

# BUREAU OF ENVIRONMENT CONFERENCE REPORT

**SUBJECT:** NHDOT Monthly Natural Resource Agency Coordination Meeting

**DATE OF CONFERENCE:** July 16, 2014

**LOCATION OF CONFERENCE:** John O. Morton Building

**ATTENDED BY:**

**NHDOT**

Christine Perron

Ron Crickard

Jim Kirouac

Chris Carucci

Doug Holmes

Joe Adams

**Federal Highway**

**Administration**

Jamie Sikora

**Army Corps of Engineers**

Michael Hicks

**EPA**

Mark Kern

**NHDES**

Gino Infascelli

Lori Sommer

**NH Fish & Game**

Carol Henderson

**Normandeau Associates**

Ian Broadwater

Jameson Paine

**FST, Inc**

Deb Duhamel

John Stockton

Dave McNamara

**GM2, Inc**

Richard Geikie

Tom Levins

*(When viewing these minutes online, click on an attendee to send an e-mail)*

**PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH:**

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**NOTES ON CONFERENCE:****Finalization of June Meeting Minutes**

The June 18, 2014 meeting minutes were finalized.

**Harts Location-Carroll, X-A003(275), 26162**

Chris Carucci provided an overview of the project. This is a culvert repair project funded under the Federal Culvert Repair Program. The culvert is a Tier 3 Stream Crossing, classified as a Bridge, and carries the headwaters of the Saco River under US Route 302. The culvert inlet is in the Town of Carroll, partly within the White Mountain National Forest and partly within the Conway Scenic Railroad right-of-way. The lower portion of the culvert is within the Town of Harts Location, partly within the highway right-of-way, railroad right-of-way, and Crawford Notch State Park. The Town Line is also the Carroll County/Coos County line.

The culvert is a corrugated metal plate arch originally constructed in 1958 and modified in 1961. The culvert length is approximately 950', with the alignment primarily under US Route 302. The culvert has less than 3' of cover for most of its length. The inlet is a complex concrete structure including retaining walls, a 5' x 16' opening and a transition section. The upper pipe segment is 137" wide x 87" high, 325' long, at 0.4% slope. The middle pipe segment is 103" wide x 71" high, 322' long at 3.9% slope. A smooth tapered concrete transition connects these segments. The lower pipe segment is 103" wide x 71" high, 276' long at 10% slope. A concrete energy dissipator is connected to the pipe outlet, which then flows to a very steep channel composed of ledge outcrops and boulders. Bridge inspectors detected corrosion in the top of the pipe in 2012. The Bureau of Bridge Maintenance patched two locations in the summer of 2012, and recommended that a permanent repair project be initiated.

The drainage area is about 867 acres, and is expected to generate 450 cfs in a 50 year storm and 700 cfs in a 100 year storm. There is significant storage in the lower watershed, including Saco Lake (approximately 7 acres), which has a dam, and a large wetland area (approximately 9 acres) on the west side of US Route 302. After accounting for storage effects, the flow through the culvert is 330 cfs for the Q50 and 430 cfs for the Q100. The existing culvert capacity is 470 cfs at maximum allowable headwater, which is set at 1' below the railroad bed. The existing culvert outlet velocity is around 20 ft/s at Q100. The existing energy dissipator was not modelled because it does not fit any of the standard types. It was evaluated for structural capacity, which indicated that it can withstand up to 40 ft/ sec outlet velocity. There is very little baseflow during dry periods (4" – 6" deep in the upper pipe), and little to no sediment transport, due to the large wetland just upstream.

Numerous options have been considered, including replacement with a structure recommended by the NH Stream Crossing Guidelines, replacement in-kind, several sprayed-on lining materials, and a corrugated metal liner. Two options are being developed further – a cement mortar lining, sprayed onto the interior of the culvert at a thickness of about 3", and a corrugated metal liner, which is constructed inside the pipe one plate at a time and then the annular space is filled with grout.

The cement lining increases capacity and velocity due to the smoother interior surface. Q100 velocity would be just under the 40 ft/sec allowable velocity. The metal liner would be one size smaller, and based on preliminary hydraulic analysis, would reduce capacity by about 15%. To restore the lost capacity, a thin cement lining could be sprayed inside the new metal liner on the first two segments of pipe. The lower pipe has significantly more capacity due to its steeper slope. The lower pipe would remain corrugated and would produce about the same outlet velocity as the existing.

The metal liner with grouted space appears to be the most durable option, and is also currently the least cost. The Department is still investigating the cost of the additional sprayed on interior coating. The mortar lining is relatively new, and only one NHDOT project has used it, with good results. It has been used in other States, and all available information indicates that it is a durable and cost effective lining method. Both of these options would require only minimal temporary wetland impacts for installation of a water diversion. Both options would allow larger storm events to pass through the culvert. Work operations would have to stop whenever a significant rainfall is forecast. A temporary diversion would convey a 2 year storm (about 2  $\frac{3}{4}$ " of rain in 24 hours). The diversion would be accomplished with a 15" plastic pipe and cofferdam, preferably with the diversion pipe placed through the existing culvert, but pumping around the existing culvert may also be an option. A 15" diversion pipe would impound about 5' of water (about 8 ac-ft).

Christine Perron noted that she has coordinated with Jacquie Colburn at DES, who visited the site with Shane Csiski. Given the length and slope of the structure, they did not have any concerns with lining the existing structure, but did have some questions about construction methods that will be answered as soon as an alternative is chosen.

Carol Henderson asked if diverting the stream was necessary. C. Carucci responded that any alternative would require stream diversion. Work would be stopped during storms. He anticipated the construction period to be relatively short.

Jamie Sikora asked if any easements would be required on the State or Federal land. C. Carucci commented that coordination with DRED and the US Forest Service still needed to occur to determine if any easements or agreements would be necessary. J. Sikora indicated that he did not expect any concerns regarding Section 4(f) impacts if easements are required.

Gino Infascelli noted that, as a Natural segment of a Designated River, the appropriate rules would need to be addressed, which he thought allowed only temporary impacts to the river. C. Perron replied that she would ensure that the project complies with the rules. She noted again that the DES Rivers Program did not have concerns with lining the pipe, and added that the Local Advisory Committee is currently inactive.

C. Carucci noted that the project is currently scheduled to advertise in January 2015, with construction taking place during low flows in Summer 2015.

*This project has not been previously discussed at a Monthly Natural Resource Agency Coordination Meeting.*

### **Bedford, X-A001(160), 16156**

David McNamara of FST presented an overview of the project. The existing Bowman Brook Culvert is on the NHDOT's red list, and was recently downgraded to critical. The culvert is a 90" corrugated metal pipe that runs under NH Route 114 as well as the Old Bedford Road bridge, which crosses over NH Route 114. Two alternatives were presented, a relocated 23' wide three sided box culvert, sized to meet current stream crossing guidelines, as well as a sliplining option. This option would also shorten the existing culvert to approximately 100 feet in length. Grading and new retaining walls would be necessary to shorten the culvert. This option would slightly increase flood elevations upstream; however, an overflow pipe could be added to maintain these elevations.

Carol Henderson asked if, instead of sliplining, a new, larger box culvert could be placed in the same location as the existing pipe. D. McNamara explained that had been considered, however it was felt that

there was too much risk. The existing pipe is set into ledge now, and a new culvert would require additional ledge removal. The ledge would be removed below the footings for the Old Bedford Road bridge piers, and within 2' of them horizontally. In addition, all the work would need to take place under the Old Bedford Road Bridge, which has 16' of clearance. There would be risk to the structural integrity of the existing bridge, as well as to cost and traffic impacts. The angle of the culvert wouldn't allow traffic to be maintained. It would need to be detoured, and due to the construction constraints, it would be very difficult to predict a detour length. The detour would be over local roads and through residential neighborhoods. It is not considered something that would be feasible for an extended period.

C. Henderson asked about the longevity of sliplining. D. McNamara stated they have a life span of approximately 75 years.

Lori Summer asked about upstream conditions. D. McNamara responded that there are 3 similarly sized culverts within about a mile upstream, including one other under NH Route 114.

L. Summer asked how an increase in the floodplain would be handled. D. McNamara said an overflow pipe would be proposed. Based on preliminary sizing, the pipe is expected to be in the range of 36" diameter.

Mike Hicks asked how much smaller the culvert would be after sliplining, and if the culvert would need to be sliplined again in 50 years or so. D. McNamara replied that sliplining would reduce the pipe size by approximately 10%. John Stockton from FST noted that would be within the expected life span of the bridge over NH Route 114. The culvert would likely be addressed with a reconstruction of the bridge, when the culvert and bridge could be designed and built together.

Mark Kern asked about costs. Conceptual estimates have the sliplining option at just over \$1 million while the new 23' wide culvert relocation would be in the \$3 to 4 million dollar range.

Gino Infascelli asked to see photos. Photos of the upstream culverts were provided and Ian Broadwater from Normandeau provided a description of the wetland types within the project area.

C. Henderson asked if there were potential concerns with woody debris blocking a sliplined culvert. I. Broadwater agreed with this concern and that the culvert should be larger. The corrugations within the existing culvert are filled with cobbles, indicating interruption in sediment transport. There is also a 3-4" perch at the culvert outlet. C. Henderson recommended that the perch be addressed in a sliplining option. It was agreed that this could be addressed.

L. Sommer asked if there was any opportunity for floodplain restoration. I. Broadwater felt there may be some opportunity upstream, but there does not appear to be much flood damage within the area.

D. McNamara discussed the schedule. The project is a priority, and the intent is to move right into the development of a NEPA document. There are also Right of Way questions being worked out that may impact the alternative selection.

Mark Kern asked C. Henderson if the area was important for fisheries. She didn't know. M. Kern noted that the larger culvert was a better option in general for natural resources, but it may not be a practical choice, particularly if there are several other problems in the vicinity. He wasn't sure that the larger culvert would be worth the cost. G. Infascelli noted that the upstream culverts are known problems in the vicinity of the project.

Mike Hicks commented that the 90 degree turn required for a new relocated culvert could present long term maintenance concerns.

Jamie Sikora suggested that other stream crossings in the vicinity of the project could be evaluated in order to support a preferred alternative.

L. Sommer requested that opportunities for enhancements within the watershed be explored.

*This project has not been previously discussed at a Monthly Natural Resource Agency Coordination Meeting.*

### **Winchester, X-A002(760), 23738 and Swanzey, X-A002(758), 23737**

The purpose of this meeting was to introduce two projects that propose to provide scour protection at Sawyer's Crossing and Gunn Mountain Road Bridges over the Ashuelot River in Swanzey and Winchester, respectively. Both bridges are historic covered bridges. Tom Levins of GM2 Associates provided an introduction. Each project involves constructing scour countermeasures to prevent scour damage at each of the historic covered bridge sites. The covered bridges were rehabilitated in the 1990s and are in very nice condition. The Swanzey bridge rehabilitation project included constructing stone fill at the west abutment and pier. The stone fill is still in place at the abutment, but not entirely at the pier. No stone fill was constructed at the east abutment. The Winchester bridge rehabilitation project plans showed stone fill at both abutments and the pier but was not part of the project. It was labeled "by others." It does not appear that the stone fill was placed, or it has been transported downstream by strong flows.

Plan of Action (POA) reports were prepared for each bridge in 2010 and it was determined that each bridge was scour critical. The Department received funds from the National Historic Covered Bridge Preservation Program for these municipally owned historic covered bridges. GM2 is proposing riprap at the abutment locations for each bridge site. The POA recommended partially grouted riprap at only the west abutment in Swanzey. GM2 is proposing riprap at the east abutment due to evidence of undercutting along river bank. Standard riprap will be suitable at the abutment locations and will be cost effective. It was determined that existing riverbed conditions were not suitable for using partially grouted riprap and control of grout would be difficult with respect to water quality. The POA also recommended partially grouted riprap at pier locations for both sites. Standard riprap has not been effective in the past at the pier locations. GM2 has evaluated other alternatives for scour countermeasures at the piers, including A-Jacks and Articulating Concrete Block mats (ACBs). GM2 is proposing to use A-Jacks at both pier locations because they will be the most effective scour countermeasure, the area of impact is significantly less, and the construction will be easier. Access for construction will be from town owned parcels located in the northwest quadrant in Swanzey and the northeast quadrant in Winchester.

Rich Geike of GM2 discussed each alternative in more detail, citing pros and cons and the construction operations anticipated. He provided more detail regarding the options the Department has and how deep each may be installed. He noted that each alternative could be buried several feet deep (approximately four feet) in the river and left either below grade and backfilled to avoid seeing the scour protection or buried slightly less (18 inches to two feet) and left above grade adjacent to the pier.

Jameson Paine of Normandeau Associates provided a brief overview of resource reviews completed to date, as well as ongoing efforts to assist in alternatives evaluations and to minimize impacts to resources in the area. He noted that cultural resource reviews were being coordinated through the NH Division of Historical Resources. In addition, as the river is a NH Designated River, coordination has occurred with the river's Local Advisory Committee (LAC). No concerns were noted for the Winchester project. The LAC stated a concern that the Swanzey project may disturb Dwarf wedgemussels in the river.

Coordination with the NH Floodplain Management Coordinator indicates that a portion of both proposed projects is located in a special flood hazard area (Zone AE) and in the floodway portion of the Ashuelot River. As such, no encroachments in the floodways are allowed without further coordination with FEMA.

Normandeau staff has been on site to delineate wetlands, top of bank, ordinary high water, and invasive species locations. Jurisdictional impacts will be calculated once a preferred alternative has been selected.

A review of the project site by the NH Natural Heritage Bureau indicates the likely presence of Dwarf wedgemussels within the section of Ashuelot River in Swanzey. The site is immediately upstream of an area where Dwarf wedgemussels were relocated prior to the removal of the Homestead Dam in Swanzey. Coordination with Susi von Oettengen of the US Fish and Wildlife Service confirmed the findings. She felt that it was a given that mussels are in the area and that an exploratory Dwarf wedgemussel survey was not warranted. It is agreed that NHDOT will have a professional, licensed diver, who is experienced with mussel surveys, evaluate the presence of dwarf wedgemussels prior to construction and then coordinate with the US Fish and Wildlife Service through a formal Section 7 consultation.

Jamie Sikora asked if there are any parks along either project area. J. Paine provided that the project's river access in Swanzey is through Town-owned property. At Winchester, T. Levins provided that access is through a town-owned area with several signs commemorating the covered bridge.

Lori Sommer asked if a crane is to be used to place any materials around the pier. Mike Hicks also asked where access points were to be located. T. Levins said that it will ultimately be up to the project contractor to decide how they will construct the project. Access points and anticipated areas of access within the river were shown in grey polygons on the plans. Christine Perron asked whether a causeway would need to be shown on wetland impact plans. Gino Infascelli and L. Sommer both replied that a causeway and its associated footprint would need to be part of the permit application.

M. Hicks asked how long it would take for construction. R. Geike responded that construction is anticipated to take approximately two to three weeks at each site. He stated that as the Swanzey site always appears to have at least four feet of water, it would have a larger construction window available to complete the work. T. Levins added that construction advertising is tentatively set for 2015, but that date may change.

Jamie Sikora asked if embedding the A-Jacks would provide any benefit to aquatic organisms. R. Geike noted that, in Connecticut, protruding A-Jacks provide habitat for fish.

*These projects have not been previously discussed at a Monthly Natural Resource Agency Coordination Meeting.*