

NOVEMBER 13, 2017
REPLACEMENT OF BRIDGES 03163 & 03164 ROUTE 160 OVER I-91
FEDERAL AID PROJECT NO. 0160(010)
STATE PROJECT NO. 118-169
TOWN OF ROCKY HILL

ADDENDUM NO. 2

This Addendum addresses the following questions and answers contained on the “CT DOT QUESTIONS AND ANSWERS WEBSITE FOR ADVERTISED CONSTRUCTION PROJECTS”:

Question and Answer Nos. 28 and 34.

SPECIAL PROVISIONS

REVISED SPECIAL PROVISIONS

The following Special Provisions are hereby deleted in their entirety and replaced with the attached like-named Special Provisions:

- ITEM NO. 0601016A – PRECAST APPROACH SLABS
ITEM NO. 0601276A – PRECAST SUBSTRUCTURE ELEMENTS
- ITEM NO. 0603061A – STRUCTURAL STEEL (SITE NO. 1)
ITEM NO. 0603062A – STRUCTURAL STEEL (SITE NO. 2)

DELETED SPECIAL PROVISION

The following Special Provision is hereby deleted in its entirety:

- ITEM NO. 0969030A – PROJECT COORDINATOR (MINIMUM BID)

CONTRACT ITEMS

REVISED CONTRACT ITEM

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ORIGINAL QUANTITY</u>	<u>REVISED QUANTITY</u>
0601276A	PRECAST SUBSTRUCTURE ELEMENTS	1,377 C.Y.	1,421 C.Y.

DELETED CONTRACT ITEM

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ORIGINAL QUANTITY</u>	<u>REVISED QUANTITY</u>
0969030A	PROJECT COORDINATOR (MINIMUM BID)	L.S.	0

PLANS

REVISED PLANS

The following Plan Sheets are hereby deleted and replaced with the like-numbered Plan Sheets:

02.01.A2 04.03.A2

The Bid Proposal Form has been revised to reflect these changes.

The Detailed Estimate Sheets do not reflect these changes.

There will be no change in the number of calendar days due to this Addendum.

The foregoing is hereby made a part of the contract.

ITEM #0601016A – PRECAST APPROACH SLABS

ITEM #0601276A – PRECAST SUBSTRUCTURE ELEMENTS

Description:

Work under the item “Precast Substructure Elements” shall include the fabrication, delivery, temporary bracing and installation of precast substructure elements at the abutments, wingwalls, and sleeper slabs. Work under the item “Precast Approach Slabs” shall include the fabrication, delivery, and installation of precast approach slabs. Both items shall include all necessary materials and equipment to complete the work, as shown on the plans. The substitution of cast-in-place concrete will not be allowed.

Concrete for the closure pours between precast elements shall be paid for under the item “High Early Strength Concrete”, found elsewhere in the specifications.

Due to the accelerated nature of this project, all substructure elements and approach slabs shall be manufactured and approved prior to the initiation of the full roadway closure at the site.

Materials:

The materials for precast substructure elements and approach slabs shall conform to the following requirements:

Concrete: Concrete shall meet the requirements of Section M.03-Class F and shall have a minimum 28-day compressive strength of 4,400 psi. All cement shall meet the requirements of ASTM C 150 Type I. Air content shall be between 5% and 7%. The use of calcium chloride or an admixture containing calcium chloride will not be permitted.

Reinforcement: Deformed steel bars and welded wire fabric shall conform to the requirements of Section 6.02 and the applicable requirements of Section 5.14.02.

Corrugated Metal Pipe: Corrugated metal pipe for forming voids shall conform to the requirements of AASHTO M 36 or AASHTO M 245.

Non-Shrink, Non-Staining Grout: Grout for filling all fixtures or holes cast into the precast sections for lifting or seating shall conform to Section M.03.05.

Grouted Splice Couplers: Use grouted splice couplers to join precast elements as shown on the plans. Provide couplers that use cementitious grout placed inside a steel casting. Threaded connections may be used for the portions of the coupler that are placed within the precast element if the strength of the coupler meets or exceeds the requirements of this specification. The following

reinforcing splice couplers are acceptable for use provided that the requirements of this specification are met:

NMB Splice Sleeve
Splice Sleeve North America, Inc.
192 Technology Drive, Suite
J, Irvine, California 926182409
www.splicesleeve.com

Dayton Superior DB Grout Sleeve
Dayton Superior
Corporate Headquarters
7777 Washington Village Dr., Ste. 130
Dayton, OH 45459
www.daytonsuperior.com

Erico Lenton Interlok
ERICO United States
34600 Solon
Road Solon,
Ohio 44139
www.ericocom

Use grouted splice couplers that are epoxy coated and can join epoxy coated reinforcing steel without removal of the epoxy coating on the spliced bar when splicing epoxy coated bars. Use grouted splice couplers that can provide 100 percent of the specified tensile strength of the connected bar. This equates to 90 ksi for reinforcing conforming to ASTM A 615 and 80ksi for reinforcing conforming to ASTM A 706. Supply grout for the inside the couplers from the manufacturer of the coupler that is matched to the certified test report for the coupler. Do not substitute any other grout in the couplers unless additional certified test reports are submitted for the grout/coupler system.

Dowel Bar Splicer System; Dowel Bar Splicer System – Epoxy Coated: Mechanical couplers shall conform to the applicable requirements of Article M.06.01, Grade 420. All mechanical couplers shall be die stenciled with the manufacturer's identification and shall be one of the following types:

- a) Sleeve-Bolted
- b) Sleeve-Filler
- c) Sleeve-Threaded
- d) Sleeve-Swaged
- e) Sleeve-Wedge

Mechanical couplers shall meet the requirements of Type 1 or 2 couplers as specified by ACI 318-02 or IBC/ICBO for both tension and compression. A Type 1 or 2 coupler may be used for all

splices except with ASTM A706 reinforcing steel. A Type 2 coupler shall be used when making splices with ASTM A706 reinforcing steel.

Threaded Sleeves: Conform to AASHTO Standard Specifications for Highway Bridges and AASHTO M 36 or AASHTO M 245.

Leveling Devices or Steel Shims: Materials for leveling devices or steel shims for leveling the precast elements during installation (to be designed by the Contractor to support the anticipated loads) shall comply with provisions of Form 817, for the applicable sections for materials utilized in the Contractor's design.

Anchor Plate / Girder Seat Plate Assemblies: All structural steel for the anchor plates and girder seat plates shall be of the type and grade specified in the contract documents and meet the pertinent requirements of Article M.06.02-Structural Steel. Positive heat identification will be required for all steel. Certified copies of the results of chemical analysis and physical tests shall be furnished to the Department. Blast cleaning of all pieces shall meet the requirements of Article M.06.02. All structural steel fabrication procedures shall comply with Article M.06.02. Anchor rods (bolts) and leveling nuts shall comply with the pertinent requirements of Article M.06.02. Zinc (hot-galvanized) coatings on structural steel, shear connectors, welded studs, anchor rods (bolts), leveling nuts, and fasteners shall meet the requirements of Article M.06.03.

Threaded Inserts, Lifting Fixtures and Miscellaneous Hardware: All inserts, fixtures and hardware cast into precast concrete components shall have a corrosion-resistant coating or be fabricated from a non-corrosive material suitable for the intended use. The coating shall be either an epoxy material or galvanizing, applied mechanically or by the hot-dip process. All hardware shall be as specified on the working drawings.

Controlled Density Fill: Controlled density fill, if required for precast approach slab and footing installation, shall be a self-compacting, flowable mixture of aggregate and cementitious material containing sufficient Portland cement to develop a 6 hour compressive strength of 100 psi. The contractor shall be responsible for producing a flowable mixture using these guidelines and adjusting the mixture design as called for by the circumstances or as directed by the Engineer. A mix design shall be submitted for this material, stating the percentage of each component to be utilized. The maximum aggregate size shall be 3/8". The amount passing a No. 200 sieve shall not exceed 12 percent. No plastic fines shall be present. The total calculated air content shall not exceed 30 percent. Substantive data that demonstrates the ability of the material to meet the specification requirements for controlled density fill shall be submitted with the proposed mix design at least two weeks prior to its use.

Precast Concrete Elements: Use a Department Certified Concrete Precaster or a pre-qualified project site caster for concrete products. Maintain a minimum compressive strength of 500 psi prior to stripping the form. Continuously wet cure the precast elements for 7-days commencing immediately after final finishing with all exposed surfaces covered. The precast elements will have a minimum cure of 14 days prior to placement. Supply test data such as slump, air voids, or unit

weight for the fresh concrete and compressive strengths for the hardened concrete after 7, 14, and 28 days, if applicable.

All fixtures and hardware cast into precast concrete slabs shall have a corrosion-resistant coating or be fabricated from a non-corrosive material suitable for the intended use. The coating shall be galvanizing that is applied by the hot-dip process. All hardware shall be as specified on the Assembly Plan.

Materials for leveling devices or non-metallic shims for setting the precast elements and approach slabs to proper grade during installation shall comply with the applicable sections of Form 817, for the specific materials used.

Construction Methods:

A Department Certified Precast Concrete Plant or a pre-qualified on-site precaster shall be used for the precast substructure elements and approach slabs.

1. Shop Drawings: The Contractor shall submit shop drawings in accordance with the requirements of Article 1.05.02 of Form 817. Approval of the shop drawings will be required prior to ordering of the materials and the fabrication of the precast elements. The width of each precast approach slab is indicated on the plans, but may be adjusted by the Contractor with approval from the Engineer.

At a minimum, the Shop Drawings shall include the following information:

- a) The stamp of the registered Professional Engineer licensed in the State of Connecticut who has reviewed and certified the shop drawings.
- b) All lifting inserts, hardware, or devices and locations for Engineer's approval.
- c) Locations and details of the lifting devices, including supporting calculations, type, and amount of any additional reinforcing required for lifting. All lifting devices will be designed based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (seventh edition).
- d) Dimensions from working points or working lines to prevent the accumulation of dimensional tolerances.
- e) The minimum compressive strength attained prior to handling the precast element.
- f) Details of leveling devices or vertical adjusting hardware.
- g) Reinforcement details in accordance with Subarticle 6.02.03-1 of Form 817.

2. Assembly Plan: The Assembly Plan is a document prepared by the Contractor and a qualified Engineer with specific knowledge of the Contractor's equipment and "means and methods" for constructing the precast elements required to complete the work on the project. The development of the Assembly Plan is closely linked to the schedule of operations and the interim material strengths necessary for the work to progress. The Contractor shall be involved with

any required modifications to the shop drawings so that he can incorporate these into the development of the Assembly Plan.

The Assembly Plan will be reviewed by both the Engineer of Record and the District Construction personnel similar to a Working Drawing. The approved Assembly Plan will serve as the governing specification with respect to progressing with construction prior to components achieving the final required material strengths as stated in Form 817. Approval of the Assembly Plan will be required prior to the start of the closure of the roadway.

Under no circumstances shall the fabrication of the precast elements commence prior to the approval of the Shop Drawings and the Assembly Plan unless written permission is given by the Engineer. The Department shall reject any components fabricated before receiving written approval or components that deviate from the approved drawings. Any expenses incidental to the revision of materials furnished, in accordance with the Shop Drawings and order lists, to make them comply with the plans and specifications, including costs incurred due to faulty detailing or fabrication, shall be borne by the Contractor.

At a minimum, the Assembly Plan shall include the following information:

- a) Details and/or cut sheets of all equipment that will be employed for the assembly of the precast element.
- b) Details of all equipment to be used to lift the precast element including cranes, excavators, lifting slings, sling hooks, and jacks. Crane locations, operating radii, and lifting calculations. The factors of safety for the lifting of slabs will be achieved by using 125% of the weight of the element being lifted in the calculations.
- c) A procedure for handling and erection including bracing requirements based on Chapter 8 of the PCI Design Handbook (seventh edition). Calculations shall be prepared for the lifting and handling in accordance with the no discernible cracking criteria and shall be submitted as part of the Assembly Plan. Lifting hook locations and hardware should be coordinated with the Fabricator.
- d) A statement of compliance with all requirements of applicable environmental permits.
- e) A work area plan, depicting all affected utilities, drainage, and protective measures that will be employed throughout the construction activities.
- f) Full size 22"x34" sheets depicting the assembly procedures for the precast seats and approach slabs.
- g) A detailed schedule with a timeline for all operations. In development of the schedule the Contractor shall account for setting and cure time for concrete closure pours.
- h) Methods of providing temporary support of the precast element. Include methods of adjusting and securing the element after placement.
- i) Procedures for controlling erection tolerances for both the horizontal and vertical direction.
- j) Methods of forming closure pours.
- k) Methods of forming grouted shear keys.

1) The Assembly Plan shall be bound into one complete document and shall be prepared and stamped by a registered Professional Engineer licensed in the State of Connecticut.

3. Forms: Forms shall be mortar tight and strong enough to prevent misalignment of precast seat and approach slab edges. They shall be constructed to allow their removal without damage to the concrete. A positive means of supporting reinforcing cages in place during forming shall be required.

The forms shall not be removed until the concrete is strong enough to avoid possible injury from such removal. A minimum compressive strength of 500 psi shall be obtained prior to stripping the form. Forms shall not be removed without approval being granted by the Engineer.

All forming materials used for casting cylindrical openings for lifting holes or holes for grouting deformed steel bars shall be removed. Do not place concrete in the forms until the Engineer has inspected the forms and approved all the materials in the precast elements.

4. Placing Concrete: Provide to the Engineer a tentative casting schedule at least two weeks in advance to make inspection and testing arrangements. Concrete shall not be deposited in the forms until the Engineer has inspected the placing of the reinforcing steel, and other cast-in-place components, and has given his approval thereof. The mix shall be proportioned and mixed in a batch mixer to produce homogeneous concrete. At no time will truck-mixed or transit-mixed concrete be allowed. The concrete temperature shall be 60 degrees F to 90 degrees F at the time of placement.

Concrete shall not be deposited into the forms when the ambient temperature is below 40 degrees F or above 100 degrees F, unless adequate heating or cooling procedures have been previously approved by the Engineer. Production during the winter season, from November 15 to March 15 inclusive, will be permitted only on beds located in a completely enclosed structure of suitable size and dimension that provides a controlled atmosphere for the protection of the casting operation and the product. Outside concreting operations will not be permitted during rainfall unless the operation is completely under cover.

Void forms shall be held in place against uplift or lateral displacement during the pouring and vibrating of the concrete by substantial wire ties or other satisfactory means as approved by the Engineer. The concrete shall be vibrated internally, or externally, or both, as ordered by the Engineer. The vibrating shall be done with care in such a manner as to avoid displacement of reinforcing steel, voids, forms, or other components. There shall be no interruption in the pouring of any of the sections. Concrete shall be carefully placed in the forms and vibrated sufficiently to produce a surface free from imperfections such as honeycombing, segregation, cracking, or checking. Any deficiencies noted in the sections may be cause for rejection.

5. Finishing: Finish the precast elements in accordance with Subarticle 6.01.03-7 and 6.01.03-10 of Form 817. Trowel-finish the top surface of all precast elements. Formed surfaces shall not be finished in any specific manner except as noted below. All fins, runs, or mortar shall be removed

from surfaces which will remain exposed. Form marks on exposed surfaces shall be smoothed by grinding.

6. Test Cylinders: During the casting of the sections, the Contractor shall make test cylinders under the supervision of a representative of the State. A minimum of 4 cylinders shall be taken during each production run or as ordered by the Engineer. The dimensions and type of cylinder mold shall be as specified by the Engineer. Cylinders shall be cured under the requirements of ASTM C31 and shall be used to determine the 28-day compressive strength requirements ($f'c$). Failure of any of the 28 day tests cylinders to meet 90% of the minimum compressive strength requirement may be cause for rejection. The Engineer also reserves the right to request and test core specimens from the sections to determine their adequacy.

7. Curing: The precast elements will be continuously wet cured for 7-days, commencing immediately after final finishing with all exposed surfaces covered. The precast elements will have minimum cure of 14 days prior to placement. Test data such as slump, air content, or unit weight for fresh concrete and compressive strengths for the hardened concrete after 7, 14, and 28 days, shall be submitted to the Engineer.

8. Patching: The Engineer shall evaluate the acceptability and the cause of the defects and the service condition of the precast seats and approach slab sections. No repairs shall be done by the Contractor unless permission has been granted by the Engineer. The Contractor shall submit to the Engineer for review, the proposed methods and materials to be used in the repair operation. All repairs shall be sound and properly finished and cured before the precast elements are delivered to the job site. The Contractor shall bear the costs of all repair work.

9. Installation: The installation of the precast substructure elements and approach slabs shall proceed as required by the approved Assembly Plan and in accordance with the special provisions "Prosecution and Progress" and "Maintenance and Protection of Traffic". The precast substructure elements and approach slab sections shall be placed in a manner to best accommodate and facilitate the accelerated construction sequence. The precast substructure elements and approach slab sections shall be set to the grade indicated on the plans or as directed by the Engineer. The following is the general procedure for installing the precast elements:

- a) Review the approved Assembly Plan. If changes are warranted due to varying site conditions, resubmit the plan for review and approval.
- b) Establish working points, working lines, and benchmark elevations prior to placement of all elements.
- c) Installation Procedure for Precast Concrete Substructure Elements: The installation of the precast concrete substructure elements shall proceed as required by the stage construction plans and in accordance with the special provisions "Prosecution and Progress" and "Maintenance and Protection of Traffic." The precast concrete substructure elements shall be set to the elevations indicated on the plans or as directed by the Engineer.
 - i. Lift precast concrete substructure elements as shown in the assembly plan using lifting devices as shown on the shop drawings.

- ii. Set the substructure element in the proper horizontal location. Adjust leveling devices or shims prior to full release of the approach slab from the crane. Check for proper alignment within specified tolerances.
 - iii. Survey the top elevation of the precast concrete substructure elements. Check for proper elevations within specified tolerances.
 - iv. Fill space between precast concrete substructure elements and top of abutment or retaining wall with non-shrink grout.
 - v. All fixtures or holes cast into the sections for lifting or seating shall be neatly filled with non-shrink grout. The finished surface shall be flush and smooth with the adjacent concrete.
- d) Installation Procedure for Precast Approach Slabs: The installation of the precast approach slabs shall proceed as required by the stage construction plans and in accordance with the special provisions "Prosecution and Progress" and "Maintenance and Protection of Traffic." The approach slab sections shall be set to the grade indicated on the plans or as directed by the Engineer.
- i. Lift approach slab segments using lifting devices as shown on the shop drawings.
 - ii. Set approach slabs in the proper horizontal location in the sequence and according to the methods outlined in the Assembly Plan. Check for proper alignment within specified tolerances.
 - iii. Survey the top elevation of the approach slab. Adjust leveling devices or shims prior to full release of the approach slab from the crane.
 - iv. Check for proper grade within specified tolerances.
 - v. Pour closure pours between approach slab elements using high early strength concrete.
 - vi. All fixtures or holes cast into the sections for lifting, anchoring, or seating shall be neatly filled with non-shrink grout. The finished surface shall be flush and smooth with the adjacent concrete.

10. Quality Control: At a minimum, the following requirements shall be met:

- a) All precast substructure elements and approach slabs shall be fabricated by a PCI certified fabricator that is approved by the Department with a minimum certification of "B1".
- b) Cracking or damage of precast substructure elements and approach slabs will be prevented during handling and storage.
- c) Defects and breakage of precast elements will be repaired or the element replaced, as follows:
 - i. Members that sustain damage or surface defects during fabrication, handling, storage, hauling, or erection are subject to review or rejection.
 - ii. Approval shall be obtained before performing repairs.
 - iii. Repair work must re-establish the elements' structural integrity, durability, and aesthetics to the satisfaction of the Engineer.

- iv. The cause will be determined when damage occurs and corrective action will be taken.
 - v. Failure to take corrective action, leading to similar repetitive damage, can be cause for rejection of the damaged element.
 - vi. Cracks that extend to the nearest reinforcement plane and fine surface cracks that do not extend to the nearest reinforcement plane but are numerous or extensive are subject to review and rejection.
 - vii. Full depth cracking and breakage greater than one foot are cause for rejection.
- d) Precast elements will be constructed to tolerances shown on the plans. Where tolerances are not shown, follow tolerance limits in the PCI MNL116-99, "Manual for Quality Control for Plants and Production of Structural Precast Concrete Products, 4th Edition".
- e) The plant will document all test results. The quality control file will contain at least the following information:
- i. Element identification.
 - ii. Date and time of cast.
 - iii. Concrete cylinder test results.
 - iv. Quantity of concrete used and the batch printout.
 - v. Form-stripping date and repairs if applicable.
 - vi. Location/number of blockouts and lifting inserts.
 - vii. Temperature and moisture of curing period.
 - viii. Document lifting device details, requirements, and inserts.
- f) The Contractor will be required to perform strength testing of materials prior to proceeding to the next stage of construction. The strength achieved at the time of testing will be required to meet the value in the approved Assembly Plan. The Contractor should not rely solely on cylinder breaks by Department personnel as the schedules for testing by the Department will not be changed. The Contractor will provide this testing at his/her own expense and shall take the required number of cylinders or cubes in the event that the material does not gain strength as anticipated.

11. Marking: Permanently mark each precast substructure element and approach slab with the date of casting and supplier identification. Stamp markings in fresh concrete.

12. Special Considerations: Dry fit adjacent elements in the shop to assure proper fit in the field.

13. Handling and Storage: Care shall be taken during storage, transporting, hoisting and handling of all precast sections to prevent damage. Sections damaged by improper storing, transporting or handling shall be repaired or replaced by the Contractor, as directed by the Engineer and at no cost to the State. All storage and handling operations shall be as directed by the Engineer. The precast sections shall not be removed from their casting beds until the concrete has attained the minimum compressive strength determined by the Contractor and approved by the Engineer. Precast sections shall not be shipped to the job site until the 28-day strength (f'c) has been attained. Provide to the Engineer a delivery schedule at least two weeks in advance of the shipment of precast seats and approach slabs to the job site.

Method of Measurement:

“Precast Substructure Elements” will be measured for payment as the actual volume in cubic yards of precast concrete substructure elements, including sleeper slabs, fabricated, cured and accepted in place.

“Precast Approach Slabs” will be measured for payment as the actual area in square yards of precast approach slabs, fabricated, cured and accepted in place. Measurements will be made across the top surface of the precast approach slabs, and shall exclude closure pour areas.

Basis of Payment:

This work will be paid for at the contract unit price per cubic yard for “Precast Substructure Elements,” and at the contract unit price per square yard for “Precast Approach Slabs”, complete and in place, which price shall include all materials, equipment, tools, labor and work incidental to the fabrication, transport, and installation. There shall be no separate payment for: reinforcing steel in closure pours, forms, polyethylene sheets, leveling devices, neoprene sheet seal, flexible foam filler, controlled density fill, PVC drain pipes, shims or any other component or material used for the work, as they are to be included in the contract unit price.

Concrete for the closure pours shall be paid for under the item “High Early Strength Concrete”.

<u>Pay Item</u>	<u>Pay Unit</u>
Precast Substructure Elements	c.y.
Precast Approach Slabs	s.y.

ITEM #0603061A – STRUCTURAL STEEL (SITE NO. 1)

ITEM #0603062A – STRUCTURAL STEEL (SITE NO. 2)

Work under this item shall conform to Section 6.03 Structural Steel as supplemented and amended herein to provide material requirements for keeper plate hardware and galvanizing.

6.03.02 Materials:

Add the following:

Keeper plate hardware: The steel keeper plates shall conform to AASHTO M270, Grade 50. Steel for welded studs shall conform the requirements of Article M.06.02.

Galvanizing keeper plate hardware: The steel keeper plate assembly including plate and welded studs shall be galvanized after fabrication in accordance with ASTM A123.

6.03.05 Basis of Payment:

Add the following:

This lump sum payment shall also include the installation of the electrical conduit hanger assemblies and the 6 - 5” electrical conduits supplied by the utility on the bridge superstructures during the off site bridge construction.