MEMORANDUM

To: Scott Rollins  
Mackenzie Kersbergen  
MaineDOT

From: Darin Bryant  
T.Y. Lin International

Date: October 21, 2019

Address: Brunswick/Topsham, ME

CC: File

Re: Frank J. Wood Bridge – 60% Submission – Materials and Finishes

As part of the Memorandum of Agreement for this project between the Maine Department of Transportation, Federal Highway Administration, and others, 60% plans are to be submitted for review by the Maine SHPO, the Bridge Design Committee, and the consulting parties to ensure compatibility with the existing historic features. Design plans stamped “60% Review Set; 10/21/2019” have been developed for this required submission which show the layouts, outlines, and limits for the project. To further clarify those preliminary plans, the additional information contained in this memo outlines the materials and finishes which have yet to be detailed on the design plans.

1. Bridge Rail

A combination parapet/rail system shown in the rendering below will be used on the bridge itself. Arched inset panels in the wall will be smooth, while the insets in the light columns will be inlaid with a brick pattern (but no color). The metal railing at the top will be black. The rendering below illustrates the appearance and configuration being designed for this feature.
2. **Approach Rail**

   The safety rail behind the sidewalk on the roadway approaches to the bridge will be a black, metal rail system with vertical elements which partially resemble the top portion of the combination parapet/rail system on the bridge. The photo below shows a similar system used on the Naples Causeway project. The rail system for this project will appear similar, except the posts will be solid and there will be an additional horizontal member at the bottom to support the bottom of the vertical elements. The photo below illustrates the appearance and configuration being designed for this feature.

3. **Lighting Type**

   The type of lighting to be used on both on the bridge and on the roadway approaches is shown in the rendering below.
4. **Pier Shape**

Trapezoidal piers are being designed as support for the bridge as shown here:

![Pier Shape Image](image_url)

This trapezoidal shape seems to be a good fit for this site from an engineering perspective. Another option studied early in the design process (a daylight arch pier) would have been somewhat more challenging and expensive. Based on the March 14, 2018 DAC vote, the solid, trapezoidal shape was selected as the preferred pier shape and is currently being used in the design of the project.

5. **Pier Surface Treatment**

A stone color ashlar finish (faux-stone) is being designed for the pier concrete surfaces. The rendering in Item 4 (above) shows the pier surface treatment being used in the design. Final confirmation of the specific texture and shape of the stone finish will occur closer to the end of the design process.
6. Bump-Out Geometry/Placement

MaineDOT has agreed to provide two crescent-shaped bump outs on the bridge, one on the upstream side and one on the downstream side. The current design shows 3 piers on the proposed replacement bridge. The first pier on the Brunswick side will be located just north of the power outfall channel (shown is the red circle to the right in the rendering below). The downstream bump out would be located over this pier. Pier 2 would have the upstream bump out (shown is the red circle to the left in the rendering below). Dimensions of the bump outs are shown in the detail below the rendering.
7. **Added Bridge Width**

MaineDOT has also agreed to provide 2 extra feet of bridge width, increasing the total bridge width from 45’-2” to 47’-2”. In addition, the final bridge rail may be somewhat narrower than the original design, providing a few more inches in available width. This added width is being split equally between the sidewalks on either side of the road. The following typical section illustrates the lane / shoulder-bike path / sidewalk configuration currently being designed for the bridge:

![Diagram of bridge section](image)

- 47’-2”
- 23’-9”
- 32’-0” (Travelway)
- 11’-0” (Travel Lane)
- 5’-0” (Shoulder)
- 16’-7” (Sidewalk)
- 11’-0” (Level)
- Ornamental Traffic/Pedestrian Railing
- Profile Grade
- Vertical Bridge Curb Type 1 (Typ.)
- 9’ Structural Concrete Side
8. Shoulder/Bike Lane Color

The bike lanes will be painted brick red to match the adjacent Cabot Mill buildings. The final treatment will need to be slip-resistant. Options on how to achieve this in a durable manner will be developed later in the design process. The rendering below illustrates the appearance and configuration currently being designed for the colored shoulder/bike lane:
9. Sidewalks

The sidewalks on the bridge and on the majority of the approach roadways will be brushed concrete. On the northerly end of the project, the sidewalks in Topsham will transition to brick to match in with the existing sidewalk materials in that location. The photo below illustrates the appearance currently being designed for the brushed concrete sidewalks:
BRUNSWICK - TOPSHAM
CUMBERLAND & SAGADAHOC
COUNTIES
FRANK J. WOOD BRIDGE
OVER
ANDROSCOGGIN RIVER
ROUTE 201/24
PROJECT NO. STP-2260(300)X
PROJECT LENGTH 0.3 mi.
BRIDGE NO. 2016

60% REVIEW SET
10/21/2019

PROJECT LOCATION
Frank J. Wood Bridge # 2016 on the Brunswick-Topsham TL which carries Route 201/24 over the Androscoggin River.

PROGRAM AREA
BRIDGE PROGRAM

OUTLINE OF WORK
BRIDGE REPLACEMENT
Steel Rail

Proposed Construction

Addition of

Temporary Construction Impacts
Cumberland - Townsend

1+50.00 to 2+00.00

Waterline

39.45 RT.

EXIST. 8", HARDWOOD,

STA. 2+00.45

54.51

2.00%

52.16

2.00%
Concrete Seal at Piers 2 and 3 shall be paid under Item 502.249, Structural Concrete Piers (Placed Under Water).

Concrete seal at Pier 1 shall be paid under Item 502.24, Structural Concrete Piers (Placed Under Water).

The depth of the seal is set for a maximum water elevation of 136.0 and the cofferdam shall be vented at this elevation. If the water elevation at the time of construction is higher, the depth of the seal shall be adjusted.

The horizontal pay limit for seal concrete shall be to the dimensions shown on the plans. No additional payment will be made for concrete placed outside of these limits.

The seal concrete placement dimensions represent the minimum seal size necessary to meet design requirements and are not based on the use of any particular sheet pile section.

The seal concrete dowels shall be installed in accordance with Standard Specification Section 511 - Cofferdams. An inspection report of the seal concrete placement shall be submitted to the Resident for review. The report shall include bedrock elevation measurements and observations and assess the levelness, cleanliness, and sediment thickness. Sediment measurements and bedrock elevation measurements will be taken at a minimum of 20 evenly disturbed locations.

Each seal shall be cored full depth in at least (3) locations to ensure that the seal was satisfactorily placed. The final core run shall sample the bedrock surface. These locations will be approved by the Resident. Seal concrete core samples will be a minimum of 20 evenly disturbed locations.

For each core that reveals a void or defect, two additional cores shall be taken after repairs are made. One additional core shall be taken in approximately the same location as the original core. The other core will be located by the Resident. All core holes shall be refilled using a non-shrink grout. The cost of all coring and repairs will be considered incidental to related contract items.

Cores shall be taken after repairs are made. One additional core shall be taken in approximately the same location as the original core. The other core will be located by the Resident. All core holes shall be refilled using a non-shrink grout. The cost of all coring and repairs will be considered incidental to related contract items.

The bedrock surface shall be benched in level steps or made completely level. Cofferdam excavation inspection shall be the responsibility of the Contractor and be conducted in accordance with Standard Specification Section 511 - Cofferdams. An inspection report of the seal concrete placement shall be submitted to the Resident for review. The report shall include bedrock elevation measurements and observations and assess the levelness, cleanliness, and sediment thickness. Sediment measurements and bedrock elevation measurements will be taken at a minimum of 20 evenly disturbed locations.

When sheet piling is used for seal cofferdams, appropriate rolled corners shall be used, and cleaning methods, grout material and grouting methods. The method of placing dowels in the seal concrete shall be approved by the Resident.

The Contractor shall provide a seal dowel submittal for review and approval by the Resident. The submittal shall indicate propsed method of hole preparation, hole diameter, proposed cleaning methods, grout material and grouting methods. The method of placing dowels in the seal concrete shall be approved by the Resident.

The seal concrete shall be placed on bedrock cleaned of all weathered rock, loose fractured rock, boulders and soil. Where the bedrock surface slope exceeds 4H:1V, the bedrock surface shall be benched in level steps or made completely level. Cofferdam cleaning and repairs will be considered incidental to related contract items.

The other core will be located by the Resident. All core holes shall be refilled using a non-shrink grout. The cost of all coring and repairs will be considered incidental to related contract items.

The bedrock surface shall be benched in level steps or made completely level. Cofferdam excavation inspection shall be the responsibility of the Contractor and be conducted in accordance with Standard Specification Section 511 - Cofferdams. An inspection report of the seal concrete placement shall be submitted to the Resident for review. The report shall include bedrock elevation measurements and observations and assess the levelness, cleanliness, and sediment thickness. Sediment measurements and bedrock elevation measurements will be taken at a minimum of 20 evenly disturbed locations.

When sheet piling is used for seal cofferdams, appropriate rolled corners shall be used, and cleaning methods, grout material and grouting methods. The method of placing dowels in the seal concrete shall be approved by the Resident.

The Contractor shall provide a seal dowel submittal for review and approval by the Resident. The submittal shall indicate propsed method of hole preparation, hole diameter, proposed cleaning methods, grout material and grouting methods. The method of placing dowels in the seal concrete shall be approved by the Resident.

The seal concrete shall be placed on bedrock cleaned of all weathered rock, loose fractured rock, boulders and soil. Where the bedrock surface slope exceeds 4H:1V, the bedrock surface shall be benched in level steps or made completely level. Cofferdam cleaning and repairs will be considered incidental to related contract items.

The other core will be located by the Resident. All core holes shall be refilled using a non-shrink grout. The cost of all coring and repairs will be considered incidental to related contract items.

The bedrock surface shall be benched in level steps or made completely level. Cofferdam excavation inspection shall be the responsibility of the Contractor and be conducted in accordance with Standard Specification Section 511 - Cofferdams. An inspection report of the seal concrete placement shall be submitted to the Resident for review. The report shall include bedrock elevation measurements and observations and assess the levelness, cleanliness, and sediment thickness. Sediment measurements and bedrock elevation measurements will be taken at a minimum of 20 evenly disturbed locations.

When sheet piling is used for seal cofferdams, appropriate rolled corners shall be used, and cleaning methods, grout material and grouting methods. The method of placing dowels in the seal concrete shall be approved by the Resident.

The Contractor shall provide a seal dowel submittal for review and approval by the Resident. The submittal shall indicate propsed method of hole preparation, hole diameter, proposed cleaning methods, grout material and grouting methods. The method of placing dowels in the seal concrete shall be approved by the Resident.

The seal concrete shall be placed on bedrock cleaned of all weathered rock, loose fractured rock, boulders and soil. Where the bedrock surface slope exceeds 4H:1V, the bedrock surface shall be benched in level steps or made completely level. Cofferdam cleaning and repairs will be considered incidental to related contract items.

The other core will be located by the Resident. All core holes shall be refilled using a non-shrink grout. The cost of all coring and repairs will be considered incidental to related contract items.

PIER NO. 1 FOOTING PLAN

Flow -->

Concrete Seal

C.J.R. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:

W.P. = Working Point

PI CONCRETE glare

床上C.B. = Construction Joint, Roughen

Surface "X" Profile Min. (Typ.)

G.B. = Working Point

LEGEND:
PIER NO. 2 FOOTING PLAN

LEGEND:
W.P. = Working Point
Surface to Gravel Aft (Typ.)
C.J.R. = Construction Joint, Roughen

Concrete Seal
Footing
Pier Shaft

Flow

PLAN

PIER NO. 2 FOOTING PLAN

LEGEND:
W.P. = Working Point
Surface to Gravel Aft (Typ.)
C.J.R. = Construction Joint, Roughen

Concrete Seal
Footing
Pier Shaft

Flow

PLAN
LEGEND:

C.J. = Construction Joint
C.J.R. = Construction Joint, Roughen
C.J. = Construction Joint

EL. 11.00
Nose Armor
Seal

EL. 14.00

EL. 29.00

EL. xx.xx
Pedestal

Flow
Node Armor

Pier Shaft

Node Armor

Pedestal

Pier Shaft

Pedestal

Pier Shaft

3'-0"

2'-0"

2'-8"

56'-6" (Typ.)

EL. 29.00

C.J.R. (Typ.)

3'-6"

4'-4"

Sta. 9+05.00

Up station (Typ.)

4'-0"

3'-0"

EL. xx.xx

PIER NO. 2 SHAFT PLAN

PIER NO. 2 ELEVATION

PIER NO. 2 END ELEVATION

Upstream End Shown. Downstream End Similar.

NOSE ARMOR DETAIL

@ 1'-0"
stud staggered

@ 1'-0" anchor

Of nose force applied transverse to pier

Ice - Thickness 2 feet, pressure 100 psi at Elevation 147.7, 30%

Wind - 100 mph centerline of pier

Stream flow - Velocity of 6.4 fps skewed at 5° to longitudinal

Buoyancy - Water level assumed at Elevation 147.7

Critical AASHTO Load Combination - Strength III

is 14.0 ksf.

The maximum factored applied footing pressure for pier 1 & 4.

Pier 2 of 6" for Girders 1 & 5 and 8" for Girders 2, and 10…” for Girders 2, 3 & 4 and a bearing height for

the contractor. The elevations given assume an overall

shall be adjusted to accommodate the bearings supplied by

drawing. Adjustments to the bearing pedestal elevations,

bearing heights shown on the "BEARING LAYOUT"

The bearing pedestal elevations shown are based on

Concrete, Piers.

Nose armor, including anchor studs, shall be

stated on that sheet.

if necessary, shall be made according to the provisions

drawing. Adjustments to the bearing pedestal elevations,

bearing heights shown on the "BEARING LAYOUT"

cover of 3 inches unless otherwise noted.

Reinforcing steel shall have a minimum concrete
**LEGEND:**
- CJR: Construction Joint, Roughen
- S.P. = Working Point
- Surface Contour Lines (Typ.)
- Cover - 3 inches unless otherwise noted.

---

**Critical AASHTO Load Combination - Strength III**
- Nose armor, including anchor studs, shall be stated on that sheet.
- The maximum factored applied footing pressure for pier 1 & 2 of 6" for Girders 1 & 5 and 8" for Girders 2, and 10..." for Girders 2, 3 & 4 and a bearing height for the contractor. The elevations given assume an overall pedestal elevations shown are based on cover of 3 inches unless otherwise noted.
- Pedestal Elevations are approximate. The actual elevations shall be adjusted to accommodate the bearings supplied by the contractor. The elevations shown on the "BEARING LAYOUT" drawing. Adjustments to the bearing pedestal elevations, bearing heights shown on the "BEARING LAYOUT" drawing. Adjustments to the bearing pedestal elevations, bearing heights shown on the "BEARING LAYOUT" drawing.
- Reinforcing steel shall have a minimum concrete cover of 3 inches unless otherwise noted.

---

**Nose Force Applied Transverse to Pier**
- Ice - Thickness 2 feet, pressure 100 psi at Elevation 147.7, 30% centerline of pier
- Wind - 100 mph
- Stream flow - Velocity of 6.4 fps skewed at 5° to longitudinal centerline of pier
- Buoyancy - Water level assumed at Elevation 147.7

---

**Other Notes:**
- The maximum factored applied footing pressure for pier 1 & 2 of 6" for Girders 1 & 5 and 8" for Girders 2, and 10..." for Girders 2, 3 & 4 and a bearing height for the contractor. The elevations given assume an overall pedestal elevations shown are based on cover of 3 inches unless otherwise noted.
- Pedestal Elevations are approximate. The actual elevations shall be adjusted to accommodate the bearings supplied by the contractor. The elevations shown on the "BEARING LAYOUT" drawing. Adjustments to the bearing pedestal elevations, bearing heights shown on the "BEARING LAYOUT" drawing.
- Reinforcing steel shall have a minimum concrete cover of 3 inches unless otherwise noted.

---

**Flow 7'-0"**
- Pier Shaft
- Concrete Seal
- Footing

---

**Flow 2'-0"**
- Pier Shaft
- Concrete Seal
- Footing
STRUCTURAL STEEL NOTES

1. Girders may be either rest notched or cut notched in accordance with ASTM specifications or the option of the Contractor.

2. Column footings, as shown, are computed to compensate for all dead load deflections and for the curvature of the finished grade profile.

3. No transverse butt weld splice will be allowed in the flange plates or web plates within 3 ft. or 40 percent of the span length. Transition flanges shall be at least 3 ft. from transverse butt welds in the web plates and no transverse web or flange butt welds shall be located within 3 ft. of other transverse welds. Connection plates to web welds or to transverse welds may be transverse butt welds but welds shall be allowed in areas of stress reversal.

4. Sections of flange plates or web plates between transverse shop splices or between a transverse shop splice and a field splice shall be not less than 30 ft. in length unless otherwise shown on the plans.

5. Flange plates may be steel conforming to the requirements of ASTM Grade 50.

6. An approved method for an alternate to the designated cross frames may be changed by the Contractor. All cross frames to be detailed and fabricated to fit under full dead load.

7. Field shop splice connections shall be made using 1/2" diameter, ASTM A325. All transverse welds on a cross frame connection shall be transverse butt welds unless otherwise shown on the plans.

8. Steel for cross frames, connection plates and stiffeners shall be ASTM A709, Grade 50.

9. Bearing stiffeners shall be plumb after erection and dead loading of the structure. Intermediate web stiffeners may be either plumb or normal to the top flanges.

10. Cross Frame connection plates may be either plumb or normal to the top flange.

11. All cross frames except those of Pier No. 2 are radial.

12. Diaphragms shall be 1 1/2" minimum thickness and 3" minimum width except where other flange exceeds 32 in. The connection plates shall be 3" minimum width. Intermediate stiffeners shall be 5/8" thick 3/4" minimum.
SUPERSTRUCTURE SLAB - SPAN NO. 1

SLAB PLACEMENT SEQUENCE

Direction of Placement

Sequential Placement Number (Typ.)

Span No. 1 = 260'-0"

Span No. 2 = 226'-0"

Span No. 3 = 205'-0"

Span No. 4 = 145'-0"

Direction of Placement

SSP - 226'-0"

Sequential Placement Number (Typ.)

Direction of Placement

Sequential Placement Number (Typ.)

Span No. 1 = 260'-0"

Span No. 2 = 226'-0"

Span No. 3 = 205'-0"

Span No. 4 = 145'-0"

Direction of Placement

Sequential Placement Number (Typ.)

Span No. 1 = 260'-0"

Span No. 2 = 226'-0"

Span No. 3 = 205'-0"

Span No. 4 = 145'-0"

Direction of Placement

Sequential Placement Number (Typ.)

Span No. 1 = 260'-0"

Span No. 2 = 226'-0"

Span No. 3 = 205'-0"

Span No. 4 = 145'-0"

Direction of Placement

Sequential Placement Number (Typ.)

Span No. 1 = 260'-0"

Span No. 2 = 226'-0"

Span No. 3 = 205'-0"

Span No. 4 = 145'-0"

Direction of Placement

Sequential Placement Number (Typ.)

Span No. 1 = 260'-0"

Span No. 2 = 226'-0"

Span No. 3 = 205'-0"

Span No. 4 = 145'-0"

Direction of Placement

Sequential Placement Number (Typ.)

Span No. 1 = 260'-0"

Span No. 2 = 226'-0"

Span No. 3 = 205'-0"

Span No. 4 = 145'-0"

Direction of Placement

Sequential Placement Number (Typ.)

Span No. 1 = 260'-0"

Span No. 2 = 226'-0"

Span No. 3 = 205'-0"

Span No. 4 = 145'-0"

Direction of Placement

Sequential Placement Number (Typ.)

Span No. 1 = 260'-0"

Span No. 2 = 226'-0"

Span No. 3 = 205'-0"

Span No. 4 = 145'-0"
SUPERSTRUCTURE SLAB - SPAN NO. 3