretical elongation.

**C. Cutting of All-Thread-Bars.**

Only cut the ends of the all-thread-bars if the jacking forces and elongations are satisfactory and approval has been obtained from the Engineer. Cut all-thread-bars by an abrasive saw to the length shown in the plans. Do not use flame cutting. Repair epoxy coating using approved procedures. Plasma cutting may be allowed under strict inspection and approval of the Engineer.

**D. Tendon Protection.**

Within 4 hours after stressing, temporarily install top and bottom caps and seal all other openings. If acceptance of the all-thread-bar is delayed, seal all openings and temporarily weatherproof the open ends. If contamination of the all-thread-bar occurs, remove and replace the all-thread-bar.

**E. Greasing Operations.**

**1. General.**

- a. When stressing has been completed and the stressed tendons have been accepted by the Engineer, grease the annular space between the all-thread-bars and the duct at the locations indicated in the plans and as indicated herein. Conduct greasing operations in the presence of the Engineer.
- b. The time between the first installation of the all-thread-bar in the duct and the completion of the greasing operations shall not exceed seven calendar days.
- c. Any light surface corrosion that can be removed by wiping with a clean rag formed during this period of time will not be a cause for rejection of the all-thread-bar.

**2. Wind Tongues and Longitudinal Restraints.**

- a. Install the bottom caps without the plug installed. Use thread sealant on the exterior threads of the bottom caps. Install the top caps with two temporary wood blocks between the top of the top cap and the underside of the rubber washer. Snug down the jam nut onto the rubber washer and wood blocks. The purpose of the temporary wood blocks is to hold the top cap in place during the greasing operation while allowing grease to flow out of the hole in the top of the top cap. Inject corrosion inhibiting grease through



the tapped hole in the bottom cap until a continuous flow of grease exits from the hole in the top of the top cap. Ensure that there are no leaks or air bubbles. If leaks or air bubbles are detected, repair as directed by the Engineer.

- b. Remove the temporary wood blocks and any excess corrosion inhibiting grease from the surrounding surfaces. Install the rubber washer and jam nut to retain the top cap as indicated in the plans.
- c. Remove any excess corrosion inhibiting grease from the surface of the bottom cap and threads of tapped hole. Install the plug in the tapped hole in the bottom cap using thread sealant.

**150216a.07 METHOD OF MEASUREMENT.**

**A. Post-Tensioning of Wind Tongues.**

Lump Sum. No method of measurement.

**B. Post-Tensioning of Longitudinal Restraints.**

Lump Sum. No method of measurement.

**150216a.08 BASIS OF PAYMENT.**

**A. Post-Tensioning of Wind Tongues.**

Payment for the post-tensioning of the wind tongues is full compensation for furnishing, installing, cutting, and greasing the post-tensioned tendons of the wind tongues.

**B. Post-Tensioning of Longitudinal Restraints.**

Payment for post-tensioning of longitudinal restraints is full compensation for furnishing, installing, cutting, and greasing the post-tensioned tendons of the longitudinal restraints.

**C.** Fabricating, installing, and temporarily supporting the steel pipes, embedded base plates, and studs for the wind tongues are not included with these items. See Design No. 817.

**D.** Fabricating, installing, and temporarily supporting the steel pipes, embedded base plates, grillage plates, and studs for the longitudinal restraints are not included with these items. See Design No. 817.

**E.** No additional payment will be made for extra concrete necessitated by approved modifications to the structure needed to accommodate the construction methods.

**F.** No additional payment will be made for extra reinforcement necessitated by approved modifications to the structure for the purposes of the construction methods.

**G.** No additional payment will be made for extra post-tensioning necessitated by approved modifications to the structure for the purposes of the construction methods.

## ESTIMATED BRIDGE QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUANTITY
1	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	5803.0	
2	2404-7775000	REINFORCING STEEL	LB	2199963	
3	2405-2705000	EXCAVATE AND DEWATER	LS	1.0	
4	2433-0002000	LOAD CELL TEST	EACH	1.0	
5	2433-0003000	DEMONSTRATION SHAFT	LF	32.0	
6	2526-8285000	CONSTRUCTION SURVEY	LS	1.0	
7	2533-4980005	MOBILIZATION	LS	1.0	
8	2599-9999009	CONCRETE DRILLED SHAFT, 84 IN. DIAMETER	LF	2306.0	

### ESTIMATED REFERENCE INFORMATION

ITEM NO.	DESCRIPTION
1	INCLUDES THE CONCRETE FOR ALL PIER FOOTINGS. ALL PIER FOOTING CONCRETE SHALL BE CLASS "C".
3	INCLUDES ALL COSTS ASSOCIATED WITH DESIGN, FURNISHING & INSTALLING MATERIALS, AND REMOVAL OF FORMWORK REQUIRED TO CONSTRUCT ALL PIER FOOTINGS. THIS MAY INCLUDE BUT IS NOT LIMITED TO STEEL FOOTING TUB FORM SUPPORTS, SIDEWALL SKIN PLATES, SPLICE PLATES, CHANNEL BRACING, CONCRETE & REINFORCING FOR THE TREMIE SEAL & FOOTING TUB FORM BOTTOM SLAB, AND GROUT FILLED GEOTEXTILE FABRIC TUBES.
4	THE LOAD CELL TEST SHALL BE AN OSTERBERG CELL AXIAL LOAD TEST AND SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 2433.03 OF THE STANDARD SPECIFICATIONS AND MATERIALS I.M. 388
5	THE DEMONSTRATION SHAFT WILL ALSO SERVE AS A TEST SHAFT. IT SHALL BE LOCATED NEAR PIER 10 AS SHOWN ON DESIGN SHEETS 3 & 5 AND CONSTRUCTED IN ACCORDANCE WITH ARTICLE 2433 OF THE STANDARD SPECIFICATIONS. THE TIP ELEVATION IS ESTIMATED TO BE AT ELEVATION 527.00 AND THE SOCKET LENGTH BELOW THE BOTTOM OF THE CASING SHALL BE 12'-0". HOWEVER, THESE WILL REQUIRE ADJUSTMENT BASED ON FIELD CONDITIONS AND RESULTS OF THE EXPLORATORY BORING. SEE DESIGN SHEET 43 FOR DETAILS OF THE TEST SHAFT. INCLUDES THE CASING, SONIC TESTING PIPES & EXCAVATION ABOVE THE DEMONSTRATION SHAFT.
6	THE CONSTRUCTION SURVEY SHALL BE DONE IN ACCORDANCE WITH ARTICLE 2526 OF THE STANDARD SPECIFICATIONS. IN ADDITION, THE CONSTRUCTION SURVEY SHALL VERIFY BOTH THE PLAN LOCATION & VERTICAL ORIENTATION OF THE COLUMN DOWEL BARS BOTH PRIOR TO & AFTER THE FOOTINGS ARE POURED. THE FOOTINGS SHALL NOT BE POURED UNTIL THE ENGINEER HAS APPROVED THE LOCATIONS OF THE COLUMN DOWEL BARS.

## 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.

\*SUBMITTAL REQUIREMENTS FOR ITEM 4 SHOULD BE IN ACCORDANCE WITH THE SPECIAL PROVISIONS FOR WORK IN THE LEVEE BUFFER ZONE.

1	EXCAVATE AND DEWATER
2	PIER BACKSTAY ANCHORAGE SYSTEM
3	DRILLED SHAFTS AND TEST SHAFT
4	WORK PLAN*

ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

SURVEY SHEETS AND ALIGNMENTS SHOWN ELSEWHERE IN ROADWAY PLANS.

POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN ROADWAY PLANS.

THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN ON THE ROAD PLAN IN THESE PLANS.

## REFERRAL NOTE

PROJECT NUMBER: IM-NHS-074-1(1975)--03-82  
DESIGN NUMBER: 1017  
SEE PIERS 10 & 11 (WESTBOUND) FOR DETAILS BY OTHERS.

PROJECT NUMBER: IM-NHS-074-1(1975)--03-82  
DESIGN NUMBER: 1217  
SEE PIERS 10 & 11 (EASTBOUND) FOR DETAILS BY OTHERS.

PROJECT NUMBER: IM-NHS-074-1(1975)--03-82  
DESIGN NUMBER: 1117  
SEE PIERS 14 & 15 (WESTBOUND) FOR DETAILS BY OTHERS.

PROJECT NUMBER: IM-NHS-074-1(1975)--03-82  
DESIGN NUMBER: 1317  
SEE PIERS 14 & 15 (EASTBOUND) FOR DETAILS BY OTHERS.

COPIES OF THESE PLANS WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS - HIGHWAY DIVISION - IOWA DOT - AMES.

## INDEX OF SHEETS

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## GENERAL NOTES:

THIS DESIGN IS FOR EIGHT PERMANENT FOUNDATIONS FOR THE FOLLOWING NEW I-74 BRIDGES OVER THE MISSISSIPPI RIVER:

A 1981'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE, CARRYING WESTBOUND INTERSTATE 74 OVER ELEVEN SOUTH APPROACH SPANS TO THE ARCH SUPERSTRUCTURE,

A 1981'-0" x VARIES CONTINUOUS WELDED GIRDER BRIDGE W/14' BIKE TRAIL, CARRYING EASTBOUND INTERSTATE 74 OVER ELEVEN SOUTH APPROACH SPANS

FROM THE ARCH SUPERSTRUCTURE,  
A 610'-10" x VARIES CONTINUOUS WELDED STEEL GIRDER BRIDGE, CARRYING WESTBOUND INTERSTATE 74 OVER THREE NORTH APPROACH SPANS TO THE ARCH SUPERSTRUCTURE

A 692'-2" x VARIES CONTINUOUS WELDED GIRDER BRIDGE, CARRYING EASTBOUND INTERSTATE 74 OVER THREE NORTH APPROACH SPANS TO THE ARCH SUPERSTRUCTURE.

THE FOUNDATIONS ARE ALSO DESIGNED TO BE USED AS TEMPORARY ANCHORAGES FOR THE BACKSTAY TIEBACKS DURING ERECTION OF ARCH SUPERSTRUCTURES (SEE DESIGN NUMBERS 617 & 717). FOR NOTES & DETAILS OF ANCHORAGE, SEE DESIGN SHEET 9.

THE BRIDGE IS DESIGNED FOR HL-93 LOADING.

THE PIERS ARE DESIGNED FOR A MAXIMUM VESSEL COLLISION LOAD OF 5096 KIPS.

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 PROJECT(S):

<u>IM-NHS-074-1(1985)--03-82</u>	<u>NORTH &amp; SOUTH APPROACH SPANS, EB &amp; WB</u>
<u>IM-NHS-074-1(1995)--03-82</u>	<u>WESTBOUND VIADUCT</u>
<u>IM-NHS-074-1(2005)--03-82</u>	<u>EASTBOUND VIADUCT</u>
<u>IM-NHS-074-1(2055)--03-82</u>	<u>BETTENDORF ROADWAY WORK</u>
<u>IM-NHS-074-1(2065)--03-82</u>	<u>BETTENDORF ROADWAY WORK</u>
<u>IM-NHS-074-1(2075)--03-82</u>	<u>BETTENDORF ROADWAY WORK</u>

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (501 IS  $\frac{3}{8}$ " 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.

ALL DRILLED SHAFT SPIRAL REINFORCING SHALL BE DEFORMED BARS, GRADE 60. NO SUBSTITUTION OF GRADE 40 REINFORCEMENT SHALL BE ALLOWED. SECTION 4151.03.A.2 OF THE STANDARD SPECIFICATIONS SHALL NOT APPLY.

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.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURES OR STRUCTURES BY OTHERS. SEE DESIGN NO. 1017, 1217, 1117, 1317, 817, 617 AND 717.

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

ELEVATIONS BASED ON NAVD 88 DATUM, UNLESS NOTED OTHERWISE. HYDRAULIC ELEVATIONS ARE NOTED WITH A "\*" AND BASED ON NGVD 1912 DATUM.

SOVEREIGN LANDS CONSTRUCTION PERMIT 16-063 SHALL APPLY TO WORK ON THIS PROJECT. THE IOWA DNR CONSERVATION OFFICER FOR THE AREA SHALL BE CONTACTED. AT LEAST 48 HOURS PRIOR TO COMMENCING WORK CONTACT SCOTT GRITTERS AT (563) 880-8781.

PERMANENT STEEL CASINGS FOR THE DRILLED SHAFTS SHALL BE OF MATERIAL MEETING ASTM A36, A242 OR A252 (GRADE 2 OR 3). PERMANENT CASINGS SHALL BE WATERTIGHT AND CLEAN OF ALL SAND, GRAVEL, BONDED CONCRETE, OR FOREIGN MATERIALS BEFORE USE. PERMANENT CASINGS SHALL BE OF AT LEAST THE THICKNESS SHOWN IN THESE PLANS AND OF SUFFICIENT STRENGTH TO RESIST DAMAGE AND DEFORMATION FROM TRANSPORTATION AND HANDLING, INSTALLATION STRESSES, AND ALL PRESSURES AND FORCES ACTING ON THE CASING DURING CONSTRUCTION. PERMANENT CASINGS SHALL BE CONTINUOUS. SPLICING OF THE PERMANENT CASING WILL NOT BE ALLOWED. PERMANENT CASINGS SHALL BE EXTENDED INTO ROCK, AS NEEDED, TO PROVIDE A POSITIVE SEAL AND TO STABILIZE THE SHAFT EXCAVATION AGAINST COLLAPSE, EXCESSIVE DEFORMATION, OR FLOW OF WATER. THE CASING MAY BE FABRICATED WITH TEETH OR A CUTTING EDGE TO FACILITATE INSERTION INTO ROCK. THE COST OF FURNISHING AND INSTALLING PERMANENT STEEL CASINGS SHALL BE INCLUDED WITH THE PRICE BID FOR "CONCRETE DRILLED SHAFT, 84 IN. DIAMETER."

## GENERAL NOTES:

CONCRETE FORMS ARE REQUIRED TO REMAIN IN PLACE 5 DAYS OR LONGER IN ACCORDANCE WITH ARTICLE 2403.03, M, 2, OF THE STANDARD SPECIFICATIONS, EXCEPT THE MINIMUM CONCRETE FLEXURAL STRENGTH REQUIRED BEFORE REMOVAL OF FORMS SHALL BE 575 PSI.

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

THE WORK UNDER THIS CONTRACT IS LOCATED ADJACENT TO A FEDERALLY CONSTRUCTED LEVEE ALONG THE MISSISSIPPI RIVER. THE CITY OF BETTENDORF IS RESPONSIBLE FOR OPERATING AND MAINTAINING THE FLOOD PROTECTION PROJECT. NO IMPROVEMENT SHALL BE PASSED OVER, UNDER, OR THROUGH THE LEVEE, IMPROVED CHANNELS OR FLOODWAYS, NOR SHALL ANY EXCAVATION OR CONSTRUCTION BE PERMITTED WITHIN THE LIMITS OF THE LEVEE BUFFER ZONE OTHER THAN THE CONSTRUCTION UNDER THIS CONTRACT WITHOUT PRIOR APPROVAL OF THE ENGINEER AND SUBJECT TO THE CONDITIONS OF THE SECTION 408 PERMIT (ISSUED BY THE U.S. ARMY CORPS OF ENGINEERS). THE LIMITS OF THE LEVEE BUFFER ZONE ARE 300 FEET RIVERWARD AND 500 FEET LANDWARD OF THE LEVEE. ANY WORK PERFORMED IN THE LEVEE BUFFER ZONE SHALL BE SUBJECT TO THE SPECIAL PROVISIONS FOR WORK IN THE LEVEE BUFFER ZONE. CONTACT INFORMATION IN REFERENCE TO THE SECTION 408 PERMIT:

CITY OF BETTENDORF  
ATTN: BRIAN SCHMIDT, P.E.  
DIRECTOR OF PUBLIC WORKS  
1609 STATE STREET  
BETTENDORF, IA 52722  
563-344-4000; 563- 344-4128  
BSCHMIDT@BETTENDORF.ORG

U.S. ARMY CORPS OF ENGINEERS  
ATTN: PAUL ST. LOUIS  
ROCK ISLAND DISTRICT  
CLOCK TOWER  
P.O. BOX 2004  
ROCK ISLAND, ILLINOIS 61204-2004  
309-794-5208  
PAUL.F.ST.LOUIS@USACE.ARMY.MIL

## SPECIFICATIONS:

DESIGN: AASHTO LRFD 5th Ed, SERIES OF 2010, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.  
GUIDE SPECIFICATIONS FOR VESSEL COLLISION DESIGN OF HIGHWAY BRIDGES, 2ND EDITION, 2010 INTERIM REVISIONS.

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, FOR MASS CONCRETE-CONTROL OF HEAT OF HYDRATION SHALL APPLY TO WORK ON THIS PROJECT FOR FOOTINGS.

THE SPECIAL PROVISIONS FOR WORK IN THE LEVEE BUFFER ZONE SHALL APPLY TO WORK ON THIS PROJECT.

THE SPECIAL PROVISIONS FOR ENVIRONMENTAL PROTECTION SHALL APPLY TO WORK ON THIS PROJECT.

THE SPECIAL PROVISIONS FOR MUSSEL CONSERVATION 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, 5th Ed, SERIES OF 2010, 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 = 3,500 PSI (FOOTINGS).  
f'c = 4,000 PSI (DRILLED SHAFTS).

STRUCTURAL STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 6.  
ASTM A709 GRADE 36,  
GRADE 50, GRADE 50W, AND GRADE 70W (AASHTO M270 GRADE 36, GRADE 50, GRADE 50W, AND GRADE 70W).

DESIGN FOR VARIABLE SKEW  
**VARIABLE CONTINUOUS WELDED GIRDER  
BRIDGE PIER FOUNDATIONS**

**ESTIMATED QUANTITIES & NOTES**  
STA. 6770+98.50 (I-74) DECEMBER 2016  
**SCOTT & ROCK ISLAND COUNTIES**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 1 OF 43 FILE NO. 30253 DESIGN NO. 917

DESIGN TEAM TJJ/KMP/KMP

SCOTT COUNTY

PROJECT NUMBER IM-NHS-074-1(1985)--03-82

SHEET NUMBER 2