GENTES ROAD BRIDGE REPLACEMENT
ESSEX, VERMONT

SCOPING PHASE REPORT
GENTES ROAD (TH 23) BRIDGE NO. 20
OVER NEW ENGLAND CENTRAL RAILROAD

PREPARED BY:
Mcfarland Johnson
53 Regional Drive
Concord, NH 03301
(603) 225-2978

PREPARED FOR:
Chittenden County Metropolitan Planning Organization

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>PURPOSE &amp; NEED</td>
<td>2</td>
</tr>
<tr>
<td>LOCATION MAP</td>
<td>3</td>
</tr>
<tr>
<td>PHOTOGRAPHS</td>
<td>4</td>
</tr>
<tr>
<td>BACKGROUND INFORMATION</td>
<td>8</td>
</tr>
<tr>
<td>GENERAL</td>
<td>8</td>
</tr>
<tr>
<td>STRUCTURAL CONDITION</td>
<td>8</td>
</tr>
<tr>
<td>HORIZONTAL ALIGNMENT</td>
<td>9</td>
</tr>
<tr>
<td>VERTICAL ALIGNMENT</td>
<td>9</td>
</tr>
<tr>
<td>CLEAR ZONE</td>
<td>9</td>
</tr>
<tr>
<td>SIGHT DISTANCE</td>
<td>9</td>
</tr>
<tr>
<td>CRASH DATA</td>
<td>9</td>
</tr>
<tr>
<td>TRAFFIC</td>
<td>10</td>
</tr>
<tr>
<td>INERMODAL/MULTI-MODEL</td>
<td>10</td>
</tr>
<tr>
<td>ENVIRONMENTAL RESOURCES</td>
<td>10</td>
</tr>
<tr>
<td>AGRICULTURE</td>
<td>10</td>
</tr>
<tr>
<td>ARCHEOLOGY</td>
<td>10</td>
</tr>
<tr>
<td>HISTORICAL RESOURCES</td>
<td>10</td>
</tr>
<tr>
<td>HAZARDOUS MATERIALS</td>
<td>10</td>
</tr>
<tr>
<td>FLOOD PLAINS</td>
<td>11</td>
</tr>
<tr>
<td>FISH AND WILDLIFE</td>
<td>11</td>
</tr>
<tr>
<td>RARE, THREATENED, AND ENDANGERED SPECIES</td>
<td>11</td>
</tr>
<tr>
<td>PUBLIC LANDS - SECTIONS 4(F) AND 6(F)</td>
<td>11</td>
</tr>
<tr>
<td>NOISE</td>
<td>11</td>
</tr>
<tr>
<td>SURFACE WATERS</td>
<td>11</td>
</tr>
<tr>
<td>WETLANDS</td>
<td>11</td>
</tr>
<tr>
<td>ALTERNATIVES</td>
<td>12</td>
</tr>
<tr>
<td>GENERAL</td>
<td>12</td>
</tr>
<tr>
<td>ALTERNATIVES CONSIDERED, BUT NOT PROGRESSED</td>
<td>12</td>
</tr>
<tr>
<td>DO NOTHING</td>
<td>13</td>
</tr>
<tr>
<td>ALTERNATIVE 1-MAINTENANCE ALTERNATIVE</td>
<td>13</td>
</tr>
<tr>
<td>ALTERNATIVE 2-NEW BRIDGE/RETAIN EXISTING ABUTMENTS</td>
<td>13</td>
</tr>
<tr>
<td>ALTERNATIVE 3-NEW BRIDGE/REMOVE EXISTING ABUTMENTS</td>
<td>15</td>
</tr>
<tr>
<td>MEETINGS</td>
<td>16</td>
</tr>
<tr>
<td>SITE VIST</td>
<td>16</td>
</tr>
<tr>
<td>LOCAL CONCERNS MEETING</td>
<td>16</td>
</tr>
<tr>
<td>ALTERNATIVES PRESENTATION MEETING</td>
<td>16</td>
</tr>
</tbody>
</table>

McFarland Johnson, Inc. - 1 - June 2011
EVALUATION MATRIX..............................................................................................................................17

RECOMMENDATIONS..................................................................................................................................18

LIST OF APPENDICES

APPENDIX A – COST ESTIMATES............................................................................................................ A-1
APPENDIX B - ROADWAY/STRUCTURAL INFORMATION...........................................................................B-1
APPENDIX C - RESOURCE RELATED INFORMATION ............................................................................... C-1
APPENDIX D - MEETING MINUTES........................................................................................................ D-1
APPENDIX E - PLANS............................................................................................................................ E-1
INTRODUCTION

This scoping report has been prepared for the Chittenden County Metropolitan Planning Organization (CCMPO) by McFarland Johnson (MJ). MJ was hired by the CCMPO to provide Phase A (scoping) design services for one bridge project within the town of Essex, Vermont.

This project deals with the study of alternatives for correcting existing deficiencies on the Gentes Road Bridge over New England Central Railroad in Essex, Vermont. The bridge carries a town-maintained highway and is owned by the town.

The Scoping Phase of this project included a site visit, a Local Concerns Meeting, and an Alternatives Presentation Meeting. The objective of this report is to establish the scope of the project and provide an overview of the project’s key issues.
Purpose and Need Statement
Essex Bridge #20
Gentes Road over New England Central Railroad
February 11, 2010
July 12, 2011

Purpose:
The purpose of the project is to provide a geometrically functional and safe travel corridor for vehicular traffic, bicycles, and pedestrians along Gentes Road in the town of Essex and maintain the existing railroad clearance envelope at the location of this bridge crossing.

Need:
Essex Bridge #20 crosses the New England Central Railroad and was originally constructed in 1910. In 1990 the existing metal pony truss was replaced with the current voided concrete slab superstructure. In 2006, the town identified deterioration of the existing abutments and commissioned a study. The study concluded that the abutments should be repaired by re-facing the existing concrete. Due to the cost to repair it was decided a scoping report with alternatives should be provided before repairs were performed. The Vermont Agency of Transportation (VTrans) inspection report, dated September 2009, indicates that the bridge was functionally obsolete, but not structurally deficient per federal standards.

- The existing bridge is 20 feet-0 inches wide. The existing bridge width does not meet the current federal standards for two-way vehicular travel. Bridge shoulders are also not adequate for pedestrian or bicycle travel. The minimum bridge width should be 26 feet-0 inches to include two 10 foot-0 inch travel lanes and two 3 foot-0 inch shoulders to allow for two-way vehicular travel while allowing for bicycle and pedestrian travel.

- The VTrans report rated the overall condition of the bridge substructure (abutments) as fair condition. It reported that the primary structural foundation elements are sound, but have minor section loss and deterioration. The main concern cited was advancement of spalling where undermining the superstructure could occur. The deck geometry rating is a 2 out of 10 (which is noted as intolerable with replacement recommended on the VTrans inspection report) and the most recent Federal Sufficiency Rating for the bridge is 65.1 out of 100. Subsequent testing of the existing abutments identified low compressive strength and high concentrations of chlorides.

- The existing Gentes Road profile over Bridge #20 has restricted sight distance without the appropriate signage to alert the driver to the limited sight distance and safe speeds.

- Common failure methods for abutments including sliding, where the abutment is slid away from the embankment, and overturning, where the abutment rotates in place until it flips over. Stability analysis performed on the abutments in 1991 found that the factor of safety for sliding were acceptable, but factors of safety for overturning were less than the preferred 2.0 for modern design and soil bearing pressures were high.
Picture No. 13  SEPERATION AT APPROACH

Picture No. 14  SUPERSTRUCTURE UNDERSIDE

Picture No. 15  EROSION AT SOUTHWEST CORNER LOOKING NORTH

Picture No. 16  SOUTHEAST WINGWALL
BACKGROUND INFORMATION

General

The Gentes Road Bridge (Bridge No. 20) carries Gentes Road over New England Central Railroad. The bridge is located adjacent to the intersection of Gentes Road and VT Route 2A. Gentes Road is classified as a Class III Town Highway and a minor collector. The bridge was originally built in 1910 and in 1990 the original metal pony truss bridge was replaced with the current voided concrete slab. Gentes Road Bridge is a single-span, 58 foot long prestressed concrete voided slab bridge. The existing bridge measures 20 feet-0 inches wide from the outside face of the bridge concrete on one side to the outside face of the bridge concrete on the opposite side and 18 feet-8 inches between faces of the guardrail; this does not meet state and federal regulations for pedestrians, bicyclists, and motorists and will be considered in the scope of this project. The minimum required width is 26 feet-0 inches to accommodate two 10 foot-0 inch lanes and two 3 foot-0 inch shoulders. The Gentes Road profile over the bridge has restricted sight distance without appropriate signage to alert drivers.

Structural Condition

Gentes Road Bridge is inspected on a two-year frequency interval by the Vermont Agency of Transportation (VTrans). The latest inspection of the bridge was performed in 2009. A copy of the report is included in Appendix B. Results of the inspection indicate the bridge is “functionally obsolete,” having a federal sufficiency rating (FSR) of 65.1 (out of 100) with the overall condition labeled as “fair.” The deck is in “good condition.” The abutments appeared to be sound, but advanced spalling below the superstructure is of special concern. The inspection report rated the deck geometry as a 2, which is noted as intolerable with replacement recommended on the VTrans inspection report. To qualify for federal replacement funds, a bridge must have an FSR of 50 or lower. To qualify for federal rehabilitation funding, a bridge must have an FSR of 80 or lower.

As part of this scoping study, the existing abutments were cored at representative locations and tested for compressive strength and the presence of chlorides (Full memorandum is located in Appendix B). These are common tests used to ascertain the integrity of the existing concrete and reinforcing steel.

To evaluate the condition of the abutment concrete based upon the testing of samples, American Concrete Institute (ACI) standards were followed. ACI, a national clearinghouse that advances concrete knowledge and provides guidelines regarding concrete evaluation, has a recognized standard, ACI 301, which states that concrete shall be considered adequate if the average core strength is equal to at least 85% of and no single core is less than 75% of the specified strength. The Vermont Agency of Transportation requires a minimum compressive strength of 3,500 psi on their new abutments. So this value has been used as the specified strength.

Compressive tests are standardized tests where a controlled sample of the existing concrete is crushed to determine its compressive strength. For the eight samples taken from the abutments and wingwalls of...
the bridge, the compressive strengths range from 1,410 pounds per square inch (psi) to 3,260 psi, with an average of 2,489 psi.

Referring back to the ACI requirements, the average sample strength must be equal to at least 85% of the 3,500 psi (2,975 psi). The Gentes road average sample strength was only 2,489 psi. ACI also requires that no single compressive strength is less than 75% of the 3,500 psi (2,625 psi). The Gentes Road minimum compressive strength was only 1,410 psi. Based on these test results, failing to meet both average and minimum ACI requirements, the existing concrete is rated as poor condition.

The presence of water soluble chlorides is an indicator of corrosion susceptibility. Concrete is a building material that is very strong in compression, but brittle in tension. By reinforcing concrete with steel reinforcement, the concrete provides compressive strength while the steel reinforcement acting in harmony with the concrete provides the tensile strength. When the steel reinforcement corrodes the overall strength of reinforced concrete is decreased significantly. Once chloride levels pass a threshold, and necessary levels of moisture and oxygen are present, it is likely that unacceptable corrosion will occur. For the Gentes Road abutments, tests showed the chloride levels far exceeded the thresholds. Given the weather conditions found in the area of the bridge, there is a high probability of corrosion.

**Horizontal Alignment**

The existing horizontal alignment across Gentes Road Bridge is straight but leads into a sharp curve on the east side. The bridge approach on the east end is very abrupt which may result in westbound vehicles encroaching into the eastbound lane as they approach the bridge.

**Vertical Alignment**

The bridge is located on a crest vertical curve. The tangent from the west is approximately ten and a half percent (10.5%) and the tangent from the east is approximately six and a half percent (6.5%). The vertical grades meet state and federal guidelines, but the resulting vertical curvature does not meet criteria for sight distance. This creates a blind spot on either side of the bridge. This deficiency is further accentuated when vehicles and bicyclists and pedestrians meet while crossing the bridge.

**Clear Zone**

A horizontal offset is the distance from the edge of the travel lane to a hazard. Examples of common hazards include trees, telephone poles, or steep slopes that could potentially cause a vehicle to overturn if it left the road surface. The VTrans Clear Zone Policy of 1997 recommends a horizontal offset of twelve feet (12 feet) for a minor collector with speed limit less than 45-mph and Annual Average Daily Traffic (AADT) between 750 and 1500 vehicles per day. There are no hazards within the clear zone at the location of the bridge not protected by guardrail.

**Sight Distance**

There is a sight distance restriction due to the crest vertical curve not currently signed to alert drivers.
Crash Data

There have been eight motor vehicle crashes in the vicinity of the Gentes Road Bridge since April of 2004. Four of the crashes have been at or near the intersection of Gentes Road and Lamore Road. Three others have been within approximately a half mile of the intersection. The data did not show sufficient detail to show a pattern, but it is likely that sight distance at the intersection was a factor in the crashes.

Traffic

The Annual Average Daily Traffic (AADT) in 2007 was 1000 vehicles per day (VPD), with approximately 1% truck traffic.

Intermodal/Multi-Modal

The Town of Essex has expressed interest in providing wider shoulders for bicyclists and pedestrians.

ENVIRONMENTAL RESOURCES

Agriculture

The bridge is located in an area mapped as Adams and Windsor loamy sands, 0 to 5 percent slopes, and Lamore Road is in an area mapped as Munson and Raynham silt loams, 2 to 6 percent slopes. Both of these soils are listed as Statewide agricultural soils. There are hayfields east of the bridge and south of Lamore Road. The alternatives that include a new alignment south of Lamore Road will potentially include agricultural impacts.

Archaeology

Hartgen Archaeological Resources was retained to evaluate the potential for impact to archaeological resources at the site. In summary, Hartgen found that there are areas of both pre-contact and historical archaeological sensitivity around the bridge and on both sides of Lamore Road. The full archaeological report is included in Appendix C.

Historical Resources

Mary Jo Llewellyn, Historic Preservation Consultant, was retained to evaluate the potential effects to historic resources at the site. In summary, Ms. Llewellyn found that there were no resources on or eligible for the National Register of Historic Places in the Area of Potential Effect (APE). The bridge itself, although older than 50 years, is not eligible for the National Register because components of the bridge have been replaced with contemporary materials. Therefore, there are no anticipated adverse effects to architectural historic resources within the APE. Ms. Llewellyn’s report is in Appendix C.
Hazardous Materials

There is a site identified by the Vermont Agency of Natural Resources as a hazardous waste generation site south of the project area. The site, “Marvin’s Market”, had three underground storage tanks removed in 1994, when it was revealed that two of the tanks had exterior corrosion and that there was contamination in the groundwater. The site was investigated and additional groundwater monitoring was recommended to insure that contamination did not reach drinking water wells. It does not appear that there will be involvement with this hazardous material site.

Floodplains

Floodplains are mapped on FEMA Community Panel Number 500034 0013 B, dated January 16, 1981. There are no mapped floodplains in the immediate vicinity of the bridge, although there are “Zone B” wetlands associated with an unnamed stream north and west of the bridge.

Fish and Wildlife

The project area lies east of Burlington and west of undeveloped forested mountains. The immediate vicinity of the bridge is characterized by residential and commercial development, and the transportation corridors of Route I-289, Route 2A, and the railroad tracks. The forest to the east likely provides habitat for numerous mammal species, including moose, deer, bear, fox, and coyote.

There is no waterway associated with the bridge and therefore there are no fisheries concerns.

Rare, Threatened, and Endangered Species

There are no records of rare, threatened, or endangered species within the project area.

Public Lands – Sections 4(f) and 6(f)

There are no Section 4(f) or Section 6(f) lands in the direct vicinity of the project area.

Noise

The project is not expected to affect the noise environment.

Surface Waters

There are no surface waters within the project area.

Wetlands

There are Class III wetlands in the vicinity of the bridge along both sides of the railroad tracks. If the selected alternative involves realignment of Lamore Road, additional field reconnaissance will be necessary to confirm the absence of wetlands south of Lamore Road.
ALTERNATIVES

General

Alternatives Considered, but Not Progressed

The study limits included the corridor between VT 289 and Colchester Pond Road. Within this corridor, options were considered for connecting between VT 2A and Gentes Road/Sand Road. It was established at the Local Concerns Meeting that eliminating the bridge crossing would not be a viable option. The railroad has made it clear on other regional projects that they are not in favor of replacement of any existing bridges with at-grade crossings due to safety concerns. Alternatives reflecting at-grade crossings are unlikely to receive approval by the railroad.

The two greatest impediments for locating a viable crossing were the residential homes along VT 2A and Gentes Road and the need to meet the clearance requirements over the railroad while maintaining acceptable approach grades. Railroad standards require a minimum clearance of twenty-two feet from the top of the rail to the bottom of the bridge. These constraints eliminated potential alternatives outside of a corridor about 100-feet wide centered on the existing bridge.

Two additional alternatives were carried through the Alternatives Presentation Public Meeting. After the testing of the existing abutments was complete, which occurred after the Alternatives Presentation meeting, providing alternatives that would rely on the integrity of the existing abutments for support of the bridge deck was not a viable. We have added a more cost effective maintenance option that could increase the life of the existing abutment at a lower cost and added a more expensive option that would include complete removal of the bridge abutments.

Former Alternative 1- Rehabilitate Existing Structure involved repairing the current bridge in order to improve safety. This alternative would have patched and repaired the existing voided slab superstructure, patched the existing abutments and wingwalls and removed and replace the existing bridge rail and approach rail. After reviewing the results of the abutment testing, this alternative was abandoned due to the concerns about the abutment in comparison to the cost of the alternative. A maintenance alternative has been added, Alternative 1 (Revised), which would target specific maintenance repairs with a refined scope and price.

Former Alternative 2-Widen and Rehabilitate Existing Structure involved repairing and widening the current bridge in order to improve safety. This alternative would have patched and repaired the existing voided slab superstructure, patched the existing abutments and wingwalls and removed and replaced the existing bridge rail and approach rail. New voided slab units would have been added and a cast-in-place abutment would have extended the existing abutment to accommodate road widening. After reviewing the results of the abutment testing, this alternative was abandoned due to the concerns about the abutment in comparison to the cost of the alternative.
Do Nothing Alternative

This alternative would leave the existing roadway and bridge as it is today, in its current condition. It is used as a benchmark for comparison to the other alternatives. Although there are no computed costs, it should be noted this alternative would continue to generate maintenance costs and it does not meet the Purpose and Need. If the structure does not receive necessary repairs it is likely that temporary or permanent closure will be required.

Closure of the road would have significant impacts on the community. The required detour would be approximately five miles with an option to route from Gentes Road to Sand Road (gravel road) to Colchester Pond Road to Depot Road and back along VT 2A, or travel along Lamore Road, Discovery Road, Lost Nation Road, VT 15, and VT 2A. This can be expected to affect residents along Gentes Road, Lamore Road, McGee Road, Discovery Road, Lost Nation Road residents north of Discovery Road and at least half of Lost Nation Road south of Discovery Road.

Alternative 1-Maintenace Alternative (New Since Alternative Presentation Meeting)

Since the Alternatives Presentation Meeting, there have been cores taken on the abutments and wingwalls. These cores were taken for testing to determine the strength and integrity of the abutments. The test results and summary memo are included in Appendix B. The test results were significantly below established levels used for analysis. This alternative would provide a maintenance level approach with carefully targeted abutment repairs specifically addressing deterioration immediately below the bridge seats. This alternative would also include the upgrades to bridge and approach railing. Since the intent of this alternative is to provide a minimal cost maintenance alternative, it was assumed that the roadway alignment would remain unchanged. Contingencies were included for coordination with the railroad, flaggers during construction, and access permits.

Work included in Alternative 1 (See Appendix E for plans of Alternative 1) would include structural and aesthetic patching of the abutments, especially in the area immediately below the bridge seats where spalling concrete is beginning to undermine the bearing location, replacement of the bridge rail, approach rail and end treatments, and the shoring needed to complete the patching of the abutments. There is some economic risk to this alternative given the condition of the abutments, but with the regularly scheduled bridge inspections to monitor the bridge condition, it is likely that this alternative would provide another ten years of service life.

This alternative would have minimal impacts to the environmental resources, with impacts limited to temporary impacts for shoring and staging along the face of the abutments.

Alternative 2 (Formerly Alternative 3 from the Alternatives Presentation Meeting) – New Bridge/Retain Existing Abutments for Earth Retainage Only

Alternative 2 (See Appendix E for plans of Alternative 2A and 2B) would replace the existing bridge on generally the same alignment as the existing bridge. At this preliminary stage of design, this alternative could include modest shifts of the alignment of up to about five feet in either direction or minor rotations to the bridge to best fit the existing conditions or additional constraints like wetlands or...
existing utilities. The intent of a scoping study is to provide the town and its citizens a good understanding of what is being proposed while leaving a degree of flexibility to the final design when more refined information is known about right-of-way, natural resources and utility locations.

This alternative involves the construction of new integral abutments on steel piles and patching the existing abutments and wingwalls. During construction the existing deck would be removed and the top few feet of the existing abutments would be cut off in order to allow a new bridge deck to be constructed over the top while supported by new abutments constructed behind the existing abutments. The existing abutments would be repaired and used to retain the earthwork adjacent to the new abutments without the weight of the existing or new bridge. This alternative would replace the existing voided slab superstructure with new steel beams and a concrete deck. The bridge rail and approach rail would be replaced in this alternative.

Bridge span lengths are determined by identifying what is being spanned, for instance a river or in this case a railroad, leaving adequate room for horizontal clearances, buffers, and proper drainage, then projecting a reasonable slope from the elevation of what is being spanned up to the elevation of the approach road. When this was done for the Gentes Road Bridge project a span of about 140 feet was required if the existing abutment was removed, but the adjacent intersection with Lamore Road would have needed to be relocated and the relocated roads would have had significant impacts to the historical property adjacent to the intersection. This can be seen best on the plans included in Appendix E. The longer span would end the bridge near the middle of the existing intersection requiring the adjacent roads to be relocated.

For this reason, the span length of the new bridge was held at 90 feet allowing for a reasonable guardrail transition into the northern segment of Gentes Road. In order to hold the span length at 90 feet, the three reasonable options were to retain the existing abutments and construct new abutments behind them (Alternative 2), construct full height abutments (significantly more expensive), or to construct stub abutments using a geotechnically engineered product and an engineered slope which allows steeper slopes than an unreinforced earthen embankment (Alternative 3).

The alternatives matrix breaks Alternative 2 into two categories; Alternative 2A, which would generally match the existing roadway alignment, and Alternative 2B, which would include a significant roadway re-alignment. Alternative 2A reconstructs the bridge while leaving the approach roadway and adjacent intersection in generally the same location. This alternative could be constructed by purchasing temporary rights, but it is unlikely that any permanent rights would be required. It would also minimize impacts to natural and cultural resources adjacent the project.

Alternative 2B would reconfigure the Gentes Road and Lamore Road intersection. This is done to correct deficiencies in the approach geometry of the bridge and better align the respective approaches to the intersection. This alternative would align Lamore Road with the new bridge and create a new intersection with the northern segment of Gentes Road tying into the realigned Lamore Road at a ninety degree angle. This alternative would require a right-of-way impact of about 0.25 acres to the neighboring parcel and would increase impacts to agricultural soils (impacts to the southwest quadrant adjacent the bridge) and potentially to archeological resources and wetlands. Potential for prehistoric archeological impacts exist to the northwest and southeast of the existing bridge and historical
archaeological resources on both sides of Lamore Road. During final design it will be necessary to conduct a Phase I-B archeological resource assessment to determine the presence of resources and better decide what needs to be done moving forward. Class III wetlands were identified along the ditch lines of the New England Central Railroad within the project area. With those potential impacts it may be necessary to obtain permits from the Army Corps of Engineers, the State Wetlands Bureau and State Historic Preservation Office.

**Alternative 3 (New Alternative since the Alternatives Presentation Meeting) - New Bridge/Remove Existing Abutments**

Alternative 3 (See Appendix E for plans of Alternatives 3A and 3B) would replace the existing bridge on generally the same alignment as the existing roadway. At this preliminary stage of design, this alternative could include modest shifts of the alignment of up to about five feet in either direction or minor rotations to the bridge to best fit the existing conditions or additional constraints like wetlands or existing utilities. The intent of a scoping study is to provide the town and its citizens a good understanding of what is being proposed while leaving a degree of flexibility to the final design when more refined information is known about right-of-way, natural resources and utility locations.

This alternative differs from Alternative 2 in that the existing abutments would be removed down to ground level at their lower face, or toward the railroad. The new abutments would be supported by an engineered slope maintaining a proposed span length at 90 feet. This alternative would replace the existing voided slab superstructure with new steel beams and a concrete deck. The bridge rail and approach rail would be replaced in this alternative. Alternative 3 would have more impacts to the wetlands at the base of the existing abutments, but repair and future maintenance of the existing abutments would be eliminated.

The alternatives matrix breaks Alternative 3 into two categories; Alternative 3A, which would generally match the existing roadway alignment, and Alternative 3B, which includes a significant roadway realignment. Alternative 3A reconstructs the bridge while leaving the approach roadway and adjacent intersection in generally the same location. This alternative could be constructed by purchasing temporary rights, but it is unlikely that any permanent rights would be required. It would also minimize impacts to natural and cultural resources adjacent the project.

Alternative 3B would reconfigure the Gentes Road and Lamore Road intersection. This is done to correct deficiencies in the approach geometry of the bridge and better align the respective approaches to the intersection. This alternative would align Lamore Road with the new bridge and create a new intersection with the northern segment of Gentes Road tying into the realigned road at a ninety degree angle. This alternative would require an impact of about 0.25 acres to the neighboring parcel and would increase impacts to agricultural soils (impacts on the southwest quadrant adjacent the bridge) and potentially to archeological resources and wetlands. Potential for prehistoric archeological impacts exist to the northwest and southeast of the existing bridge and historical archeological resources on both sides of Lamore Road. During final design it will be necessary to conduct a Phase I-B archeological resource assessment to determine the presence of resources and better decide what needs to be done moving forward. Class III wetlands were identified along the ditch lines of the New England Central Railroad within the project area. With those potential impacts it may be necessary to obtain permits from the Army Corps of Engineers, the State Wetlands Bureau and State Historic Preservation Office.
MEETINGS

The scoping process for this bridge included a site visit, a Local Concerns Meeting and an Alternatives Presentation Meeting both held at the Essex Fire Station.

Site Visit

McFarland Johnson visited the site November 11\textsuperscript{th}, 2009, April 14\textsuperscript{th}, 2010, and has done previous evaluations of the structure.

Local Concerns Meeting

A Local Concerns Meeting was held November 19\textsuperscript{th}, 2009 at the Essex Fire Department. Attendees included the Essex Town Engineer, the CCMPO, McFarland Johnson and a number of private citizens. (See appendix D for meeting minutes). MJ presented the project constraints and the scoping process. Comments from the citizens included the desire to retain a grade separated intersection, concern about bicycle and pedestrian safety, and a desire to keep costs down.

Alternatives Presentation Meeting

An Alternatives Presentation Meeting was held on May 11, 2010 at the Essex Fire Department. Attendees included the Town of Essex, the CCMPO, McFarland Johnson, and a number of private citizens. (See appendix D for meeting minutes). MJ began the meeting with a general overview and presented the project alternatives. Alternatives were divided into two subcategories including roadway alternatives and bridge alternatives. Discussion included the current safety of the bridge, the desire to keep any solutions within the general area around the existing bridge, and concerns about funding.
<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Do Nothing</th>
<th>Maintenance Alternative</th>
<th>New Bridge/Retain Existing Abutments (For Retention of Earth Only)</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Alternative 1</td>
<td>Alternative 2</td>
<td>Alternative 3</td>
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<td>T E Species</td>
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<td>SHPO</td>
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* FUNDING CONTRIBUTIONS FOR ALTERNATIVES 2 AND 3 ASSUME THAT THE BRIDGE RATING WILL BE BELOW AN FSR OF 50 AT THE TIME OF RECONSTRUCTION.
RECOMMENDATIONS

As the Gentes Road Bridge over the New England Central Railroad began to show significant deterioration in its substructure, it was decided to conduct a scoping study to look at the full complement of alternatives before focusing on a single solution. Looking at the corridor between VT 289 and the Colchester Pond Road railroad crossing, it was determined that the existing corridor was the only feasible location for a separated crossing that did not require extensive right-of-way acquisition.

After some initial data collection, a local concerns meeting was held with the residents throughout the corridor. Local concerns included strong support for keeping the bridge open. Residents did not believe closure was an option given the increased response times for emergency equipment and general inconvenience. During the Alternatives Meeting more discussion surrounded the integrity of the abutments. It was decided that before the Selectboard was asked to make a decision there should be testing of the existing abutments to verify their condition. The time of the Alternatives Presentation meeting there were three alternatives that included a deck rehabilitation without widening the bridge, a deck rehabilitation with widening of the bridge, and a bridge reconstruction option that included new abutments, but retained the existing abutments for retaining the earthwork only (no support of the bridge).

Since the Alternatives presentation meeting, a testing program was completed. The tests for concrete compression strength and chloride tests provide guidance for the integrity of the abutment concrete and the corrosion susceptibility of the steel reinforcing bar embedded in the reinforced concrete. The strength of the concrete was below the standard and the test for chlorides showed readings that were significantly above the threshold for corrosion. The net result was abutments that could at best be rated as fair and would be a concern for founding new infrastructure upon.

With this new information, MJ has revised the alternatives to include a maintenance alternative, eliminated the rehabilitation alternatives due to the high cost for alternatives that do not necessarily guarantee longer service life, we retained the reconstruction alternative that utilized the existing abutments only as retaining walls, and added a reconstruction alternative that removed the existing abutments.

Another factor is the bridge inspection report. This bridge is inspected every two years. The report cites poor deck geometry and approach roadway geometry both as intolerable, but rates the substructure as fair, which with proper inspection still implies additional service life. Bridges that are inspected are assigned a rating between 0 and 100 called a Federal Sufficiency Rating (FSR). This rating is important since federal funding eligibility is based upon the FSR. Bridges rated below eighty are eligible for federal rehabilitation funding. Bridges rated below fifty are eligible for federal replacement funding. Interestingly, the Gentes Road Bridge was rated 48.6 after an inspection in the fall of 2007, but in the 2009 inspection the rating increased to 65.1. The bridge is due to be re-inspected in the fall of 2011 and the testing scores have been forwarded to the State inspectors for their information when reassessing the bridge, but at this time, the bridge would not be eligible for federal replacement funds.
COST
ESTIMATES
**Project:** Essex Bridge #20 Gentes Road over New England Central Railroad  
**Calculated by:** MAH  
**Date:** 6/2011

**ALTERNATIVE #1 - Maintenance Alternative**

**PRELIMINARY CONSTRUCTION ESTIMATE**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
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</thead>
<tbody>
<tr>
<td>Guard Rail</td>
<td>LF</td>
<td>360</td>
<td></td>
<td>$25.00</td>
<td>$9,000.00</td>
</tr>
<tr>
<td>Bridge Approach Rail</td>
<td>EA</td>
<td>4</td>
<td></td>
<td>$3,000.00</td>
<td>$12,000.00</td>
</tr>
<tr>
<td>End Treatment</td>
<td>U</td>
<td>4</td>
<td></td>
<td>$3,000.00</td>
<td>$12,000.00</td>
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<td><strong>SUBTOTAL #1</strong></td>
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<td>15.00%</td>
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**PROJECT TOTAL:** $265,451
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<th>Item No.</th>
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<th>Cost</th>
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<td>REMOVAL OF EXISTING BRIDGE RAILING</td>
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<td>580.14</td>
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**SUBTOTAL BRIDGE** $145,900

**Assumptions**

- Contingency Percentage 20% $29,180.00
- Contingency Percentage - Railroad Work 10% $14,590.00
- Construction Engineering 12.5% $18,237.50
- Mobilization 7.5% $10,942.50

**BRIDGE TOTAL** $218,850
McFarland-Johnson, Inc.  

Project: Essex Bridge #20 Gentes Road over New England Central Railroad  
Calculated by: MAH    Date: 6/2011

ALTERNATIVE #2A - New Bridge Retain Existing Abutment for Retainment Only  
Minor Roadway Improvements

PRELIMINARY CONSTRUCTION ESTIMATE

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<th>ITEM</th>
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<th>PRICE</th>
<th>AMOUNT</th>
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<td>430</td>
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<td>LF</td>
<td>360</td>
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<td>U</td>
<td>4</td>
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<td>$12,000.00</td>
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| SUBTOTAL #1                               |                                                       |      |          |       | $118,250.00|
| Misc. Items (15%)                         |                                                       |      | 15.00%   |       | $17,737.50 |

| SUBTOTAL #2                               |                                                       |      |          |       | $135,987.50 |
| Drainage (15%)                            |                                                       |      | 15.00%   |       | $20,398.13  |

| SUBTOTAL #3                               |                                                       |      |          |       | $156,385.63 |
| Water Pollution Control (2%)              |                                                       |      | 2.00%    |       | $3,127.71   |

| SUBTOTAL #4                               |                                                       |      |          |       | $159,513.34 |
| Construction Engineering (12.5%)          |                                                       |      | 12.50%   |       | $19,939.17  |
| Mobilization (7.5%)                        |                                                       |      | 7.50%    |       | $11,963.50  |

| Highway Cost                              |                                                       |      |          |       | $191,416    |
| Bridge Cost                               |                                                       |      |          |       | $805,000    |
| Right of Way (R.O.W.)                     |                                                       |      |          |       | $0          |

PROJECT TOTAL: $996,416
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<tr>
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**SUPERSTRUCTURE**

**SUBTOTAL BRIDGE** $536,454

**Assumptions**

- Contingency Percentage: 20% $107,290.83
- Contingency Percentage - Railroad Work: 10% $53,645.42
- Construction Engineering: 12.5% $67,056.77
- Mobilization: 7.5% $40,234.06

**BRIDGE TOTAL** $804,681
## ALTERNATIVE #2B - New Bridge Retain Existing Abutment for Retainment Only

Roadway Realignment

### PRELIMINARY CONSTRUCTION ESTIMATE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2.00%</td>
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<td>$4,862.83</td>
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<td>12.50%</td>
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<td>$31,000.56</td>
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Project: Essex Bridge #20 Gentes Road over New England Central Railroad  
Calculated by: MAH    Date: 6/2011

ALTERNATIVE #3A- New Bridge-Remove Existing Abutment  
Minor Roadway Improvements

PRELIMINARY CONSTRUCTION ESTIMATE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
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</tr>
<tr>
<td>Bridge Approach Rail</td>
<td>EA</td>
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<td>$12,000.00</td>
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<td>4</td>
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<td>$12,000.00</td>
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</tr>
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SUBTOTAL #1: $118,250.00

Misc. Items (15%): 15.00%  $17,737.50

SUBTOTAL #2: $135,987.50

Drainage (15%): 15.00%  $20,398.13

SUBTOTAL #3: $156,385.63

Water Pollution Control (2%): 2.00%  $3,127.71

SUBTOTAL #4: $159,513.34

Construction Engineering (12.5%): 12.50%  $19,939.17

Mobilization (7.5%): 7.50%  $11,963.50

Highway Cost  $191,416

Bridge Cost  $930,000

Right of Way (R.O.W.)  $0

PROJECT TOTAL: $1,121,416
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<thead>
<tr>
<th>ITEM No.</th>
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**SUPERSTRUCTURE**

**SUBTOTAL BRIDGE** $620,104

**Assumptions**

- Contingency Percentage 20% $124,020.83
- Contingency Percentage - Railroad Work 10% $62,010.42
- Construction Engineering 12.5% $77,513.02
- Mobilization 7.5% $46,507.81

**BRIDGE TOTAL** $930,156
Project: Essex Bridge #20 Gentes Road over New England Central Railroad  
Calculated by: MAH    Date: 6/2011  

ALTERNATIVE #3B- New Bridge-Remove Existing Abutment Roadway Realignment  

PRELIMINARY CONSTRUCTION ESTIMATE  

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<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
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<td>CY</td>
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<td>$19,700.00</td>
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<tr>
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<td>Drainage (15%)</td>
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<td>Water Pollution Control (2%)</td>
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ROADWAY / STRUCTURAL INFORMATION
### CONDITION

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<td>Superstructure Rating</td>
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<tr>
<td>Substructure Rating</td>
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<td>Channel Rating</td>
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<td>Culvert Rating</td>
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<td>Deficiency Status of Structure</td>
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### AGE and SERVICE

- **Year Built:** 1910
- **Year Reconstructed:** 1991
- **Service On:** 1 HIGHWAY
- **Service Under:** 2 RAILROAD
- **Lanes On the Structure:** 02
- **Lanes Under the Structure:** 00
- **Bypass, Detour Length (miles):** 05
- **ADT:** 001500
- **% Truck ADT:** 02
- **Year of ADT:** 2007

### GEOMETRIC DATA

- **Length of Maximum Span (ft):** 0052
- **Structure Length (ft):** 000058
- **Lt Curb/Sidewalk Width (ft):** 0
- **Rt Curb/Sidewalk Width (ft):** 0
- **Bridge Rdwy Width Curb-to-Curb (ft):** 18.8
- **Deck Width Out-to-Out (ft):** 20
- **Appr. Roadway Width (ft):** 026
- **Skew:** 00
- **Bridge Median:** 0 NO MEDIAN
- **Min Vertical Ctr Over (ft):** 99 FT 99 IN
- **Feature Under:** RAILROAD BENEATH STRUCTURE
- **Min Vertical Underclr (ft):** 22 FT 01 IN

### STRUCTURE TYPE and MATERIALS

- **Bridge Type:** PRESTRESS CONC. SLAB
- **Number of Approach Spans:** 0000
- **Number of Main Spans:** 001
- **Kind of Material and/or Design:** 5 PRESTRESSED CONCRETE
- **Deck Structure Type:** 2 CONCRETE PANELS
- **Type of Wearing Surface:** 6 BITUMINOUS
- **Type of Membrane:** 2 PREFORMED FABRIC
- **Deck Protection:** 0 NONE

### APPRAISAL

*AS COMPARED TO FEDERAL STANDARDS*

- **Bridge Railings:** 1 MEETS CURRENT STANDARD
- **Transitions:** 1 MEETS CURRENT STANDARD
- **Approach Guardrail:** 1 MEETS CURRENT STANDARD
- **Approach Guardrail Ends:** 1 MEETS CURRENT STANDARD
- **Structural Evaluation:** 5 BETTER THAN MINIMUM TOLERABLE CRITERIA
- **Deck Geometry:** 2 INTO TOLERABLE, REPLACEMENT NEEDED
- **Underclearances Vertical and Horizontal:** 6 EQUAL TO MINIMUM CRITERIA
- **Waterway Adequacy:** N NOT OVER WATER
- **Approach Roadway Alignment:** 3 INTO TOLERABLE, CORRECTIVE ACTION NEEDED
- **Scour Critical Bridges:** N NOT OVER WATERWAY

### DESIGN VEHICLE, RATING, and POSTING

- **Load Rating Method (Inv):** 5 NO RATING ANALYSIS PERFORMED
- **Posting Status:** 4 OPEN, NO RESTRICTION
- **Bridge Posting:** 5 NO POSTING REQUIRED
- **Load Posting:** 10 NO LOAD POSTING SIGNS ARE NEEDED
- **Posted Vehicle:** POSTING NOT REQUIRED
- **Posted Weight (tons):**
- **Design Load:** 0 OTHER OR UNKNOWN

### INSPECTION and CROSS REFERENCE

- **Insp. Date:** 092009
- **Insp. Freq. (months):** 24
- **X-Ref. Route:**
- **X-Ref. BrNum:**

### INSPECTION SUMMARY and NEEDS

09/02/09 The overall condition of this bridge is good except for slow on going deterioration of both abutment stemwalls and general pavement breakdown. DCP

---

**Tuesday, July 05, 2011**
**CONDITION**

- Deck Rating: 8 VERY GOOD
- Superstructure Rating: 8 VERY GOOD
- Substructure Rating: 5 FAIR
- Channel Rating: N NOT APPLICABLE
- Culvert Rating: N NOT APPLICABLE
- Federal Str. Number: 100406002004061
- Federal Sufficiency Rating: 48.6
- Deficiency Status of Structure: SD

**STRUCTURE TYPE and MATERIALS**

- Bridge Type: PRESTRESS CONC. SLAB
- Number of Approach Spans: 0000
- Number of Main Spans: 001
- Kind of Material and/or Design: 5 PRESTRESSED CONCRETE
- Deck Structure Type: 2 CONCRETE PANELS
- Type of Wearing Surface: 6 BITUMINOUS
- Type of Membrane: 2 PREFORMED FABRIC
- Deck Protection: 0 NONE

**APPRAISAL *AS COMPARED TO FEDERAL STANDARDS**

- Bridge Railings: 1 MEETS CURRENT STANDARD
- Transitions: 1 MEETS CURRENT STANDARD
- Approach Guardrail: 1 MEETS CURRENT STANDARD
- Approach Guardrail Ends: 1 MEETS CURRENT STANDARD
- Structural Evaluation: 5 BETTER THAN MINIMUM TOLERABLE CRITERIA
- Deck Geometry: 2 INTORELABLE, REPLACEMENT NEEDED
- Underclearances Vertical and Horizontal: 6 EQUAL TO MINIMUM CRITERIA
- Waterway Adequacy: N NOT OVER WATER
- Approach Roadway Alignment: 3 INTORELABLE, CORRECTIVE ACTION NEEDED
- Scour Critical Bridges: N NOT OVER WATERWAY

**GEOMETRIC DATA**

- Length of Maximum Span (ft): 0052
- Structure Length (ft): 000008
- Lt Curb/Sidewalk Width (ft): 0
- Rt Curb/Sidewalk Width (ft): 0
- Bridge Rdwy Width Curb-to-Curb (ft): 18.8
- Deck Width Out-to-Out (ft): 20
- Appr. Roadway Width (ft): 026
- Skew: 00
- Bridge Median: 0 NO MEDIAN
- Min Vertical Ctr Over (ft): 99 FT 99 IN
- Feature Under: RAILROAD BENEATH STRUCTURE
- Min Vertical Underclr (ft): 22 FT 01 IN

**INSPECTION SUMMARY and NEEDS**

- **08/10/2005** The overall condition of this bridge is less than fair due to heavy ongoing deterioration of both abutment stemwalls, heaving pavement at both approach ends and degenerating pavement overlay.(PLB)
- **10/04/2007** The overall condition of this bridge is good except for slow ongoing deterioration of both abutment stemwalls and general pavement breakdown.(PLB)

**INSPECTION and CROSS REFERENCE**

- Inspect Date: 102007
- Inspect Freq. (months): 24
- X-Ref. BrNum:
MEMORANDUM

TO: Christine Forde, CCMPO
    Dennis Lutz, Town of Essex, VT.

FROM: Ronald L. Joy, P.E.

DATE: April 15, 2011

SUBJECT: Gentes Road (TH 23) Bridge No. 20 over New England Central Railroad Field Testing of Existing Abutments

Introduction

The Chittenden County Metropolitan Planning Organization (CCMPO) sponsored the development of a Scoping Report for Bridge No. 20, Gentes Road over New England Central Railroad, within the Town of Essex, Vermont. The Scoping Phase of this project included a site visit, a Local Concerns Meeting, and an Alternatives Presentation Meeting. In the report, bridge alternatives that involved repairing the existing bridge abutments were investigated, per the request of the Town. Before the Town identifies their preferred bridge rehabilitation/replacement alternative, they requested that additional field testing be performed to better determine whether the integrity of the existing abutments is at a reasonable level to consider their reuse.

Field Investigation

Referring to Attachments 1 & 2, eight drilled cores were taken, four at each abutment, at various locations and elevations. Each core was tested to determine the Factored Compressive Strength of the existing concrete. In addition to compressive strength testing, four samples were taken to test for the quantity of water soluble chloride present in the existing abutments. Measurements of chloride ion concentrations are made to determine if any environment exists which is conducive to corrosion of reinforcing steel (if it exists).

Summary of Findings

The American Concrete Institute (ACI) is a national clearinghouse that advances concrete knowledge and provides guidelines regarding concrete evaluation. The ACI is a reference that is used throughout the engineering industry in evaluating the condition of concrete, including compression testing and chloride content evaluations, and has been referenced in this report.

Referring to Attachment 3, the Factored Compressive Strength tests ranged from a low of 1410 pounds per square inch (psi) to a high of 3260 psi. An average compressive strength of 2489 psi was calculated from the results provided. This value is approximately 29% lower than the current minimum 28 day compressive strength of 3,500 psi required by the Vermont Agency of Transportation for new reinforced concrete abutments. ACI 301 states that concrete shall be considered adequate if the average of the core strengths is equal to at least 85% of and no single
core is less than 75% if the specified strength. Based on the test results, the existing concrete is in poor condition.

Referring to Attachment 4, four samples were tested for the quantity of water soluble chloride present in the existing abutments. Analytical results were expressed as “parts per million” (ppm) by weight of concrete. Since ACI references to water soluble chlorides are expressed in percent by weight of cement (% bwoc), MJ converted the analytical results to these units, considering an estimated 16% cement content. Whenever there is a presence of chloride in concrete, the risk of corrosion increases. When the chlorine content exceeds a certain value, termed the chloride threshold, unacceptable corrosion may occur provided that other necessary conditions, chiefly the presence of oxygen and moisture, exist to support the corrosion reactions. A summary of the analysis results compared to the accepted threshold level is provided below.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Water Soluble Chloride in Concrete ¹ (ppm)</th>
<th>Water Soluble Chloride by Weight of Cement (% bwoc)</th>
<th>Water Soluble Chloride in Cement Threshold ² (% bwoc)</th>
<th>Percent of Threshold</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>300</td>
<td>0.19</td>
<td>0.30</td>
<td>63</td>
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<td>2</td>
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<td>510</td>
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</table>

1. Data provided by American engineering Testing, Inc.
2. Reference ACI 318 with a Category of “Other Reinforced Concrete

The percent of water soluble chloride contained within the existing abutments is far beyond the threshold recommendations provided by the ACI. The chloride content along with the typical weather conditions found in the area of the bridge provides for a very high probability of corrosion.

**Conclusion and Recommendations**

Based on the results presented above, we have concluded that the quality of the existing concrete is poor and the integrity of the existing abutments is questionable to support additional loads associated with a new structure over the long term. Though endorsing a bridge rehabilitation scheme that includes repair or widening of the existing abutments may have a lower overall construction cost, it is likely that subsequent repairs will be required over the long term resulting in overall higher life cycle costs. As such, we recommend that the existing abutments not be reused to support a new or rehabilitated superstructure. However, we do not have any reservations in retaining a portion of the abutments as proposed in Alternative #3 of the Scoping Report.

**Attachments:**
Attachment 1 – Core Locations – Plan View
Attachment 2 – Core Locations – Elevation View
Attachment 3 – Summary of Core Compressive Strengths
Attachment 4 – Summary of Chloride Analysis Findings
NOT TO SCALE

PLAN VIEW

L1
L1/2
L2/3
L2/3
L2/3
L2
P
VIZA

EAST EAVEMENT

RAILROAD

WEST EAVEMENT

GENTES ROAD

NOT TO SCALE
DATE: March 8, 2011

Client: Engineers Construction, Inc.
Attn: Hugh Strebel

KCE#: 11137

Project: Gentes Road – Essex
ECI #114299

Subject: Compressive Strength of Drilled Concrete Core (ASTM C42)

Samples: [ 8 ] 3.72" Diameter Drilled cores Taken By Engineers Construction and Delivered to KCE lab. Cores were saw cut to lengths indicated, capped according to ASTM C617, and tested in accordance with ASTM C39.

<table>
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<tr>
<th>Dated Received</th>
<th>Core</th>
<th>Core (in.) Diameter</th>
<th>Core (in.) Original Length</th>
<th>Core (in.) Length</th>
<th>Capped Core (in.) Length</th>
<th>L/D</th>
<th>L/D Factor</th>
<th>Load (lbs)</th>
<th>Factored Compressive Strength (psi)</th>
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Note: ACI 301 "Specifications For Structural Concrete" states that concrete in the area represented by cores shall be considered adequate if the average of the core strengths is equal to at least 85% of and no single core is less than 75% of the specified strength.

Submitted by:

Paul Elkert
Senior Engineering Technician

PE: nmv

S:\111137\Concrete Core Break Report 1.doc
REPORT OF: CHLORIDE ANALYSIS

PROJECT: GENTES ROAD RAILROAD BRIDGE
REPORTED TO: AMERICAN ENGINEERING TESTING, INC
ATTN: GERARD MOULZOLF
4263 BONITA BEACH ROAD
BONITA SPRINGS, FL 34134

DATE: March 24, 2011

LABORATORY NO: 24-00341
Date Received: 3/18/2011
Date Sampled: ---

ANALYTICAL RESULTS

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<tr>
<th>Parameter</th>
<th>#1, 4&quot; Dia, East Wing Wall, 5' From Bottom</th>
<th>#2, 4&quot; Dia, East Abutment, 5' From Top</th>
<th>#2, 2&quot; Dia, East Abutment, 7' From Top</th>
<th>#6, 4&quot; Dia, West Abutment, 5' From Top</th>
<th>Date</th>
<th>Method*</th>
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<tr>
<td>Water Soluble Chloride in</td>
<td>11-0883</td>
<td>11-0884</td>
<td>11-0885</td>
<td>11-0886</td>
<td>ASTM C1218</td>
<td>03/21/11</td>
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<tr>
<td>Concrete</td>
<td>300</td>
<td>3,710</td>
<td>4,810</td>
<td>2,440</td>
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All results are in parts per million (ppm)

LABORATORY QUALITY CONTROL

ACCURACY DATA

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<th>Parameter</th>
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<th>Matrix Spike</th>
<th>Matrix Spike Duplicate</th>
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<tr>
<td>Chloride</td>
<td>11-0886</td>
<td>98%</td>
<td>93%</td>
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</table>

PRECISION DATA

| Relative Percent Difference | 4.6% |

American Engineering Testing, Inc.
Virginia VerMurlt
QA Manager

Dan T. Hanson
Chemistry Manager
Darren Benoit - FW: Gentes Road bridge study

From: "Robert Lagrow" <rlagrow@ESSEX.ORG>
To: <dbenoit@mjinc.com>
Date: 4/27/2009 2:42 PM
Subject: FW: Gentes Road bridge study
CC: "Dennis Lutz" <DENNIS@essex.org>

Since April of 2004, there have been a total of 8 motor vehicle accidents on Gentes Rd.

12/18/2004  Gentes Rd. at Lamore Rd.
1/24/2005    Near #66 Gentes Rd
9/21/2005    Gentes Rd & Coilechester Rd. Intersection
1/22/2007    Near #3 Gentes Rd
1/23/2007    Near #3 Gentes Rd.
11/04/2007   Near #69 Gentes Rd.
2/1/2009     Gentes Rd & Lamore Rd. Intersection

Bob LaGrow
Essex Police Department
Support Services
81 Main St.
Essex Jct, VT 05452
(802) 878-1335

From: Dennis Lutz
Sent: Monday, April 27, 2009 1:07 PM
To: Robert Lagrow
Subject: gentes road bridge study

Bob,

McFarland Johnson Consulting Engineers is doing a scoping study on the Gentes Road Bridge. As part of their analysis, their engineer, Darren Benoit, has asked for any traffic counts and any accident history in the vicinity of the bridge.

I have taken care of the traffic counts but if you could send him the accident history direct that would be helpful. It can include anything in the general vicinity -- VT2A near the bridge, the bridge itself, Gentes Road, Lamore Road. Whatever information you have would be helpful. You can send it to him at dbenoit@mjinc.com. Thanks.

Dennis
RESOURCE RELATED INFORMATION
I have reviewed the Department’s database for potential impacts to rare, threatened, and endangered species and significant natural communities for the following projects:

- Huntington Bridge 8, Huntington
- Huntington Bridge 10, Huntington
- Gentes Road Bridge, Essex

A search reveals none of these resources mapped in the vicinity of the project areas. Please contact me if you have any questions.

Everett Marshall
Vermont Fish & Wildlife Department
103 South Main St.
Waterbury VT 05671-0501
Tel: 802-241-3715; Fax: 802-241-3295
http://www.vtfishandwildlife.com/wildlife_nongame.cfm
http://www.vtfishandwildlife.com/nnhp_RegulationReview.cfm

---

Dear Everett,

McFarland-Johnson, Inc. is performing studies in support of three bridge rehabilitation projects in Vermont. We request your assistance in identifying the presence of known significant natural communities or rare, threatened, or endangered animal or plant species within the study areas shown on the attached maps. The maps include information available on the VT GIS website that provide locations of deer wintering habitat and rare, threatened, and endangered species.

The project involves the rehabilitation or reconstruction of three bridges; a bridge in Essex that crosses a rail line, a town-owned bridge (Bridge 8) in Huntington that crosses Cobb Brook, and a town owned bridge (Bridge 10) that crosses the Huntington River in Huntington. We have not developed design alternatives yet. We are collecting baseline resource information to determine what constraints exist to guide the development of alternatives.

Thank you for your time and consideration of this request. If you have any questions, please contact me at (603)225-2978.

Vicki Chase
Environmental Analyst

McFarland-Johnson, Inc.
53 Regional Drive
Concord, NH 03301
Prime Agricultural Soils

NPSL
Prime
Statewide

1 inch = 200 feet
FEMA Map
Town of Essex, Vermont
Chittenden County
Community Panel Number
500034 0013 B
January 16, 1981

1 inch = 200 feet

Project Location

CCMPO
ESSEX, VT

SCALE : DATE : FIGURE :
AS SHOWN FEBRUARY 2010 WILDLIFE

GENTES ROAD
Legend

- Precontact and Historic sensitivity
- Historic sensitivity

Archaeological sensitivity derived from Archaeological resource Assessment, Hartgen Archaeological Associates, July 2009

1 inch = 100 feet

Project Location
July 20, 2009

Scott Newman  
Vermont Agency of Transportation  
Technical Services Division  
National Life Building  
Montpelier, Vermont  05602-0501

Re: Gentes Road Bridge  
Essex, Vermont  
CMPO  
Historic Resource Identification

Dear Mr. Newman,

This Historic Resource Identification Report will assist the Town of Essex, the Chittenden County Municipal Planning Organization, the Vermont Agency of Transportation (VTrans), and the Federal Highway Administration (FHWA) with compliance under Section 106 of the National Historic Preservation Act. Project review has been conducted according to the standards set forth in 36 C.F.R., regulations established by the Advisory Council on Historic Preservation to implement Section 106. The purpose of this report is to identify historic buildings, structures, districts, landscapes and settings that may be affected by this project. A final clearance letter for Section 106 will be drafted by VTrans.

INTRODUCTION

The purpose of this letter report is to identify historic resources listed on or eligible for listing on the National Register of Historic Places (NR) within the project’s Area of Potential Effect (APE), “the geographic area within which the project may cause changes to the character of or the use of the historic properties” [36CFR 800.2(c)]. The determination of National Register eligibility follows the guidelines established in National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation, published by the National Park Service.

The report will also provide an opinion of the potential effect of the project on historic resources, and include recommendations for possible mitigation for any potential adverse effect as needed. The report has been prepared for McFarland-Johnson, Inc., Concord, New Hampshire. Archaeological review will be conducted by Hartgen Archaeological Associates, Inc. National Register and Vermont State Register (SR) files were reviewed.
to identify listed sites located within the project area. A site visit was made on June 10, 2009, at which time photographs were taken.

PROJECT DESCRIPTION

The scope of the project to rehabilitate or replace the bridge that carries Gentes Road over the New England Central Railroad has not bee determined. For the purpose of this historic resource identification report the project area has been defined as along VT 2A from the intersection of VT 289 to 500' north of the Gentes Road intersection; Gentes Road from VT 2A to 500' north of the intersection with Lamore Road, Lamore Road from Gentes road to 500' east of the intersection and the railroad corridor 500' north and south of the bridge.

The existing bridge was constructed in 1910. The original abutments, concrete “gravity type” retaining walls, are still in place. The original deck was replaced in 1990 with pre-casted bridge planks bearing on new concrete caps over the original concrete bridge seats. Contemporary W-beam rails were installed at the same time.

In 2006 an engineering letter report prepared by McFarland-Johnson indicated that there is significant spalling on the east abutment just below the bearing for the bridge structure. The spalling was at least 12” deep at the NE corner of the east abutment at the time. In addition, the east end wall behind the bridge seat on the SE corner of the east abutment is tilting back away from the bridge seat. The west abutment also shows some deterioration but to a much lesser extend than the east abutment.

The engineering report also states that the abutments appeared to be adequately supporting the bridge at the time but expressed concern over continued spalling and delaminating and recommended that the progress of the deteriorating be closely monitored.

It appears that excavation to establish the necessary grade for trains occurred in the vicinity of Gentes Road/Route 2A when the track was laid, but despite the re-grading, the bridge is elevated above the level of Gentes Road as it passes over the tracks. Because of the elevation difference and the short distance from the west end of the bridge and the intersection with Route 2A westbound traffic on Gentes Road must come to a stop on a slight downhill slope. Gentes Road also intersects VT Route 2A at an angle from the northeast and Route 2A bends to the west just north of the intersection, thus impacting the ability of drivers’ entering VT 2A to easily see eastbound traffic.

On the east end of the bridge, Gentes Road immediately bends to the north as it drops from the elevation of the bridge and continues north parallel to the tracks. Lamore Road Ts into the east side of Gentes Road in the middle of the bend. Southbound traffic on Gentes Road cannot see onto the bridge because of its elevation and because of the sharp bend in the road at the east end of the bridge. The bridge is also narrow so that cars traveling either direction apparently frequently elect to stop and wait till opposing traffic has crossed. See attached Site Plan.
DESCRIPTION OF THE RESOURCES

**Gentes Road Bridge** over the New England Central RR. The single span bridge was constructed in 1910. The original abutments, concrete “gravity type” retaining walls, are in place but the original bridge deck has been replaced with a pre-caste concrete deck. The original railings have been replaced with contemporary W-beams.

**New England Central Railroad Corridor**
The New England Central Railroad is the successor to the Vermont Central Railroad. The Vermont Central Railroad was chartered in 1843 to run from Windsor through Montpelier to Burlington. The first section of line was completed to Bethel in 1848 and reached Burlington in 1949. The historic rail bed in the vicinity of Gentes Road is apparently in tact but the 1910 bridge that carries Gentes Road over the tracks has been altered. In addition, there are no features historically associated with rail service, such as freight houses, or building and structures dependent on rail service, such as manufacturing, immediately adjacent to the tracks in the project area.

**State Register 0405-4. The Baker House**
The brick house located between Gentes Road and Lamore Road on the east side of the bridge was individually listed on the Vermont State Register in 1976. The form and massing of the brick main block, which is highlighted by the corbelled fascia bands on all elevations, are intact. When the house was listed on the State Register, it had 1/1 wood window sash that were not original to the building but were representative of the Colonial Revival period and therefore historic. The gable-roofed front door hood, supported on round stylized Doric columns and the concrete stoop are also shown in the 1976 State Register photo but the design of the door hood suggests that it does not date from the Colonial Revival period. Similarly the detailing at the tops of the columns does not appear to be historic. Although the photo is a bit unclear, the historic front door does not appear to be in place. The small shed-roofed front and covered porch on the south gable end were also in place when the property was listed on the State Register but these elements also do not appear to be historic, despite the presence of historic four-panel doors in the west and east elevations of the wing. The front entry door hood and concrete stoop, side porch and shed wing are clearly not part of the original c.1846 construction date but did not seriously compromise the architectural integrity of the house when it was listed on the State Register in 1976.

Since it was listed on the State Register, several addition changes have occurred that do compromise its historic integrity. These include new 6/1 replacement sash that appear to have snap-in muntins, construction of a very large, exterior fieldstone chimney on the north gable end that replaced the simple brick chimney that existed in 1976, and the introduction of two skylights on each roof slope of the main block.

**Small Gable-front Camp or Cottage**
The small house or camp is located on the west side of Gentes Road, just as the road begins to bend to the west, north of the Gentes Road Bridge. The single-story gable-front house is set back a bit from the road and is easily missed as vegetation has grown up in
front of the vacant building. The 3 x 2 bay main block is sheathed with clapboards. The centered front door is covered by a Colonial Revival style door hood that is supported on simple wooden brackets. The door hood is a much better example of the feature than the one seen on the Baker House (SR 0405-4). The camp’s front door is apparently missing. A wooden screen door hangs in the opening. All windows are filled with 2/2 sash. Rafter tails are exposed on the eave elevations. An exterior concrete block chimney has been constructed against the north elevation of the main block and the roof of a rear wing is visible behind the vegetation. The house is not listed on the National Register or the State Register but the exposed rafter tails, 2/2 sash and Colonial Revival period door hood suggest that it was constructed c.1890 – c.1920.

Convenience Store/Mobile Station
The convenience store/Mobile Station on the west side of Route A2, immediately south of the intersection with Gentes Road is not listed on the State or National Register. The form, massing and proportional relationship of the width and height of the walls suggest that the gable-roof main block of the complex may have been constructed c. 1900. Some of the material seen in the boxed eaves is old and worn. Eaves of utilitarian buildings were commonly boxed in the late 19th/early 20th centuries. A non-historic exterior brick chimney and several large non-historic additions have been added to the original main block.

Yellow House on the south side of Lamore Road
This house consists of an eave front gable-roofed main block and a gable roofed wing. Despite the existence of a Colonial Revival style-referenced porch on the front (west) elevation of the main block, all the exterior materials on the building are contemporary.

Three buildings on the west side of Vermont Route 2A
Equipment Rental Business – this large building is immediately south of the small, c.1900 camp. House – the house is located between the equipment rental building and the complex of buildings that appears to be a lumber or supply business. Supply Business – this complex of buildings is located between the house and the road to the Essex Drop-off-center. Each of these three buildings is less than fifty years old.

EVALUATION OF ELIGIBILITY TO THE NATIONAL REGISTER

Gentes Road Bridge
The bridge was constructed in 1910 and has therefore gained sufficient age to be considered for eligibility for listing on the National Register. The original deck and railing system has been replaced with contemporary materials so that the bridge has lost its architectural integrity. It therefore does not appear to be eligible for the National Register.
New England Central Railroad
The corridor of the New England Central Railroad, formerly the Vermont Central Railroad was constructed in 1848-49 and therefore is potentially eligible for listing on the National Register as a linear historic district. The research required to determine the eligibility of the rail corridor is beyond the scope of this project but the section of the rail line in the project area does not appear to possess sufficient historic features to be considered as contributing. In addition, the widening and construction of new roads including the Circumferential Highway immediately east of the project area and the construction of numerous non-historic buildings and structures has seriously compromised the historic context of the rail corridor in the vicinity of Gentes Road.

State Register 0405-4. The Baker House
State Register # 0405-4, the Baker House, was listed on the Vermont State Register in 1976. At that time, the non-historic alterations to the building did not seriously compromise its historic architectural integrity. Although the house is well-maintained and remains legible as a mid-19th century brick building, the changes made to it since 1976 are significant. These include the loss of historic sash windows and the addition of a large exterior fieldstone chimney and skylights on both slopes of the main roof. The State Register form does not indicate that the house included a dormer so it is assumed that the shed-roofed dormer on the rear elevation was also added after 1976. Therefore, the cumulative effect of the various non-historic alterations sufficiently impacts the house so that it can not be considered as individually eligible for listing on the National Register. It is possible that the house could be considered as contributing to a historic district.

Small Gable-front Camp or Cottage
The small house appears to be in Poor condition and lacks sufficient architectural distinction to be considered as individually eligible for the National Register. It is quite possible that the building could be considered as contributing to a district that included other similar structures.

Convenience Store/Mobile Station
The store is not eligible to the National Register due to numerous exterior and interior alterations and the construction of large, incompatible additions.

Yellow House on the south side of Lamore Road
The house appears to be less than 50 years old and is therefore not eligible for listing on the National Register or the Vermont State Register.

Three buildings on the west side of Vermont Route 2A
Each of the three buildings is less than 50 years old and is not eligible for listing on the National Register or the Vermont State Register.
POTENTIAL EFFECTS

No properties listed on or eligible for listing on the National Register were identified within the project area. Therefore, although the details of the project to repair or replace the Gentes Road Bridge have not been determined, it appears that the project will have No Adverse Effect on historic resources.

Please let me know if you need additional information. If the Vermont Agency of Transportation concurs with this determination, please sign on the line provided below.

Thank you.

Sincerely,

Mary Jo Llewellyn
Historic Preservation Consultant

CONCUR:

Scott Newman, VAOT Historic Preservation Coordinator

Date

cc: Darren Benoit, McFarland-Johnson, Inc.

Attachments:

Vermont Town Highway Map, Essex, Vermont
Site Plan
Photo 1 – 28

Bibliography


Vermont State Register of Historic Places, Essex, Vermont. On file at the Vermont
Photo 1. Gentes Road Bridge, Essex, Vermont. View N, showing the intersection of VT Route 2A and VT 289. The project area extends from this intersection north along 2A for approximately 2/10 mile. Gentes Road Y's into the east side of VT 2A north of the Mobil Station.

Photo 2. View NE, showing the intersection of VT 2A and Gentes Road. The Gentes Road Bridge crosses the tracks of New England Central Railroad. The bridge was constructed in 1910. The bridge deck was replaced in 1990.
Photo 3. View E, showing VT 2A and Gentes Road. The elevation of the bridge is higher than the elevation of Gentes Road as it passes over the RR tracks. Traffic must drop down and come to a stop at VT 2A immediately after crossing the bridge. The angled intersection impacts visibility for traffic turning south on VT 2A from Gentes Road.

Photo 4. View N, showing VT 2A immediately north of Gentes Road and the northern end of the project area. The small house shown in Photo 5 below is located just north of the advertising sign and chain link fence on the west side of VT 2A.
Photo 5. View W. This house, located on the west side of VT 2A, approximately .1 mile north of Gentes Road appears to be over 50 years old but is not listed on the Vermont State Register. Although the house might be NR eligible as part of a historic district, it does not appear to be individually eligible.

Photo 6. This contemporary commercial building on the west side of VT 2 just north of Gentes Road is not historic.
Photo 7. This house on the west side of VT 2A, opposite the intersection of Gentes Road is less that 50 years old and is not historic.

Photo 8. This complex of commercial buildings is located on the west side of VT 2A, opposite the intersection of Gentes Road. The complex is not historic.
Photo 9. View S, showing VT 2A and the intersection of Gentes road on the right, just behind the cyclist. The VT 289 intersection is visible in the distance.

Photo 10. View S, showing the intersection of VT 2A and Gentes Road. The traffic lights in the distance are located at the intersection of VT 2A and VT 289, the southern end of the project area. Note the roofline of the gable-roofed convenience store/ Mobil Station just south of Gentes Road.
Photo 11. View SE, showing the intersection of Gentes Road and VT 2A. The grade of Gentes Road drops down from the elevated bridge to the level of VT 2A so that traffic existing Gentes Road must stop at the bottom of this short descending grade. The central building core of the service station complex south of the intersection appears to be over 50 years old but is not listed on the SR and does not appear NR eligible.

Photo 12. View NE, showing the service station complex on the east side of VT 2A, south of Gentes Road. The gable-roofed central core of this building appears to date from the late 19th/early 20th century but does not appear to be NR eligible due to incompatible alterations and large non-historic additions.
Photo 13. View NE, showing the intersection of VT 2A, Gentes Road and the Gentes Road Bridge that
Passes over the tracks of the New England Central Railroad. Note the elevated grade of the bridge to
accommodate the height of the train cars.

Photo 14. View NE, showing the deck and east abutment of the Gentes Road Bridge. The bridge was
constructed in 1910. The original deck was replaced in 1990 with the present pre-caste concrete deck.
Photo 15. View SE, showing a portion of the deck and the east abutment of the Gentes Road Bridge as seen from VT 2A.

Photo 16. View NE, showing the east end of the Gentes Road Bridge. Gentes Road curves sharply to the north at the east end of the narrow bridge making the eastern approach to the bridge very tight. Lamore Road intersects the east side of Gentes Road in the middle of the curve.
Photo 17. View N, showing the intersection of Gentes Road (right) and Lamore Road (left) immediately east of the Gentes Road Bridge. The red house located between Gentes and Lamore Roads is listed on the Vermont State Register (SR# 0405-4).

Photo 18. View E, showing Gentes Road and the Baker House that was listed on the Vermont State Register in 1976. Since then, the skylights, exterior fieldstone chimney and 6/1 replacement sash have been added. The front door hood, columns and concrete porch are shown in the 1976 photo of the house.
Photo 19. View E, detail of the front elevation of SR # 0405-4. Note non-historic front door and 6/1 sash replacements. The detailing of the door hood suggests that it may not date from the Colonial Revival period.

Photo 20. View SE, showing front (west) and north gable end of the SR # 0405-4. Note skylights on front roof slope, non-historic exterior field stone chimney, replacement 6/1 sash.
Photo 21. View NW, showing rear (east) elevation of SR# Note skylights and non-historic dormer. The four-panel door may have been relocated to the shed-roofed wing/connector on the south gable end, non-historic garage.

Photo 22. View NE, showing front and south gable end of SR# 0405-4. The shed-roofed wing and porch are shown on the 1976 State Register photo but do not appear to be historic.
Photo 23. View E, looking east along Lamore Road from the intersection with Gentes Road. The house on the south side of Lamore Road is within the project’s APE.

Photo 24. View SE, showing the house on the south side of Lamore Road east of the bridge. The house appears to have been constructed fairly recently and is therefore not historic. All the visible exterior materials appear to be new.
Photo 25. View S, looking from Gentes Road towards the intersection with Lamore Road (left) and the sharp curve at the east approach to the Gentes Road Bridge (right). The elevation of the bridge makes it difficult to see traffic on the bridge from the stop sign on Gentes Road.

Photo 26. View W, showing Gentes road just west of the intersection with Lamore Road. Note that Gentes Road curves sharply to the west as it approaches the narrow bridge. West bound traffic on Gentes Road frequently elects to stop before entering the bridge to allow east bound traffic to cross the bridge.
Photo 27. View W, showing Gentes Road as it meets the east end of the bridge on a curve. The elevation of the bridge also makes it difficult to see traffic entering Gentes Road from VT 2A.

Photo 28. View NE, looking from the west side of VT 2A across the Gentes road Bridge. The elevated level of the bridge deck makes it difficult to see traffic approaching the bridge from the east.
To:
Darren Benoit
McFarland-Johnson, Inc.
53 Regional Drive
Concord, New Hampshire 03301

RE:
Archaeological Resource Assessment
Gentes Road Bridge
Town of Essex, Chittenden County, Vermont

Date: July 7, 2009       Job: V508-11

Enclosed please find the following items:

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</tbody>
</table>

These are transmitted as checked below:

__ For your approval  __ For review and comment
X  For your use       __ FOR BIDS DUE
__ As requested       

REMARKS: Hi Darren, Let me know if you want me to send a copy directly to the VTrans Archeologist.

SIGNED
ARCHEOLOGICAL RESOURCE ASSESSMENT
GENTES ROAD BRIDGE
TOWN OF ESSEX, CHITTENDEN COUNTY, VERMONT

(HAA V508-11)

Prepared for:

McFarland-Johnson, Inc.
53 Regional Drive
Concord, New Hampshire 03301

Prepared by:

Hartgen Archeological Associates, Inc.
Certified WBE/DBE
PO Box 81
Putney, Vermont 05346
Phone: (802)387-6020
Fax: (802)387-8524
Email: tjamison@hartgen.com
www.hartgen.com

AN ACRA MEMBER FIRM
www.acra-crm.org

July 2009
Dear Darren,

Hartgen Archeological Associates, Inc. (HAA, Inc.) recently conducted an Archeological Resource Assessment (ARA) for the proposed replacement of the Gentes Road bridge over the Central Vermont Railroad, located in the Town of Essex, Chittenden County, Vermont (Fig. 1). This letter report examines a broad area around the bridge that may be affected by the project. This area of potential effects (APE) includes (Fig. 2):

- VT Route 2A from the intersection of VT Route 289 to 500 feet (152 m) north of the Gentes Road intersection, 50 feet (15 m) from the east side of the road and 100 feet (30 m) from the west side of the road.
- Gentes Road from VT Route 2A to 500 feet (152 m) north of the Lamore Road intersection, 50 feet (15 m) from road on north side and west of bridge on south side, 75 feet (23 m) from road on south side east of bridge.
- Lamore Road from Gentes Road to 500 feet (152 m) east of the intersection, 50 feet (15 m) on each side.
- Central Vermont Railroad alignment, 500 feet (152 m) north and south of Gentes Road bridge.

**Archeological Resource Assessment**

The ARA provides information for determining the potential of the project to effect precontact and historic archeological deposits within the project area. The information in the ARA aids the developer in assessing cultural resource issues within specific portions of a project area prior to final development plans and scheduling. Based on the general findings of the ARA, recommendations are presented concerning potential affects to archeological resources within the project area. If potential for the presence of precontact or historic archeological sites is identified, a Phase I archeological survey of sensitive areas in the APE will have to be undertaken to determine effect, thus complying with Section 106 of the National Historic Preservation Act of 1966, as amended.
Project Area Location
(1948, Photorevised 1987
USGS Colchester and Essex Center
Vermont, 7.5' Topographic Quadrangle)

Figure 1
Project Plan
With Archeological Sensitivity Areas
Historic Structures, and Disturbances
(Base Map Provided by
McFarland - Johnson, Inc. June 2009)

Precontact & Historic
Archeologically
Sensitive

Historic
Archeologically
Sensitive

Figure 2
The site visit was conducted in warm and dry conditions. The results of the archeological assessment and recommendations are presented below.

**Project Description**

The project is proposed to replace the bridge over the Vermont Central Railroad. However, the project may involve development of alternative alignments for the bridge and adjacent roads (Colchester Road – Route 2A, Gentes Road and Lamore Road). The bridge is a recent reinforced concrete slab set on c. 1910 abutments. The bridge deck is in good condition, but the abutments are deteriorating. A steel Warren Pratt truss bridge that was listed on the Vermont Historic Sites and Structures Survey was formerly in this location and was removed sometime after April 1985 (VHSSS 0405-3).

**Background Research**

The project area is located in the northeastern Champlain Valley on the former delta of the Winooski River that formed when the Champlain Sea occupied the valley. The project area is located approximately 360 feet (110 m) above mean sea level and about 270 feet (82 m) above Lake Champlain. A small tributary of Indian Brook crosses the northeast corner of the APE about 5.6 miles (9 km) upstream from where Indian Brook empties into Lake Champlain. The soils of the APE include Adams and Windsor loamy sands and Munson and Raynham silty loams, formed in glaciolacustrine deposits (USDA 2009).

The bedrock geology of the immediate project area is the Skeels Corner slate and Mill River conglomerate that includes black slate, dolomite, sandstone and limestone. Immediately to the west is the Clarendon Springs, Ticonderoga and Rock River dolomite that includes quartz, sandstone and chert. Further west is the Shelburne, Whitehall and Strites Pond formation consisting of white marble, gray limestone and dolomite and the Cutting dolomite and Morgan Corner and Wallace Creek formations consisting of dolomite with calcareous sandstone at the base. Directly east of the project area is the Cheshire quartzite and the Fairfield Pond member of greenish quartzitic schist (Doll et al. 1961). Slate was used during the Archaic for groundstone tools, including finely formed projectile points. The Clarendon Springs chert and the Cheshire quartzite are known to have been widely used for precontact tools by Native American groups in the region. Dolomite and other bedrock materials located nearby may also have been utilized for groundstone tools. Therefore, the project area is located in close proximity to at least two sources of extensively utilized lithic raw material.

Documentary and map research was conducted at the Vermont Historical Library and the Vermont Division for Historic Preservation (VDHP). Research at the VDHP entailed examination of:
- Archeological and cultural resource reports within the project vicinity;
- Archeological site file search for recorded sites within or adjacent to the APE;
National Register (NR) listed archeological sites and standing structures or historic districts located within or adjacent to the APE;
- Archeological sites being considered for the NR;
- Town files for information on archeological sites and standing structures;
- Reference to *Burial Grounds of Vermont* for the existence of any cemeteries within or adjacent to the project area.

The primary archeological survey that has been conducted in the project vicinity is the extensive Chittenden County Circumferential Highway work that the University of Vermont conducted from 1983 to 2000. This project identified and investigated most of the known sites in the project vicinity.

**Precontact Sites and Sensitivity**

An examination of the archeological site files indicated that 15 precontact archeological sites are reported within a mile (1.6 km) of the project APE (Table 1). Four of these sites also have historic components. These sites range from the Early Archaic through the Late Woodland periods (c. 7000 BC to AD 1600). In addition, outside of the 1 mile radius from the APE there are many other precontact sites identified including a nearby Paleoindian site.

<table>
<thead>
<tr>
<th>VAI #</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>VT-CH-237</td>
<td>Late Archaic and Middle Woodland, points, debitage, calcined bone, FCR</td>
<td>335 m to S/SE</td>
</tr>
<tr>
<td>VT-CH-238</td>
<td>Late Archaic, flakes, hearths</td>
<td>305 m to S</td>
</tr>
<tr>
<td>VT-CH-243</td>
<td>Middle Woodland, point, flakes, FCR</td>
<td>213 m to S</td>
</tr>
<tr>
<td>VT-CH-492</td>
<td>Unknown precontact</td>
<td>549 m to SW</td>
</tr>
<tr>
<td>VT-CH-493</td>
<td>Late Archaic projectile point, flakes</td>
<td>1.5 km to SE</td>
</tr>
<tr>
<td>VT-CH-494</td>
<td>Early Archaic and Middle Woodland, points</td>
<td>884 m to SW</td>
</tr>
<tr>
<td>VT-CH-495</td>
<td>Late Archaic, Early and Late Woodland, points, features</td>
<td>1 km to SW</td>
</tr>
<tr>
<td>VT-CH-497</td>
<td>Middle Woodland, point</td>
<td>1.2 km to SW</td>
</tr>
<tr>
<td>VT-CH-500</td>
<td>Unknown precontact, flakes</td>
<td>518 m to SW</td>
</tr>
<tr>
<td>VT-CH-501</td>
<td>Unknown precontact</td>
<td>488 m to SW</td>
</tr>
<tr>
<td>VT-CH-502</td>
<td>Late Archaic, points, flakes, biface</td>
<td>427 m to S/SE</td>
</tr>
<tr>
<td>VT-CH-612</td>
<td>Unknown precontact, flakes</td>
<td>853 m to W</td>
</tr>
<tr>
<td>VT-CH-613</td>
<td>Early and Late Archaic, points</td>
<td>732 m to W</td>
</tr>
</tbody>
</table>

The VDHP Precontact Site Predictive Model Form produced a rating of 36, resulting in a designation of archeological sensitivity for the project area (attached). This rating is primarily based on the APE’s location adjacent to a tributary of Indian Brook and the presence of numerous precontact sites in the project vicinity. However, substantial disturbance in portions of the APE reduce the potential for precontact sites in the APE to remain intact. The VDHP ArcheoMap website shows up to four sensitivity factors present in parts of the APE.

Judging by the known sites in the area, the kinds of sites that may be present in the APE would likely be small hunting camps and processing stations related to localized resources.
**Archeological Resource Assessment, Gentes Road Bridge, Town of Essex, Chittenden Co.**

6

**Historic Sites and Sensitivity**

**National Register of Historic Places**

There are no National Register (NR) listed sites within the project area. The only NR property in the Town of Essex is the Essex Junction Downtown Historic District, located 1.9 miles (3 km) to the south/southeast of the project area.

**Vermont Historic Site and Structure Survey**

There are four Vermont Historic Site and Structure Survey (VHSSS) listed properties within a mile (1.6 km) of the project area (Table 2). These properties include the c. 1845 Baker House located directly east of the bridge at the intersection of Gentes and Lamore Roads where there is potential for associated historic deposits to be located within the project APE. These structures indicate the period of settlement of the area; however, there is certainly potential for earlier sites to be located in the project area. Most of the early settlement in Essex took place along the Winooski River, but some early settlement may have occurred in the project vicinity as demonstrated by the archeological sites listed below.

<table>
<thead>
<tr>
<th>VHSSS#</th>
<th>Name</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>0405-1</td>
<td>Gregory House</td>
<td>c. 1845 center hall brick</td>
<td>1.2 km to SW</td>
</tr>
<tr>
<td>0405-2</td>
<td>R. A. Parizo House</td>
<td>c. 1840/1900 farm house</td>
<td>427 m to S</td>
</tr>
<tr>
<td>0405-4</td>
<td>Baker House</td>
<td>c. 1845 vernacular brick</td>
<td>61 m to E</td>
</tr>
<tr>
<td>0405-5</td>
<td>Gentes House</td>
<td>c. 1845 Greek Revival</td>
<td>1.1 km to N</td>
</tr>
</tbody>
</table>

**Historic Archeological Sites**

There are six recorded historic archeological sites located within a mile (1.6 km) radius of the project area (Table 3). These sites in the project vicinity reveal the agricultural, residential and some industrial use of the area during the 19th century. One of the historic sites is an early 19th-century earthfast structure that did not appear in the documentary record (Sloma 1992).

<table>
<thead>
<tr>
<th>VAI#</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>VT-CH-491</td>
<td>Early 19th-century earthfast structures</td>
<td>655 m to SW</td>
</tr>
<tr>
<td>VT-CH-492</td>
<td>Historic deposits</td>
<td>549 m to SW</td>
</tr>
<tr>
<td>VT-CH-493</td>
<td>Early 19th-century artifacts, foundation and rock pile</td>
<td>1.5 km to SE</td>
</tr>
<tr>
<td>VT-CH-497</td>
<td>Historic deposits</td>
<td>1.2 km to SW</td>
</tr>
<tr>
<td>VT-CH-498</td>
<td>19th-century grist mill and saw mill</td>
<td>700 m to SW</td>
</tr>
<tr>
<td>VT-CH-500</td>
<td>19th-century farm dump</td>
<td>518 m to SW</td>
</tr>
</tbody>
</table>

**Hartgen Archeological Associates, Inc.**

July 2009
Historic Maps

A review of historic maps of the project area was conducted to attain an overview of the historical landscape within the project area. The 1857 Walling map (Fig. 3) and the 1869 Beers atlas (Fig. 4) depict the project area with houses and businesses labeled. The two maps appear almost identical with the exception of different names associated with the structures. They depict the road alignments with the Central Vermont Railroad passing through the project area. At the time, what is now Colchester Road (Route 2A) extended into the south end of the APE but did not continue north on its current alignment. Rather, it crossed the railroad at the project area and continued north along the east side of the tracks. That road is currently called Gentes Road, a name applied in the 1950s (Clapp 2001). The jog in the road alignment shown on the maps suggests it may have been redesigned when the railroad was constructed to create a perpendicular, possibly at grade, crossing. Since the 19th century, the railroad grade has probably been improved by cutting it down to level it, causing the road crossing to develop into a bridge over the tracks.

Structures shown on the 19th-century maps in the project vicinity include the standing c. 1845 Baker House (0405-4) that is labeled J. Waught in 1857 and J. Varney in 1869. Also on the maps is a structure in the vicinity of Bob’s Auto Service immediately south of the bridge, labeled H. White in 1857 and A. Periso in 1869. No other historic structures are depicted on those maps in the immediate project vicinity. However, there is certainly potential for historic archeological sites to be located within undisturbed portions of the project area as evidenced by VT-CH-491, an historic site identified a short distance southwest of the project area that did not appear on any maps or in any historic records examined (Sloma 1992). The only non-residential structures shown on the 19th-century maps are a lamp black factory on Gentes Road north of the APE, a grist mill southwest of the APE and a school south of the APE.

The historic sensitivity of the project area is considered to be high in certain portions of the APE adjacent to the Baker House and in undisturbed areas around Bob’s Auto Service.

Site Visit

A site visit was conducted on April 23, 2009 in cool and overcast conditions. The project area was examined to assess the potential for intact archeological deposits to be present in the project APE. Figure 2 illustrates areas of archeological sensitivity and disturbance. Photographs characterizing the area and soil cores to determine areas of disturbance were taken at this time. The project area can be divided into four quadrants extending from the bridge and the west side of Colchester Road (Route 2A).
Beginning south of the Route 289 exit ramp, there is a large embankment that clearly indicates the area east of Colchester Road has been disturbed. However, to the north, between the exit ramp and Bob's Auto Service is a small area that appears to be intact. A soil core encountered natural stratigraphy of 40 cm of dark brown sand over 20 cm of dark yellow brown sand and yellowish brown sand subsoil (Fig. 5). Most of the southwest quadrant of the APE, including Bob's Auto Service, however, is disturbed due to the construction and activity around the existing gas station and auto repair business (Fig. 6). However, that disturbance may be shallow and 19th-century features may be present under the disturbed surface around those structures. The APE in this area is immediately adjacent to the roadside and has been substantially disturbed, so is unlikely to retain historic deposits or features.
The southwest quadrant of the APE is an area that extends south along the railroad alignment and east along Lamore Road (Fig. 7). The integrity of this area is uncertain. It is approximately the same elevation as the southwest quadrant, but a soil core encountered 40 cm (16 in) of very dark brown sand. The soil core could not penetrate below the sand due to gravel or some other obstruction. Similar stratigraphy was encountered in the northwest quadrant of the APE where a soil core encountered 50 cm (20 in) of dark brown sand over a gravelly obstruction. These soils are not the natural stratigraphy expected for the area. However, they may not be significantly disturbed or may be a created landform related to the railroad. In either case, there is potential for significant historic archeological deposits to be present in both areas.
**Figure 5.** Southern end of APE from Bob's Service Station. Note undisturbed lawn to the left, ditch in the foreground and embankment of VT Route 289 in the background. View to the south.

**Figure 6.** Bob's Service Station. Note disturbance around the store and bridge to the left. View to the east.
Figure 7. Possible man-made landform southeast of bridge. Note Lamore Road in the foreground and Bridge #8 in the upper right. View to the southwest.

The northeast quadrant of the bridge is bisected by Gentes Road as it heads north along the east side of the railroad tracks. The narrow area between the road and tracks is sloped and disturbed by the cutting of the railroad alignment. On the opposite side of the road is the c. 1845 Baker House. Although the house has been altered, there is potential for intact archeological deposits associated with the house or with precontact use of the landform along the small brook that passes east of the house (Fig. 8). East along Lamore Road, both sides of the road are considered sensitive for precontact archeological deposits due to the presence of the small brook at the eastern extreme of the APE. A soil core south of Lamore Road encountered 50 cm (20 in) of dark brown sandy silt over 50 cm (20 in) of yellowish brown silty sand, suggesting the area is undisturbed. Historic archeological potential is considered to be low in this area.
The west side of Colchester Road (Route 2A) has undergone substantial disturbance in recent years due to development of several properties. However, there remain some locations that have archeological potential. At the northern end of the APE a small cottage is standing abandoned (Fig. 9). The cottage is an early 20th-century one-story wood-framed vernacular residence. A soil core in front of the cottage encountered 40 cm (16 in) of dark brown sand over yellowish brown sand, suggesting intact soils and archeological sensitivity. To the south there are three properties that have been heavily disturbed by grading and drainage ditching to Landfill Lane. Soil cores at the north end of this area encountered 10 cm (4 in) of dark brown silty loam over 30 cm (12 in) of dark yellowish brown silty sand with clay mottling over hard silty clay. In the southern end of this area soil cores encountered 10 cm (4 in) of dark brown silty loam over compact gravel. In both areas the cores and surrounding landscape indicate grading associated with construction on the associated properties (Fig. 10). A portion of the area south of Landfill Lane was tested in 1984 as part of the Circumferential Highway survey (Thomas and Florentin 2002:223). However, most of it was not tested and is considered sensitive for precontact and possible historic archeological deposits.
Figure 9. Cottage at northwest corner of the APE, c. 1915-1930. The surrounding yard area may contain significant archeological deposits. View to the west/southwest.

Figure 10. Areas of disturbance along west side of Colchester Road (Route 2A). View to the west/northwest.
Summary

The historic archeological sensitivity of the project area is moderate due to the presence of two 19th-century residences and the potential for associated deposits in the vicinity of each. Although the Baker House has been substantially modified, the surrounding yard areas may retain intact 19th-century deposits and features. The vicinity of Bob's Auto Service has been disturbed on the surface, but there may be intact deposits and features below that disturbance. The areas directly west of the bridge have been heavily disturbed by grading and ditching. The soils in the northwest and southeast quadrants of the APE are of uncertain origin and may be created landforms related to construction of the railroad in the 19th century. As such, they have a low to moderate potential to retain significant historic archeology deposits or features.

The precontact sensitivity of the general project vicinity is high because of its location adjacent to an unnamed brook and numerous known sites in the vicinity. There is potential for intact subsurface deposits in undisturbed portions of the APE such as around the Baker House in the northeast quadrant, along Lamore Road to the east and south of Bob's Auto Service in the southwest quadrant, as well as to the southwest along the west side of Colchester Road.

Recommendations

The origin of the soils in the southeast and northwest quadrants of the bridge is unknown. Documentation of disturbance in these areas has not been encountered. However, monitoring wells of some sort are present in the southeast quadrant and may indicate significant disturbance. If so, that area would be ideal for staging for the project. Lacking such documentation, however, limited Phase IB testing is recommended for portions of the APE identified on Figure 2 as archeologically sensitive that can not be avoided by the project. If these areas can be avoided during construction, no further archeological review is recommended for the APE as depicted on Figure 2. If other areas are considered for disturbance, further review may be necessary.

Sincerely,

[Signature]

Thomas R. Jamison, Ph.D., RPA
Project Manager

Attachments: Bibliography
VDHP Predictive Model

Bibliography

Beers, Frederick W.  

Clapp, George  

Doll, Charles G., Wallace M. Cady, James B. Thompson, Jr. and Marland P. Billings  

Hyde, Arthur L., and Frances P. Hyde (editors)  

Sloma, Robert  

Thomas, Peter A., and Robert Florentin  
2002 *Selected Phase 1 Survey, Phase 2 Site Evaluations and Phase 3 Data Recovery for Prehistoric Archaeological Sites within the Revised Section F (Routes 15-2A) Alignment, Central Vermont Railroad Wetland Replacement Area, and the Susie Wilson Road Bypass, Chittenden County Circumferential Highway, Essex, Vermont.* UVM-CAP Report No. 202, on file at the Vermont Division for Historic Preservation, Montpelier.

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United States Geological Survey (USGS)  
1948/1987 *Colchester, Vermont 7.5' USGS Quadrangle.* Reston, VA.  
1948/1987 *Essex, Vermont 7.5' USGS Quadrangle.* Reston, VA.
Walling, H. F.
1857  *Map of Chittenden County, Vermont.* Published by Baker and Tilden, New York.
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<th>Value</th>
<th>Assigned Score</th>
<th>Field Inspection Comments</th>
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<td>1) Proximity to Rivers and Permanent Streams</td>
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<tr>
<td>2) Proximity to Intermittent Streams</td>
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<td>12</td>
<td></td>
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<td>7) Major Floodplain - Alluvial Terrace</td>
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<td>8) Knoll or Swamp Island</td>
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<td>9) Stable Riverine Island</td>
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<td>B. Lakes and Ponds</td>
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<td>10) Proximity to Pond or Lake</td>
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<td></td>
<td>90-180 m</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11) Proximity to Stream-Waterbody Confluences</td>
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<td>Layer 4: Proximity to Stream-Waterbody Confluences (0-180 m)</td>
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<tr>
<td></td>
<td>90-180 m</td>
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<tr>
<td>12) Lake Coves, Peninsulas, and Bayheads</td>
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<tr>
<td></td>
<td>90-180 m</td>
<td>6</td>
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<tr>
<td>C. Wetlands</td>
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</tr>
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<td>13) Proximity to Wetlands*</td>
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<td>Layer 3: Proximity to Wetlands (0-180 m)</td>
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<td>90-180 m</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14) Knoll or Swamp Island</td>
<td></td>
<td>32</td>
<td></td>
<td>Layer 3: Proximity to Wetlands (0-180 m)</td>
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<td>D. Valley edge and Glacial Landforms</td>
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<td>Environmental Predictive Model</td>
<td>ArcheoMapTool GIS Model</td>
<td>Field Inspection Comments</td>
<td></td>
<td></td>
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<td><strong>Value</strong></td>
<td><strong>Assigned Score</strong></td>
<td><strong>Variable</strong></td>
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<tr>
<td>15) High Elevated Landform (e.g. Knoll Top, Ridge Crest, Promontory)</td>
<td>12</td>
<td>See Landmarks (Info Layers) and catchment layers (Water-related Layers)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16) Valley Edge Features (e.g. Kame Outwash Terrace)</td>
<td>12</td>
<td>Layer 9 Glacial Outwash and Kame Terrace Soils</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17) Marine/Lake Delta Complexes</td>
<td>12</td>
<td>Layer 9 Glacial Outwash and Kame Terrace Soils Presence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18) Champlain Sea or Glacial Lake Shore Line**</td>
<td>12</td>
<td>Layer 8: Paleo Lake Soils Proximity (0-180 m)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**E. Other Environmental Factors**

| **Variable**                  | **Proximity** | **Value** | **Assigned Score** | **Variable** |
| 19) Caves and Rockshelters | 32 | - |
| 20) Natural Travel Corridors (e.g. Drainage Divides) | 12 | See Landmarks (Info Layers) and catchment layers (Water-related Layers) |

| **Variable**                  | **Proximity** | **Value** | **Assigned Score** | **Variable** |
| 21) Existing or Relict Springs | 0–90 m | 8 |
| 21) Existing or Relict Springs | 90–180 m | 4 |
| 22) Potential or Apparent Prehistoric Quarry for Lithic Material Procurement | 0–90 m | 8 | See Soils with "M" parent material (Under Construction) |
| 22) Potential or Apparent Prehistoric Quarry for Lithic Material Procurement | 90–180 m | 4 |
| 23) Special Environmental or Natural Area~ | 0–180 m | 32 | - |

**F. Other High Sensitivity Layers**

| **Variable**                  | **Proximity** | **Value** | **Assigned Score** | **Variable** |
| 24) High Likelihood of Burials | 32 | See VAI layer (Under Construction) |
| 25) High Recorded Archeological Site Density | 32 | See VAI layer (Under Construction) |
| 26) High likelihood of containing significant site based on recorded or archival data or oral tradition | 32 | See VAI layer (Under Construction) |
Environmental predictive model links wetlands to those > one acre in size, 3rd dimension.

- Such as million acres, mountain top, etc. (historically or physically scored or traditional site locations, other physiographic types).
- As evaluated by a qualified archaeological professional or engineer based on criteria and other data, such as a gravel pit, and so forth.

**Remains incompletely mapped:** digital layer includes paleo lakes and wetlands based on soils data.

| Field Inspection Comments |  |
|--------------------------|--
| **Environmental Predictive Model** |  |
| **Archeological Model/GIS Model** |  |
| **Field Inspection Comments** |  |

<table>
<thead>
<tr>
<th>Factor</th>
<th>Score</th>
<th>Proximity</th>
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<th>Spatial Model</th>
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<td>1. <strong>Field Inspection</strong></td>
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<td>2. <strong>Environmental Factors</strong></td>
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<td>3. <strong>Slope Layer (r) and Layers</strong></td>
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<td>4. <strong>Horizontal/Vertical Levels</strong></td>
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<td>5. <strong>Negative Factors</strong></td>
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<td>6. <strong>Previously Disputed Land</strong></td>
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<td>7. <strong>Excessive (&gt;20%) Slopes</strong></td>
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<td>8. <strong>Excessive (&gt;15%) of Steep</strong></td>
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<td>9. <strong>Other</strong></td>
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MEETING MINUTES
LOCAL CONCERNS MEETING MINUTES

DATE: November 19, 2009
LOCATION: Essex Fire Department

PROJECT: Gentes Road Bridge over NEC Railroad (MJ Ref 17288.01)

PRESENTERS

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Dennis Lutz</td>
<td>Town Engineer, Town of Essex</td>
</tr>
<tr>
<td>Christine Forde</td>
<td>Senior Transportation Planner, Chittenden County Metropolitan Planning Organization</td>
</tr>
<tr>
<td>Darren Benoit</td>
<td>Project Manager, McFarland-Johnson Inc.</td>
</tr>
<tr>
<td>Ron Joy</td>
<td>Structural Engineer, McFarland-Johnson Inc.</td>
</tr>
<tr>
<td>Brian Colburn</td>
<td>Highway Engineer, McFarland-Johnson Inc.</td>
</tr>
</tbody>
</table>

Dennis Lutz began the meeting by giving a brief presentation of the history of the Gentes Road bridge over the New England Central (NEC) Railroad. The original structure was constructed in 1910. This structure consisted of the abutments as they stand today with a metal pony truss with a wooden deck. The pony truss and wooden deck were replaced with the current voided concrete slab in 1990 by the Contractor who constructed the adjacent section of VT Route 289. In 2006, the Town began to notice advanced decay of the abutments and commissioned a study to provide recommendations. This study concluded that the abutments should be re-facing the existing concrete. This repair was estimated to cost $367,000 and the repairs were recommended to be completed in the next couple of years. Due to the significant cost of repair, the Town decided to prepare a scoping report to better understand the range of alternatives for repair or replacement of this bridge before moving ahead with any repairs.

Darren Benoit and Ron Joy then gave a presentation of the scoping report process, and the existing conditions of the bridge. Pictures showing the existing deck, abutments, as well as the roadway approaches were shown to describe some of the existing issues and deficiencies with the existing bridge. It was noted that the purpose of the Local Concerns Meeting was to gain information about the public’s views of the bridge and the issues/concerns they had with the existing condition and any improvements they would like to see. The meeting was then opened up to questions and comments from the public.

PUBLIC COMMENTS

- One member of the public indicated that he wanted the bridge repaired or replaced in place. An at-grade intersection with the railroad should not be considered as it is unsafe and would require the train to blow their horns in a residential area. If the bridge were removed, it would add 5 miles of travel to the residents in the area and this extra distance would be over dirt roads. It was also noted that this alternate route outlets onto the main road at a dangerous intersection.
CHITTENDEN COUNTY METROPOLITAN PLANNING ORGANIZATION       FINAL SCOPING REPORT
GENTES ROAD BRIDGE
BRIDGE NO. 20 OVER NEW ENGLAND CENTRAL RR

- It was also noted that the original deck structure was narrower than the current structure and there were minimal safety issues. Many residents indicated that the existing bridge width acts as a traffic calming device and they see this as a benefit. This narrow width should be preserved to maintain this traffic calming feature and limit speeds in the area.

- McFarland-Johnson noted that if the existing bridge width is maintained, any repairs would have to be financed exclusively by the Town since the bridge does not meet State and Federal standards. If the repairs to the bridge include widening the structure to meet these standards, State and Federal funds could be used to pay for the construction.

- Many residents stated that closing the bridge should not be considered as a viable option. It was noted that if the bridge were closed, response times for emergency services would increase substantially.

- It was further indicated that if any repairs or replacement options are to be evaluated, one-way traffic over the bridge should be maintained during any construction.

- Members of the public expressed concern over whether the superficial deterioration was all that was wrong with the abutments. Both the Town and McFarland-Johnson stated that additional deterioration of the abutments could be taking place where it is not visible. Additional testing would be needed to determine the extent of the repairs that would be needed.

- One member of the public noted that if the bridge deck is widened, the widening should occur immediately to the north of the existing structure so that the bridge will line up better with Lamore Road. McFarland Johnson noted that more box beams could be added to the structure to the north, but the existing abutment would have to be extended to support the new box beams.

- A member of the public noted that if the bridge was converted to one-way operation, traffic would back up onto Route 2A. This should be avoided due to the heavy traffic volumes on Route 2A.

- A question was asked about who would vote on the recommended alternative. The Town indicated that it was a decision that the Selectboard would ultimately make, but there is a lot of opportunity for public input throughout the Scoping Report process.

- A question was raised about the schedule of developing the alternatives and how often the bridge is being inspected. McFarland Johnson stated that the alternatives would be presented at another public meeting in 3 to 6 months. The Town indicated that the bridge is being inspected every two years by the State and the Town is doing their own visual inspection approximately at 6 month intervals. Subsequent to the meeting, it was determined that the inspections may have not been done on a periodic basis by the State. The Town will be working with the State to try and get an inspection done next summer by VTRANS staff.

- One member of the public stated that he does not feel safe having his daughters ride their bikes over the bridge. Other members added that the bridge is not comfortable to ride a bike over or walk over due to the narrow width, poor sight distance, and the low height of the guardrail.

- A member of the public asked if metal plate culverts would be viable at this location. McFarland-Johnson noted that most likely they would not since the railroad would be losing vertical and horizontal clearance. A member of the public noted that at another location near this bridge, the railroad did not allow a plate culvert.
There was discussion about the impact of future development. The Town noted that they would require any development to complete a traffic impact study to determine the impact of the development on the existing roadway network. The Town stated that as part of this process, the Town could require that the developer contribute some money to the repair or replacement of the existing bridge.

A member of the public asked if the Town should proceed with two design options. The first option would be to use Town funds and keep the bridge geometry as it currently exists. The second option would be to increase the width of the bridge to become eligible for Federal funds. The Town indicated that the purpose of the scoping report is to determine which option makes the most sense and move forward with a single design.

McFarland-Johnson noted that at the next public meeting they would present in more detail the alternatives for repair and replacement for the existing structure. After the Alternatives Presentation meeting, a preferred alternative would be recommended and presented to the Town Selectboard.

It was decided that the minutes from this meeting would be posted on the Town website.

Any person(s) who take exception to any statements in these minutes shall kindly notify the Preparer, in writing, within seven (7) days from the date of receipt of this report, stating in detail the correction or omission. Otherwise, this document shall be considered correct and final.

Respectfully submitted,

Brian Colburn, P.E.
McFarland Johnson, Inc.

cc: Attendees, File
DATE: May 11, 2010
LOCATION: Essex Fire Department

PROJECT: Gentes Road Bridge over NEC Railroad (MJ Ref 17288.01)

Attendees

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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</thead>
<tbody>
<tr>
<td>Aaron Martin</td>
<td>Town of Essex</td>
</tr>
<tr>
<td>Christine Forde</td>
<td>Senior Transportation Planner, Chittenden County Metropolitan Planning Organization</td>
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Along with approximately 20 citizens.

MJ began the meeting by giving a brief presentation of the history of the Gentes Road bridge over the New England Central (NEC) Railroad. The original structure was constructed in 1910. This structure consisted of the abutments as they stand today with a metal pony truss with a wooden deck. The pony truss and wooden deck were replaced with the current voided concrete slab in 1990 by the Contractor who constructed the adjacent section of VT Route 289. In 2006, the Town began to notice advanced decay of the abutments and commissioned a study to provide recommendations. This study concluded that the abutments should be repaired by re-facing the existing concrete. This repair was estimated to cost $367,000 and the repairs were recommended to be completed in the next couple of years. Due to the significant cost of repair, the Town decided to prepare a scoping report to better understand the range of alternatives for repair or replacement of this bridge before moving ahead with any repairs.

Darren Benoit and Ron Joy then gave a presentation of the scoping report process, and the existing conditions of the bridge. Pictures showing the existing deck, abutments, as well as the roadway approaches were shown to describe some of the existing issues and deficiencies with the existing bridge. The purpose and need statement was discussed and the proposed alternatives for the bridge were described.

The alternatives were broken into bridge repair alternatives and roadway reconfiguration options. The roadway alternatives included maintaining the existing geometry including the intersection with Lamore Road or realigning the roadway such that Lamore Road was aligned with the bridge and Gentes Road to the north would form a Tee intersection with the realigned road.

The bridge alternatives included:

- Alternative 1 which includes minor repairs to the deck, patching the existing abutments, and replacing the approach and bridge guard rail (no widening of the existing bridge).
- Alternative 2 which includes minor repairs to the deck, patching the existing abutments, widening the existing abutment adding width to the deck and replacing the approach and bridge guard rail.
- Alternative 3 which includes new integral abutments on piles, new steel beams, a new concrete deck, new approach and bridge railing, and patching of the existing abutment and wingwalls.

It was noted that for each bridge option either roadway alternative could be used.
The meeting was then opened up to questions and comments from the public.

There was discussion about how soon the bridge was expected to fail. The bridge is scheduled for inspection every two years. The information doesn’t suggest that bridge failure is imminent, but given the cost of a replacement structure it is important that a town be proactive planning for future replacement.

There was a question about kinking the alignment (rotating the bridge). This could potentially have greater impacts to adjacent properties if a significant kink was added to the alignment Minor rotation of the bridge would be considered during final design depending on whether it was decided to maintain the existing abutments. The Scoping report will include alternatives that were considered, but ultimately not progressed.

There was concern about speed if the intersection is corrected. Some thought that vehicles from Lamore Road would be more inclined to not stop or roll stop through the intersection with Gentes Road.

Many stated that a bridge should remain at this location or within the general corridor. There was a comment about using the at-grade intersection further north, but more citizens chimed in about sections of dirt road and their disapproval of eliminating the bridge.

There was discussion about local, state, and federal funding. It was noted that some funding options would be limited by not meeting state or federal design standards.

cc: Attendees
    File
PLANS
Alternative 1 – Existing Alignment

MAINTENANCE ALTERNATIVE

- INCLUDES STRUCTURAL ABUTMENT PATCHES OF SELECT AREAS BELOW BRIDGE SEATS
- INCLUDES AESTHETIC ABUTMENT PATCHES
- REMOVAL OF EXISTING BRIDGE RAIL
- NEW BRIDGE RAIL
Alternative 2A – Existing Alignment

NEW BRIDGE / RETAIN EXISTING ABUTMENT (RETAIMENT ONLY)

- INCLUDES NEW DECK
- INCLUDES NEW ABUTMENTS
- INCLUDES PATCHING OF EXISTING ABUTMENTS
- TOP OF EXISTING ABUTMENTS ARE CUT OFF TO NOT INTERFERE WITH NEW BRIDGE, BUT RETAINED TO SUPPORT EMBANKMENT
- INCLUDES APPROACH ROADWORK
- INCLUDES NEW BRIDGE RAIL, APPROACH RAIL AND GUARDRAIL WITH END UNITS
Alternative 2B – New Alignment East of Bridge

NEW BRIDGE / RETAIN EXISTING ABUTMENT
(RETAINMENT ONLY)

- INCLUDES NEW DECK
- INCLUDES NEW ABUTMENTS
- INCLUDES PATCHING OF EXISTING ABUTMENTS
- TOP OF EXISTING ABUTMENTS ARE CUT OFF TO NOT INTERFERE WITH NEW BRIDGE, BUT RETAINED TO SUPPORT EMBANKMENT
- INCLUDES ROAD REALIGNMENT
- INCLUDES NEW BRIDGE RAIL, APPROACH RAIL AND GUARDRAIL WITH END UNITS

LEGEND

EXISTING DRIVEWAYS
EXISTING ROADWAY
PROPOSED DRIVEWAY
PROPOSED ROADWAY
PROPOSED SHOULDERS
PROPOSED SLOPES
Alternative 3A - Existing Alignment

NEW BRIDGE / REMOVE EXISTING ABUTMENTS

- INCLUDES NEW DECK
- INCLUDES NEW ABUTMENTS
- INCLUDES NEW BRIDGE RAIL, APPROACH RAIL AND GUARDRAIL WITH END UNITS
- INCLUDES FULL REMOVAL OF EXISTING BRIDGE AND ABUTMENTS

LEGEND

- EXISTING DRIVEWAYS
- PROPOSED DRIVEWAY
- PROPOSED ROADWAY
- PROPOSED SHOULDERS
- PROPOSED SLOPES

AGRICULTURAL SOILS

POTENTIAL PREHISTORIC ARCHAEOLOGICAL RESOURCES

POTENTIAL HISTORIC ARCHAEOLOGICAL RESOURCES

NEW BRIDGE / REMOVE EXISTING ABUTMENTS

INCLUDES FULL REMOVAL OF EXISTING BRIDGE AND ABUTMENTS

APPROX. EXIST. R.O.W.

APPROX. EXIST. R.O.W.

APPROX. EXIST. R.O.W.

SLOPE IMPACTS

MAJ N E T I C
Alternative 3B – New Alignment East of Bridge

NEW BRIDGE / REMOVE EXISTING ABUTMENTS

- INCLUDES NEW DECK
- INCLUDES NEW ABUTMENTS
- INCLUDES NEW BRIDGE RAIL, APPROACH RAIL AND GUARDRAIL WITH END UNITS
- INCLUDES FULL REMOVAL OF EXISTING BRIDGE AND ABUTMENTS
- INCLUDES REALIGNMENT OF APPROACH ROADWAY