

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 21, 2017

B.O.	Proposal ID	Proposal Work Type	County	Project Number	Addendum
001	82-0741-197	BRIDGE – STEEL GIRDER	SCOTT	IM-NHS-074-1(197)5--03-82	25APR001A09

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

Replace SP-150177 for ITS INFRASTRUCTURE INSTALLATION with attached SP-150177a.

Replace SP-150179a for MAINTENANCE WATER LINE with attached SP-150179b.

Make the following changes to the PLAN:

Replace SHEETS C.2, C.3, N.4, P.7, P.15, P.16, P.18 and P.31 with attached SHEETS C.2, C.3, N.4, P.7, P.15, P.16, P.18 and P.31.

Note: Sheet C.2

Modified the materials under “Handholes and Junction Boxes” to include galvanized steel junction boxes as noted in plans.

Sheet C.3

Modified the materials under “Junction Box, 16” x 16” x 8” (Private Utility)” to be galvanized steel junction boxes.

Sheet N.4

Notes 26 & 27 were modified for the new concrete insert detail and to reference the P sheets for details.

Sheet P.7

Added detail for universal concrete insert. Modified note 12 to match new concrete insert detail.

Sheet P.15

Denoted locations for galvanized steel junction boxes.

Sheet P.16

Denoted locations for galvanized steel junction boxes.

Sheet P.18

Denoted locations for galvanized steel junction boxes.

Sheet P. 31

Modified concrete insert note 7 to reference plan note 12 and detail on sheet P.7.



**SPECIAL PROVISIONS
FOR
ITS INFRASTRUCTURE INSTALLATION**

**Scott County
IM-NHS-074-1(197)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.

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PART I GENERAL REQUIREMENTS

This part consists of the general provisions necessary when furnishing and installing the ITS Infrastructure as described in the project plans and these special provisions.

This project involves supplying and installing conduit, bridge attachments, handholes, junction boxes, device poles, device cabinets and footings, tracer wire and pull tape, power supplies and cabling, and power terminations deemed necessary for a complete ITS Infrastructure installation designed for use with future proposed ITS fiber and device deployments and other uses planned by the DOT. The DOT plans to initiate separate contracts to install and terminate the fiber optic cable and place it in service (light the fiber network). Separate contracts will also be initiated to supply and install the cameras, sensors, and other ancillary equipment in or on the cabinets and poles, as well as other items required to provide a complete and functioning network of ITS devices.

The Contractor shall not take advantage of any apparent error, discrepancy or omission in the plans or specifications. Upon discovery of such an error, discrepancy or omission, the Contractor shall notify the Engineer immediately. The Engineer will then make such corrections or interpretations as necessary to fulfill the intent of the plans and specifications.

Materials or work described in words which, so applied, have known technical or trade meaning shall be held to refer to such recognized standards.

Figured dimensions on the plans shall be taken as correct but shall be checked by the Contractor before starting construction. Any errors, omissions, or discrepancies shall be brought to the attention of the Engineer and the Engineer's decision thereon shall be final. Correction of errors or omissions on the drawings or specifications may be made by the Engineer when such correction is necessary for the proper execution of the work.

The Contractor for this project shall coordinate work with the contractor(s) working on the fiber optic cable and device deployment projects. The Iowa DOT will assist in the coordination and scheduling of work. The Contractor for this project shall assign a responsible staff member that will work with the Iowa DOT on decisions regarding order of work and scheduling as needed throughout the duration of this project.

1.01 Related Specifications and Standards

The work as detailed on the plans for the ITS Infrastructure Installation shall be completed in accordance with the plans, special provisions and all other contract documents including the documents listed below. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete project.

- A. Specifications of the Underwriter's Laboratories, Inc.
- B. National Electric Code
- C. Manual on Uniform Traffic Control Devices

1.02 Local Requirements

A. General

Comply with any special requirements and limitations identified in the plans.

B. Coordination of Work

Contractor for this project shall coordinate work with the Contractor(s) working on other Iowa DOT projects in the vicinity as noted in the plans. The Contractor shall provide the Engineer any requests to perform work during the dates of special events noted in the plans a minimum of 5 days prior to the event. The decision of the Engineer regarding a request shall be final.

C. Building Facilities

All work in or around any building facility shall be coordinated with the Engineer and the Iowa DOT District staff. Provide a minimum of 48 hour notice to the Engineer before performing any work in the immediate vicinity of a building or surrounding parking area.

1.03 Contractor's Responsibility

A. Coordination with Utilities

1. The Contractor is responsible for determining the exact location and elevation of all public utilities in proximity to any construction work and shall conduct all activities to ensure that public utilities are not disturbed or damaged.
2. The Contractor is fully liable for all expenses incurred as a result of failing to obtain required clearances, location of utilities, and any damage to utilities caused by construction.
3. 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 starting construction date.

B. One Call Locating

Until final acceptance, the Contractor shall provide all utility locates of the work performed under this contract when requested through One-Call services or by the Engineer. The Contractor shall perform any such locations within 48 hours of receiving notice that such locations are needed.

C. Material and Equipment Storage and Construction Site Access

1. Contractor shall secure a designated material storage area for this project. Any request to store material in the right-of-way in order to complete the current work activity shall be approved by the Engineer.
2. Construction equipment may be stored within the right-of-way during non-working hours if it is outside of the roadway clear zone, as far from the traveled way as practical and as approved by the Engineer. No equipment shall be stored at the toe of any roadway slope.
3. No worker vehicles will be allowed to park in, or access a job site directly from an Interstate or Freeway facility. Access to the job site for both workers and materials shall only be via interchanges or intersecting roadways unless otherwise approved by the Engineer. Worker vehicles shall be parked off-site or at a location acceptable to the Engineer.

D. Finishing Activities

Upon completion of the work at each project area, thoroughly clean the site and restore it to a condition at least equal to that existing prior to construction. Project area is defined as the approximate area disturbed during a normal week of work. During and after completion, employ appropriate measures for erosion control, where applicable. Seed and fertilize work areas upon completion of work in accordance with the contract documents.

1.04 Contractor Submissions

A. Materials List

The Engineer shall furnish a list of materials required for the project to each bidder with the proposal. Complete and submit one electronic pdf file of the materials list within 14 calendar days after award of the project contract. Include the name of the materials supplier and catalog number of each item listed.

B. Construction Schedule

1. Within 30 days after award of contract, the Contractor shall submit to the Engineer one electronic pdf file of the detailed construction schedule including dates of commencement for each major work

item, duration of each major work item and completion of each major work item on each segment of the proposed construction.

2. Major items of work to be included on the schedule are installation of conduit, handholes, device poles and footings, device cabinets and footings, and electrical installations.
3. Upon acceptance of the schedule, the Contractor will be expected to adhere to these dates as proposed unless modified with the approval of the Engineer.
4. Submittal and approval of the proposed construction schedule by the Engineer is required before the Contractor can commence construction activities.

C. Shop Drawings/Catalog Cuts

1. Prior to construction and after approval of the Materials List, submit one electronic pdf file of the shop drawings or catalog cuts for the materials to the Iowa DOT for approval.
2. The Engineer shall review the shop drawings/catalog cuts for the purpose of assuring general conformance with the project design concept and contract documents.
3. Provide written notice of any deviations from the requirements of the contract documents.
4. Engineer's approval of shop drawings/catalog cuts does not relieve the Contractor of responsibility for providing satisfactory materials complying with the contract documents. Errors not detected during review do not authorize the Contractor to proceed in error.
5. The Engineer shall provide approval before any materials are ordered.

D. Materials Procurement

1. Shop drawings, specification data, and samples for acceptance testing (when requested) shall be submitted to the Iowa DOT for approval and/or selection prior to the placing of orders for any equipment and materials.
2. The Contractor shall order all materials requiring production lead time greater than 4 weeks within 5 business days of receiving the approved shop drawing(s).
3. The Contractor shall submit to the Engineer proof of material purchase order in electronic pdf format.

E. Warranty

1. Transfer all required standard materials warranties on the date of final acceptance to the Iowa DOT.
2. Warranty periods shall not commence prior to final acceptance of the work.

1.05 As-Built Documentation

A. General

1. As-built record drawings will be the responsibility of, and completed by, an on-site representative of the Engineer. As such, it will be the responsibility of the Engineer's representative to coordinate directly with the Contractor to ensure that a master record set of the plans is maintained throughout construction to document all installations and any deviations from the design shown in the contract documents.

2. It is the responsibility of the Contractor to maintain written records of daily construction progress, areas worked and quantities installed to aid in the completeness of as-constructed documentation by the Engineer.

B. GPS Data Recording Staking Assistance

1. The Engineer's on-site representative will be responsible for collecting GPS data of all installations including, but not limited to: conduit routing, handholes, device poles, device cabinets, and power supplies. All efforts will be made by the Engineer to coordinate with the Contractor and collect construction progress daily.
2. The Contractor shall be responsible to coordinate and assist the Engineer's on-site representative in this effort by staking, flagging or otherwise locating all installed features until such time that the GPS data can be collected.

PART II TECHNICAL PROVISIONS

This part consists of the material requirements, construction details, and methods of measurement and basis of payment necessary to complete construction of the ITS Infrastructure project, in place, as described in the contract documents.

2.01 General

- A. Supply only new materials from reputable suppliers and manufacturers approved by the Engineer. Provide any items, equipment, or materials not specifically addressed in the contract documents but required to provide a complete and functional installation. The level of quality shall be consistent with other specified items. All miscellaneous electrical equipment and materials shall be UL-approved. Securely store and protect all materials delivered to the project site. Provide appropriate material quantities for testing or verification at no additional cost when requested by the Engineer.
- B. The Contractor shall expect some reasonable variation in location of the facilities shown due to unforeseen conflicts, changes in proposed work, installation difficulties, or other circumstances. The Engineer shall authorize any changes in location in writing before performing the installation. No additional compensation shall be provided for additional work associated with or resulting from unauthorized changes to the contract documents.

2.02 Device Cabinets

Furnish all work, apparatus, and materials to construct and install the device cabinets designed to house the control equipment required for the planned ITS system.

A. Materials

Furnish materials of new stock only.

1. General

- a. Supply device cabinets, clean-cut in design and appearance.
- b. Cabinets shall be dimensioned as identified in the contract documents and have a typical internal layout as identified in the detailed drawings.
- c. Cabinets shall be corrosion resistant, UL-50 approved, NEMA Type 3R compliant, constructed of welded sheet aluminum with a minimum nominal thickness of 0.125 inch.
- d. Cabinets shall be complete with all required internal components, fully wired back panel, side mount DIN rails, terminal strips, and stainless steel hardware.
- e. Cabinets shall include one mounting shelf.
- f. Cabinets shall meet the requirements of ASTM B-209 for 5052 H-32 aluminum sheet. The aluminum shall be smooth and the exterior shall be left in its unpainted natural color.
- g. The cabinet structure shall be effectively sealed to prevent the entry of rain, dust, and dirt.
- h. All exterior seams for cabinet and doors shall be continuously welded. All edges shall be filed to a radius of 1/32 inch minimum.
- i. All pole mount cabinets shall be equipped with top and bottom mounting flanges and include pole mounting reinforcement/stiffener plates as part of the cabinet design. Mounting brackets shall be fabricated from 0.250 inch thick aluminum, 5052-H32, mill finish.

2. Cabinet Doors

- a. The cabinet door shall be sturdy, torsionally rigid, and attached by a continuous heavy duty gauge aluminum butt hinge utilizing a stainless steel hinge. The door shall substantially cover the full area of the front of the cabinet and have a stainless steel, pad-lockable handle.
- b. The cabinet shall be hinged on the right side (as viewed from the front)
- c. The cabinet door shall be provided with a door stop catch mechanism to hold the door open at three positions – 90 degrees, 120 degrees and 180 degrees, with plus or minus 10 degrees accuracy. Both the door and door stop mechanism shall be of sufficient strength to withstand a simulated wind load of five pounds per square foot of door area applied to both inside and outside surfaces.

- d. A closed-cell neoprene gasket shall be provided to act as a permanent and weather resistant seal at the cabinet door facing. The gasket material shall be of a non-absorbent material and shall maintain its resiliency after long term exposure to the outdoor environment. The gasket shall have a minimum thickness of 1/3 inch. The gasket shall be located in a channel provided for this purpose either on the cabinet or on the door. An "L" bracket is acceptable in lieu of this channel if the gasket is fitted snugly against the bracket to insure a uniformly dust and weather resistant seal around the entire door facing.
- e. Cabinet light (LED) with light bulb provided shall be operated by door switch.
- f. Each cabinet door shall be provided with a high quality, heavy duty tumbler-type lock. Two No. 2 keys for each tumbler lock shall be provided for each cabinet. All locks for the project shall be keyed identically to key pattern 9R46142 or as otherwise identified by the Engineer. Keys shall be given to the Engineer. Do not attach keys to the exterior of the cabinet at any time during storage or installation.
- g. A heavy-duty clear plastic envelope shall be provided, securely attached to the inside wall of the cabinet or cabinet door, for stowing cabinet wiring diagrams and equipment manuals. Minimum dimensions shall be 9 inches wide by 12 inches deep.

3. Power Panel, Connecting Cables and Wiring

- a. Provide cabinets equipped and configured with internal power components as shown in the contract documents.
- b. One four position service entrance terminal block with tin plated aluminum connectors, nickel plated steel screws, and a current rating up to 70 Amps.
- c. One 20 Amp single pole breaker (Main).
- d. One 15 Amp single pole breaker (Equipment).
- e. One 15 Amp single pole breaker (Auxiliary).
- f. A 120/240 VAC surge protector with surge current at minimum of 100KA, nanosecond response time, and an operating temperature of -40°C to +85°C.
- g. An auxiliary four terminal electrical block rated for a maximum 250 VAC RMS maximum voltage and 20 Amps current.
- h. A 15 Amp GFCI receptacle in Ivory color.
- i. An eight outlet Power Distribution Unit with built in surge suppressor (1800 Joules of surge/lightning protection) that includes a resettable circuit breaker and minimum cord length of 6 feet.
- j. One 7 TAP Ground Bar.
- k. One 7 TAP Neutral Bar.
- l. All miscellaneous wiring, harnesses connectors and attachment hardware.
- m. All conductors used on the cabinet wiring shall be No. 14 AWG or larger with a minimum of 19 strands. Conductors shall conform to MIL SPEC MIL-W-168780, Type B or D. The insulation shall have a minimum thickness of 10 MILS. All wiring containing line voltage shall be a minimum size of No. 12 AWG.

4. Ventilation

a. Vents

- 1) Furnish cabinets containing a suitably designed rain tight vent or vents that:
 - Are equipped with suitable screens or dust filters, and
 - Allow the release of excessive heat and/or any explosive gases which may enter the cabinet.
- 2) Ensure when filters are utilized, positive retainment is provided on all sides to prevent warpage and entry of foreign matter around the edges.
- 3) The filters shall be dry type, easily removed and replaced, and standard dimensions commercially available.

b. Vent Fan

Meet the following requirements:

- A thermostatically controlled vent fan is furnished to provide air circulation within the cabinet.

- The thermostat controlling the fan is manually adjustable to turn on between 90°F and 150°F with a differential of not more than 10°F between automatic turn on and turn off.
- The fan is located with respect to the vent holes to direct the bulk of the air flow over the internal components within the cabinet.
- Ventilation fan shall be fused separately and wired after the main AC+ circuit breaker.

5. Grounding

- a. The cabinet internal ground shall consist of one or more ground bus-bars permanently affixed to the cabinet and connected to the grounding electrode.
- b. Use bare stranded No. 6 AWG copper wire between bus-bars and between the bus-bar and grounding electrode.
- c. Each copper ground bus-bar shall have a minimum of 20 connector points. Each connector point shall be capable of securing at least one No. 6 AWG conductor.
- d. AC neutral and equipment ground wiring shall return to bus-bars.

B. Construction

1. General

- a. Install cabinets in accordance with the contract documents and the manufacturer's recommendations.
- b. Do not penetrate the top of any cabinets without prior authorization by the Engineer.
- c. Do not allow screws used for mounting shelves or other mounting purposes to protrude beyond the outside wall of the cabinet.
- d. All connections shall be watertight.
- e. Contact the Engineer a minimum of 1 week in advance to arrange a field review prior to placing the cabinets.

2. Mounting

- a. Orient cabinets as shown in the contract documents unless otherwise directed by the Engineer.
- b. Ensure sufficient clamps, nuts, hardware, etc., as required for the specified mounting type, are furnished with each cabinet.
- c. Seal all conduit openings in the controller cabinet with a sealing compound that meets the following requirements:
 - Readily workable, soft plastic,
 - Workable at temperatures as low as 30°F, and
 - Does not melt or run at temperatures as high as 300°F.

C. Method of Measurement & Basis of Payment

1. Measurement and payment for device cabinets shall be paid for at the contract unit price per each for the pay items Cabinet, Furnish and Install, 46 Inch X 24 Inch X 20 Inch.
2. Payment is full compensation for:
 - The furnishing and installation of all pole mounted and pedestal mounted cabinets,
 - Including all internal components and accessories required to provide a complete cabinet installation per the contract documents,
 - Providing and installing all mounting materials, cable pulling, routing and management, cable termination, and all necessary electric grounding materials, and
 - Furnishing all materials, labor, equipment, and other incidental items necessary to meet the requirements of the contract documents.

2.03 Handholes

A. Materials

1. General

- a. Supply handholes constructed of epoxy or polyester resin mortar with woven glass fiber reinforcement and an appropriate aggregate dimensioned as indicated in the contract documents.
- b. Handhole materials shall not support combustion when tested in accordance with "Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position" ASTM D-635.
- c. Water absorption shall not exceed two percent of the original weight of material under test conditions per "Standard Test Method for Water Absorption of Plastics" ASTM D-570.
- d. The handhole shall be functional without failure throughout a temperature range of -50°F to +170°F.
- e. The handhole walls shall not deflect more than 0.24 inches per foot of length of box when installed and subject to an ASTM C-857 TIER 22 load.
- f. Handholes shall meet ANSI/SCTE 77 standards and be verified by a registered third party and stamped by a registered Professional Engineer.
- g. Handhole lid strength shall be tested to 33,750 pounds (Tier 22).
- h. Handhole lids shall be labeled as indicated in the plans or as directed by the Engineer.
- i. The Engineer shall provide approval prior to use of any handholes satisfying the contract documents requirements for structural, physical, and chemical properties.

2. Test Stations

- a. Supply Rhino part TVTI780B-EM9125-0R or approved equivalent test stations at all Type III handholes.
- b. Test Stations shall be 78 inch triangular flexible orange plastic marker with 5 separate access terminals, isolation lever, and set screw to hold terminal concealment cap on.
- c. Place custom warning decals on all sides, the Engineer shall provide prior approval of decals.

B. Construction

1. Install the type and size of handholes at the locations indicated in the contract documents.
2. Construct all Type III handholes as located by in the plans.
3. Set handholes flush with the surface when constructing in a sidewalk or driveway. Set handholes approximately 6 to 12 inches below the finished surface of the surrounding ground when constructing in an earth embankment or non-paved surface.
4. Install course aggregate bedding to a depth of 1 foot below the handhole.
5. Conduit shall enter the handhole from the bottom and extend conduit ends between 4 and 6 inches above the aggregate bedding.
6. Side penetrations of the handholes are not permitted.
7. Terminate each tracer wire run in test stations at Handhole, Type III locations.
8. Label all ground wires and tracer wires in test stations.
9. Install ground rods at all Type III handholes as indicated in the contract documents.
10. Plug all open conduit ends within the handhole in a manner acceptable to the Engineer.
11. Rodent proof all handholes to the satisfaction of the Engineer.

C. Method of Measurement & Basis of Payment

1. Measurement and payment for all handholes shall be paid for at the contract unit price per each for the pay items Handhole, Furnish and Install, Type I and Handhole, Furnish and Install, Type III.
2. Payment is full compensation for:
 - The furnishing and installation of all handholes,
 - Including all surface excavations, repair or restoration of any nearby areas, concrete, proper water/moisture drainage materials, all necessary electric grounding materials and installation,
 - Furnishing and installing all test stations at Handhole, Type III locations, and
 - Furnishing all materials, labor, equipment, and other incidental items necessary to meet the requirements of the contract documents.

2.04 Junction Boxes**A. Materials**

1. Supply only new junction boxes, free from damage, meeting the requirements in the standard specifications, NEC, and NEMA 3R.
2. Junction boxes shall be constructed of ~~Stainless Steel 316 material~~ galvanized steel per ASTM A 653 and shall be furnished with a lockable lid.
3. Junction boxes shall be gasketed and vented.
4. The Engineer shall provide approval prior to use of any junction boxes satisfying the contract documents requirements for structural, physical, and chemical properties.

B. Construction

1. Install the type and size of junction boxes at the locations indicated in the contract documents.
2. Mount junction box through the flanges or, mount junction box through the wall of the junction box. Use silicone sealant between mounting hardware and wall of the junction box.
3. Penetrate conduits 1.5 inches into the junction box. Terminate with bushings and/or bell ends that protect cables from chafing.

C. Method of Measurement & Basis of Payment

1. Measurement and payment for all junction boxes shall be paid for at the contract unit price per each for the pay items Junction Box, Furnish and Install, 30 Inch X 30 Inch X 16 Inch; Junction Box, Furnish and Install, 30 Inch X 20 Inch X 16 Inch; Junction Box, Furnish and Install, 12 Inch X 10 Inch X 6 Inch; and Junction Box, Furnish and Install, 10 Inch X 8 Inch X 4 Inch.
2. Payment is full compensation for:
 - The furnishing and installation of all junction boxes,
 - Including all mounting equipment, repair or restoration of any nearby areas, proper water/moisture drainage materials, all necessary electric grounding materials and installation,
 - Furnishing all materials, labor, equipment, and other incidental items necessary to meet the requirements of the contract documents.

2.05 Conduit

A. Materials

1. High Density Polyethylene Conduit

- a. High Density Polyethylene (HDPE) conduit shall be smooth wall ORANGE.
- b. Comply with ASTM F 2160 (conduit) and ASTM D 3350 (HDPE material), minimum SDR 13.5, and NEMA TC-7 EPEC-B standards.
- c. Sequential foot markings printed on HDPE.
- d. Continuous reel or straight pieces to minimize splicing.
- e. For dissimilar conduit connections provide an adhesive compatible with both materials.

2. Liquidtight Flexible Nonmetallic Conduit

- a. Liquidtight Flexible Nonmetallic Conduit (LFNC) conduit shall be smooth wall GREY.
- b. LFNC shall be manufactured according to UL 1660 Type B.
- c. The conduit shall have a temperature range of -20°F to 176°F.
- d. The thermoplastic covering shall be resistant to oil, water, chemical and UV and shall be suitable for outdoor, direct bury, and extreme cold use.
- e. Sequential foot markings printed on LFNC.
- f. Continuous reel or straight pieces to minimize splicing.
- g. For dissimilar conduit connections provide an adhesive compatible with both materials.

B. Construction

1. General

- a. Follow all general guidelines covering the construction of buried conduit.
- b. Install conduit by plowing, jacking, pushing, boring, or other approved methods within the public right of way and in a manner that minimizes atypical damage from construction operations.
- c. The minimum bending radius of HDPE conduit shall be the larger of 20 times the outside diameter or the HDPE manufacturer's recommendations for minimum bending radius.
- d. Open trench installation is only permitted within 25 feet of any handhole, pole, structure, or other similar improvements, and any other requested locations approved by the Engineer.
- e. At the discretion of the Engineer, verify the integrity of the conduit structure in a manner acceptable to the Engineer.
- f. Tunneling under the pavement or water jetting shall not be permitted.
- g. No excavations are permitted to cross any roadways or any other paved or other similarly improved areas. At these locations, install conduits by boring method unless otherwise directed or approved in writing by the Engineer. Where indicated in the contract documents and at all roadway and stream crossings, install conduit sections with external protection as specified herein.
- h. No direct-buried cable is allowed.
- i. Seal all conduit openings using an approved sealing compound (duct seal) at all conduit openings at the junction boxes, handholes, poles, cabinets, and building entrances.

2. Installation Clearances

- a. Depth of all bores shall be a minimum of 48 inches unless otherwise specified in the plans.
- b. Unless otherwise indicated, install all conduit at rail crossings at a minimum of 15 feet below base of rail or 15 feet below natural ground line, whichever is greater.
- c. Maintain the minimum depth throughout the length of all conduit installations.
- d. Maintain a minimum of 2 feet of separation when underground conduits parallel an existing facility.

3. Conduit Splicing

- a. All mechanically joined conduit splices shall use compression couplings designed for underground placement and blown-in fiber installation.
- b. Electrofusion joining of HDPE conduit will be allowed provided that the method used does not create a ridge on the inside of the conduit that may impact future fiber installation.
- c. Butt fusion welding and solvent welding of conduits will not be allowed.

- d. All conduit splices shall be watertight to 200 psi.
- e. Conduit splicing is incidental to the connected items of work.

4. Facilities Protection

- a. The contractor is responsible for protecting and maintaining the conduit throughout construction and until final acceptance.
- b. To avoid possible damage to buried conduit from exposure to traffic, livestock and other hazards, complete trenching of laterals, trenching around culverts, construction of aerial inserts and similar operations as soon as practicable behind all segment installations.
- c. If more than 48 hours lag is expected behind a segment installation, install additional protective measures acceptable to the Engineer.

5. Backfilling

- a. Backfill trenches and other excavations in lifts of 6 inches or less in compacted depth. Compact each layer thoroughly before placing subsequent layers.
- b. Remove all cinders, broken concrete, or other hard or abrasive materials in the backfill material before commencing backfilling operations.
- c. Remove and dispose of surplus and unsuitable materials upon completion of the backfilling operations in the area.
- d. Place and carefully hand tamp backfill under and around the structures in lifts not to exceed 4 inches in loose thickness. Use a suitably sized mechanical tamper for all areas inaccessible to rollers. Operate pneumatic or other mechanical tampers in accordance with the manufacturer's recommendations.
- e. Perform operations in a manner that minimizes soil erosion and employs appropriate storm water pollution prevention measures during all construction operations.
- f. Maintain work areas in a neat, clean, and orderly condition at all times.
- g. Upon completion of conduit/cable placing operations and any other work in an area, remove all debris, materials, tools, and equipment from the area and restore the disturbed area(s) to original or better condition within 24 hours or as soon as practicable as determined by the Engineer. Backfill all excavations and grade all disturbed areas during the restoration process.
- h. Remove and dispose of rock and debris excavated and remaining after backfilling as directed by the Engineer.
- i. Immediately repair or replace any unauthorized disturbance or damage. Replace improved landscaping, lawns, shrubs, and hedge removed or damaged during construction in a manner acceptable to the Engineer. Re-sod damaged lawns using like grasses.

6. Multiple Duct Installation

Install multiple ducts, in continuity, at locations indicated in the contract documents unless authorized in writing by the Engineer.

7. Plowing

- a. Use equipment and construction methods subject to the approval of the Engineer that cause minimal displacement of the soil.
- b. Furnish competent supervision at all times at the site of plowing operations to assure compliance with the contract documents.
- c. The equipment shall be capable of extending the plow in order to maintain the required minimum depths under all terrain conditions.
- d. The reel carrier shall be of adequate size and be configured so that the reel sizes being used can be safely handled.
- e. Avoid damaging any paved surfaces, ditches, or other similar surface features. Immediately repair any damage to such features to the satisfaction of the Engineer.
- f. Perform plowing in accordance with standard industry practices using a prime mover with hydrostatic type steering and a vibratory plow. The design of the plowshare shall be such that the buried conduit passing through the plow shall not bind and shall not be bent in a radius less than 20 times the outside diameter of the conduit and maintains the structural integrity of the

conduit. The feed chute shall have a removable gate for the purpose of inspection and to allow the conduit to be removed from or inserted into the feed chute at any intermediate point between splice locations. The conduit path inside the feed chute shall have low friction surfaces and be free of burrs and sharp edges to prevent damage to the conduit as it passes through. Smooth any welds before use. Internal guide rollers shall not be used. Exercise care during the plowing operation to avoid conduit damage. Feed the conduit into the ground through the plow loose and at no tension.

- g. Excavate as needed start and finish pits and pits at points of intersection in advance of plowing. Expose ends of casings and crossings of foreign utilities before the start of plowing operations for a conduit segment. Exercise care in the use of trenching and excavating tools and equipment to avoid damaging installed and intersecting conduits or other facilities.
- h. Restore plow furrowed areas to conform to the surrounding terrain using a rubber tired tractor or heavy truck or a vibratory roller having a weight of three tons and a drum width between 4 and 6 feet or by other suitable means approved by the Engineer.

8. Conduit In Trench

- a. Use equipment and construction methods subject to the approval of the Engineer that cause minimal displacement of the soil.
- b. Excavate open trench straight as practicable. Shape the trench to be smooth, free from any sharp edges, and clear of debris and loose rock. Excavate only gradual grade changes.
- c. Do not leave trenches unattended at any time or open during non-working hours unless approved in writing by the Engineer. Install barriers or other protective measures to prevent livestock or persons from falling into an open trench when appropriate.
- d. Notify the Engineer immediately if solid rock is encountered at any location. Excavate rock trenches using a rock saw or other suitable equipment. The excavation, backfill, and road crossings in solid rock areas shall conform to the requirements stated above unless specifically exempted in this section.
- e. Rock excavation shall be considered extra work and shall be paid as a separate cost item. Obtain approval from the Engineer before commencing any rock excavation.

9. Bored Crossings

- a. Use equipment and construction methods subject to the approval of the Engineer that cause minimal displacement of the soil.
- b. Bore all crossings beneath roadways, streets, other paved surfaces, railroads, or other structure in accordance with requirements and regulations of the authority having jurisdiction and as directed in the contract documents.
- c. Limit bore hole sizes to the outside diameter of the conduit being placed.
- d. Locate bore pits a minimum of 2 feet from the edge of pavement or shoulder unless otherwise directed by the Engineer.

C. Method of Measurement & Basis of Payment

- 1. Measurement and payment for all HDPE conduit shall be paid for at the contract unit price per linear foot for the pay items Conduit, Furnish and Install, HDPE, 2 Inch; Conduit, Furnish and Install, Liquidtight Flexible Nonmetallic, 2 Inch; and Conduit, Furnish and Install, Liquidtight Flexible Nonmetallic, 1 Inch.
- 2. Payment is full compensation for:
 - The furnishing and installation of all HDPE conduits per the contract documents,
 - Including all surface excavations or surface preparation work, repair or restoration of any disturbed areas to pre-construction conditions, proper water/moisture drainage materials,
 - Conduit mounting on new or existing infrastructure, and
 - Furnishing all materials, labor, equipment, and other incidental items necessary to meet the requirements of the contract documents.

2.06 Poles

Furnish all work, apparatus, and materials to construct and install the device poles designed to mount future ITS equipment to as required for the planned ITS system.

All ITS poles shall be a 45 feet tall, conventional type, tapered steel pole. All poles shall be either round, 12 sided, or 16 sided.

A. Materials

Contractor shall supply all necessary materials and incidental items required to install the steel, black painted pole furnished by the Iowa DOT. Contractor shall contact Tony Taylor, 515-239-1902, TONY.TAYLOR@DOT.IOWA.GOV, to procure poles for installation. Contractor shall notify Iowa DOT upon receiving contract.

B. Construction

1. Pole Erection

- a. Erect poles and securely bolt to the foundation base plate such that the pole is vertically plumb.
- b. Use leveling nuts on each anchor bolt installed below the pole flange. Adjust the pole's vertical position by adjusting both the upper and lower nuts. Nuts shall be tightened per the manufacturer's recommendation.
- c. For bridge-mounted poles, the pole shall be set plumb on the foundation and fastened to the anchor bolts with self-locking nuts or double nuts (two per anchor bolt) and washers. Flat washers shall be installed below and above the isolation washer. A 0.5 inch minimum isolation pad and a 0.5 inch minimum leveling plate shall be installed between the light pole base plate and the bottom nut (leveling nut) with a steel washer between the leveling nut and the leveling plate. The nuts shall be tightened in compliance with torque specifications recommended by the manufacturer of the isolation pad. See plans for attachment detail.
- d. The space between the finished top of the foundation and the bottom of the base plate of the pole shall be enclosed with an expanded metal screen made of stainless steel. The mesh of the screen shall be 0.250 inch or less as approved by the Engineer. The screen shall be held in place with bands made of stainless steel. At least two bands shall be installed around the pole base plate. The bands shall be held tight by a ratchet-type device. Grouting shall not be used to enclose the above described space.

2. Bridge Mounted Pole Accessories

When mounted on bridges, a vibration isolation mounting pad, isolation washers, and a galvanized steel leveling plate shall be included with the pole. The pad and leveling plate shall have the same shape as the bottom of the pole base with appropriate bolt holes and opening for the center of the pole. Included with the pad shall be four washers. The pad and washers shall be made from a rugged elastomeric material with a minimum thickness of 0.5 inch or as recommended by the manufacturer. The ultimate breakdown of the pad and washers under compressive load shall be not less than 10,000 psi for the specified thickness without extrusion or detrimental reduction in thickness. The material shall also have a Shore-A Durometer reading of not less than 85. The isolation washers shall be installed with galvanized steel washers of the same diameter and adequate thickness top and bottom to prevent overstressing of the isolation washer. The leveling plate shall be according to AASHTO M 270 Grade 50 or 50S and shall be galvanized according to AASHTO M 111.

C. Method of Measurement & Basis of Payment

1. Measurement and payment for all steel poles shall be paid for at the contract unit price per each for the pay items Pole, Steel Black Painted, 45 Foot, Install Only.
2. Payment is full compensation for:
 - The installation of all poles and accessories,
 - Including fitting the appropriate bolt pattern to the foundation base plate, all conduit entrances and attachments, all necessary electric grounding materials, and

- Furnishing all materials, labor, equipment, and other incidental items necessary to meet the requirements of the contract documents.

2.07 Step-Down Transformers

A. Materials

Step-down transformers shall comply with the requirements of the contract documents and all generally accepted standards and requirements for the electrical components entering and exiting the transformer.

1. All step-down transformers shall be dry-type distribution, general purpose, factory assembled, air-cooled, single phase, with ratings as indicated on the plans.
2. Transformer winding shall be Aluminum for transformers with a rating higher than 2kVA.
3. Primary voltage shall be 480V stepped down to secondary voltage 120V.
4. Step-down transformers shall be UL listed and conform to the requirements of ANSI/National Fire Protection Association (NFPA).
5. Transformer enclosure shall be NEMA 3R compliant.
6. Step-down transformers shall be capable of mounting to electrical rack without compromising rack structural integrity and such mounting shall be effectively sealed to prevent the entry of rain, dust, and dirt.
7. Transformers shall be capable of carrying a continuous 15% overload without exceeding 239°F rise in a 104°F ambient.
8. Provide grounding in accordance with the Standard Specifications.

B. Construction

1. Install step-down transformers in accordance with the contract documents, Local Utilities, and all NEC requirements. Locate and orient step-down transformers as shown in the plans.
2. Contractor shall coordinate installations in advance as noted on the contract documents.
3. The Contractor is responsible for coordinating and scheduling all locally required inspections of electrical work prior to putting a step-down transformer into service.
4. The Contractor shall coordinate with the Engineer and power provider to request that electrical service at a device location be initiated.

C. Method of Measurement & Basis of Payment

1. Measurement and payment for all step-down transformers shall be paid for at the contract unit price per each for the pay items Step Down Transformer, Furnish and Install, 3 kVA; Step Down Tranformer, Furnish and Install, 25 kVA; and Step Down Transformer, Furnish And Install, 30 kVA.
2. Payment is full compensation for:
 - The furnishing and installation of all step-down transformer accessories as shown in the contract documents,
 - Including the proper installation of the conduit, breaker enclosures, circuit breakers, wiring and accessories, neutral bars and accessories, ground bars and accessories, terminations, and grounding in the transformer, and

- Furnishing all materials, labor, equipment, and other incidental items necessary to meet the requirements of the contract documents.

2.08 Power Connections

A. Materials

Power connections shall comply with the requirements of NEC, the contract documents and all generally accepted standards and requirements for the electrical components and power terminations in the individual power source.

B. Construction

1. Install power connections in accordance with the contract documents and all NEC requirements.
2. Contractor shall coordinate installations in advance as noted on the contract documents.
3. Contractor shall provide all conduit, breaker enclosures, circuit breakers, wiring and accessories, neutral bars and accessories, ground bars and accessories, terminations and grounding in the power source.
4. Unless otherwise directed by the Engineer, the Contractor shall install the power connections as illustrated in the contract documents.
5. The Contractor is responsible for coordinating and scheduling all locally required inspections of electrical work prior to putting a location into service.
6. The Contractor shall coordinate with the Engineer and power provider to request that electrical service at a device location be initiated.

C. Method of Measurement & Basis of Payment

1. Measurement and payment for all power connections shall be paid for at the contract unit price per each for the pay item Power Connection.
2. Payment is full compensation for:
 - The furnishing and installation of all power connection accessories as shown in the contract documents,
 - Including the proper installation of the conduit, breaker enclosures, circuit breakers, wiring and accessories, neutral bars and accessories, ground bars and accessories, terminations, and grounding in the power source, and
 - Furnishing all materials, labor, equipment, and other incidental items necessary to meet the requirements of the contract documents.



**SPECIAL PROVISIONS
FOR
MAINTENANCE WATER LINE**

**Scott County
IM-NHS-074-1(197)5--03-82
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.

150179b.01 DESCRIPTION.

The Work consists of furnishing and installing all piping, valves, water hammer arrestors, expansion fittings, piping supports, devices and all the components for installation of a maintenance water line for the I-74 approach spans bridges to make it an integrated and functional system as per the contact documents. The main intent of the Work is to provide hose outlets to facilitate washing the bridge surface.

150179b.02 MATERIALS.

A. General.

1. Manufacturer's equipment used as basis of design is indicated in these Special Provisions and/or the contract documents. If no manufacturer is listed, basis of design is industry standard indicated.
2. Each major component piece of equipment shall have the manufacturer's name and address as well as model number, capacity rating serial number, labels of tested compliances and other pertinent data on a nameplate securely affixed in a conspicuous place. The nameplates of the distributing agent will not be acceptable. ASME Code Rating, or other pertinent data which is die-stamped into the surface of the equipment shall be in an easily visible location that is accessible to service personnel.
3. Where needed for proper identification, operation, maintenance or safety, provide appropriate signs of engraved plastic-laminate. Where appropriate for normal operating and maintenance information, tags of plasticized card stock may be provided in lieu of signs.

B. Piping.

1. Provide pipe and tube of type, joint type, grade, size and weight (wall thickness or Class) indicated for each service. Where type, grade or class is not indicated, provide proper selection as determined by installer for installation requirements, and comply with governing regulations and industry standards.
2. **Galvanized Steel Pipe.**
Hot dipped, Carbon steel, Schedule 40 Galvanized Steel Pipe conforming to ASTM A 53. Each length of pipe shall be legibly identified at the mill by paint, stenciling or raised symbols identifying manufacturer and class of pipe.

C. Pipe/Tubing Fittings.

1. Provide factory-fabricated fittings of type, materials, grade, class, and pressure rating indicated for each service and pipe size. Provide sizes and types matching pipe, tube, and valve or equipment connection in each case. Where not otherwise indicated, comply with governing regulations and industry standards for selections and pipe manufacturer's recommendations where applicable.
2. Fittings for Steel Pipe:
 - a. Malleable Iron Threaded Fittings: ANSI B16.3, galvanized, 150 Psig
 - b. Malleable Iron Threaded Unions: ANSI B16.39, selected by installer for proper piping fabrication and service requirements, including style, end connections, and metal-to-metal seats, galvanized, 150 Psig
 - c. Threaded Pipe Plugs: ANSI 16.14.
 - d. Steel Flanges/Fittings: ANSI B16.5, including bolting and gasketing of following material group, end connection, and facing except as otherwise indicated:
 - 1) Material Group: Group 1.1.
 - 2) End Connections: Threaded.
 - 3) Facings: Raised face.
 - e. Pipe Nipples: Fabricated from same pipe as used for connected pipe, except do not use less than Schedule 80 pipe where length remaining unthreaded is less than 1 1/2 inches, where pipe size is less than 1 1/2 inches, and do not thread nipples full length (no close nipples).
 - f. 4 inch pipes may be joined by rigid grooved couplings designed for use with galvanized steel pipe, in lieu of threaded connections. The couplings shall be galvanized.
3. Cold galvanize the threads of piping after the connections with the fittings have been made.

D. Miscellaneous Piping Materials/Products.

Gaskets for Flanged Joints: ANSI B16.21; full faced for cast iron flanges, raised face for steel flanges unless otherwise indicated.

E. Quick Hose Connecting Fitting (Adapters and Fill Cap).

1. Aluminum Cam and Groove Adapters shall be manufactured in accordance with ASTM F 1122 and A-A-59326 (MIL-C-27487).
2. Adapters shall be of high pressure Cam and Groove type.
3. Handles and Pin shall be 316 Stainless Steel.
4. Face seal gaskets are long lasting BUNA-N.
5. Working pressure 750 psi.

6. Size of adapters and caps (non-lockable) for bridge washing hose connections: 1 1/2 inch by 1 1/2 inch (Note: The Contractor shall coordinate with the Engineer before ordering the type to ensure the selected type is compatible with the Engineer's requirements.)
7. Size of lockable fill caps at Abutment 1 and Pier 16: 4 inch by 4 inch. (Note: The Contractor shall coordinate with the Engineer before ordering the type to ensure the selected type is compatible with the Engineer's requirements.)
8. **Manufacturers.**
 - a. OPW
 - b. Dixon "Andrews"
 - c. Balflex

F. Expansion Loop.

1. Flexible loop shall consist of two flexible sections of hose and braid, two galvanized 90 degree elbows and a galvanized 180 degree return, for pipe size 4 inches.
2. Loop shall have a drain plug and support bracket.
3. Loop shall have flanged ends.
4. Fittings shall be SCH 40, carbon steel, galvanized.
5. Hose and Braids shall be Series 300 Stainless Steel.
6. **Manufacturers:**
 - a. Flexicraft Industries, MLF80400
 - b. Metraflex Company
 - c. Senior Flexonics

G. Flexible Hose Connector.

1. Flexible Hose Connector shall be doubled braided type female pipe coupling as the end fitting with flanges.
2. Inner corrugated hose and outer braid shall be type 304 stainless steel.
3. Hose size 2 inches, length 10 inches.
4. Flexible Hose Connector shall comply with the following:
 - a. Working pressure at 70°F = 250 psig.
 - b. Test pressure at 70°F = 400 psig.
 - c. Burst pressure at 70°F = 1000 psig.
5. **Manufacturers.**
 - a. Metraflex Company, Model SST
 - b. Flexicraft Industries
 - c. Senior Flexonics

H. Pipe Sleeves.

1. General: Concrete Slab Sleeves for piping shall be standard weight galvanized steel pipe with bottom end flush with surface, top end extended 1 inch above slab, caulked.

2. Piping Sleeves shall be fabricated from 16 gauge galvanized sheet steel and shall be 2 inches larger inside diameter than pipe. Sleeves shall be length required for a 4 inches wide collar (waterstop) welded to the sleeve, placed on top of structural slab. Caulk sleeves in place, watertight with silicone sealant.

I. Valves.

1. General.

- a. Factory-fabricated valves recommended by manufacturer for use in service indicated.
- b. Types and pressure ratings indicated.
- c. End connections, which properly mate with pipe, tube, and equipment connections.
- d. Where more than one type indicated, selection is Contractor's option.
- e. Sizes: Unless otherwise indicated, provide valves of same size as upstream pipe size.

2. Operators.

- a. Hand wheels fastened to valve stem for valves other than 1/4 turn.
- b. Lever handle for 1/4 turn valves 6 inches and smaller, other than ball valves.
- c. Gear operators for 1/4 turn valves 8 inches and larger.

3. Valve Features: Provide valves with features indicated and, where not otherwise indicated, provide proper valve features as determined by Contractor for installation requirements.

- a. ASME B31.9 for building services piping and ASME B31.1 for power piping.
- b. Bypass: MSS SP-45, and except as otherwise indicated, manufacturer's standard bypass piping and valving.
- c. Drain: MSS SP-45, threaded pipe plugs.
- d. Flanged: Valve flanges comply with ANSI B16.1 (cast iron), ANSI B16.5 steel) or ANSI B16.24 (bronze).
- e. Threaded Valve Ends: ANSI B1.20.1.
- f. Butt Welded Valve Ends: ANSI B16.25.
- g. Socket Welded Valve Ends: ANSI B16.18.
- h. Flangeless Valve Bodies: Fit between flanges complying with ANSI B16.1 (cast iron), ANSI B16.5 (steel) or ANSI B16.24 (bronze).

J. Gate Valves.

1. Manufacturers.

- a. Stockham Valves and Fittings.
- b. NIBCO, Inc.
- c. Milwaukee Valve Company, Inc.
- d. Or equal.

2. ASTM B 62 Class 125, bronze, screw-in bonnet, rising stem, ASTM B 62 solid bronze wedge.

- a. Threaded Ends: Stockham Figure B-100, or equal.
- b. Solder Ends: Stockham Figure B-109, or equal.

K. Combination Air Valves.

1. Manufacturers.

- a. Golden – Anderson Industries, Figure 945.
- b. APCO Valves.
- c. Or equal.

2. The combination air valve shall consist of a kinetic air and vacuum valve and an air release valve contained in a single body housing. The valve shall be designed to exhaust large amounts

of air during filling, to release small amounts of accumulated air during operation and to admit large amounts of air upon impending vacuum during draining.

3. The inlet shall be the nominal size of the valve and the outlet shall be the same size as the inlet. Body and cover shall be of cast iron conforming ASTM A 126, Class B. The Air and Vacuum portion of the valve shall be designed to exhaust air at up to sonic velocity without blowing shut. The floats shall be spherical and shall be capable of withstanding a test pressure of 1000 psi. The Air Release portion shall have a stainless steel leverage mechanism and float. The small orifice shall be stainless steel and have a rubber seat.
4. Inlet shall have a surge check.
5. Valve body to be fusion bond epoxy lined and coated.

L. Ball Valves (Drain Valves).

1. **Manufacturers.**
 - a. Jamesbury, Model 4A-2236XT/36" SE.
 - b. NIBCO, Inc.
 - c. Stockham Valves and Fittings.
 - d. Or equal.
2. Carbon Steel Construction:
Two piece valves, 2 inch and smaller: ASTM A 216 carbon steel body, 1500 psi stainless steel standard port ball and stem, reinforced TFE packing and seats, stainless steel trim.
 - a. Threaded Ends: Conbraco "Apollo" 73-100 Series, or equal.
 - b. 36 inch stem extension and lever operator comply ANSI B1.20.1 for end connection.
3. MSS Compliance: MSS SP-72.

M. Water Hammer Arrestor.

1. **Manufacturers.**
 - a. Flexicraft Model MHY320500, Style Hydropad.
 - b. Metraflex Company.
 - c. Or equal.
2. Water Hammer Arrestor shall consist of a diaphragm-type stainless steel bellows unit enclosed by an outer shell. Bellows shall be of multiple-type diaphragms, and heli-arc welded at inner and outer peripheries. Bellows shall be exposed internally to line pressure and all material in contact with line fluid shall be 316L stainless steel. Unit shall have sufficient volume between outer steel shell to limit maximum surge to desired pressure. Unit shall be filled on site with nitrogen gas between bellows and steel shell. Nitrogen gas pressure shall be 3 to 5 psig below the normal line pressure at point of installation. All Hydropads shall be designed and welded to meet ASME unfired pressure vessel codes.

N. Surge Relief Valve.

1. **Manufacturers.**
 - a. Golden – Andrewson Industries Figure 6625
 - b. APCO Valves.
 - c. Or equal.
2. Main valve body shall be long radius elbow pattern of cast iron conforming to ASTM A126 Class B. The valve body shall be inherently self-cleaning and have a net flow area through the valve

no less than the area of its normal pipe size. The body shall have a removable 316 stainless steel body liner. The valve disc shall be aluminum. The spring chamber shall be aluminum. Valve shall be fusion bond epoxy lined and coated. The valve shall be factory tested and set to open at a pressure of 110 psi. Springs shall permit field adjustment from near zero to 10% above factory setting.

3. The surge relief valve shall quickly open when the system pressure exceeds its setting, remain open as long as the pressure exceeds this setting, and slowly close drop tight when the pressure subsides below the spring setting.

O. Pipe Support Systems.

1. Manufacturers.

- a. Anvil.
- b. PHD Manufacturing.
- c. ERICO.

2. 2 inch Water Branch Hangers.

- a. Carbon steel.
- b. Galvanized.
- c. Anvil Figure 212.

3. 4 inch Water Branch Hangers.

- a. Carbon steel.
- b. Galvanized.
- c. Anvil Figure 181.

4. Vertical Pipe Supports.

- a. Carbon steel clamp and bracket.
- b. Galvanized.
- c. Anvil Figure 103.

5. Beam Clamps.

- a. Carbon steel.
- b. Galvanized.
- c. Anvil Figure 134.

6. Concrete Insert.

- ~~a. All concrete inserts in bridge deck shall be epoxy coated.~~
- ~~b. Malleable iron.~~
- ~~c. Galvanized.~~
- ~~d. Anvil Figure 282.~~

Universal concrete inserts for supporting pipes with 1/2 inch and 5/8 inch rods are shown in Figures 1 and 2 at the end of this special provision.

P. References.

Where indicated, comply with requirements and recommendations of the standards or publications listed, except where more detailed and stringent requirements are required by other regulations.

- Building Codes of the City of Bettendorf, and the State of Iowa.
- American National Standards Institute.
- American Society of Mechanical Engineers.
- American Society of Plumbing Engineers.
- American Society for Testing Materials.
- American Water Works Association.

- American Welding Society.
- Association of Safety Engineers.
- Environmental Protection Agency.
- Manufacturers Standardization Society of the Valve and Fitting Industry.
- Mechanical Contractors Association of America.
- National Institute of Standards and Testing.
- National Electrical Contractor Association.

Q. Submittals.

1. **Product Data:** Submit installation instructions. Submit manufacturer's catalog cuts, product specifications, and technical product data, including installation instructions. For each type and size of valve include pressure drop curve or chart. Submit valve schedule showing manufacturer's figure number, size, service rating, and valve features for each required valve.
2. Piping schedule showing manufacturer, pipe or tube weight, fitting type, and joint type for piping system.
3. **Welding Certifications:** Submit reports as required for Work.
4. **Shop Drawings.**
 - a. Submit manufacturer's assembly type (exploded view) shop drawings for each type of valve indicating dimensions, weights, materials, and methods of assembly of components.
 - b. Prepare shop drawings to an accurate scale except where diagrammatic representations are specifically indicated by the Engineer as being acceptable. For critical locations, show clearance dimensions.
5. **Operation and Maintenance Manuals.**
 - a. Submit maintenance data and spare parts lists for each type of valve, include product data and Shop Drawings.
 - b. Submit manufacturer's operating instructions for items of mechanical equipment. Supplement operating instructions with Project application instructions. Instructions are to be in typewritten form.
 - c. Submit operating and maintenance instructions for the system as a whole, including as-built schematic drawings, volume of water required to fill the system and estimated volume of water to purge to system of air, requirements for clarity of water to prevent sediment accumulation in lines, sequence for opening and closing valves when filling, purging and draining system with each use, etc.
 - d. The Contractor shall prepare and deliver to the Engineer six copies of "Installation, Operating and Maintenance Manuals and Parts Lists" for all items of mechanical equipment furnished under this item of Work. Each manual shall contain all information pertinent to the equipment and essential for good preventative maintenance practice. Include information about efficient replacement of all expendable components, such as data covering model, type, serial numbers, capacities, and maintenance schedules. Operation instructions shall cover all phases of items installed.
 - e. Manuals shall be compiled in three ring binders and shall be furnished complete with a typed index.
 - f. Manuals shall be prepared by the original equipment manufacturer and shall be complete in all necessary details of information to permit the proper installation, operating and maintenance of the equipment. Manuals shall refer only to the actual equipment provided and all references to alternative equipment shall be deleted. Critical points of the operation and hazardous limits shall be boldly underscored and emphasized.
 - g. Generally, the manuals shall include the items listed below and other features as may be recommended by the manufacturers:

- Catalog information of the unit installed.
 - Capacity and installation details.
 - Special valves and control devices.
 - All points requirement lubrication and type of lubricant.
 - Frequency of lubrication.
 - Operating pressures and temperatures.
 - Relief devices and settings.
- h. In addition to the six hard copies of the manuals described above, submit an electronic copy in pdf format, including all the data included in the hard copy. Wherever possible, the text shall be searchable.

R. Quality Assurance.

1. Products shall comply with the specified requirements and shall provide a quality no less than that of the manufacturer's standard products, as specified by their published product data. Off-the-shelf conditions should not be assumed to comply with specified requirements. Do not purchase any materials and equipment until the review of submittals by the Engineer that might affect the purchase.
2. Except as otherwise indicated, provide new products. All products shall be free of defects and harmful deterioration.
3. Provide each product complete with trim, accessories, finishes, guards, safety devices, and similar components recognized as integral to the product or required by governing regulations.
4. Unless otherwise indicated, complete the fabrication, assembly, finishing and testing of products prior to delivery to the site.
5. Contractor Qualifications: Installation and alterations of equipment, specialties and accessories, and repair and servicing of equipment shall be performed only by a qualified Contractor. The term qualified means experienced in such work. The Contractor shall have successfully completed a minimum of five projects in the past similar in size and scope to this Project. The Contractor shall be familiar with all precautions required and shall comply with all the requirements of the authority having jurisdiction, and upon request, submit evidence of such qualifications to the Engineer.
6. Manufacturer Qualifications: Components shall be produced by companies regularly engaged and specializing in manufacturing of pipe, tube, fittings, valves and devices of types and sizes required whose products have been in satisfactory use in similar service for not less than 5 years.
7. Valve Types: Provide valves of same type by same manufacturer to greatest extent possible.
8. Valve and Rating Identification: Provide valves with manufacturer's name (or trademark) and pressure rating clearly marked on valve body.
9. **Codes and Standards.**
 - a. MSS Compliance: Mark valves in accordance with MSS SP-25.
 - b. ANSI Compliance: For face-to-face and end-to-end dimensions of flanged or welded end valve bodies, comply with ANSI B16.10.

S. Delivery, Storage and Handling.

1. Deliver products properly identified with names, model numbers, types, grades and compliance labels. Products shall be adequately packaged or protected to prevent deterioration during

- shipment, storage and handling. Except where prepared and protected specifically for exterior storage, store in a dry and well ventilated indoor space.
2. Delivery, storage and handling of valves:
 - a. Preparation For Transport: Prepare valves for shipping as follows:
 - 1) Ensure valves are dry and internally protected against rust and corrosion.
 - 2) Protect valve ends against damage to threads, flange faces, and weld-end preps.
 - 3) Set valves in best position for handling. Set globe and gate valves closed to prevent rattling, set ball and plug valves open to minimize exposure of functional surfaces; set butterfly valves closed or slightly open; and block swing check valves in either closed or open position.
 - b. Storage: Use the following precautions during storage:
 - 1) Do not remove valve end protectors unless necessary for inspection; then reinstall for storage.
 - 2) Protect valves from weather. Store valves indoors. Maintain valve temperature higher than the ambient dew point temperature. If outdoor storage is necessary, support valves off the ground or pavement in watertight enclosures.
 - c. Handling: Use a sling to handle valves whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use handles or stems as lifting or rigging points.
 3. Delivery, storage and handling of pipe, tube and fittings:
 - a. Provide factory-applied basic protection and caps on each length of pipe and tube, except for hub-and-spigot pipe. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and eliminate dirt and moisture from inside of pipe and tube.
 - b. Where possible, store pipe and tube inside and protected from weather. Where necessary to store outside, elevate above grade and enclose with durable, waterproof wrapping.
 - c. Protect flanges and fittings from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.

T. Special Requirements.

1. Field Measurements: Before proceeding with the fabrication of the work, the Contractor shall verify all dimensions and take such measurements as are required for proper fabrication and erection of the Work.
2. Coordination: The Contractor shall coordinate this work with adjacent work of other trades.

U. Extra Materials and Spare Parts.

1. Where spare parts or extra materials are called for in any specification section they shall be supplied.
2. The contractor shall turn over to the Engineer all spare parts and extra materials in the original factory packaging.
3. The Contractor shall supply spare parts as recommended by the various equipment manufacturers. These shall be of the types and quantities shown in the operation and maintenance manuals.

150179b.03. CONSTRUCTION.

A. Product Installation General.

1. Except where more stringent requirements have jurisdiction, comply with manufacturer's installation instructions and recommendations regarding but not limited to: handling,

- anchorage, assembly, connections, cleaning, testing, charging, lubrication, start-up and shut-down of equipment within the scope of this work.
2. The plans serve as working plans for the general layout of the various items. However, the layout of equipment, accessories, specialties, and piping systems shown are diagrammatic and do not necessarily indicate every required valve, fitting, trap, elbow, and so forth. Provide such items as required for proper and complete installation of the work.
 3. Where new work is to be applied to existing surfaces, removals and patching shall produce surfaces that are suitable for the new work. Patching shall be performed in a neat manner. Finished surfaces of patched area shall be flush with adjacent existing surfaces and shall match the existing adjacent surfaces in texture and finish.
 4. Provide a union ahead of each screwed valve, trap, or strainer, and on each piece of equipment and wherever needed to dismantle piping.
 5. Changes in pipe sizes shall be made with the proper size-reducing fittings, reducing elbows, or reducing tees. Bushings are not permitted.

B. Installation of Pipe, Tube, Fittings, Expansion Loops, Supports and Sleeves.

1. General.

- a. Install pipe, fittings and all other specified items in accordance with recognized industry practices achieving permanently leak proof piping systems, capable of performing each indicated service without piping failure.
- b. Install each run with minimum joints and couplings, but with adequate and accessible unions for disassembly, maintenance or replacement of valves and equipment.
- c. Reduce sizes (where indicated) by use of reducing fittings.
- d. Align piping accurately at connections, within 1/16 inch misalignment tolerance.
- e. Comply with ANSI B31.1 - Code for Pressure Piping.

2. Piping Arrangements.

- a. Locate piping runs, as indicated, vertically and horizontally (pitched to drain).
- b. Locate runs as shown or described by diagrams, details, and notations.

3. Piping System Joints.

- a. Provide joints of type indicated in each piping system.
 - b. Thread pipe in accordance with ANSI B1.20.1; cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside dia. Apply pipe joint compound or pipe joint tape (Teflon) where recommended by pipe/ fitting manufacturer, on male threads at each joint, and tighten joint to leave not more than three threads exposed.
4. Flanged Joints: Match flanges within piping system and at connections with valves and equipment. Clean flange faces and install gaskets. Tighten bolts to provide uniform compression of gaskets.

5. Pipe supports.

- a. Fabricate and install pipe supports of type and location as shown on structural design plans and also on mechanical design plans.
- b. Locate pipe supports at maximum spacing of 10 feet. Locate at least one support for each length of pipe at each change of direction and at each valve.

6. Sleeves.

- a. Set sleeves in position in formwork. Provide reinforcing around sleeves.
- b. Size sleeves large enough to allow for movements due to expansions and contractions.

7. Piping Tests:

- a. Test pressure piping in accordance with ANSI B31.1.
- b. Repair piping systems sections which fail required piping test, by disassembly and reinstallation, using new materials to extent required to overcome leakage.
- c. Drain test water from piping systems after testing and repair work has been completed.

C. Installation of Valves, Gate Valves, Combination Air Valves, Ball Valves (Drain Valves) and Water Hammer Arrestor.

1. Except as otherwise indicated, comply with following requirements.
 - a. Install valves where required for proper operation of piping and equipment, include valves in branch lines where necessary to isolate sections of piping. Locate valves so accessible and separate support can be provided when necessary.
 - b. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable.
2. Install water hammer arrestor as close to valves as possible.
3. Valve Adjustment: After piping systems have been tested and put into service, but before final testing, adjusting, and balancing; inspect each valve for possible leaks. Adjust or replace packing to stop leaks. Replace valve if leak persists.
4. Cleaning: Clean factory finished surfaces. Repair marred or scratched surfaces with manufacturer's touch-up paint.

D. Coordination with Other Work.

1. Before making any installation, make necessary and proper arrangement for changes required to avoid interference with or improper effect on operation of other systems.
2. No additional cost shall be charged for any part of the Contractor's coordination of work.
3. If any work is installed so that project work that will be installed later will not have required clearances or will interfere with finished design, the Contractor shall make such changes in their Work as directed by the Engineer to permit the proper installation of all work under the contract.
4. Where, in the opinion of the Engineer, there are pre-installation changes that are deemed necessary to avoid interferences, the Contractor shall make these changes.
5. For locations where several elements of mechanical or structural Work shall fit into an available space, prepare coordination shop plans showing accurate physical dimensions. Submit these plans to the Engineer for approval prior to purchase, fabrication, and installation of work.

E. Coordination.

1. Piping shall be positioned straight, true and aligned with other work.
2. Give right-of-way to piping that shall slope for drainage. Arrange Work to facilitate maintenance, repair, or replacement of equipment. Locate operating and control equipment and devices for easy access.

3. All unions, valves, meters, gauges or other equipment requiring frequent readings, adjustments, inspections, repairs, replacements or removals shall be conveniently and accessibly located.
4. Piping shall be installed with sufficient clearances to allow for proper servicing.
5. In no case shall any pipe, conduit, duct, or item of equipment be installed where it is supported on, or suspended from, another pipe, conduit, duct, or equipment.
6. Accessibility:
 - a. Install mechanical work to permit removal (without damage to other parts) of pumps, and other parts requiring periodic replacement or maintenance.
 - b. Arrange pipes, and equipment to permit ready access to valves, motors, control components, and to clear the openings of swinging and utility access covers.

F. Mechanical Symbols.

Mechanical Contract plans are diagrammatic and show requirements by the use of symbols. In general, these are recognized symbols of the industry and of the engineering profession. Most of the symbols used to show mechanical work are from the ASHRAE Handbook of Fundamentals.

G. Cutting and Patching.

1. Except under detailed written instructions signed by the Engineer, do not cut structural members intended to withstand stress. Cut openings through concrete (for pipe penetrations and similar services) by core drilling or sawing.
2. All cutting and patching and repair of damaged areas of work shall be done in a neat and workmanlike manner.
3. Restore the cut work in every respect, including the elimination of visual defects in exposed finishes.

H. Expansion and Contraction.

1. All piping shall be installed throughout the Project with due regard for expansion or contraction to prevent damage to the equipment piping. Provide anchors or offsets where required for the accurate control of movement.
2. All loops or offsets, shall be supplemented with adequate guides as close as possible to preserve alignment and pitch.

I. Tools.

On completion of the work, the Contractor shall furnish and deliver to the Engineer, any special tools that may be required for the proper servicing of any equipment that the Contractor has been furnished on the project.

J. Pressure Tests.

1. Each piping system shall be tested by the trade responsible for the work, under the supervision of either the Engineer or their authorized representative, or both.
2. Provide all necessary pumps, gauges, instruments, test equipment and personnel required for performing the tests. Drain all piping systems and remove all testing equipment after completion and acceptance of tests.

3. All defective material or defects in quality that develop during the tests shall be corrected in an approved manner and the subject piping retested.
4. All piping and connections shall be subjected to a pressure test.
5. Test may be made on isolated portions of such piping as will facilitate general progress of the installation. Any revision made in the piping system subsequently will necessitate retesting of such affected portion of the piping systems.
6. The test pressure shall be not less than 150 psi unless otherwise specified.

K. Piping System Cleaning.

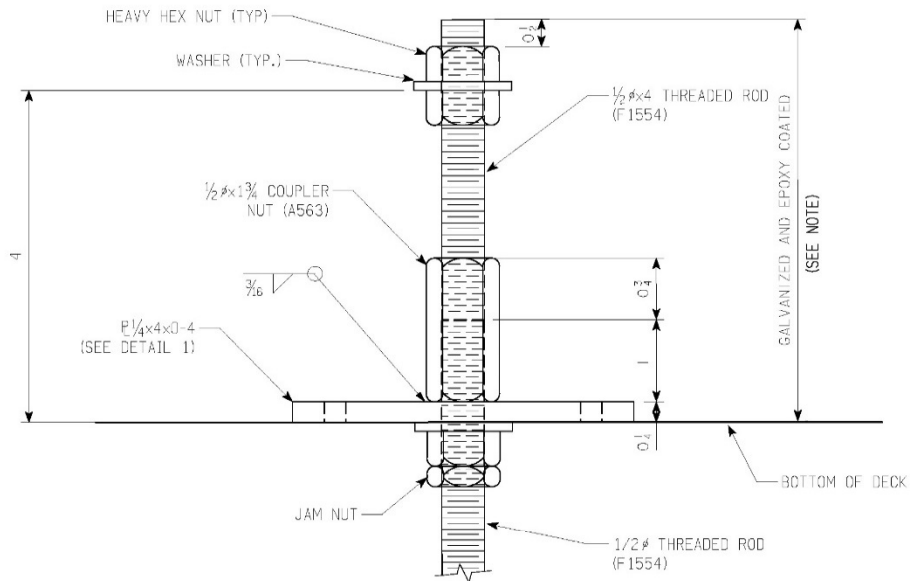
Piping systems and equipment shall be thoroughly cleaned, after pressure testing.

150179b.04 METHOD OF MEASUREMENT.

Maintenance Water Line will be measured as a lump sum item.

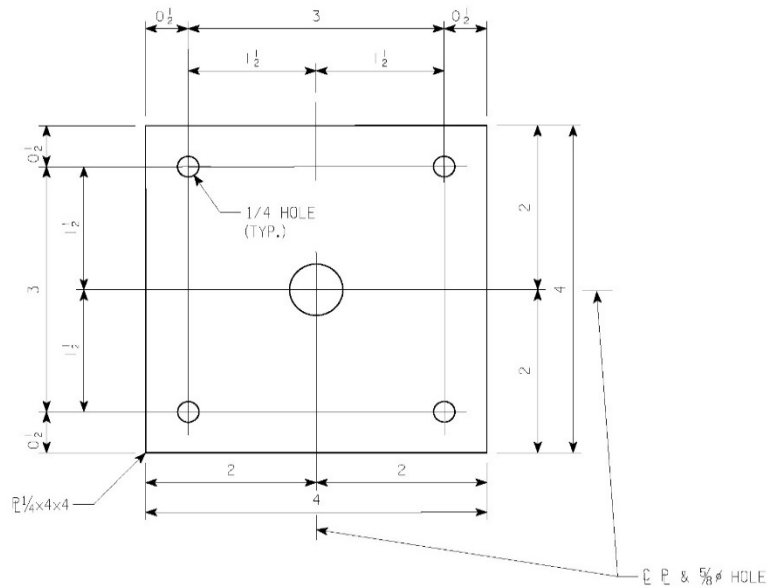
150179b.05 BASIS OF PAYMENT.

The Contractor will be paid the lump sum contract price for Maintenance Water Line. This payment shall be full compensation for furnishing all materials, tools and labor for the performance of all work as described in the contract documents.



UNIVERSAL CONCRETE INSERT DETAIL

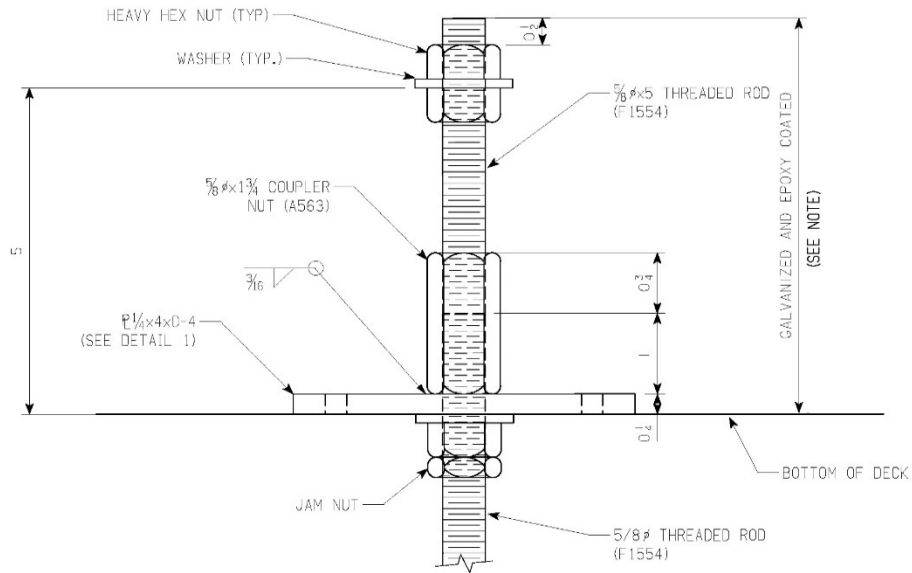
NOTE: THE UNIVERSAL CONCRETE INSERT MAY BE DEPICTED DIFFERENTLY WITHIN THE DETAIL PLANS.



DETAIL 1

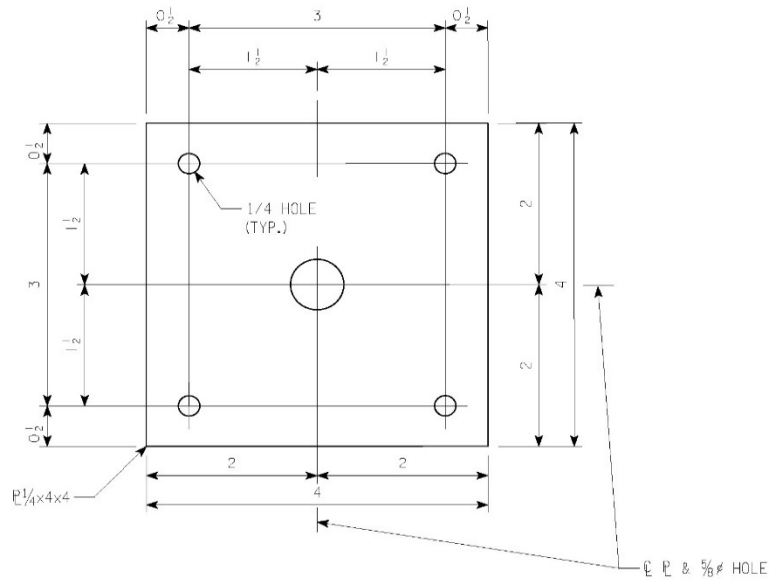
NOTE:
 THE UNIVERSAL CONCRETE INSERT AND ALL COMPONENTS INCLUDING THE THREADED ROD, HEX NUTS, JAM NUTS, WASHERS AND STEEL PLATES SHALL BE HOT-DIPPED GALVANIZED AND SHALL COMPLY WITH ASTM F 2329. THREADED RODS SHALL COMPLY WITH ASTM F1224. HEAVY HEX NUTS, JAM NUTS AND COUPLER SHALL COMPLY WITH ASTM A 563 GRADE A. WASHERS SHALL COMPLY WITH ASTM F436. SEE UNIVERSAL CONCRETE INSERT DETAIL, THIS SHEET FOR DETAILS. THE ALLOWABLE LOAD (AS DEFINED IN I.M. 453.09) IS 1.5 KIPS. THE GALVANIZED INSERT SHALL BE EPOXY COATED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A1055. GALVANIZED THREADS SHALL BE PROTECTED FROM EPOXY COATING.

Figure 1: Universal Concrete Insert with 1/2 Inch Diameter Rod



UNIVERSAL CONCRETE INSERT DETAIL

NOTE: THE UNIVERSAL CONCRETE INSERT MAY BE DEPICTED DIFFERENTLY WITHIN THE DETAIL PLANS.



DETAIL 1

NOTE:

THE UNIVERSAL CONCRETE INSERT AND ALL COMPONENTS INCLUDING THE THREADED ROD, HEX NUTS, JAM NUTS, WASHERS AND STEEL PLATES SHALL BE HOT-DIPPED GALVANIZED AND SHALL COMPLY WITH ASTM F 2329. THREADED RODS SHALL COMPLY WITH ASTM F1224. HEAVY HEX NUTS, JAM NUTS AND COUPLER SHALL COMPLY WITH ASTM A 563 GRADE A. WASHERS SHALL COMPLY WITH ASTM F436. SEE UNIVERSAL CONCRETE INSERT DETAIL, THIS SHEET FOR DETAILS. THE ALLOWABLE LOAD (AS DEFINED IN I.M. 453.09) IS 1.5 KIPS. THE GALVANIZED INSERT SHALL BE EPOXY COATED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A1055. GALVANIZED THREADS SHALL BE PROTECTED FROM EPOXY COATING.

Figure 2: Universal Concrete Insert with 5/8 Inch Diameter Rod

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	2518-6910000	SAFETY CLOSURE Refer to Tab 108-13A on the C Sheets
2	2523-0000200	ELECTRICAL CIRCUITS The pay item electrical circuits shall be used for all electrical cable called for on the Roadway and aesthetic lighting P Sheets. Bid to include 600 volt fuses at 5 amperes for luminaire supply (L-1 connectors) and 20 amperes for tap circuit protection (Y-1 connectors) located in the junction boxes or handholes. Included are 88 type L-1 connectors, 264 Y-1 connectors, 54 type Y-3 connectors, and 92 type L-2 connectors. Electrical circuit length is calculated from plan dimensions as the linear, one-way length of both new and existing embedded conduits. No allowance has been added to this quantity. Allowances have been added to all wire and cable quantities listed in Tab 108-12 on sheet P.1. Conduit shall not be included as part of this pay item, but paid for separately.
3	2523-0000310	HANDHOLES AND JUNCTION BOXES The following estimate reference information is for junction boxes called for in the lighting plans (P.sheets). Junction boxes shall be mounted on the surface of a structure or embedded in a structure as shown on the plans. The junction box shall be furnished with a cover, gasket, and hardware. Hardware furnished for the cover shall be stainless steel. A grounding lug shall be provided in every junction box. A stainless steel conduit fitting shall be used to connect to a stainless steel junction box. Junction box covers shall have a continuous formed, seamless, urethane, oil-resistant gasket. The gasket shall be placed directly onto the junction box cover. The gasket shall adhere to the cover without the use of adhesives. Junction box covers shall be attached to the box with un-slotted hex head screws. For boxes mounted on bridge structures, the cover shall be furnished with a retaining chain and captive screws. All junction boxes to be sized according to LI-104 and shall be made of stainless steel, unless otherwise noted. The stainless steel junction box shall be made of Type 304 stainless steel, not less than 14 gauge with all seams continuously welded with a stainless steel weld wire and ground smooth. Exterior surfaces shall have a smooth polished finish. The box shall be according to NEMA Type 4X and be UL 50 "Junction and Pull Box", "Junction and Pull Box, "Junction Box", or "Pull Box." The galvanized steel junction box shall be made of galvanized steel, NEMA Type 3R and be listed. It shall be hot-dip galvanized according to ASTM A 653 (A 653M). When specified for attachment to a structure, the box shall be suitable for surface mounting, complete with external mounting lugs or brackets of similar material welded to the box. The box shall have an overlapping cover that is secured to the box with a continuous hinge, both of similar material to the junction box, and a minimum of four captive stainless steel clamps utilizing captive stainless steel hex-head bolts or deep slotted stainless steel screws. When specified for embedment in structure, the box shall be constructed with the cover arranged to fit flush with the structure surface. The cover shall be attached with stainless steel unslotted hex-head screws. Junction boxes which are located in the bridge concrete barrier railing are included in the cost of the bridge plans. The cost of the concrete inserts required to support the junction boxes suspended from the bridge deck are included with the cost of the bridge plans. The cost of the hanger rods and assemblies is incidental to the cost of the junction boxes. Refer to P Sheets.
4	2523-0000400	Control Cabinet Control cabinet per LI-152, of the size specified. Refer to P Sheets.
5	2528-8445110	TRAFFIC CONTROL The Mississippi River Trail closures, detour and signage is included in the unit price bid for Traffic Control. See J Sheets for additional information
6	2533-4980005	MOBILIZATION Includes dredging for barge access and Special Revetment backfill, if any, See U Sheets.
7	2599-9999005	AESTHETIC LIGHT, INSTALL ONLY (TYPE "LC") See P sheets for locations, details, and additional tabulations DESCRIPTION This work shall consist of receiving, assembling, and installing a Aesthetic Luminaire as shown on the plans. The work includes but is not limited to required submittals, unloading, storing, and all other miscellaneous work required for complete installation. Included in this item is coordination with the Aesthetic Luminaire Supply Contractor for delivery and installation requirements. All work shall conform to Section 2523 of the Standard Specifications, except as specified in the Special Provisions. CONSTRUCTION Refer to the Special Provisions for LIGHTING. MATERIALS Refer to the Special Provisions for LIGHTING.

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
		METHOD OF MEASUREMENT The Aesthetic Luminaire will be measured by the unit "Each", complete. All related apparatus shall be included.
		BASIS OF PAYMENT This work will be paid for at the contract unit price per each for AESTHETIC LIGHT, INSTALL ONLY (TYPE "LC"), which price shall include all material, hardware, storage, and labor required for complete installation of the Aesthetic Luminaires, as shown on the contract plans and as specified herein.
8	2599-9999005	AESTHETIC LIGHT, INSTALL ONLY (TYPE "LD") See P sheets for locations, details, and additional tabulations DESCRIPTION This work shall consist of receiving, assembling, and installing a Aesthetic Luminaire as shown on the plans. The work includes but is not limited to required submittals, unloading, storing, and all other miscellaneous work required for complete installation. Included in this item is coordination with the Aesthetic Luminaire Supply Contractor for delivery and installation requirements. All work shall conform to Section 2523 of the Standard Specifications, except as specified in the Special Provisions. CONSTRUCTION Refer to the Special Provisions for LIGHTING. MATERIALS Refer to the Special Provisions for LIGHTING. METHOD OF MEASUREMENT The Aesthetic Luminaire will be measured by the unit "Each", complete. All related apparatus shall be included. BASIS OF PAYMENT This work will be paid for at the contract unit price per each for AESTHETIC LIGHT, INSTALL ONLY (TYPE "LD"), which price shall include all material, hardware, storage, and labor required for complete installation of the Aesthetic Luminaires, as shown on the contract plans and as specified herein.
9	2599-9999005	CABINET, FURNISH AND INSTALL, 46 INCH x 24 INCH x 20 INCH DESCRIPTION This work shall consist of furnishing and installing the 46 inch x 24 inch x 20 inch Cabinets for the proposed ITS infrastructure within this project. This work shall include all materials, hardware, and labor required for complete mounting and installation of the Cabinets. MATERIALS Refer to the Special Provisions for ITS INFRASTRUCTURE. INSTALLATION Refer to the Special Provisions for ITS INFRASTRUCTURE. METHOD OF MEASUREMENT Refer to the Special Provisions for ITS INFRASTRUCTURE. BASIS OF PAYMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.
10	2599-9999005	HANDHOLE, FURNISH AND INSTALL, TYPE I DESCRIPTION This work shall consist of furnishing and installing the Type I Handholes for the proposed ITS infrastructure within this project. This work shall include all materials, hardware, and labor required for complete installation of the Type I Handholes. MATERIALS Refer to the Special Provisions for ITS INFRASTRUCTURE. INSTALLATION Refer to the Special Provisions for ITS INFRASTRUCTURE. METHOD OF MEASUREMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.
11	2599-9999005	HANDHOLE, FURNISH AND INSTALL, TYPE III DESCRIPTION This work shall consist of furnishing and installing the Type III Handholes for the proposed ITS infrastructure within this project. This work shall include all materials, hardware, and labor required for complete installation of the Type III Handholes. MATERIALS Refer to the Special Provisions for ITS INFRASTRUCTURE. INSTALLATION Refer to the Special Provisions for ITS INFRASTRUCTURE. METHOD OF MEASUREMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
		BASIS OF PAYMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.
12	2599-9999005	JUNCTION BOX, 16" X 16" X 8" (PRIVATE UTILITY)
		DESCRIPTION This work shall consist of furnishing and installing the 16 inch x 16 inch x 8 inch Junction Boxes for the proposed ITS infrastructure within this project. This work shall include all materials, hardware, and labor required for complete mounting and installation of the Junction Boxes.
		MATERIALS All junction boxes to be sized according to LI-104 and shall be made of galvanized steel. The galvanized steel junction box shall be made of galvanized steel, NEMA Type 3R and be listed. It shall be hot-dip galvanized according to ASTM A 653 (A 653M).
		When specified for attachment to a structure, the box shall be suitable for surface mounting, complete with external galvanized steel mounting lugs or brackets welded to the box. The box shall have an overlapping galvanized steel cover that is secured to the box with a continuous galvanized steel hinge and a minimum of four captive stainless steel clamps utilizing captive stainless steel hex-head bolts or deep slotted stainless steel screws.
		INSTALLATION Exposed junction boxes on structures shall be installed on 1/2 in. long galvanized steel spacers with the hinge on the side of the box and the cover lying in the vertical plane when closed. The exact orientation shall be as shown on the plans or as directed by the Engineer. Care shall be taken to assure proper orientation of mounting lugs. Field cut conduit openings shall be uniform and smooth. All burrs and rough edges shall be filed smooth prior to the installation of conduit(s) into the junction box. Field cut conduit openings shall be fitted with the appropriate conduit fittings and accessories.
		Refer to P Sheets for locations.
		METHOD OF MEASUREMENT The JUNCTION BOX, 16" X 16" X 8" (PRIVATE UTILITY) will be measured by the unit "Each", complete. All related apparatus shall be included.
		BASIS OF PAYMENT This work will be paid for at the contract unit price per each for JUNCTION BOX, 16" X 16" X 8" (PRIVATE UTILITY) which price shall include all material, hardware, storage, and labor required for complete installation of the Junction Box, as shown on the contract plans and as specified herein.
13	2599-9999005	JUNCTION BOX, FURNISH AND INSTALL, 10 INCH x 8 INCH x 4 INCH
		DESCRIPTION This work shall consist of furnishing and installing the 10 inch x 8 inch x 4 inch Junction Boxes for the proposed ITS infrastructure within this project. This work shall include all materials, hardware, and labor required for complete mounting and installation of the Junction Boxes.
		MATERIALS Refer to the Special Provisions for ITS INFRASTRUCTURE.
		INSTALLATION Refer to the Special Provisions for ITS INFRASTRUCTURE.
		METHOD OF MEASUREMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.
		BASIS OF PAYMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.
14	2599-9999005	JUNCTION BOX, FURNISH AND INSTALL, 12 INCH x 10 INCH x 6 INCH
		DESCRIPTION This work shall consist of furnishing and installing the 12 inch x 10 inch x 6 inch Junction Boxes for the proposed ITS infrastructure within this project. This work shall include all materials, hardware, and labor required for complete mounting and installation of the Junction Boxes.
		MATERIALS Refer to the Special Provisions for ITS INFRASTRUCTURE.
		INSTALLATION Refer to the Special Provisions for ITS INFRASTRUCTURE.
		METHOD OF MEASUREMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.
		BASIS OF PAYMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.
15	2599-9999005	JUNCTION BOX, FURNISH AND INSTALL, 30 INCH x 20 INCH x 16 INCH
		DESCRIPTION This work shall consist of furnishing and installing the 30 inch x 20 inch x 16 inch Junction Boxes for the proposed ITS infrastructure within this project. This work shall include all materials, hardware, and labor

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
		required for complete mounting and installation of the Junction Boxes.
		MATERIALS Refer to the Special Provisions for ITS INFRASTRUCTURE.
		INSTALLATION Refer to the Special Provisions for ITS INFRASTRUCTURE.
		METHOD OF MEASUREMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.
		BASIS OF PAYMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.
16	2599-9999005	JUNCTION BOX, FURNISH AND INSTALL, 30 INCH x 30 INCH x 16 INCH
		DESCRIPTION This work shall consist of furnishing and installing the 30 inch x 30 inch x 16 inch Junction Boxes for the proposed ITS infrastructure within this project. This work shall include all materials, hardware, and labor required for complete mounting and installation of the Junction Boxes.
		MATERIALS Refer to the Special Provisions for ITS INFRASTRUCTURE.
		INSTALLATION Refer to the Special Provisions for ITS INFRASTRUCTURE.
		METHOD OF MEASUREMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.
		BASIS OF PAYMENT Refer to the Special Provisions for ITS INFRASTRUCTURE.
17	2599-9999005	LIGHTING POLE, INSTALL ONLY
		See P sheets for locations, details, and additional tabulations.
		DESCRIPTION This work shall consist of receiving and installing a light pole complete with an arm(s) and all appurtenances required for a complete operating unit and installing it on a concrete foundation. The work includes but is not limited to required submittals, unloading, storing, and all other miscellaneous work required for complete installation. Included in this item is coordination with the light pole Supply Contractor for delivery and installation requirements. All work shall conform to Section 2523 of the Standard Specifications, except as modified within the Special Provisions.
		CONSTRUCTION Refer to the Special Provisions for LIGHTING.
		MATERIALS Refer to the Special Provisions for LIGHTING.
		METHOD OF MEASUREMENT The Light Pole will be measured by the unit "Each", complete. All related apparatus shall be included.
		BASIS OF PAYMENT This work shall be paid for at the contract unit price each for LIGHTING POLE, INSTALL ONLY, of the mounting height and luminaire mounting positions indicated, which shall be payment in full for installing the light pole complete as described in the Special Provisions.
18	2599-9999005	PEDESTRIAN LUMINAIRE, INSTALL ONLY
		See P sheets for locations, details, and additional tabulations
		DESCRIPTION This work shall consist of receiving, assembling, and installing a Pedestrian Luminaire as shown on the plans. The work includes but is not limited to required submittals, unloading, storing, and all other miscellaneous work required for complete installation. Included in this item is coordination with the Luminaire Supply Contractor for delivery and installation requirements. All work shall conform to Section 2523 of the Standard Specifications, except as specified in the Special Provisions.
		CONSTRUCTION Refer to the Special Provisions for LIGHTING.
		MATERIALS Refer to the Special Provisions for LIGHTING.
		METHOD OF MEASUREMENT The Pedestrian Luminaire will be measured by the unit "Each", complete. All related apparatus shall be included.
		BASIS OF PAYMENT This work will be paid for at the contract unit price per each for PEDESTRIAN LUMINAIRE, INSTALL ONLY, which price shall include all material, hardware, storage, and labor required for complete installation of the Pedestrian luminaires, as shown on the contract plans and as specified herein.

GENERAL NOTES

1. THE CONTRACTOR'S BID SHALL INCLUDE ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO PROVIDE A COMPLETE AND FUNCTIONAL ITS INSTALLATION IN CONFORMANCE WITH THE PLANS AND SPECIFICATIONS.
2. THE PLAN LOCATIONS OF UNDERGROUND UTILITIES, WHEN SHOWN, ARE APPROXIMATE ONLY. IN ADDITION, A PORTION OF UTILITY INFORMATION MAY NOT HAVE BEEN PROVIDED. ALL UTILITIES SHALL BE LOCATED AND MARKED PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING UTILITIES AND LOCATOR SERVICES AND SCHEDULING THE LOCATION OF UNDERGROUND UTILITIES. THE CONTRACTOR SHALL ALSO CONTACT ANY AND ALL UTILITIES AND LOCAL GOVERNMENT AGENCIES NOT PARTICIPATING IN LOCATION SERVICES.
3. PROPOSED ITS EQUIPMENT LOCATIONS ARE APPROXIMATE AND MAY REQUIRE MODIFICATION TO AVOID CONFLICTS WITH UNDERGROUND UTILITIES OR OTHER OBSTRUCTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ANY CONFLICTS WITH EXISTING UTILITIES AT SITES IN THE FIELD PRIOR TO INITIATION OF CONSTRUCTION AT THAT SITE. AS THE CCTV AND SENSOR LOCATIONS ARE LOCATION SENSITIVE, THE CONTRACTOR SHALL RECEIVE WRITTEN APPROVAL FROM THE ENGINEER PRIOR TO REVISING THE PLAN LOCATION OF ANY CONDUIT, POLES, FOUNDATIONS, OR CABINETS.
4. ABOVE GROUND RISERS SHALL BE RIGID STEEL CONDUIT. ALL OTHER CONDUIT SHALL BE HDPE CONDUIT. RIGID P.V.C. CONDUIT (SCHEDULE 40 OR AS APPROVED) MAY BE SUBSTITUTED FOR CONDUIT RUNS UNDER 50 FEET.
5. ANY AND ALL IMPROVEMENTS SUCH AS ASPHALT OR CONCRETE PAVEMENTS, CURBS, GUTTERS, WALKS, DRAINAGE DITCHES, CULVERTS, DRAIN TILES, EMBANKMENTS, SHRUBS, TREES, GRASS, SOD, ETC., IF DAMAGED, SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS (OR BETTER) AS DIRECTED BY THE ENGINEER.
6. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR EXISTING CONDUIT, CONDUCTORS, OR OTHER FACILITIES DAMAGED DURING CONSTRUCTION. ALL EXISTING INFRASTRUCTURE REMOVED OR DAMAGED BY THE CONTRACTOR SHALL BE REPLACED IN KIND BY THE CONTRACTOR, WITH NO ADDITIONAL COMPENSATION.
7. THE CONTRACTOR SHALL NOT DISTURB ANY EXISTING UTILITIES EXCEPT AS SPECIFICALLY DEFINED WITHIN THE SCOPE OF WORK FOR THIS CONTRACT. WHERE WORK AFFECTS OR IS AFFECTED BY THE EXISTING UTILITIES, THE WORK SHALL BE COORDINATED WITH THE UTILITY COMPANY AND/OR OWNER. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE DOT.
8. 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 STARTING CONSTRUCTION DATE.
9. ALL ITS CONDUITS SHALL INCLUDE ONE POLYPROPYLENE PULL ROPE WITH A MINIMUM 2,670N PROPER TENSILE STRENGTH (COST INCIDENTAL TO THE CONDUIT).
10. ALL CONDUIT SHALL BE PLACED AT A 48 INCH MINIMUM COVER UNLESS OTHERWISE SPECIFIED ON THE PLANS.
11. THE CONTRACTOR SHALL BORE UNDER ANY EXISTING ASPHALT OR CONCRETE PAVEMENT, RAILROAD, OR OTHER STRUCTURE.
12. THE CONTRACTOR SHALL PLOW ALL CONDUIT WHERE EXISTING CONDITIONS ALLOW UNLESS OTHERWISE SPECIFIED ON THE PLANS. THE CONTRACTOR MAY BORE IN LIEU OF PLOWING AT THE CONTRACTOR'S EXPENSE.
13. THE MINIMUM BENDING RADIUS OF CONDUIT AND MULTIDUCT SYSTEMS SHALL BE THE LARGER OF THE FIBER OPTIC CABLE MANUFACTURER'S RECOMMENDATION OR NATIONAL ELECTRIC CODE (NEC) REQUIREMENTS. ALL CONDUIT SWEEP RADIUS SHALL BE GREATER AND/OR EQUAL TO 15 INCHES.
14. ALL WIRING AND GROUNDING SYSTEMS SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.

GENERAL NOTES








15. THIS PROJECT DOES NOT INCLUDE PURCHASING, OR INSTALLATION OF, ANY CAMERAS, SENSORS, OR OTHER ITS DEVICES OR STRUCTURAL HEALTH MONITORING SENSORS.
16. LINEAR MEASUREMENTS ARE TAKEN BETWEEN POLE BASE, HANDHOLE, AND JUNCTION BOX CENTERS AND DO NOT INCLUDE ALLOWANCES FOR VERTICAL RISES OR SPLICES.
17. MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF ALL APPLICABLE SECTIONS INCLUDING BUT NOT LIMITED TO SECTION 2523 AND 2525 OF THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015' PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.
18. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ANTICIPATE, COMMUNICATE, AND COORDINATE THIS WORK WITH ADJACENT CONSTRUCTION PROJECTS THAT INCLUDE BUT ARE NOT LIMITED TO ADJACENT ARCH BRIDGE, VIADUCT, AND ROADWAY PROJECTS.
19. THE ITS ELECTRICAL CIRCUITS IN PROJECT IM-NHS-074-(197)5--03-82 ARE SERVICED BY THE PROPOSED POINT OF SERVICE ON LADY LUCK PKWY LOCATED WITHIN THE PROJECT IM-NHS-074-(199)5--03-82 (WB VIADUCT) LIMITS. THE PROJECT IM-NHS-074-(199)5--03-82 CONTRACTOR SHALL NOTIFY THE PROJECT IM-NHS-074-(197)5--03-82 CONTRACTOR WHEN THE POINT OF SERVICE IS ACCESSIBLE THROUGH THE WB VIADUCT ITS INFRASTRUCTURE.
20. THE ITS ELECTRICAL CIRCUITS IN PROJECT IM-NHS-074-(197)5--03-82 ARE SERVICED BY THE PROPOSED POINT OF SERVICE ON LADY LUCK PKWY LOCATED WITHIN THE PROJECT IM-NHS-074-(199)5--03-82 (WB VIADUCT) LIMITS. THE PROJECT IM-NHS-074-(200)5--03-82 (EB VIADUCT) CONTRACTOR SHALL NOTIFY THE PROJECT IM-NHS-074-(197)5--03-82 CONTRACTOR WHEN THE POINT OF SERVICE IS ACCESSIBLE THROUGH THE EB VIADUCT ITS INFRASTRUCTURE.
21. THE ITS ELECTRICAL CIRCUITS IN PROJECT IM-NHS-074-(197)5--03-82 ARE SERVICED BY THE PROPOSED POINT OF SERVICE ON LADY LUCK PKWY LOCATED WITHIN THE PROJECT IM-NHS-074-(199)5--03-82 (WB VIADUCT) LIMITS. THE PROJECT IM-NHS-074-(198)5--03-82 (ARCH BRIDGE) CONTRACTOR SHALL NOTIFY THE PROJECT IM-NHS-074-(197)5--03-82 CONTRACTOR WHEN THE POINT OF SERVICE IS ACCESSIBLE THROUGH THE ARCH BRIDGE ITS INFRASTRUCTURE.
22. THE ITS ELECTRICAL CIRCUITS IN PROJECT IM-NHS-074-(198)5--03-82 (ARCH BRIDGE) ARE SERVICED BY THE PROPOSED STEP DOWN TRANSFORMERS IN THE APPROACH BRIDGES IN PROJECT IM-NHS-074-(197)5--03-82. THE PROJECT IM-NHS-074-(197)5--03-82 CONTRACTOR SHALL NOTIFY THE PROJECT IM-NHS-074-(198)5--03-82 CONTRACTOR WHEN THE TRANSFORMERS ARE ACCESSIBLE THROUGH THE APPROACH BRIDGE ITS INFRASTRUCTURE.
23. CONTRACTOR SHALL FURNISH AND INSTALL CONDUIT EXPANSION FITTINGS AT A MINIMUM OF EVERY 300 FEET AND AT EVERY JUNCTION BOX IN THE PVC COATED RIGID GALVANIZED STEEL CONDUIT SPECIFIED IN THE HANGER SYSTEM FOR THIS PROJECT.
24. CONTRACTOR SHALL FURNISH AND INSTALL AT LEAST ONE EXPANSION FITTING PER VERTICAL CONDUIT RUN.
25. GALVANIZED HINGED EXTENSION SPLIT CONDUIT CLAMPS SHALL BE USED TO SECURE AND SUPPORT CONDUIT ATTACHED TO PIERS. CONDUIT SHALL BE SECURED AND SUPPORTED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE. COST OF CONDUIT CLAMPS IS INCLUDED IN THE COST OF THE CONDUIT.
26. ALL MECHANICAL CONCRETE ANCHORS OR MECHANICAL INSERTS SHALL CONFORM TO MATERIALS IM 453.09. ALL COMPONENTS OF THE ATTACHMENT ASSEMBLIES TO CONCRETE SHALL BE HOT DIP OR MECHANICALLY GALVANIZED STEEL ONLY. ELECTRODEPOSITED ZINC COATING WILL NOT BE ALLOWED. ALL CONCRETE ANCHORS SHALL BE POST-INSTALLED MECHANICAL CONCRETE ANCHORS OR CAST-IN-PLACE INSERTS. CONTRACTOR SHALL AVOID ALL REINFORCING WHEN DRILLING HOLES FOR CONCRETE ANCHORS. COST OF CONCRETE ANCHORS FOR PIERS IS INCLUDED IN THE COST OF PIER CONCRETE.

GENERAL NOTES





27. CONCRETE INSERTS SHALL BE EPOXY COATED. HANGER RODS AND ALL OTHER HANGER SYSTEM HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. SEE P SHEETS FOR ADDITIONAL INFORMATION REGARDING THE INSERT AND HANGER SYSTEM.
28. FIELD WELDING OF ITS ATTACHMENTS TO THE BRIDGE STRUCTURE IS NOT ALLOWED.

ITS LEGEND




INFRASTRUCTURE

---	CONDUIT
	CABINET
	STEP DOWN TRANSFORMER
	HANDHOLE (COMM)
	HANDHOLE (POWER)
	JUNCTION BOX (COMM)
	JUNCTION BOX (POWER)
	45 FOOT ITS POLE

ITS DEVICES (SEE NOTE 15)

	MOTOR VEHICLE DETECTOR SENSOR (MVDS)
	ITS CLOSED CIRCUIT TELEVISION CAMERA (CCTV)
	NON-ITS CLOSED CIRCUIT TELEVISION CAMERA (SSTV)
	ROAD WEATHER INFORMATION SYSTEM (RWIS)

SHM SENSORS (SEE NOTE 15)

	EMBEDDED CORROSION SENSOR
	VIBRATING WIRE DISPLACEMENT TRANSDUCER (VWDT)
	VIBRATING WIRE TILT METER

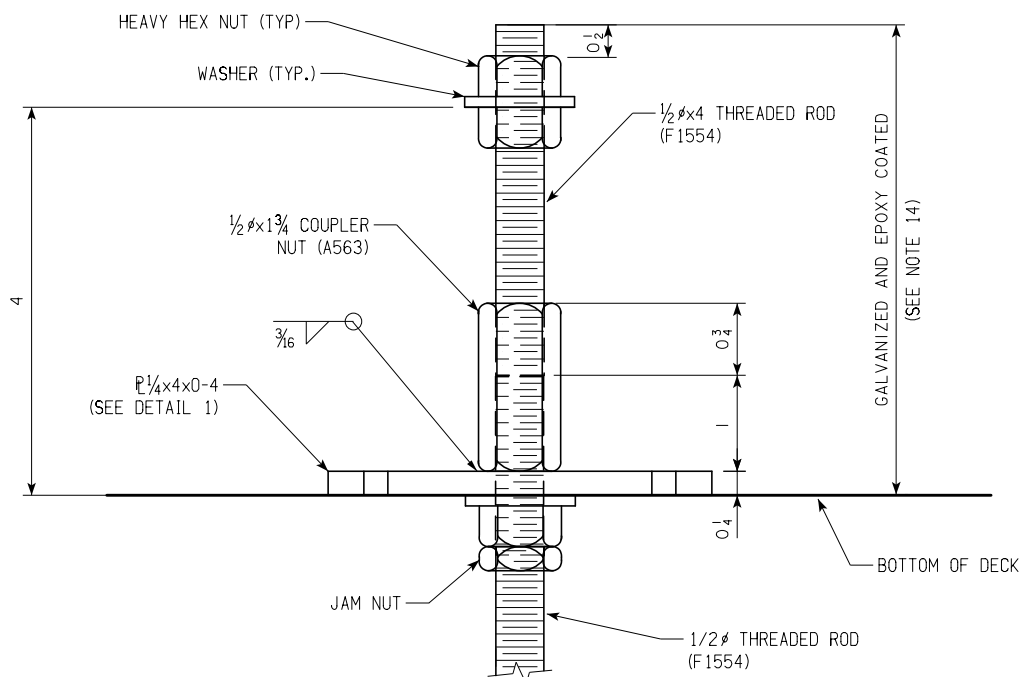
ITS GENERAL NOTES

ROADWAY LIGHTING GENERAL NOTES:

- A. ALL ELECTRICAL WORK SHALL CONFORM TO NATIONAL, STATE, AND LOCAL CODES.
- B. IT IS THE INTENT OF THESE PLANS AND SPECIFICATIONS TO PROVIDE A COMPLETE AND PROPERLY OPERATING ELECTRICAL LIGHTING SYSTEM. THE EQUIPMENT SHALL BE FURNISHED AS SPECIFIED AND SHALL INCLUDE ALL INCIDENTAL ITEMS NECESSARY TO PROVIDE A COMPLETE WORKING SYSTEM. INCIDENTAL ITEMS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING ITEMS: ANCHORAGES, MOUNTING HARDWARE, CONNECTORS, LUGS, FUSES, ETC.
- C. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS, QUANTITIES, AND TYPE OF UTILITIES IN AREAS TO BE EXCAVATED PRIOR TO THE COMMENCEMENT OF ANY WORK AND SHALL HAND EXCAVATE AS REQUIRED IN ORDER TO NOT INTERRUPT ANY EXISTING SERVICES. SEE CIVIL DRAWINGS FOR LOCATIONS OF EXISTING AND NEW UTILITIES. IF, IN PERFORMING WORK, DAMAGE TO EXISTING UTILITIES OCCURS, THE CONTRACTOR SHALL NOTIFY UTILITY IMMEDIATELY AND PAY ANY COST INCURRED FOR REPAIR OR REPLACEMENT.
- D. ELECTRICAL EQUIPMENT, RACEWAY, ETC. ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. CONTRACTOR SHALL INSTALL ELECTRICAL EQUIPMENT, RACEWAYS, ETC. WHERE DIRECTED BY THE ENGINEER IN ORDER TO BEST SUIT JOB CONDITIONS.
- E. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING STATE OWNED LIGHTING AND/OR TRAFFIC SIGNAL UTILITIES WITHIN THE PROJECT LIMITS.
- F. NO SPLICING OF EXISTING-TO-NEW WIRING IS ALLOWED INSIDE ELECTRICAL DUCTS. ALL WIRING INTERCONNECTIONS SHALL BE INSTALLED IN ACCESSIBLE AREAS AND SHALL BE MADE WITH IOWA DOT APPROVED CONNECTORS.

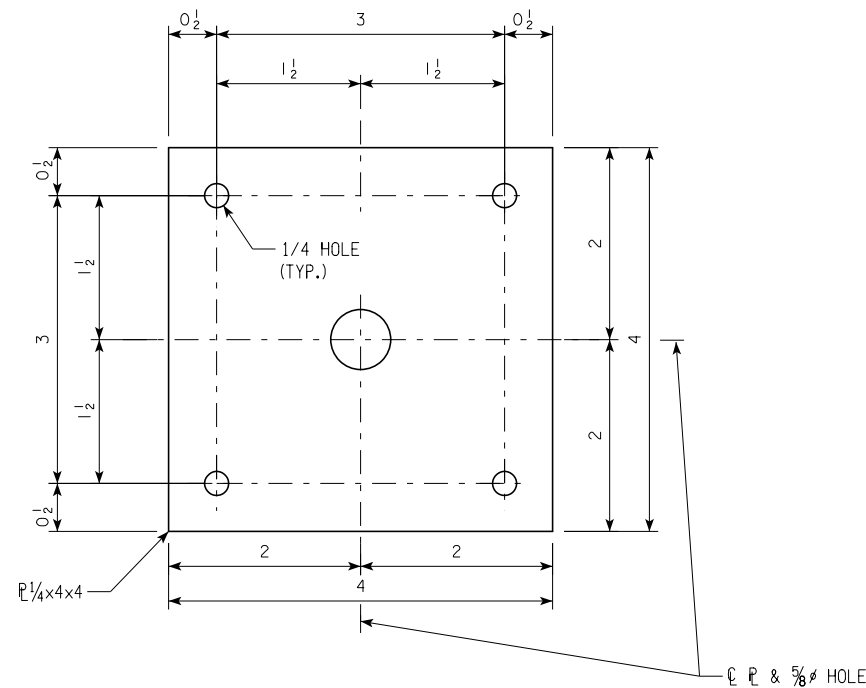
ELECTRICAL PLAN NOTES:

1. A. STATE LIGHTS INSTALLED APPROACH BRIDGE PARAPET, TYPE 1:
INSTALL PROPOSED LIGHT POLE, MAST ARM AND LUMINAIRE. LIGHT POLE SHALL BE MOUNTED ON BRIDGE PARAPET AS PER THE DETAIL ON SHEET P.64.
- B. RAMP LIGHTING AT BIKE PATH:
INSTALL PROPOSED LIGHT POLE, MAST ARM, AND LUMINAIRE. LIGHT POLE SHALL BE MOUNTED ON BRIDGE STRUCTURE AS PER THE TYPE 2 DETAIL ON SHEET P.65. REFER TO STRUCTURAL DETAILS FOR LIGHT JUNCTION BOX AND CONDUIT ROUTING DETAILS.
- C. BIKE PATH LIGHTING:
INSTALL PROPOSED LIGHT POLE, MAST ARM, AND LUMINAIRE. LIGHT POLE SHALL BE MOUNTED ON BRIDGE STRUCTURE AS PER THE TYPE 3 DETAIL ON SHEET P.65. REFER TO STRUCTURAL DETAILS FOR LIGHT JUNCTION BOX LOCATION AND CONDUIT ROUTING DETAILS.
2. INSTALL PROPOSED CONTROL CABINET (PAD MOUNTED) AND FOUNDATION PER LI-152.
3. INSTALL PRECAST HANDHOLE, TYPE 2, PER LI-103.
4. EMBEDDED JUNCTION BOX SHALL BE INCIDENTAL TO CONCRETE BARRIER RAILING.
5. INSTALL JUNCTION BOX PER LI-104. JUNCTION BOX SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED.
6. PULL CIRCUIT TO END LOCATION. INSTALL FEMALE PORTION ONLY OF CONNECTOR. TAPE AND SEAL FOR FUTURE CONNECTION.
7. CONDUIT SHALL BE CAPPED AND SEALED FOR FUTURE CONNECTION.
8. AESTHETIC LIGHTING:
CONSTRUCT CONDUIT FOR THE AESTHETIC LIGHTING TO LOCATIONS INDICATED IN THE THE PLANS AND INSTALL THE AESTHETIC LIGHTS AS SHOWN ON THE DETAIL SHEETS.
9. INSTALL MALE CONNECTORS ON PROPOSED CONDUCTORS AND CONNECT TO EXISTING FEMALE CONNECTORS ON THE EXISTING CONDUCTORS.
10. REMOVE CAP FROM EXISTING CONDUIT AND MAKE LIQUID-TIGHT CONNECTION TO PROPOSED CONDUIT.
11. 4-2" PVC COATED GALVANIZED RIGID STEEL CONDUIT (EMPTY) FOR FUTURE USE BY OTHERS.
12. INSTALL LARGE RADIUS BENDS FOR 4-2" PVC COATED GALVANIZED RIGID STEEL CONDUIT ATTACHED TO STRUCTURE TO GORE AREA BETWEEN RAMP RD-G AND I-74 EASTBOUND. CONDUITS SHALL BE MOUNTED TO THE BOTTOM OF THE STEEL GIRDERS AND SHALL PENETRATE ABUTMENT AT THE LAST GIRDER.
13. CONNECT CONDUIT TO JUNCTION BOX AT BIKE TRAIL LIGHT POLE X0801 (STA. 6756+96).
14. THE UNIVERSAL CONCRETE INSERT AND ALL COMPONENTS INCLUDING THE THREADED ROD, HEX NUTS, JAM NUTS, WASHERS AND STEEL PLATES SHALL BE HOT-DIPPED GALVANIZED AND SHALL COMPLY WITH ASTM F 2329. THREADED RODS SHALL COMPLY WITH ASTM F1224. HEAVY HEX NUTS, JAM NUTS AND COUPLER SHALL COMPLY WITH ASTM A 563 GRADE A. WASHERS SHALL COMPLY WITH ASTM F436. SEE UNIVERSAL CONCRETE INSERT DETAIL, THIS SHEET FOR DETAILS. THE ALLOWABLE LOAD (AS DEFINED IN I.M. 453.09) IS 1.5 KIPS. THE GALVANIZED INSERT SHALL BE EPOXY COATED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A1055. GALVANIZED THREADS SHALL BE PROTECTED FROM EPOXY COATING.
15. PRIVATE UTILITY JUNCTION BOX. ONE SHOWN FOR CLARITY. FOUR 1'-4" x 1'-4" x 8" GALVANIZED STEEL JUNCTION BOXES SHALL BE INSTALLED AT EACH LOCATION, ONE FOR EACH PRIVATE UTILITY CONDUIT.
16. 4-2" PVC COATED GALVANIZED RIGID STEEL CONDUITS (EMPTY), UNDERGROUND, FROM RADIUS BENDS (SEE NOTE 12) TO 50 FEET PAST IDENTITY ELEMENT FOUNDATION.
17. ALL SURFACE MOUNTED STAINLESS STEEL JUNCTION BOXES SHALL BE ATTACHED USING APPROVED STAINLESS STEEL CONCRETE ANCHORS LISTED IN MATERIALS IM 453.09.



UNIVERSAL CONCRETE INSERT DETAIL

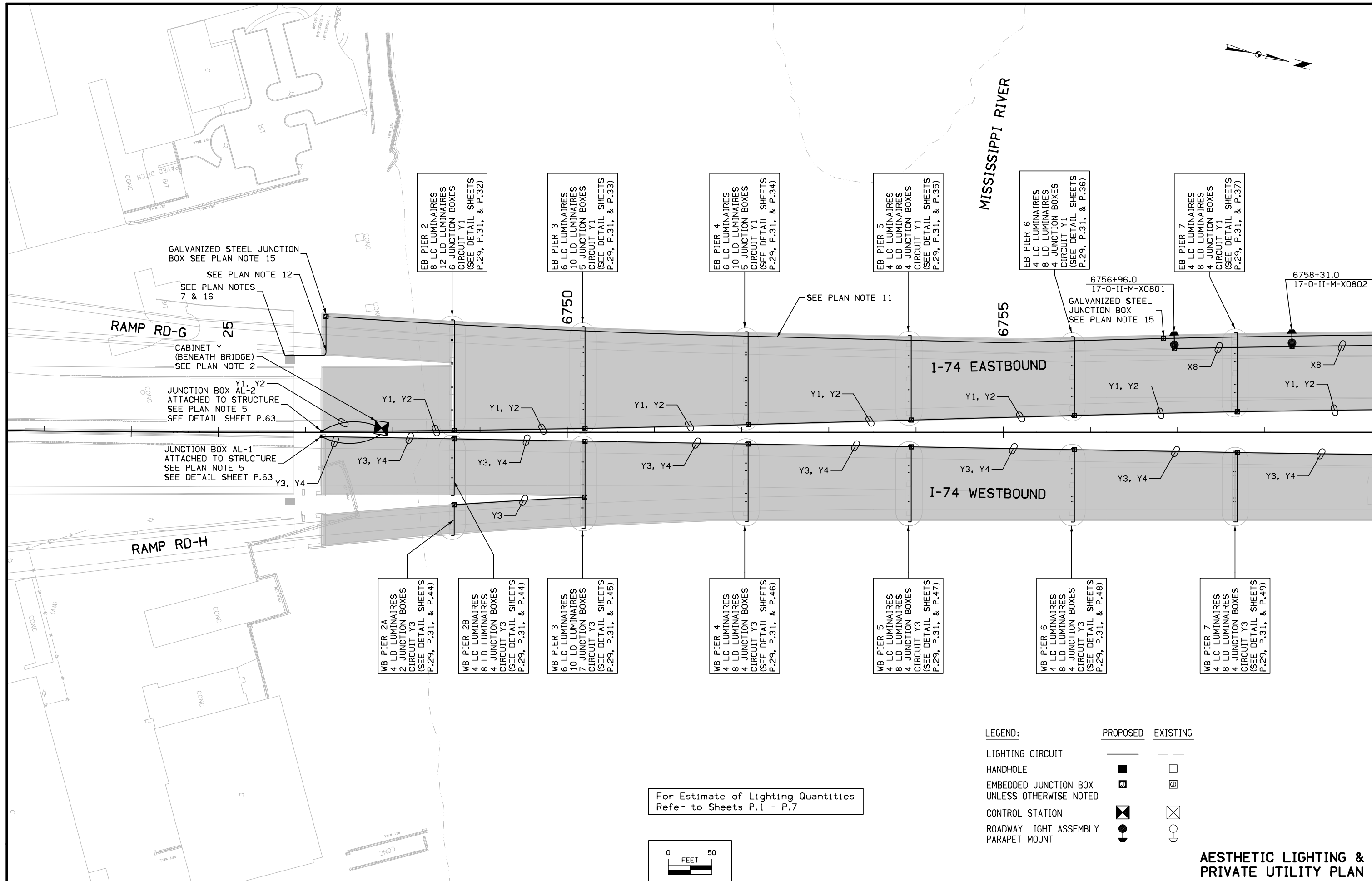
NOTE: THE UNIVERSAL CONCRETE INSERT MAY BE DEPICTED DIFFERENTLY WITHIN THE DETAIL PLANS.



DETAIL 1

LIGHTING GENERAL & PLAN NOTES

Changed by Addenda



GALVANIZED STEEL JUNCTION BOX SEE PLAN NOTE 15

SEE PLAN NOTE 12
SEE PLAN NOTES 7 & 16

RAMP RD-G 25

CABINET Y (BENEATH BRIDGE) SEE PLAN NOTE 2

JUNCTION BOX AL-2 ATTACHED TO STRUCTURE SEE PLAN NOTE 5 SEE DETAIL SHEET P.63

JUNCTION BOX AL-1 ATTACHED TO STRUCTURE SEE PLAN NOTE 5 SEE DETAIL SHEET P.63

RAMP RD-H

EB PIER 2
8 LC LUMINAIRES
12 LD LUMINAIRES
6 JUNCTION BOXES
CIRCUIT Y1
(SEE DETAIL SHEETS P.29, P.31, & P.32)

EB PIER 3
6 LC LUMINAIRES
10 LD LUMINAIRES
5 JUNCTION BOXES
CIRCUIT Y1
(SEE DETAIL SHEETS P.29, P.31, & P.33)

EB PIER 4
6 LC LUMINAIRES
10 LD LUMINAIRES
5 JUNCTION BOXES
CIRCUIT Y1
(SEE DETAIL SHEETS P.29, P.31, & P.34)

EB PIER 5
4 LC LUMINAIRES
8 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y1
(SEE DETAIL SHEETS P.29, P.31, & P.35)

EB PIER 6
4 LC LUMINAIRES
8 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y1
(SEE DETAIL SHEETS P.29, P.31, & P.36)

EB PIER 7
4 LC LUMINAIRES
8 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y1
(SEE DETAIL SHEETS P.29, P.31, & P.37)

WB PIER 2A
4 LC LUMINAIRES
2 JUNCTION BOXES
CIRCUIT Y3
(SEE DETAIL SHEETS P.29, P.31, & P.44)

WB PIER 2B
4 LC LUMINAIRES
8 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y3
(SEE DETAIL SHEETS P.29, P.31, & P.44)

WB PIER 3
6 LC LUMINAIRES
10 LD LUMINAIRES
7 JUNCTION BOXES
CIRCUIT Y3
(SEE DETAIL SHEETS P.29, P.31, & P.45)

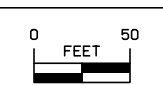
WB PIER 4
4 LC LUMINAIRES
8 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y3
(SEE DETAIL SHEETS P.29, P.31, & P.46)

WB PIER 5
4 LC LUMINAIRES
8 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y3
(SEE DETAIL SHEETS P.29, P.31, & P.47)

WB PIER 6
4 LC LUMINAIRES
8 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y3
(SEE DETAIL SHEETS P.29, P.31, & P.48)

WB PIER 7
4 LC LUMINAIRES
8 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y3
(SEE DETAIL SHEETS P.29, P.31, & P.49)

For Estimate of Lighting Quantities Refer to Sheets P.1 - P.7



LEGEND:

	PROPOSED	EXISTING
LIGHTING CIRCUIT	—	- - -
HANDHOLE	■	□
EMBEDDED JUNCTION BOX UNLESS OTHERWISE NOTED	⊙	⊠
CONTROL STATION	⊠	⊠
ROADWAY LIGHT ASSEMBLY	●	○
PARAPET MOUNT	⊙	⊙

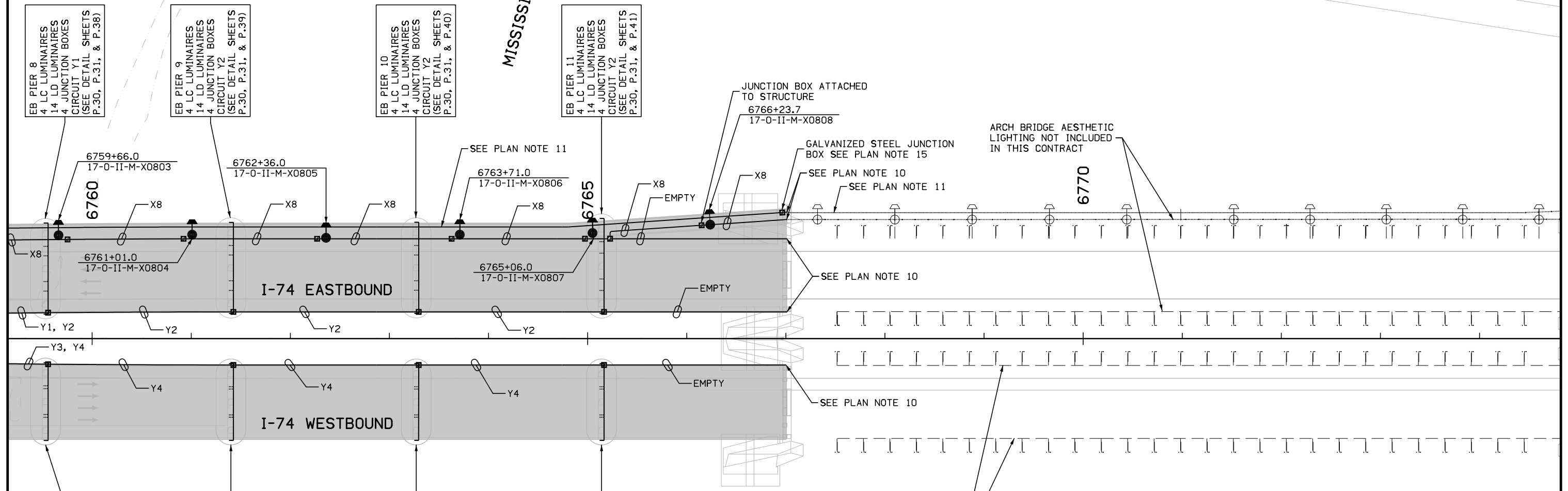
AESTHETIC LIGHTING & PRIVATE UTILITY PLAN

Changed by Addenda



EXISTING I-74

MISSISSIPPI RIVER



EB PIER 8
4 LC LUMINAIRES
14 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y1
(SEE DETAIL SHEETS
P.30, P.31, & P.38)

EB PIER 9
4 LC LUMINAIRES
14 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y2
(SEE DETAIL SHEETS
P.30, P.31, & P.39)

EB PIER 10
4 LC LUMINAIRES
14 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y2
(SEE DETAIL SHEETS
P.30, P.31, & P.40)

EB PIER 11
4 LC LUMINAIRES
14 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y2
(SEE DETAIL SHEETS
P.30, P.31, & P.41)

WB PIER 8
4 LC LUMINAIRES
14 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y3
(SEE DETAIL SHEETS
P.30, P.31, & P.50)

WB PIER 9
4 LC LUMINAIRES
14 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y4
(SEE DETAIL SHEETS
P.30, P.31, & P.51)

WB PIER 10
4 LC LUMINAIRES
14 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y4
(SEE DETAIL SHEETS
P.30, P.31, & P.52)

WB PIER 11
4 LC LUMINAIRES
14 LD LUMINAIRES
4 JUNCTION BOXES
CIRCUIT Y4
(SEE DETAIL SHEETS
P.30, P.31, & P.53)

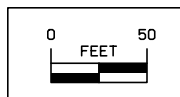
ARCH BRIDGE AESTHETIC
LIGHTING NOT INCLUDED
IN THIS CONTRACT

ARCH BRIDGE AESTHETIC
LIGHTING NOT INCLUDED
IN THIS CONTRACT

LEGEND:

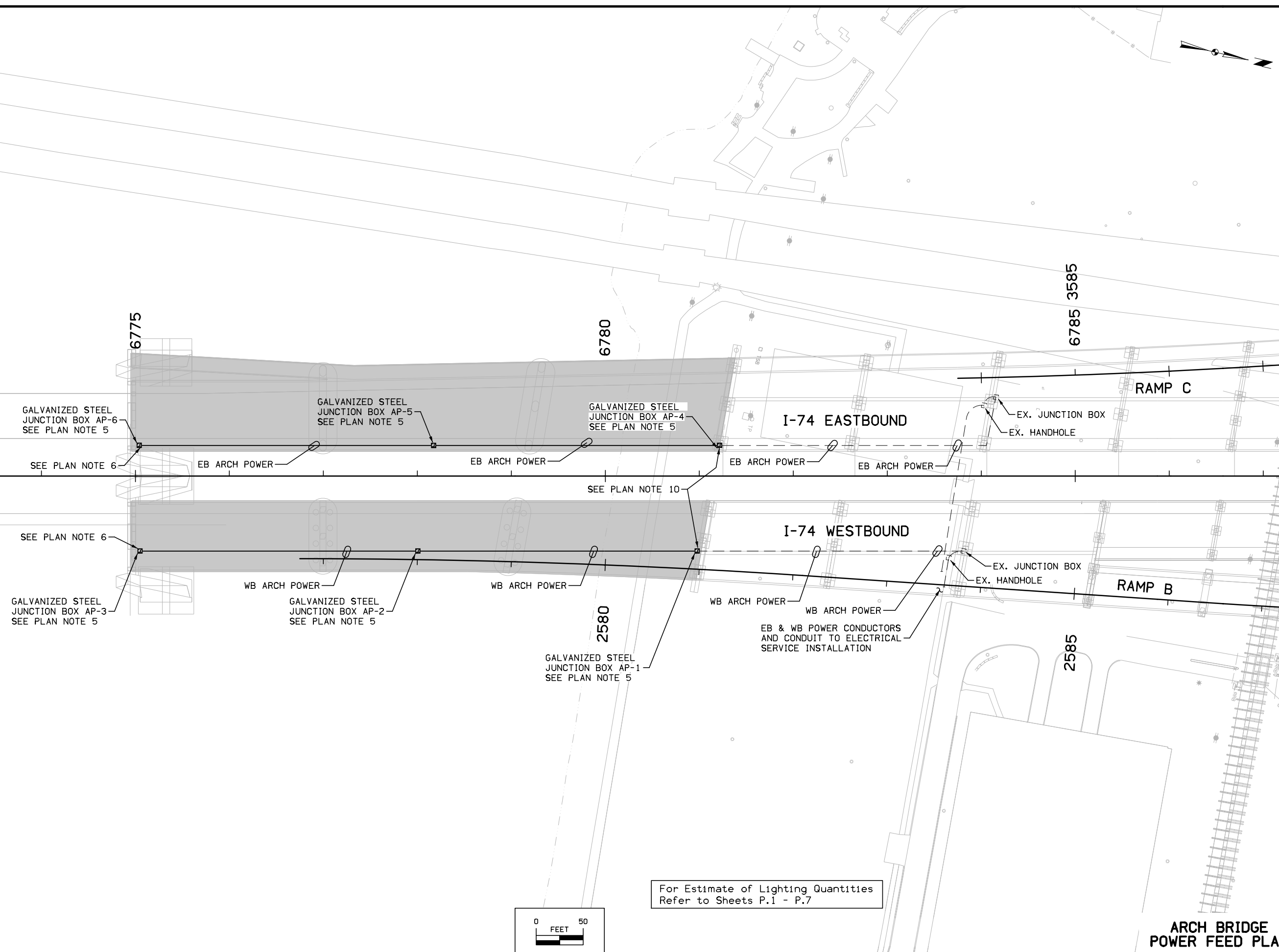
	PROPOSED	EXISTING
LIGHTING CIRCUIT	—	- - -
HANDHOLE	■	□
EMBEDDED JUNCTION BOX UNLESS OTHERWISE NOTED	⊠	⊞
CONTROL STATION	⊠	⊞
ROADWAY LIGHT ASSEMBLY PARAPET MOUNT	●	○

For Estimate of Lighting Quantities
Refer to Sheets P.1 - P.7

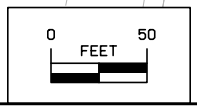


**AESTHETIC LIGHTING &
PRIVATE UTILITY PLAN**

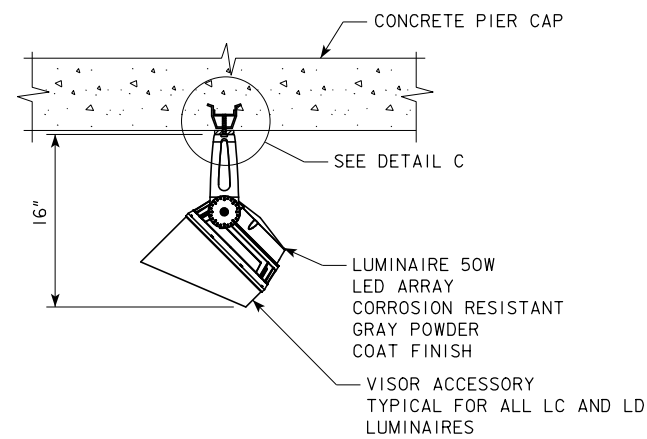
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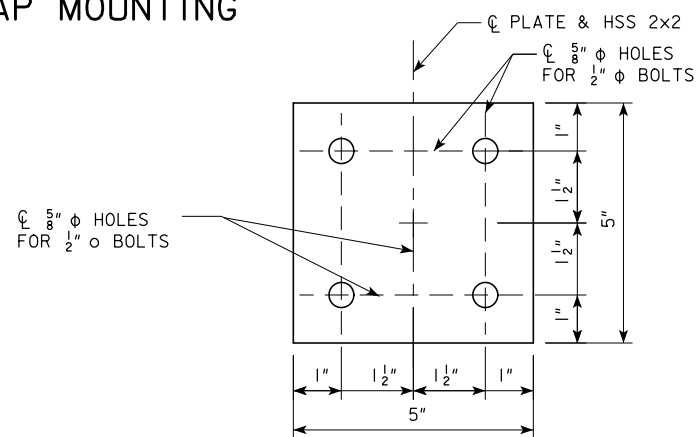
For Estimate of Lighting Quantities
Refer to Sheets P.1 - P.7



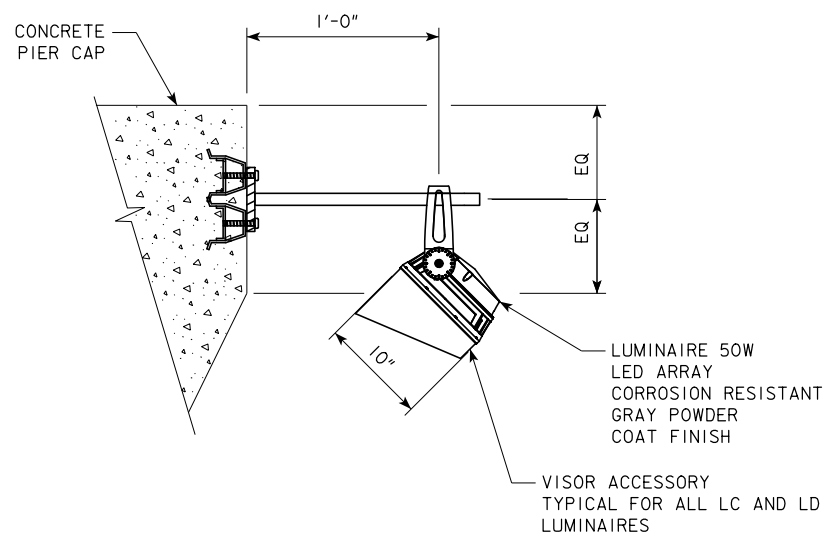
**ARCH BRIDGE
POWER FEED PLAN**



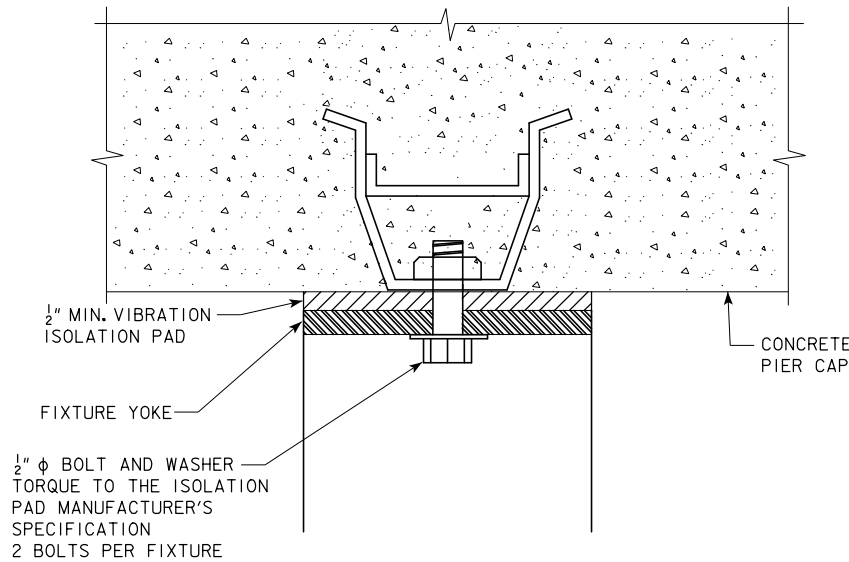
DETAIL B
RIVER PIER CAP MOUNTING



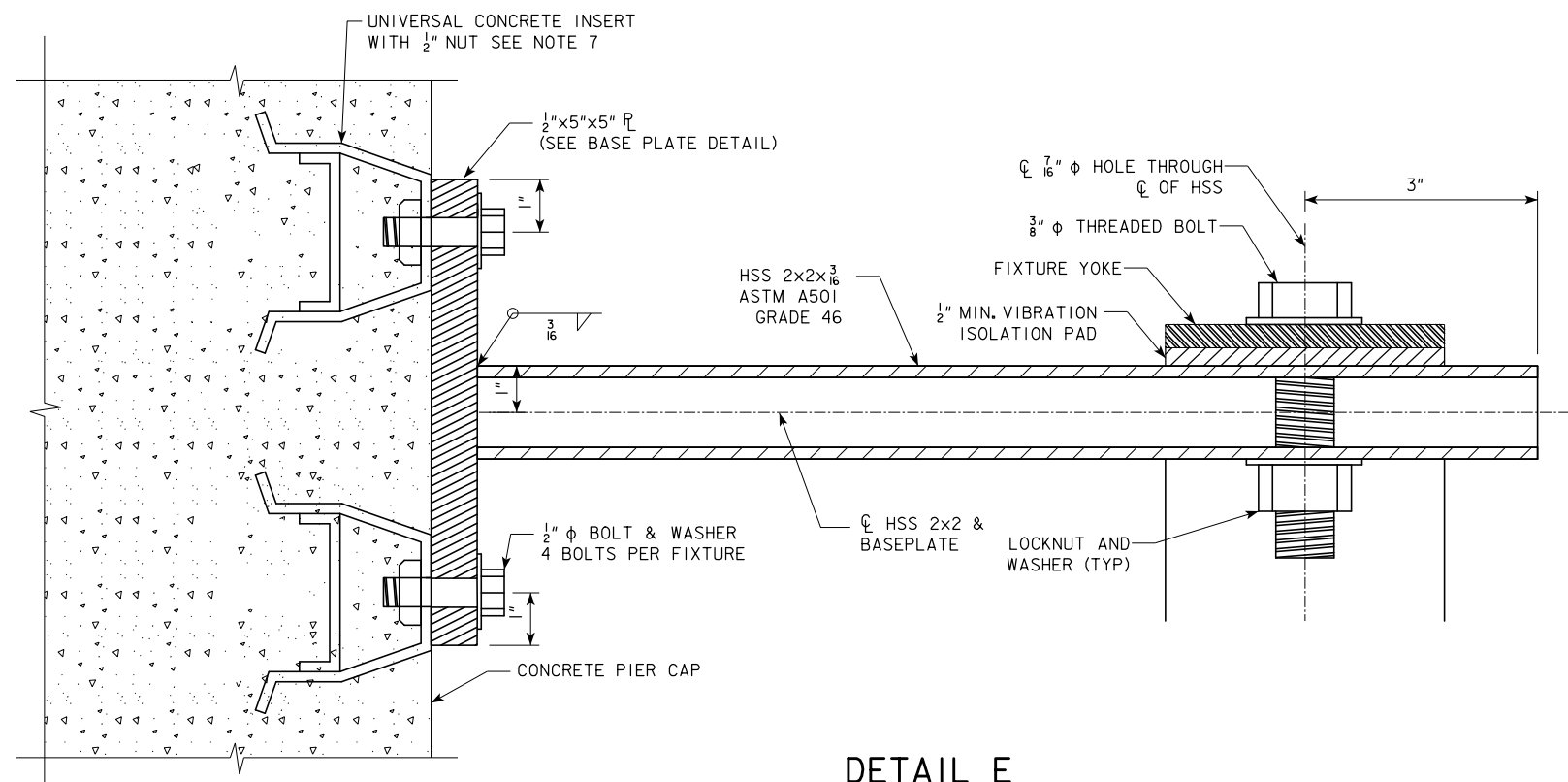
BASE PLATE DETAIL



DETAIL D
RIVER PIER CAP OUTER MOUNTING
FOR FIXTURE ATTACHMENT, SEE DETAIL E



DETAIL C
RIVER PIER CAP FIXTURE ATTACHMENT



DETAIL E
RIVER PIER CAP OUTER FIXTURE ATTACHMENT

NOTES:

1. SEE SHEETS NUMBER P.29 AND P.30 AESTHETIC LIGHTING RIVER PIER ELEVATION AND PLAN IA PIERS 2 THRU 7 AND AESTHETIC LIGHTING RIVER PIER ELEVATION AND PLAN IA PIERS 8 THRU 16 FOR FIXTURE LOCATIONS AND AIMING INFORMATION.
2. AESTHETIC LUMINAIRE AND ISOLATION PAD SHALL BE SUPPLIED BY OTHERS. SEE SPECIAL PROVISION FOR "AESTHETIC LIGHT, INSTALL ONLY".
3. BRACKET ASSEMBLIES SHALL BE GALVANIZED STEEL, WITH A NATURAL (NO PAINT) FINISH.
4. SUBMIT SHOP DRAWINGS FOR LUMINAIRE BRACKET ASSEMBLIES.
5. BOLTS, NUTS AND WASHERS SHALL BE IN ACCORDANCE TO ASTM A 307. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED PER 4153.06,A,3 OF THE STANDARD SPECIFICATIONS.
6. ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND CONFORM TO ASTM A709 GRADE 36.
7. UNIVERSAL CONCRETE INSERTS SHALL BE PER PLAN NOTE 14 AND DETAIL ON SHEET P.7.

AESTHETIC LIGHTING
RIVER PIER DETAILS
IA PIERS 2-18