



STATE OF MAINE  
 DEPARTMENT OF TRANSPORTATION  
 16 STATE HOUSE STATION  
 AUGUSTA, MAINE 04333-0016

Paul R. LePage  
 GOVERNOR

David Bernhardt  
 COMMISSIONER

October 11, 2013  
 Subject: **Weld**  
 Federal Project No: BH-1992(400) &  
 BH-1992(500)  
 State WIN: 019924.00 & 019925.00  
**Amendment No. 1**

Dear Sir/Ms:

Make the following changes to the Bid Documents:

In the Bid Book (pages 16 thru 18) **REMOVE** the "SCHEDULE OF ITEMS" 3 pages dated 130916 and **REPLACE** with the attached new "SCHEDULE OF ITEMS" 3 pages dated 131010.

In the Bid Book (pages 68-74) **REMOVE** "SPECIAL PROVISION, SECTION 502, STRUCTURAL CONCRETE, (Precast Block Mat)" 7 pages dated September 5, 2013 and **REPLACE** with the attached new "SPECIAL PROVISION, SECTION 502, STRUCTURAL CONCRETE, (Precast Block Mat)" 8 pages dated September 10, 2013.

In the Plans, **ADD** the following items to the "ESTIMATED QUANTITIES" for each Plan Set in pen and ink as follows;

Bowley Brook – BH-1992(400) – 019924.00 – Sheet Number 2 of 5

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
615.07	Loam	10	CY
618.1411	Seeding Method 3- Plan Quantity -	1	Unit
619.1201	Mulch	1	Unit
619.1401	Erosion Control Mix	10	CY

Houghton Brook – BH-1992(500) – 019925.00 – Sheet Number 2 of 5

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
615.07	Loam	10	CY
618.1411	Seeding Method 3- Plan Quantity -	1	Unit
619.1201	Mulch	1	Unit
619.1401	Erosion Control Mix	10	CY



PRINTED ON RECYCLED PAPER

Consider this change and information prior to submitting your bid on October 16, 2013.

Sincerely,



For

George M. A. Macdougall P.E.  
Contracts & Specifications Engineer

SCHEDULE OF ITEMS

CONTRACT ID: 019924.00

PROJECT(S): BH-1992(400)  
BH-1992(500)

CONTRACTOR : \_\_\_\_\_

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
SECTION 0001 PROJECT ITEMS						
0010	203.20 COMMON EXCAVATION	CY 40.000				
0020	502.248 UNDERWATER GROUT BAGS	CY 1.000				
0030	502.83 PRECAST BLOCK MAT BOWLEY BROOK	SF 1950.000				
0040	502.83 PRECAST BLOCK MAT HOUGHTON BROOK	SF 1850.000				
0050	511.07 COFFERDAM: BOWLEY BROOK LEFT ABUTMENT	LUMP	LUMP			
0060	511.07 COFFERDAM: BOWLEY BROOK RIGHT ABUTMENT	LUMP	LUMP			
0070	511.07 COFFERDAM: HOUGHTON BROOK LEFT ABUTMENT	LUMP	LUMP			
0080	511.07 COFFERDAM: HOUGHTON BROOK RIGHT ABUTMENT	LUMP	LUMP			
0090	610.07 STONE FILL	CY 120.000				
0100	613.319 EROSION CONTROL BLANKET	SY 40.000				

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PAGE: 2

SCHEDULE OF ITEMS

DATE: 131010

REVISED:

CONTRACT ID: 019924.00

PROJECT(S): BH-1992(400)  
BH-1992(500)

CONTRACTOR : \_\_\_\_\_

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0110	615.07 LOAM	CY 20.000				
0120	618.1411 SEEDING METHOD NUMBER 3 - PLAN QUANTITY	UN 2.000				
0130	619.1201 MULCH - PLAN QUANTITY	UN 2.000				
0140	619.1401 EROSION CONTROL MIX	CY 20.000				
0150	620.50 EROSION CONTROL FILTER LAYER	SY 170.000				
0160	629.05 HAND LABOR, STRAIGHT TIME	HR 20.000				
0170	631.121 HEAVY DUTY ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	HR 20.000				
0180	631.172 TRUCK - LARGE (INCLUDING OPERATOR)	HR 20.000				
0190	652.33 DRUM	EA 50.000				
0200	652.34 CONE	EA 100.000				
0210	652.35 CONSTRUCTION SIGNS	SF 200.000				

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SCHEDULE OF ITEMS

PAGE: 3  
 DATE: 131010  
 REVISED:

CONTRACT ID: 019924.00

PROJECT(S): BH-1992(400)  
 BH-1992(500)

CONTRACTOR : \_\_\_\_\_

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0220	652.361 MAINTENANCE OF TRAFFIC CONTROL DEVICES	LUMP	LUMP			
0230	652.38 FLAGGER	HR 80.000				
0240	656.75 TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	LUMP	LUMP			
0250	659.10 MOBILIZATION	LUMP	LUMP			
	SECTION 0001 TOTAL					
	TOTAL BID					

**SPECIAL PROVISION**  
**SECTION 502**  
**STRUCTURAL CONCRETE**  
(Precast Block Mat)

Add the following to the end of Section 502- Structural Concrete:

Description. This work shall consist of excavating, grading, and placing an articulating concrete block system hereinafter, Precast Block Mat, designated on plans as precast block mat, on designated channels in accordance with these specifications and in reasonably close conformity with the lines, grades and thickness as shown in the plans or as directed by the Resident. The Contractor shall furnish all labor, materials, equipment, and incidentals required to perform all operations in connection with the installation of the Precast Block Mat. This Precast Block Mat system shall be made up of mattresses of concrete blocks and connecting cables with geotextile attached or the concrete blocks can be placed on top of geotextile material. The Precast Block Mats are made up of precast concrete blocks interlocked by cables cast within each block, forming an articulating concrete block armor layer. Refer to plans for approximate limits required. Multiple irregular mat sizes may be designed for side by side placement and clamped together to provide one homogeneous erosion protection system.

Design. The Precast Block Mat system shall be comprised of concrete blocks that are wet-cast. The size of the concrete blocks shall be approximately 15.5 inches square at the base and 11.5 inches square at the top face (a truncated pyramid shape.) The height of the block shall be as noted on the contract plans. No holes will be allowed in the concrete blocks. The Contractor may submit a site specific design for an alternate size mat. Any alternate design considered shall meet the requirements of the specifications listed herein.

If the required block height is not noted on the contract plans than the blocks shall be designed for the following conditions:

Flow	Velocity (ft/s)	Shear Stress (psf)
Q500	15	6.0

Concrete for precast block mat. The minimum required concrete strength is 4000 psi at 28 days. Air entrainment of 4 percent to 7 percent shall also be added. All applicable ASTM standards will be met in the production of the concrete. The finished concrete product shall consist of a minimum density of 140lbs/cf, in an average of 3 units. No individual block shall consist of a minimum concrete density lower than 135lbs/cf.

Individual concrete blocks shall be solid and intact with the stainless steel cables fully imbedded inside. No cracks are allowed in any of the concrete blocks. Repairing of individual concrete blocks is not allowed. The surface of the concrete blocks shall be true

and even, free from stone pockets and depressions or projections and of uniform texture. All mats shall be handled, stored and shipped in such a manner as to eliminate the chance of chipping, cracks, fracture and excessive bending stressed. Any units found damaged upon delivery, or damaged after delivery, shall be subject to rejection by the Resident.

Cables. Component cables of the articulating block system shall be constructed of high tenacity, low elongating, and continuous stainless steel aircraft cable of type 302 or 304. The cable shall be of type 1 x 19 construction. Cable shall be integral (cast into) to the concrete block, and shall traverse through each block in both longitudinal and lateral directions of the mat system.

Geotextile. The geotextile used is to be specified by the manufacturer of the Precast Block Mat. The standard geotextile material used on non-specific projects is a Class I, non-woven fabric meeting the requirements of Standard Specification 722.03. The geotextile fabric can be attached to the bottom of concrete blocks or the geotextile can be placed separately on the prepared subbase prior to the installation of the Precast Block Mat.

Clamps. Stainless steel wire rope or 3/16" stainless steel U-type clamps shall be used to secure loops of adjoining Precast Block Mats. Sufficient stainless steel clamps shall be used to secure loops of adjoining precast block mats. The standard placement of clamps shall be placed evenly at 4 foot centers interlocking adjoining mats together. A minimum of two clamps shall be used along the edge of a mat to attach to the adjacent mat. Clamps shall be installed as close to the concrete blocks as possible.

Anchoring. Precast Block Mats shall be anchored in accordance with the manufacturer's recommendations. Anchorage shall be provided along the perimeter of the mat system areas. Anchorage of the leading upstream edge and trailing downstream edge of mat area shall be accomplished by complete burial of at least one entire block row.

Ground Preparations. The subbase of the Precast Block Mat area shall be clear of all deformities such as roots, grade stakes, debris and large stones. The entire area shall be smooth so that intimate contact with each individual block can be achieved. To obtain required streambed elevations, clean borrow meeting the requirements of Subsection 703.12, Aggregate for Crushed Stone Surface, may be used as a leveling base. Minor excavation and shaping shall be accomplished to the extent required to remove obstructions, to prepare an optimal contact surface for the mat systems and to place the top of mat systems in a way that conforms to the established streambed elevations.

If a very large boulder or obstruction is encountered that cannot practicably be removed than the Contractor can choose between one of the following options:

The top of the obstruction or boulder shall be removed so that the precast block mat can go over the obstruction with a maximum slope of 2 horizontal to 1 vertical. The second option is to trim and/or cut the precast block mat to fit as tightly as possible around the

obstruction. The gap between the obstruction and the mat shall be grouted around the entire obstruction. The grout shall completely fill the void space and extend a minimum of one and half blocks on to the precast block mat.

Additionally, the streambed through the bridge site shall be shaped to provide a low flow channel within the stream that will sustain fish passage in low flow conditions. The location of the low flow channel will be determined by the Resident. For a single span bridge, the low flow channel shall be three feet (2 blocks) wide and two feet lower than established streambed. There shall be a 2:1 slope from the bottom of the low flow channel to the established streambed elevation. Diagram of low flow channel configuration can be seen in Figure 1 below. For a multiple span bridge, the low flow channel only needs to be done for one span as determined by the Resident. Once the streambed/ground preparations are complete and the Contractor can demonstrate the cable mats will be installed at the desired streambed elevations (top and bottom of sag), the streambed/ground preparations shall be approved by the Resident so installation can proceed.

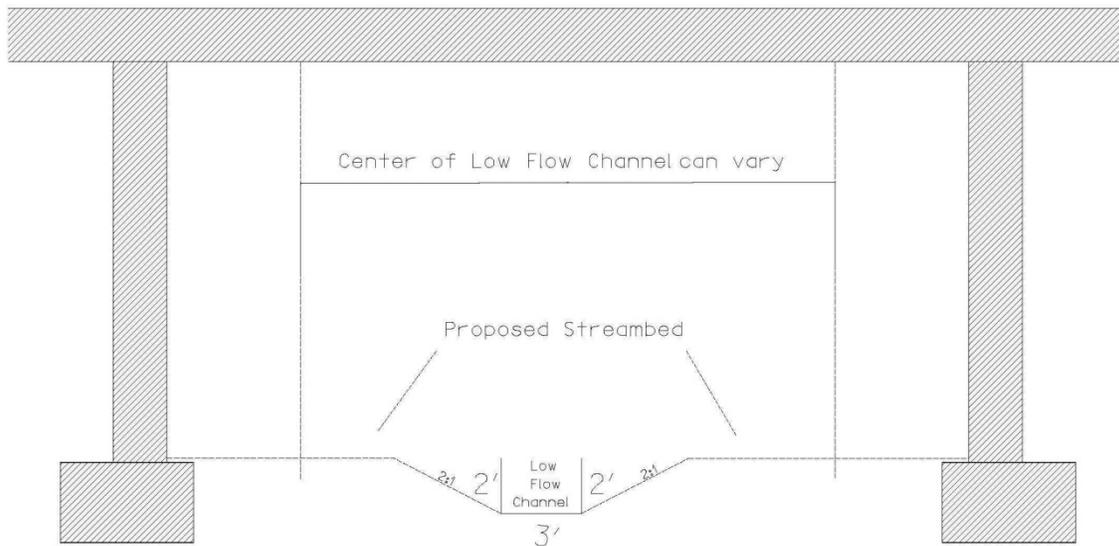


Figure 1.

**Installation.** Placement of the Precast Block Mats shall start at the downstream end of the channel and proceed upstream. It may be necessary to weight down the geotextile outside the limits of the Precast Block Mat to be placed, prior to installation of the Precast Block Mat.

When the geotextile is secured to the bottom of the precast block mat, an overlap of at least 2 feet shall be incorporated on three sides of the mat. The overlap shall provide an area for

the adjoining mats to be placed upon and prevent undermining of the erosion control system.

Rips or damage in the geotextile material shall be repaired in accordance with the manufacturer's recommendations. No individual block within the plane of placed articulating concrete block systems shall protrude more than two inch. The Contractor shall ensure that the concrete blocks are flush and develop intimate contact with the subbase.

If assembled and placed as large mattresses, Precast Block Mats shall be attached to a spreader bar or other approved device to aid in the lifting and placing of the mats in their proper position by the use of a crane or other approved equipment. The equipment used should have adequate capacity to place the mats without bumping, dragging, tearing or otherwise damaging the underlying geotextile. The mats shall be placed side-by-side and/or end-to-end, so that the mats adjoin each other. The gaps between each mat and seams between mats shall not be greater than 2 inches, both below and above water. Grouting will only be permitted where the Precast Block Mats are sealed along structures or at any locations where the stainless steel cables have been cut.

Individual concrete blocks can be cut or trimmed to allow for a tight fit along structures. The Contractor shall make every effort practicable to minimize the number of individual blocks cut. Avoid cutting the stainless steel cables if at all possible. The method of cutting the blocks shall be approved by the Resident. No overlapping of the Precast Block Mats is allowed.

Installation of the Precast Block Mats shall be done during low-flow stream conditions and during the in-stream work window.

Anchor trenches and flanking trenches along upstream and downstream terminations shall be backfilled and compacted flush with the top of the blocks. The integrity of the trench backfill must be maintained so as to ensure a surface that is flush with the top surface of the concrete blocks for its entire service life. Backfilling and compaction of trenches shall be completed in a timely fashion.

Any excess stainless steel cables that protrude above the top of the mats shall either be tucked underneath the mats, or secured with nylon cable ties (i.e. zip ties) so that the stainless steel cable is below the top of the block.

Once all clamps and anchors have been installed, inspected and accepted, the gaps in the articulating concrete block system shall be partially backfilled from the geotextile material up to the flush surface of the concrete block. For Precast Block Mats within the stream bed, the mats shall be backfilled with replaced streambed material or a suitable alternative approved by the resident.

Precast Block Mat – Concrete Structure Interface. The interface between the Precast Block Mats and the existing structure, such as an abutment, pier, wing wall, or retaining wall, shall be tightly sealed to prevent the loss of streambed material. The maximum gap between the Precast Block Mat and the abutment, pier, wing wall, or retaining wall shall be two inches. The methods listed below are acceptable methods to accomplish this. The Contractor may propose other methods, but must receive approval in writing from the Resident to proceed.

1. Grout Placement. The interface between the Precast Block Mats and the existing structure shall be sealed using 3000 psi minimum concrete or grout. The concrete or grout shall be minimally as thick as the Precast Block Mat and shall completely encapsulate at least two (2) rows of concrete blocks. . The grout shall be sloped to drain away from the structure. The entire joint between the Precast Block Mat and structure shall be closed at the face of the structure.
2. Grout Filled Bags. Grout filled bags shall be a minimum of one (1) foot thick, three (3) feet wide, and six (6) feet long and placed directly over the interface of the structure and Precast Block Mat so that the completed position of the grout-filled bag is resting atop the Precast Block Mat and against the structure. The bag shall be made of material meeting the properties of a Class 1 erosion control geotextile and shall be equipped with a self-sealing fill valve. If the bag is longer than twenty (20) feet, a second self-sealing fill valve shall be installed. Grout bags shall be butted against each other to form a continuous row along the entire interface.

The grout bags shall be filled using 3000 psi minimum concrete or grout as recommended by the manufacturer.

#### Test Standards and Specifications.

ASTM C31	Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Specifications for Concrete Aggregates
ASTM C39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C42	Obtaining & Testing Drilled Cores and Sawed Beams of Concrete
ASTM C140	Sampling and Test Concrete Masonry Units
ASTM C150	Specification for Portland Cement
ASTM C207	Specification for Hydrated Lime Types
ASTM C618	Specifications for Fly Ash and Raw or Calcined Natural Pozzolans for use in Portland Cement Concrete.
ASTM D18.25.04	Specifications for Articulated Concrete Clock Systems (In Design)

ASTM D698	Laboratory Compaction Characteristics of Soil Using Standard Effort
ASTM D3786	Hydraulic Burst Strength of Knitted Goods and Non-woven Fabrics
ASTM D4355	Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water
ASTM D4491	Water permeability of Geotextiles by Permittivity
ASTM D4533	Trapezoidal Tearing Strength of Geotextiles
ASTM D4632	Breaking Load and Elongation of Geotextiles (grab Method)
ASTM D4751	Determining Apparent Opening Size of a Geotextile
ASTM D4833	Index Puncture Resistance of Geotextiles, Geomembranes and Related Products
ASTM D5101	Measuring the Soil-Geotextile System Clogging Potential by the Gradient Ratio
ASTM D5567	Hydraulic Conductivity Ratio Testing of Soil/Geotextile Systems
ASTM D6684-04	Standard Specification for Materials and Manufacture Articulating Concrete Block (ACB) Revetment Systems
AASHTO T88	Determining the Grain-size Distribution of Soil
AASHTO M288-96	Standard Specification for Geotextiles
FHWA-RD-89-199	November 1989 Standard Testing for Hydraulic Stability of Concrete Revetment System During Overtopping Flow
FHWA-RD-88-181	Minimizing Embankment Damage During Overtopping Flow (Replace by FHWA-RD-89-199 in November 1989)

Quality Control. Units shall be sampled and tested in accordance with ASTM D 6684-04, Standard Specification for Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems.

All units shall be sound and free of defects that would interfere with either the proper placement of the unit or impair the performance of the system. Surface cracks incidental to the usual method of manufacture, or surface chipping resulting from the customary methods of handling in shipment and delivery, shall not be deemed grounds for rejection. Chipping resulting in a weight loss exceeding 10 percent of the average weight of a concrete unit shall be deemed grounds for rejection. Blocks rejected prior to delivery from the point of manufacture or at the jobsite shall be repaired with structural grout or replaced at the expense of the Contractor. The Department or their authorized representative shall be accorded proper access to facilities to inspect and sample the units at the place of manufacture from lots ready for delivery.

Field installation procedures shall comply with the procedures utilized during the hydraulic testing procedures of the recommended system. All system restraints and ancillary components shall be employed as they were during testing. For example, if the hydraulic testing installations utilize a drainage layer, then the field installation must utilize a drainage layer; and installation without the drainage layer would not be permitted.

The theoretical force-balance equation used for performance extrapolation tends for conservative performance values of thicker concrete units based on actual hydraulic testing of thinner units. When establishing performance values of thinner units based on actual hydraulic testing of thicker units, there is a tendency to overestimate the hydraulic performance values of the thinner units. Therefore, all performance extrapolation must be based on actual hydraulic testing of a thinner unit then relating the values to the thicker units in the same family of blocks.

Additional testing, if required, for alternate designs shall be the responsibility of the Contractor.

Hydraulic Testing, Calculations and Submittals. The Contractor shall submit to the Resident all manufacturers' hydraulic testing and calculations in support of the proposed articulated concrete block system and geotextile filter fabric. All calculations submitted must be consistent with the hydraulic details found in the section and stamped by a Professional Engineer licensed in the State of Maine.

The Contractor shall furnish the manufacturer's Certificates of Compliance for Precast Block Mat, revetment cable, and any revetment cable fittings and connectors as specified in this Special Provision. The Contractor shall also furnish the manufacturer's specifications, literature, shop drawings for the layout mats, and any recommendations, if applicable, that are specifically related to the Project. The Contractor shall also submit the proposed method for anchoring the Precast Block Mat, both to the embankments and the streambed/abutments.

Alternative materials may be considered. Such materials must be approved in writing by the Resident. Submittal packages must include, as a minimum, the following:

1. Full-scale laboratory testing and associated engineered calculations quantifying the hydraulic capacity of the proposed Precast Block Mat system in similar conditions to the specific project. Submitted calculations must be PE stamped by a duly licensed Engineer registered to practice in the State of Maine.
2. A list of five comparable projects, in terms of size and applications, in the United States, where the results of the specific alternate revetment system used can be verified after a minimum of five (5) years of service life.

Method of Measurement. The Precast Block Mat will be measured for payment by the area of articulating block mat system in square feet, accepted and in place.

Basis of Payment. The accepted quantity of Precast Block Mat shall be paid for at the contract unit price. Such payment being full compensation for all labor, materials, equipment, Quality Control, submittals, testing and incidentals necessary to complete the

work as specified including, but not limited to, ground preparation, Precast Block Mats, geotextile, anchors, clamps, grouting, grout bags and backfill.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
502.83 Precast Block Mat	Square Foot