Town of Spencer
157 Main Street
Spencer, MA 01562

ADDENDUM NO. 2

March 23, 2020

To prospective Bidders and Others on:

DONNELLY CROSS ROAD BRIDGE
BOXFORD, MA

BIDS DUE: **THURSDAY, APRIL 16, 2020 AT 1:00 PM**

Transmitting the following revisions to the Contract Documents:

Revised due dates:

BIDS DUE/BID OPENING: **THURSDAY APRIL 16, 2020 AT 1:00 PM**

LAST DAY FOR QUESTIONS: **THURSDAY APRIL 9, 2020**

BID FORM – SECTION 00300:

A revised Bid Item List (Pages 00300-3 through 00300-6) is attached hereto and shall be completed and submitted with Section 00300 Bid Form. *Please review the entire form, as items may have been added, deleted and/or quantities revised.*

Questions from prospective bidders:

From Maverick Construction via email dated 3/18/2020:

Q1: …due to the current circumstances, it is taking longer to receive quotes from vendors. Will the due date for bids be extended?

A: Please see Addendum 1 extending the Bid Opening to April 16th @ 2:30PM

From E.T.&L. Corp. via two emails dated 3/19/2020:

Q2: Items 999.2 Traffic Detail and 999.9 Temporary Utility Pole, do not have an associated special provision detailing the scope and payment for the work in these Contract items.

A: Traffic Details shall be provided by the Spencer Police and are a bill through expense. Police Detail requirements shall be coordinated with the Spencer Police Department.

Recent Utility work by National Grid has resulted in the Overhead Lines no longer being anticipated to be in conflict with any operations. Contractors should inspect the site to fully understand the site conditions and determine their need for temporary utility relocations. Any onsite utilities deemed in conflict, by the Owner, will be reimbursed to the contractor plus an allowable markup.

Q3: The scope of work for Items 916.01 – Precast Moment Slab and 916.02 Precast highway transition; as stated in the special provisions page 00900-27, sees [sic] like it is either a specification from another project or it overlaps with the work in other items of this project. Please clarify the scope of work under these two items of work.

A: Revisions to specifications 916.01 and 916.02 are included with this addendum.

Q4: Please identify the pay limits for item 996.32 – Prefabricated Modular Wall - Sloped Top. The varying height seems to be taken up in the precast moment slab.

A: The payment limits for Item 996.32 – Prefabricated Modular Wall - Sloped Top are as follows:

Sta. 1+55.29 RT to 1+68.78 RT
Sta. 1+56.60 LT to 1+69.14 LT

The contractor may at their option use a system of standard wall sections and sloped moment slabs. The precast units must be designed to meet the standards in the contract documents. Shop drawings shall include how the units will work together. No additional compensation will be provided for alterations to Items 616.01, 916.02, 996.31 or 996.32 or any other parts of work changed as a result of this modification, including but not limited to environmental permitting.

Q5: Under item 996.31 and 996.32 – prefabricated Modular walls, the lengths on the plans are as the specification indicate “schematic”, will variations in the wall lengths be allowed to accommodate the differences in the different modular wall manufacturers unit lengths, if the CSI wall system is not selected by the Contractor?

A: The limits of the walls have been determined to be necessary to maintain the

minimum allowable side slopes on the banks of the waterway. Should the contractor desire to use a system that would result in a shorter wall length than shown on the plans, it is incumbent on them to provide a revised grading plan stamped by a Professional Civil Engineer showing that the revised grades meet the maximum permissible embankment slopes on the plans. No additional compensation will be provided for this work including, but not limited to any additional plan changes or environmental permitting necessary to implement the revised wall layout.

Q6: Could the normal anticipated flow of Shaw Brook be provided, in order to estimate the control of water during construction?

A: The normal baseflow indicated on the dam reconstruction plans is 45 cfs. Bayside Engineering estimated the flow during field visits to be approximately 10-20 cfs based on measurements taken during the visits.

Q7: Please indicate where Item 141. Class A trench to be encountered on the project.

A: Item 141 - Class A trench is included for the modular wall excavation.

Q8: Will the culvert receive Damp proofing? If so please indicate the limits and will it get paid under item 970 Bituminous Damp-proofing?

A: Item 970 Bituminous Damp-proofing is used for moment slabs and modular walls as indicated on the plans.

Q9: Under the specifications for Item 995.011- Culvert Structure, it indicates that the item included Wing Walls and Approach Slabs. The contract drawings do not show approach slabs and it appears that the wing walls are covered under Items 996.31 and 996.32, please clarify if they should be designed and supplied under this item.

A: A revised Item 995.011 – Culvert Structure is included in this addendum.

Q10: Where is the removal of the existing culvert and head walls to be paid ?

A: The culvert removal is intended to be included in Item 140.11 – Culvert Excavation.

Q11: Plan S-6 shows a section of the proposed footing, where Gravel for Bridge Foundations is installed. The contract does not include the item Gravel Borrow for Bridge Foundations. Please advise if this excavation and the installation of this material is necessary.

A: Based on the borings, the bearing resistance listed on the plans should be attainable without the need for additional gravel borrow. If the field conditions differ from the boring logs, the contractor shall notify the Engineer of Record in accordance with the Typical Culvert Section, Note 7 on Sheet S-7. Please note, a 12-inch thick tightened layer of Item 156.11 - Crushed Stone for Bridge

Foundations is required under the precast footing as shown on Section 1 – Sheet 6. The item has been added to the Bid Item List. Item 156.11 special provision is included in this addendum.

From New England Building and Bridge Co. Inc. via email dated 3/21/2020:

Q12: Regarding item 996.32 – Prefabricated Modular Wall – Sloped Top; please advise where this item is required. The elevation on sheet S-5 shows the tops of the modular block walls to be level and the moment slab to be sloped. Please clarify if the modular walls are to be level and the moment slabs are to be constructed with roadway slope or if the wall is to be sloped and the moment slab are to follow the slope of the walls.

A: Please refer to the answer in Q4 and Q5

Q13: Regarding item 999.2 – Traffic Details; please provide a job specific specification for this item. Specifically, please advise if this is to be uniformed police or are flaggers allowed. Also, please advise of the Towns rate for police details, if a uniformed officer is required.

A: Traffic Details shall be provided by the Spencer Police and are a bill through expense. Police Detail requirements shall be coordinated with the Spencer Police Department.

Q14: Regarding item 999.9 – Temporary Utility Pole; please provide a job specific specification for this item. Specifically, please provide the actual scope required to be performed by the contractor. What are the specifications for the temporary poles. Is the contractor required to perform the utility relocation or just to install the temp. poles?

A: Recent Utility work by National Grid has resulted in the Overhead Lines no longer being anticipated to be in conflict with any operations. Contractors should inspect the site to fully understand the site conditions and determine their need for temporary utility relocations. Any onsite utilities deemed in conflict, by the Owner, will be reimbursed to the contractor plus an allowable markup.

Q15: The Roadway Pavement Notes for Full Depth Construction on sheet S-6 calls for 4” of Dense Graded Crushed Stone over 8” of gravel borrow however there is no pay item for the dense graded crushed stone. Please clarify which bid item this gets paid under.

A: Item 402 – Dense Graded Crushed Stone for Sub-base has been added to the Bid Form (attached).

From Maverick Construction Management Services via email dated 3/23/2020:

Q16: This project specifies work Under #420 / 460 Items- is this under the new 460 mix classification which uses superpave as the mix items or is this under standard superpave mix designs? We Need Clarification And Mix Design Requirements To Bid This Project. SuperPave are typically broken out as separate items, not lumped as 1 Item.

A: The Bid Items have been updated and now include Standard MassDOT Items 450.22, 450.31 and 450.42.

SPECIAL PROVISIONS - SECTION 00900:

Replace Item 916.01 Precast Moment Slab and 916.02 Precast Highway Guardrail Transition (Includes Base) completely with the following:

ITEM 916.01	**PRECAST MOMENT SLAB**	**EACH**
ITEM 916.02	**PRECAST HIGHWAY GUARDRAIL TRANSITION (INCLUDES BASE)**	**EACH**

The work under this Item shall conform to the applicable provisions of Section 900 of the Standard Specifications and the specific requirements stipulated below for component parts of the subject Item. For those component parts where no specific requirement is stipulated, the Standard Specifications shall apply, except for payment.

Work under this Item shall include all materials, equipment and labor needed for the following:

- PRECAST CONCRETE MOMENT SLAB
- PRECAST HIGHWAY GUARDRAIL TRANSITION (INCLUDES BASE)

A. General.

The work under this Heading consists of fabricating, transporting and installing precast concrete approach slabs and highway guardrail transitions and includes all necessary labor, materials, and equipment to complete the work as shown on the Plans. The work shall conform with the MassDOT Standard, Supplemental, and Interim Specifications and the requirements of the current AASHTO LRFD Bridge Construction Specifications, supplemented by the current relevant provisions of the latest edition of PCI MNL-116 (The Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products), except as noted herein.

QUALITY ASSURANCE

A. General.

Quality Assurance includes all the planned and systematic actions necessary to provide confidence that a product or facility will perform satisfactorily in service.

B. Plant.

Prior to the fabrication of Precast Concrete Bridge Elements, the Fabricator's precast concrete plant shall obtain the following:

(a) Certification by the National Precast Concrete Association (NPCA) Plant Certification Program or Precast/Prestressed Concrete Institute (PCI) Plant Certification Program, for the applicable types of Precast Concrete Highway Unit(s) being fabricated
(b) MassDOT Approval

All concrete for a given Precast Concrete Bridge Element shall be produced by a single company and plant, unless otherwise approved by the Engineer.

C. Fabricator Quality Control.

Quality Control shall be performed by the Fabricator. The Fabricator shall maintain a Quality Control system to monitor, assess, and adjust placement and fabrication processes to ensure the fabricated Precast Concrete Bridge Element(s) meet the specified level of quality, through sufficient Quality Control sampling, testing, inspection, and corrective action (where required). The Fabricator's Quality Control system shall address all key activities during the placement and fabrication and shall be performed in conformance with the Fabricator's NPCA or PCI Certification. Quality Control documentation shall meet the requirements of the *Fabricator Quality Control – Documentation* section below.

1. Personnel.

The Fabricator shall provide adequate training for all QC personnel in accordance with NPCA or PCI certification. There shall be sufficient personnel trained and certified to perform the tests listed under Subsection M4.02.13, Part D. At a minimum, the Fabricator's Quality Control Personnel shall maintain the following qualifications and certifications:

(a) QC Manager with an active NETTCP Field Technician or ACI Concrete Field Testing Technician – Grade I certification or higher, and a minimum of 4 years continuous experience in the manufacture of Precast Concrete Bridge Elements for state transportation departments. The QC Manager shall be on site while the batch plant is producing and placing concrete for MassDOT projects.
(b) A Technician/Inspector having the Precast/Prestressed Concrete Institute (PCI) Technician/Inspector Level I or NorthEast Transportation Training and Certification Program (NETTCP) Precast Concrete Inspector, or higher.

2. Laboratory.

The Fabricator shall provide a room of sufficient size to house all equipment and to adequately perform all testing. The room shall have either a separate moisture storage room or curing box for concrete cylinders, and it shall be thermostatically controlled to maintain temperatures consistent with AASHTO T 23. It shall include a desk and file cabinet for proper record keeping, and have good lighting and ventilation. This room shall be kept for testing and quality control and not used for any other purpose. An additional desk and file cabinet shall be provided for exclusive use of the Engineer. No exception from these requirements will be allowed without the express written permission of the Engineer.

3. Testing Equipment.

At a minimum, the Fabricator's plant facility shall have the following testing equipment:

(a) Air Content Meter Type A or B: AASHTO T 152
(b) Air Content Meter Volumetric Method: AASHTO T 196 (Required for Lightweight Concrete)
(c) Slump Cone: AASHTO T 119
(d) Cylinder Molds AASHTO M 205
(e) Concrete Testing Machine: AASHTO T 22
(f) Screening Sieve: AASHTO T 27, AASHTO T 11
(g) Curing Box: AASHTO T 23
(h) Spread Test Base Plate for Self-Consolidating Concrete (SCC): ASTM C1611

(i) All other equipment prescribed by AASHTO and ASTM standards for the tests to be performed by the Fabricator as specified

4. Inspection.

Quality Control personnel shall monitor and inspect the fabrication of each Precast Concrete Bridge Element. Quality Control personnel shall report all inspection activities on Quality Control Inspection Reports and non-conformances on Non-Conformance Reports (NCRs) throughout the entire fabrication process, as speciefied herein.

5. Temperature Monitoring.

At a minimum, the Fabricator shall monitor, record, and report the temperatures of the form, ambient temperatures surrounding the concrete, and temperatures of the concrete continuously, without interruption as specified below:

- Prior to placement of concrete to verify that Ti ≥ 50°F.
- Immediately after placement to verify that T_i ≥ 50°F is maintained.
- Throughout the entire duration of the curing cycle, at regular intervals not to exceed one hour until 100% Design Strength (f'_c) is attained and concrete has cooled to within 40°F of the ambient temperature surrounding the Precast Concrete Bridge Element.

At a minimum, the temperature measuring devices shall record and report the temperature of the concrete to the nearest 2°F. At least two temperature sensors (thermocouples) shall be positioned to record the maximum and minimum anticipated concrete temperatures. The anticipated minimum temperature shall be measured with one or more thermocouples at a distance no greater than 2 inches from the surface of the thinnest section. The anticipated maximum temperature shall be measured with one or more thermocouples at the center of the thickest section. Proposed temperature measurement locations shall be submitted to the Engineer for approval. Temperature recording devices shall be located within the curing enclosure and calibrated as required by PCI MNL-116 Section 4.18.4. Maximum heat increase and cool down rates shall comply with PCI MNL-116, Section 4.19. The Contractor shall furnish temperature logs recorded at a minimum frequency of once per hour to the Inspector as required, with each post-pour QC inspection report.

6. Sampling and Testing.

At a minimum, the Fabricator shall perform random Quality Control sampling and testing as specified in *Table 1: Quality Control Sampling and Testing*. The Fabricator shall perform additional Quality Control sampling and testing on concrete that has been retempered with admixtures or hold-back water during fabrication. Test Specimens shall conform to the requirements of Section M4.02.13 of the MassDOT Standard and Supplemental Specifications and AASHTO R 60, with the exception of the Stripping (80% f'_c) set of cylinders. Stripping (80 % f'_c) cylinders shall be cured in the same location and environment as the Precast Bridge Elements they represent. If approved by the Engineer, compressive strength cylinder match curing equipment, that maintains the same concrete conditions that the corresponding Precast Bridge Element is exposed to, may be utilized in lieu of Stripping (80 % f'_c) field cured cylinders, with the use of thermocouples, controllers, and heaters.

Table 1: Quality Control Sampling and Testing

Quality Characteristic	Test Method	Sample Size	Specification Limit	Lot Size (c)	Sublot Size (d)	Frequency	Point of Sampling
Slump (in.) (a)	AASHTO T 119	Per AASHTO	≤ 8 in. or as approved by the Engineer	Total Quantity of Concrete (cy) produced on a Contract, per Type of Element fabricated, per Mix Design	20 cy	One (1) per Sublot or fraction thereof	Point of Discharge
Air Content (%)	AASHTO T 152	Per AASHTO	5% ≤ % ≤ 8%				
Temperature (°F)	AASHTO T 309	Per AASHTO	50°F ≤ °F ≤ 90°F				
Compressive Strength (psi)	AASHTO T 22 AASHTO T 23	Stripping Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 80% f'_c at Stripping				
		7-day Cylinders: One (1) set of Three (3) 4 x 8 in.	For Information at 7 days				
		28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 100% f'_c at 28 days				
		56-day Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 100% f'_c at 56 days (b)				

Notes:

(a) Self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.
(b) 56-day Compressive Strength test specimens shall require testing only when 28-day Compressive Strength test specimens have failed to meet Design Strength (f'_c).
(c) Lot shall be defined as a specific quantity of material from a single source, produced or placed by the same controlled process.
(d) Sublot shall be defined as an equal division or part of a Lot from which a sample of material is obtained in order to assess the Quality Characteristics of the Lot.

7. Certificate of Compliance.

The Fabricator shall provide a Certificate of Compliance in accordance with Standard Specifications, Division I, Section 6.01, stating that QC test cylinders have achieved the design strength, f'_c. A Certificate of Compliance shall accompany each shipment and shall be presented to the MassDOT Resident Engineer or designee upon delivery to the site.

8. Documentation.

At a minimum, the Fabricator shall maintain a filing system for the following QC records and documentation. All QC records and documentation shall be made available to MassDOT upon the request of the Department.

(a) Current MassDOT Approved Mix Design Sheet(s) and Approval Letter(s)
(b) PCI or NPCA Certification
(c) Current Qualifications and Certifications for QC Manager(s) and QC Technician(s)
(d) Most current set of Approved Shop Drawings

(e) Fabricator Certificate of Compliance for each fabricated Precast Concrete Bridge Element
(f) Admixture Manufacturer's Certification of Compliance for each approved Admixture
(g) Completed QC Inspection Report for each fabricated Precast Concrete Bridge Element
(h) Identification Number for each fabricated Precast Concrete Bridge Element
(i) Time and date of casting of each fabricated Precast Concrete Bridge Element
(j) Date of stripping of each fabricated Precast Concrete Bridge Element
(k) Batch Ticket Printout reporting the quantity of concrete produced for each batch of concrete produced
(l) Concrete temperature records for each Precast Concrete Bridge Element fabricated
(m) QC Test Report Forms for each sublot of concrete produced
(n) Non-Conformance Reports (NCRs)
(o) Documentation of Repairs (if applicable)

MATERIALS

D. Materials.
Materials shall meet the following specifications (if applicable):

General	M4.00.00
Portland Cement	M4.01.0
Blended Hydraulic Cements	M4.01.1
Fly Ash	M4.01.2
Cement Concrete	M4.02.00
Cement	M4.02.01
Cement Mortar	M4.02.15
Aggregates	M4.02.02
Lightweight Aggregates	M4.02.03
Water	M4.02.04
Cement Concrete Additives	M4.02.05
Proportioning	M4.02.06
Mixing and Delivery	M4.02.10
Test Specimens	M4.02.13
Mortar for Filling Keyways	M4.04.0
Slag	AASHTO M 302
High Performance Cement Concrete	M4.06.1
Self-Consolidating Concrete (SCC)	M4.02.17
Controlled Density Fill – Non-Excavatable	M4.08.0
Reinforcing Bars	M8.01.0
Epoxy Coated Reinforcing Bars	M8.01.7
Galvanized Reinforcing Bars	M8.01.8
Welded Wire Reinforcement	M8.01.2
Mechanical Reinforcing Bar Splicer	M8.01.9
Lifting Devices	PCI MNL-116
Corrugated Metal Pipe	AASHTO M 36

1. Cement Concrete Mix Design.

Cement concrete for Precast Concrete Bridge Elements shall meet the requirements of M4.06.1 High Performance Cement Concrete. When used, self-consolidating concrete (SCC) shall meet the requirements of M4.02.17. The cement concrete shall be composed of specified proportions by the mass of aggregates, cement, supplementary cementitious materials (SCMs), water, and QCML approved admixtures to form a homogenous composition.

Prior to the production and placement of the cement concrete for Precast Concrete Bridge Elements, the Fabricator's proposed mix design shall be approved by MassDOT RMS.

Modifications made to the aggregate, cement, supplementary cementitious materials (SCMs), admixtures (including coloring agents), or formulation to previously approved mix designs during fabrication are prohibited.

2. Vertical Adjustment Assembly.

Vertical Adjustment Assembly details and material requirements shall be as shown on the plans. Alternate devices may be used provided that they are adjustable and can support the anticipated loads. The design of the leveling devices, with necessary calculations, shall be submitted to the Engineer for approval.

3. Grout.

Grout used for shear keys, vertical adjustment assembly voids, and hand holes shall be in accordance with M4.04.0.

4. Reinforcement.

All reinforcing steel shall be coated Grade 60 unless otherwise noted on the plans. Mechanical reinforcing bar splicers shall be epoxy coated.

5. Threaded Inserts.

Threaded inserts are permissible to facilitate forming the keyway pours. Threaded inserts shall be hot dip galvanized or made of stainless steel. The number of threaded inserts shall be minimized, and the inserts shall not come in contact with the reinforcing steel.

6. Corrugated Metal Pipe.

Corrugated Metal Pipe to be used for forming voids as specified on the plans shall be fabricated from steel and shall have a protective metallic coating of zinc (galvanizing).

CONSTRUCTION METHODS – PLANT FABRICATION

E. Shop Drawings.

Prior to performing any work under this Section, the Contractor shall receive approval for all shop drawings for the Precast Concrete Bridge Element being worked on and any special Contract requirements, provided that a complete shop drawing package is provided. The Contractor shall not order materials or begin work before receiving approved shop drawings. The municipality will reject Precast Concrete Bridge Elements that deviate from the approved drawings or are fabricated prior to receiving written approval of the shop drawings. The Contractor shall bear full responsibility and costs for all materials ordered or work performed prior to the approval of the shop drawings or written authorization from the municipality or Engineer of Record.

Contractor shall submit scaled shop drawings to the Engineer of Record for review and approval. Upon approval, the Engineer of Record will forward two (2) sets of scaled, full size (minimum 24x36") paper copies of the Approved (or Approved As Noted) shop drawings to the municipality. An approval stamp shall appear on every shop drawing sheet. Wet-stamping or wet-signing is not required, provided that the stamp and reviewer name are legible. The Fabricator's name and address shall appear on each sheet.

Resubmittal of "Approved as Noted" shop drawings is not necessary for minor revisions, provided that the correction can be clearly understood and is unambiguous without possibility of misinterpretation. Shop drawings with questions or comments that require a response and/or additional information from the Fabricator must be resubmitted.

Detailed shop drawings shall be prepared in accordance with the relevant provisions of Subsection 5.02 and shall, at a minimum, contain the following:

- Number and type and/or piece mark of the precast concrete bridge element including overall length, width and height.
- Skew angle.

- Location, size and geometry of all steel reinforcement, including mechanical reinforcing bar splicers to be used for connecting Precast Concrete Bridge Elements together in the field.
- Location and details of all inserts, anchors, Vertical Adjustment Assemblies, and any other items required to be cast into the Precast Concrete Bridge Elements (whether detailed on the plans by the Engineer of Record or provided for the Contractor's convenience). Precast Concrete Bridge Elements shall not be fired or drilled into for attachment purposes. All hardware shall be galvanized except as noted.
- Locations and details of the lifting devices, including supporting calculations, type and amount of any additional reinforcing required for lifting. The Fabricator shall design all lifting devices based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (7^{th} edition).
- The minimum compressive strength required prior to handling the precast concrete bridge element.

The shop drawings shall not include procedures for placement, finishing, and curing of concrete.

F. Reinforcement.

The reinforcing bars shall be installed in accordance with Section 901.62 of the Supplemental Specifications, including tolerances for cover and horizontal spacing of bars. Components of mechanical reinforcing bar splicers shall be set with the tolerances shown on the plans. The reinforcing bars and mechanical reinforcing bar splicers shall be assembled into a rigid cage that will maintain its shape in the form and which will not allow individual reinforcing bars to move during the placement of concrete. This cage shall be secured in the form so that the clearances to all faces of the concrete, as shown on the plans, shall be maintained.

Where reinforcing bars are to protrude from one Precast Concrete Bridge Element in order to mate with reinforcing bar splicers in a second precast concrete element, the fabricator shall set the reinforcing bars and the reinforcing bar splicers with a template in order to ensure proper fit up within the tolerances specified on the plans.

G. Tolerances.

Fabrication shall comply with tolerances specified on the plans. Tolerances for steel reinforcement placement shall be in accordance with 901.62. In the absence of specifications on the plans, tolerances shall comply with the latest version of the PCI MNL 135, Precast Tolerance Manual.

H. Forms.

Concrete shall be cast in rigidly constructed forms, which will maintain the Precast Concrete Bridge Elements within specified tolerances to the shapes, lines and dimensions shown on the approved fabrication drawings. Forms shall be constructed from flat, smooth, non-absorbent material and shall be sufficiently tight to prevent the leakage of the plastic concrete. When wood forms are used, all faces in contact with the concrete shall be laminated or coated with a non-absorbent material. All worn or damaged forms, which cause irregularities on the concrete surface or damage to the concrete during form removal, shall be repaired or replaced before being reused. Any defects or damage of more than minor nature, due to form work, stripping or handling, shall be cause for rejection, as defined in Repairs and Replacement, unless approved for repair through the NCR process. If threaded inserts are cast into the elements for support of formwork, the inserts shall be recessed a minimum of 1 inch and shall be plugged after use with a grout of the same color as that of the precast cement concrete.

I. Mixing of Concrete.

The concrete shall be proportioned and mixed in conformance with the Fabricator’s MassDOT approved mix design and M4.02.10 Mixing and Delivery. Fabrication shall not occur without a MassDOT approved mix design.

J. Placement of Concrete.

Prior to the placement of concrete, the temperature of the forms shall be greater than or equal to 50°F. Quality Control inspection shall be performed by the Fabricator as specified in the *Fabricator Quality Control* section. The Fabricator shall verify all materials and equipment required for protecting and curing the concrete are readily available and meet the requirements of the *Final Curing Methods* section below. All items encased in the concrete shall be accurately placed in the position shown on the Plans and firmly held during the placing and setting of the concrete. Clearance from the forms shall be maintained by supports, spacers, or hangers and shall be of approved shape and dimension.

During placement, the concrete shall maintain a concrete temperature range between 50°F and 90°F. The Fabricator shall minimize the time to concrete placement (measured from start of mixing to completion of placement). In no event shall time to placement exceed 90 minutes. The Fabricator shall perform additional Quality Control sampling and testing on concrete that has been retempered with admixtures or hold-back water during the placement of the concrete as specified in the *Fabricator Quality Control* section above. Delays or shutdowns of over 30 minutes shall not be allowed during the continuous filling of individual forms.

K. Consolidation of Concrete.

Suitable means shall be used for placing concrete to prevent segregation or displacement of reinforcing steel or forms. The concrete shall be thoroughly consolidated by external or internal vibrators or a combination of both. Vibrators shall not be used to move concrete within the forms. Vibrators shall be used as specified in 901.63C and as directed by the Engineer. Concrete shall be placed and consolidated in a way that minimizes the presence of surface voids or bug holes on the formed surfaces. When used, self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.

L. Finishing of Concrete.

The finish of the Precast Concrete Bridge Elements shall be as indicated on the plans. Where Precast Concrete Bridge Elements have keyways for grout or closure pours, the surfaces of these shear keys shall be abrasive blasted prior to shipment. The Fabricator may utilize a surface retarder with water blast, sandblast, or a combination of both to achieve the desired keyway finish. At a minimum, the profile of the keyway surfaces shall be similar to that of 60 grit sand paper. The exposed reinforcing steel in the precast slab shall be protected from damage during the cleaning of the keyways. Damaged epoxy coating of steel reinforcement shall be repaired, and the reinforcing steel shall be cleaned as directed by the Engineer.

The Fabricator shall permanently mark each precast concrete bridge element with its type and/or piece mark, date of casting, and supplier identification either by stamp markings in fresh concrete, waterproof paint, or other approved means on a surface that will not be exposed after assembly.

M. Exposed Surfaces of Precast Concrete Bridge Elements.

As soon as conditions permit, before the concrete has fully hardened, all dirt, laitance, and loose aggregate shall be removed from the exposed concrete surfaces. Contractor shall not allow foot traffic on the uncured concrete until it has reached sufficient strength to prevent damage.

N. Final Curing Methods.

All exposed concrete surfaces shall meet the requirements of the selected final curing method and maintain the required concrete temperature ranges throughout the duration of the final curing method cycle. Controlled and gradual termination of the final curing method cycle shall occur after all the specified conditions are met, until the concrete gradually cools to within 40°F of the ambient tempurate outside of the final curing method enclosure. Maximum heat increase and cool down rates shall meet the requirements specified herein.

7. Water Spray Curing.

The final curing method cycle shall begin immediately after the concrete has hardened sufficiently to prevent surface damage from the water spray. After the concrete has sufficiently hardened, all exposed concrete surfaces shall remain moist with a continuous fine spray of water throughout the entire duration of the final curing method cycle. Controlled and gradual termination of the final curing method cycle shall occur after all specified conditions are met (see *Table 4: Termination of Curing Cycle for Water Spray Curing*).

Table 4: Termination of Curing Cycle for Water Spray

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Five (5) days	≥ 80% f'_c

After the termination of the final curing method cycle has occured, Precast Concrete Bridge Elements shall continue to maintain a minimum concrete temperature of 40°F until 100% f'c is attained (see *Handling and Storage* section below).

8. Saturated Covers for Curing.

The final curing method cycle shall begin immediately after the concrete has hardened sufficiently to prevent surface damage from the saturated burlap. After the concrete has sufficiently hardened, all exposed concrete surfaces shall be covered with water-saturated burlap throughout the entire duration of the final curing method cycle. Controlled and gradual termination of the final curing method cycle shall occur after all specified conditions are met (see *Table 5: Termination of Curing Cycle for Saturated Cover Curing*).

Table 5: Termination of Curing Cycle for Saturated Covers

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Three (3) days	≥ 80% f'_c

After the termination of the final curing method cycle has occured, Precast Concrete Bridge Elements shall continue to maintain a minimum concrete temperature of 40°F until 100% f'c is attained (see *Handling and Storage* section below).

9. Curing Covers

Curing covers shall be Plastic Coated Fiber Blankets or Polyethylene Curing Covers. Proposed curing covers shall be submitted for approval to the Designer of. The final curing method cycle shall begin immediately after the concrete has hardened sufficiently to prevent surface damage from the curing covers. After the concrete has sufficiently hardened, all exposed concrete surfaces shall be covered with curing covers throughout the entire duration of the final curing method cycle. The Fabricator shall ensure that the surface of the concrete remains wet until the covers are placed. If forms are removed from the Precast Concrete Bridge Element, curing covers shall be placed over the exposed concrete for the remainder of the final curing method cycle. Adjoining covers shall overlap not less than 12 inches. All edges of the covers shall be secured to maintain a moist environment (100% minimum relative humidity). Controlled and gradual termination of the final curing method cycle shall occur after all specified conditions are met (see *Table 6: Termination of Curing Cycle for Curing Covers*).

Table 6: Termination of Curing Cycle for Curing Covers

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Three (3) days	≥ 80% f'_c

After the termination of the final curing method cycle has occurred, Precast Concrete Bridge Elements shall continue to maintain a minimum concrete temperature of 40°F until 100% Design Strength (f'_c) is attained (see *Handling and Storage* section below).

10. Membrane Curing Compound.

This curing method shall be accomplished using a membrane curing compound approved by the Engineer meeting the requirements of ASTM C 1315, Type I, Class A. Membrane curing compound shall be applied in accordance with manufacturer's recommendations. All exposed concrete surfaces on the precast unit shall be coated after the concrete has been finished and immediately after the water sheen has disappeared from the surface of the concrete. Concrete surfaces receiving curing compound shall not fall below 50°F for a minimum duration of 8 hours after application of the curing compound or as specified by the manufacturer's recommendations, whichever is greater. The concrete temperature of the unit shall not fall below 40°F until f'_c is achieved.

When forms are removed prior to completion of the 7-day period, curing compound shall be applied to the exposed concrete within 30 minutes so that all surfaces have been covered with curing compound and edges of existing compound are overlapped to ensure a continuous coating. The curing compound shall remain in place for the remainder of the 7-day period.

If patching or finishing repairs are to be performed prior to the application of curing compound, the unit shall be covered temporarily with curing covers until the repairs are completed and the curing compound is applied. Only areas being repaired may be uncovered during this period. While the covers are removed to facilitate the patching process, the work shall continue uninterrupted. If for any reason the work is interrupted, the covers shall be replaced until the work continues and is completed, at which time the curing compound shall be applied to the repaired area.

Curing compound shall be removed by blast-cleaning from any concrete surface that is to have plastic concrete or grout bonded to it. These surfaces shall be further blast-cleaned to remove the cement matrix down to exposed aggregate to ensure proper bonding to the mating concrete or grout. The method used to remove the curing compound shall not damage the reinforcement and coating. Membrane curing will not be permitted on any concrete surface that will have a penetrating or coating type treatment such as a sealer, stain, or waterproofing membrane applied to it. Termination of the final curing method cycle shall occur after all specified conditions are met (see *Table 7: Termination of Curing Cycle for Liquid Membrane-Forming Compounds*).

Table 7: Termination of Curing Cycle for Membrane Curing Compound

Sustained Concrete Temperature	Final Curing Method Cycle Duration	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ Seven (7) days	≥ 80% f'_c

After the termination of the final curing method cycle has occurred, Precast Concrete Bridge Elements shall continue to maintain a minimum concrete temperature of 40°F until 100% Design Strength (f'_c) is attained (see *Handling and Storage* section below).

11. Accelerated Curing.

Accelerated curing shall use live steam or radiant heat with moisture in accordance with PCI MNL-116 as modified herein. Concrete temperature monitoring shall meet the requirements of the *Temperature Monitoring* section. Excessive and fluctuating rates of heating and cooling shall be prohibited. The concrete temperature shall meet the maximum heat increase and cool down rates as specified herein. The concrete temperature shall not exceed 158°F at any time.

(A) PRESET PERIOD.

Accelerated curing of the precast unit shall begin after initial set of the concrete. The Fabricator shall determine the time of initial set according to AASHTO T 197 specifications for the full range of concrete temperatures proposed to be used during initial set. The temperature of concrete shall not exceed 104°F during initial set.

(B) RAMP-UP PERIOD.

Once initial set is complete, the concrete temperature shall rise at a rate not to exceed 36°F per hour.

(C) ACCELERATED TEMPERATURE PERIOD.

Once the ramp-up period is complete, the Precast Concrete Birdge Element shall be cured in a moist environment at a controlled elevated temperature of at least 120°F for no less than 8 hours and no more than 48 hours. The maximum concrete temperature shall not exceed 158°F at any time. Termination of the accelerated temperature period and the start of the ramp-down period shall occur after all specified conditions are met (see *Table 8: Termination of Accelerated Temperature Period*).

Table 8: Termination of Accelerated Temperature Period

Sustained Concrete Temperature	Accelerated Temperature Period	Compressive Strength
120°F ≤ °F ≤ 158°F	8 hrs ≤ Time ≤ 48 hrs	≥ 80% f'_c

(D) RAMP-DOWN PERIOD.

The concrete temperature shall be reduced at a rate not to exceed 50°F per hour until the concrete temperature is within 40°F of the ambient temperature outside of the curing enclosure.

O. Stripping.

The Fabricator shall not strip forms or handle the Precast Concrete Bridge Element until Quality Control compressive strength cylinders attain a minimum compressive strength of 80% Design Strength (f'_c) or the value indicated on the approved drawings has been achieved. After removal from the form, all exposed concrete surfaces shall continue to be cured in conformance with the *Final Curing Methods* sections until completion.

P. Handling and Storage of Precast Concrete Bridge Elements.

The precast concrete bridge element may be exposed to temperatures below freezing (32°F) when the chosen curing cycle has been completed, provided that the following conditions are met:

(a) Precast Concrete Bridge Elements are protected from precipitation with polyethylene curing covers until they achieve 100% of f'_c.
(b) Precast Concrete Bridge Elements shall maintain a minimum concrete temperature of 40°F until 100% f'_c is attained.

Precast Concrete Bridge Elements damaged during handling and storage will be repaired or

replaced at the municipalities direction at no cost to the municipality. Precast Concrete Bridge Elements shall be lifted at the designated points by approved lifting devices embedded in the concrete and in accordance with proper lifting and handling procedures. Storage areas shall be smooth and well compacted to prevent damage due to differential settlement. Precast Concrete Bridge Elements shall be supported on the ground by means of continuous blocking, in accordance with the approved dunnage plan.

Precast Concrete Bridge Elements shall be loaded on a trailer with blocking as described above, in accordance with the approved dunnage plan. Shock-absorbing cushioning material shall be used at all bearing points during transportation of the Precast Concrete Bridge Elements. Blocking shall be provided at all locations of tie-down straps. Precast Concrete Bridge Elements stored prior to shipment shall be inspected by the Contractor prior to being delivered to the site to identify damage that would be cause for repair or rejection.

Q. Repairs and Replacement.

In the event defects are identified, they shall be classified in the following categories and a non-conformance report (NCR) shall be filed if required. Defects in all categories shall be documented by plant Quality Control personnel and made available to the municipality upon request. Any required repairs shall utilize materials listed on the MassDOT QCML.

Where noted, defects shall be repaired according to the PCI Northeast Region Guidelines for Resolution of Non-Conformances in Precast Concrete Bridge Elements, Report Number PCINE-18-RNPCBE. Please note that reference to PCINE-18-RNPCBE is made for repair details only. In the case of conflicts with this Special Provision, this Special Provision shall govern.

12. Category 1, Surface Defects.

Category 1 defects do not need to be repaired, and an NCR does not need to be filed. Surface defects are defined as the following:

(a) Surface voids or bug holes that are less than 5/8-inch in diameter and less than ¼-inch deep, except when classified as Category 4
(b) Cracks less than or equal to 0.006” wide
(c) Cracks less than or equal to 0.125” wide on surfaces that will receive a field-cast concrete overlay

13. Category 2, Minor Defects.

Category 2 defects shall be repaired, but an NCR does not need to be filed. Minor defects are defined as the following:

(a) Spalls, honeycombing, surface voids that are less than 2 inches deep and have no dimension greater than 12 inches
(b) Cracks less than or equal to 0.016” that will not receive a concrete overlay
(c) Broken or spalled corners that will be covered by field-cast concrete

Minor defects shall be repaired according to PCINE-18-RNPCBE. Cracks shall be sealed according to the PCI Repair Procedure #14 in PCINE-18-RNPCBE.

14. Category 3, Major Defects.

For Category 3 defects, the Fabricator shall prepare an NCR that documents the defect and describes the proposed repair procedure. The NCR shall be submitted to MassDOT for approval prior to performing the repair. Major defects are defined as the following:

(a) Spalls, honeycombing and surface voids that are deeper than 2 inches or have any dimension greater than 12 inches, when measured along a straight line
(b) Concentrated area of defects consisting of four or more Category 2 Defects within a 4-square foot area.

(c) Exposed reinforcing steel
(d) Cracks greater than 0.016 inch and less than or equal to 0.060" in width that will not receive a concrete overlay
(e) Bearing area spalls with dimensions not exceeding 3 inches
(f) Cracks, spalls and honeycombing that will be encased in cast in place concrete need not be repaired, but the limits and location of the defects shall be documented with an NCR

Upon the municipalities approval, defects and cracks shall be repaired according to PCINE-18-RNPCBE and this specification. All repairs shall be completed at the expense of the Contractor.

15. Category 4, Rejectable Defects.

Rejectable defects as determined by the Engineer may be cause for rejection. Fabricator may submit an NCR with a proposed repair procedure, requesting approval. Some rejectable defects are defined as the following:

(a) Surface defects on more than 5% of the surface area which will be exposed to view after installation
(b) Minor defects that in total make up more than 5% of the surface area of the unit
(c) Cracks greater than 0.060" in width except as noted in Category 1
(d) Elements fabricated outside of the specified tolerances
(e) Compressive strength testing that does not meet the specified Design Strength, f'_c

R. Shipping.

Prior to shipment, the Fabricator shall perform the following actions and provide the required documentation to the MassDOT Plant Inspector:

(a) Precast Concrete Bridge Elements shall remain at the Fabricator's plant for a minimum of 7 days after cast date.
(b) QC Inspection Reports shall be signed by the Quality Control Manager.
(c) QC Compressive Strength Test Report Forms attaining Design Strength, f'c for the Precast Concrete Bridge Element's representative Sublot shall be generated by the Fabricator.
(d) Certificate of Compliance shall be generated by the Fabricator as described under the Fabricator Quality Control section.
(e) All approved Corrective Actions submitted on the Non-Conformance Reports (NCR), shall have been completed.
(f) All NCRs shall be signed off by the Quality Control Manager.

S. Delivery.

Upon Delivery, the following documentation shall be provided to the MassDOT Resident Engineer or designee:

(a) QC Compressive Strength Test Report Forms attaining Design Strength, f'c for the Precast Concrete Bridge Element's representative Sublot.
(b) Certificate of Compliance generated by the Fabricator as described under the Fabricator Quality Control section.
(c) QC Inspection Reports signed by the Quality Control Manager.

The Contractor shall inspect Precast Concrete Bridge Elements upon receipt at the site. Precast Concrete Bridge Elements damaged during delivery shall be repaired or replaced at the municipality's direction at no cost to the municipality.

T. General.

All of the Contractor's field personnel involved in the erection and assembly of the Precast Concrete Bridge Elements shall have knowledge of and follow the approved Erection Procedure and Quality Control Plan for Precast Concrete Bridge Element Assembly.

Prior to installation, the following documentation shall be reviewed and confirmed by the Resident Engineer or designee:

(a) QC Compressive Strength Test Report Forms attaining Design Strength, f'c for the Precast Concrete Bridge Element's representative Sublot.
(b) Certificate of Compliance generated by the Fabricator as described under the Fabricator Quality Control section.
(c) QC Inspection Reports signed by the Quality Control Manager.

Field construction staff shall verify that the Resident Engineer has accepted all Precast Concrete Bridge Elements prior to installation.

U. Erection Procedure and Quality Control Plan for Precast Concrete Bridge Element Assembly.

Prior to the erection, the Contractor shall submit an Erection Procedure and a Quality Control Plan for Precast Concrete Bridge Element Assembly for approval by the Engineer. This submittal shall include computations and drawings for the transport, hoisting, erection and handling of the Precast Concrete Bridge Elements. The Erection Procedure and Quality Control Plan for Precast Concrete Bridge Element Assembly shall be prepared and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts with working knowledge of the Contractor's equipment, approved shop drawings, and materials to build the bridge. The Erection Procedure and Quality Control Plan for Precast Concrete Bridge Element Assembly shall, at a minimum, include the following:

16. Erection Procedure

The Erection Procedure shall be prepared to conform to the requirements of 960.61, Erection and the applicable sections in Chapter 8 of the PCI Design Handbook (seventh edition) for handling, erection, and bracing requirements. At a minimum, the Erection Procedure shall provide:

(a) Minimum concrete compressive strength for handling the Precast Concrete Bridge Elements.
(b) Concrete stresses during handling, transport, and erection.
(c) Crane capacities, pick radii, sling geometry, and lifting hardware.
(d) Verification that the equipment can handle all pick loads and weights with the required factor of safety.
(e) Evaluation of construction sequence and evaluation of any geometric conflicts in the lifting of the Precast Concrete Bridge Elements and setting them as shown on the plans.
(f) Design of crane supports including verification of subgrade for support.
(g) Location and design of all temporary bracing that will be required during erection.

Non-shrink grout and concrete materials, approved by the Engineer, shall be placed as shown on the plans fill joints, keyways, and voids, in strict accordance with the specifications and manufacturer's recommendations and instructions.

For footings, approach slabs and highway guardrail transitions, once these Precast Concrete Bridge Elements have been set to the correct horizontal and vertical alignment, the void between them and the supporting soil shall be filled with Controlled Density Fill – Non-Excavatable to the limits as shown on the plans. Add additional grout ports in the footings to facilitate the bedding process if required.

Joints shall be filled flush to the top with non-shrink grout, and any vertical misalignment

between adjacent elements shall be feathered out on a slope of 1 to 12.

Curing of grout or concrete shall be performed in strict accordance with the specifications and manufacturer's recommendations. Filling shall not be completed in cold weather when either the ambient temperature or the precast member's temperature is below the manufacturer's recommendation. No localized heating of either the precast members or of the air surrounding the element will be permitted in an attempt to reach application temperatures.

If the joints or voids are not filled within five days after the precast elements are erected, the Contractor shall cover and protect the openings from weather and debris until they are filled.

V. Survey and Layout.

Working points, working lines, and benchmark elevations shall be established prior to placement of all elements. The Contractor is responsible for field survey as necessary to complete the work. MassDOT reserves the right to perform additional independent survey. If discrepancies are found, the Contractor may be required to verify previous survey data.

W. Preparation of Keyways Prior to Erection.

The precast concrete keyways that will receive the closure pour concrete shall be free of materials such as paint, oil, curing compound, bond breaker, dirt, etc. that will inhibit bonding. The precast concrete keyways shall be cleaned with equipment that can remove asphaltic material, oils, dirt, rubber, curing compounds, paint carbonation, laitance, and other potentially detrimental materials, which may interfere with the bonding of the grout.

Immediately prior to erecting the beams, the shear keys shall be cleaned at the job site of all dust, dirt, and carbonation using a high-pressure water blast. In addition, the surfaces of the shear keys shall be wetted so that the surfaces shall have a Saturated Surface Dry (SSD) condition no more than 24 hours prior to the placement of the closure pour concrete.

X. Erection.

The elements shall be placed in the sequence and according to the methods outlined in the Erection Procedure for Precast Concrete Bridge Element Assembly. As the erection proceeds, the Contractor shall constantly monitor the assembly to ensure that the precast concrete bridge element is within proper horizontal and vertical location and tolerances prior to releasing it from the crane and setting the next unit. The Contractor may use shims to maintain proper setting tolerances.

The concrete elements shall be lifted only by the lifting devices, and the utmost care shall be taken to prevent distortion of the elements during handling, transportation or storage.

Suitable spreaders shall be used during lifting so that only a vertical pull will be made on the lifting device. A non-vertical lifting force may be permitted if prior written approval is given by the Engineer. This approval will be contingent on the Contractor demonstrating by calculations, prepared by a Professional Engineer registered in Massachusetts, that the elements will not be damaged by the non-vertical lifting force and by documentation that the capacity of the lifting devices is adequate for the non-vertical lifting force.

Precast components shall be pre-bed with non-shrink grout thicker than shim stacks prior to placing other precast elements on top of them.

After all Precast Concrete Bridge Elements have been placed, the actual overall dimensions of the structure both horizontal and vertical, as laid out shall not deviate from the nominal dimensions shown on the plans beyond a tolerance of +0 inches and -1 inches. Once the layout of Precast Concrete Bridge Elements has been accepted by the Engineer, the Contractor shall cut all lifting devices off below the surfaces of the elements. If the voids in the Precast Concrete Bridge Elements where the lifting devices were located will be exposed, the Contractor shall fill these voids with grout.

COMPENSATION

Basis of Payment.

The furnishing, fabricating, and erecting of all Precast Concrete Bridge Elements for the structure shall be paid for at the contract unit price EACH under the Lump Sum Item 916.01 and Item 916.02, complete in place.

Payment Items.

916.01 Precast Concrete Moment Slab
916.02 Precast Highway Guardrail Transition

Replace Item 995.011 Culvert Structure completely with the following:

ITEM 995.011 CULVERT STRUCTURE LUMP SUM

Work under this item shall conform to the relevant provisions of Section 230 and 995 and in accordance with the design and to the lines and grades shown on the plans. The work under this item shall include the precast concrete culvert, headwalls and all necessary erection hardware, backfilling, and compaction.

The work under this section does not include culvert excavation, streambed/bank restoration, class B rock excavation, crushed stone for bridge foundations, gravel borrow, fine grading and compacting, hot mix asphalt, stone for erosion control, control of water structure S-23-015, or any other items in the contract.

Method of measurement and Basis of payment

Compensation for the work described under this item will be made by the contract Lump Sum price for Item 995.011 which will be full compensation for precast concrete culvert, headwalls, erection hardware, backfilling, compacting, labor, equipment, tools and incidental work.

Culvert excavation, streambed/bank restoration, class B rock excavation, crushed stone for bridge foundations, gravel borrow, fine grading and compacting, hot mix asphalt, embankment stone and control of water structure S-23-015 will be measured and compensated under their respective items.

Add the following Item:

ITEM 156.11 CRUSHED STONE FOR BRIDGE FOUNDATIONS TON

The work to be done under this item shall conform to the relevant provisions of Section 150 and the following:

The crushed stone limits shall be a minimum of 12 inches horizontally from the footing in all directions and 12 inches below the footing. Stone shall be placed and tightened on subgrade compacted in accordance with the contract documents.

The work under this item shall include materials and labor for the item, complete in place.

****

END OF ADDENDUM 1

Bid Item List
Donnelly Cross Road over Shaw Brook

ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE Dollars	UNIT PRICE Cents	AMOUNT Dollars	AMOUNT Cents
105.45		SUPPLEMENTAL BORROW FOR NATIVE MATERIAL				
	20	AT ..... PER CUBIC YARD				
120.11		UNCLASSIFIED EXCAVATION				
	225	AT ..... PER CUBIC YARD				
140.11		CULVERT EXCAVATION				
	200	AT ..... PER CUBIC YARD				
141		CLASS A TRENCH EXCAVATION				
	210	AT ..... PER CUBIC YARD				
143.1		STREAMBED EXCAVATION				
	7	AT ..... PER CUBIC YARD				
144		CLASS B ROCK EXCAVATION				
	25	AT ..... PER CUBIC YARD				
151		GRAVEL BORROW				
	100	AT ..... PER CUBIC YARD				
151.2		GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES				
	60	AT ..... PER CUBIC YARD				
156		CRUSHED STONE				
	5	AT ..... PER TON				
156.11		CRUSHED STONE FOR BRIDGE FOUNDATIONS				
	27	AT ..... PER TON				
170		FINE GRADING AND COMPACTING				
	420	AT ..... PER SQUARE YARD				
402		DENSE GRADED CRUSHED STONE FOR SUB-BASE				
	50	AT ..... PER CUBIC YARD				

Bid Item List
Donnelly Cross Road over Shaw Brook

ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE Dollars	UNIT PRICE Cents	AMOUNT Dollars	AMOUNT Cents
450.22		SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)				
	35	AT ..... PER TON				
450.31		SUPERPAVE INTERMIDIATE COURSE - 12.5 (SIC - 12.5)				
	47	AT ..... PER TON				
450.42		SUPERPAVE BASE COURSE - 37.5 (SBC -37.5)				
	75	AT ..... PER TON				
452		ASPHALT EMULSION FOR TACK COAT				
	45	AT ..... PER GAL				
464.5		HOT POURED RUBBERIZED ASPHALT SEALER				
	350	AT ..... PER FOOT				
482.3		SAWING ASPHALT PAVEMENT				
	50	AT ..... PER FOOT				
627.1		TRAILING ANCHORAGE				
	2	AT ..... PER EACH				
627.82		GUARDRAIL TANGENT END TREATMENT, TL-2				
	2	AT ..... PER EACH				
628.24		TRANSITION TO BRIDGE RAIL				
	4	AT ..... PER EACH				
697.2		FLOATING SILT FENCE				
	50	AT ..... PER FOOT				
698.4		GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL				
	30	AT ..... PER SQUARE YARD				
748		MOBILIZATION				
	1	AT ..... PER LUMP SUM				

Bid Item List
Donnelly Cross Road over Shaw Brook

ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE Dollars	UNIT PRICE Cents	AMOUNT Dollars	AMOUNT Cents
751		LOAM BORROW				
	30	AT ..... PER CUBIC YARD				
754		WETLAND SOIL REHANDLED AND SPREAD				
	10	AT ..... PER CUBIC YARD				
755		WETLAND REPLICATION AREA				
	10	AT ..... PER SQUARE YARD				
765.44		SEEDING - ROADSIDE RIVERBANK - PART SHADE MIX				
	150	AT ..... PER SQUARE YARD				
765.45		SEEDING - UPLAND RESTORATION MIX				
	100	AT ..... PER SQUARE YARD				
767.121		SEDIMENT CONTROL BARRIER				
	650	AT ..... PER FOOT				
852		SAFETY SIGNING FOR TRAFFIC MANAGEMENT				
	150	AT ..... SQUARE FOOT				
853.1		PORTABLE BREAKAWAY BARRICADE TYPE III				
	2	AT ..... PER EACH				
853.2		TEMPORARY BARRIER				
	50	AT ..... PER FOOT				
856.12		PORTABLE CHANGEABLE MESSAGE SIGN				
	50	AT ..... PER DAY				
916.01		PRECAST MOMENT SLAB				
	4	AT ..... PER EACH				

Bid Item List
Donnelly Cross Road over Shaw Brook

ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE Dollars	UNIT PRICE Cents	AMOUNT Dollars	AMOUNT Cents
916.02		PRECAST HIGHWAY GUARDRAIL TRANSITION (INCLUDES BASE)				
	4	AT ..... PER EACH				
970		BITUMINOUS DAMP-PROOFING				
	150	AT ..... PER SQUARE YARD				
975.1		METAL BRIDGE RAIL (3 RAIL), STEEL (TYPE S3-TL4)				
	94	AT ..... PER FOOT				
983.521		STREAMBED/BANK RESTORATION				
	50	AT ..... PER CUBIC YARD				
984.65		EMBANKMENT STONE				
	55	AT ..... PER TON				
991.1		CONTROL OF WATER STRUCTURE NO. S-23-015				
	1	AT ..... PER LUMP SUM				
995.011		CULVERT STRUCTURE				
	1	AT ..... PER LUMP SUM				
996.31		PREFABRICATED MODULAR WALL - STANDARD				
	520	AT ..... PER SQUARE FOOT				
996.32		PREFABRICATED MODULAR WALL - SLOPED TOP				
	160	AT ..... PER SQUARE FOOT				
999.2		TRAFFIC DETAILS	$5,000.00		$5,000.00	

TOTAL: _____

Total in words: _____